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**MINING TRANSNATIONAL CORPORATIONS
AND DEVELOPING NATIONS:
THE CASE OF GOLD IN THE 1990S**

A DISSERTATION SUBMITTED TO THE GRADUATE DIVISION OF THE
UNIVERSITY OF HAWAII IN PARTIAL FULFILLMENT
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By

James P. Rizer

Dissertation Committee

Robert B. Stauffer, Chairperson
Benedict J. Kerkvliet
Neal A. Milner
Carolyn M. Stephenson
Terence Wesley-Smith

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This dissertation is the conclusion to the process of earning a doctorate, which began with my entrance to the doctoral program 11 years ago. This lengthy time period is the result of having to work full time and my attempt to live as "normal" a life as possible. Over 11 years, there have been a number of personal events and transitions, which have caused digressions from my quest for a doctorate.

I would not have been able to complete the dissertation without the support and encouragement from my committee members. I would like to express my thanks and appreciation to all of them. In particular, I owe my chairperson, Dr. Robert Stauffer, considerable gratitude. Dr. Stauffer has provided guidance and valuable insights throughout these last 11 years. While his status as an emeritus professor clearly demonstrates his superior scholarship, I would also like to state that he is someone that I greatly admire as a person.

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ABSTRACT

The global economy has experienced considerable shocks, planned restructuring and unplanned evolution in the five decades following World War II. Dozens of nations have gained independence and new fields of study have been born. Large transnational corporations have emerged as the dominant force in the global economy, transcending geopolitical boundaries and the efforts of nations to control their profits and operations. Within this context, minerals-led developing nations have attempted to maximize or optimize the resource rents derived from their mining industries, which are often owned and operated by mining transnational corporations (MTNCs). The performance of minerals-led developing nations has generally not been positive.

This dissertation assesses the efforts of development theory and its applicability to developing nations with respect to mining transnational corporations, and, specifically, to the gold mining industry. The gold mining industry has experienced considerable evolution following the termination of the gold standard over two decades ago. Technological advancements in exploration and gold recovery have enabled the development of many new mines. Whereas gold used to be produced primarily in South Africa, the former U.S.S.R., Canada and the United States, gold is now being mined in a number of widely scattered developing nations. These new mines are a direct result of the rapid increase in the global demand for gold. Gold mining is one of the few mineral industries which will experience considerable growth during the 1990s.

Because the new gold mines have only been operating for the last several years, the dissertation discusses the policies and experiences of several minerals-led

developing nations during the 1960s, 1970s, and 1980s. Specific attention is given to the interaction between MTNCs, national governments, and local communities impacted by mining. The data suggest that MTNCs and the governments of developing nations establish several common objectives and mechanisms for communication. The data indicate that impacted local communities are excluded from this communication, and ultimately forced to bear most of the negative impacts of minerals development, while retaining limited levels of the economic surpluses.

The dissertation concludes that under present development scenarios, local communities should reject gold mining. Alternative strategies for minerals development which stress the inclusion of local communities in project planning and decision making, are also discussed.

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Chapter 1

INTRODUCTION

Introduction

This dissertation focuses on whether developing nations can effectively utilize the rents derived from the exploitation of their natural resources.

"Effective use" of minerals rents can be defined as the capability to reinvest these rents in order to accrue further economic surpluses or to develop other social and economic resources including but not limited to a trained workforce, community infrastructure, and physical infrastructure. Mineral resources, and specifically gold, provide the basis for the analysis. Because of technological, economic and geological factors, gold is an important metal for the global mining industry as well as for many nations. Moreover, because of increased demand gold mining's importance has markedly increased over the last two decades, a trend which is expected to continue through the 1990s. The dissertation concludes with policy recommendations aimed at facilitating the optimized use of mining rents.

This chapter's second section describes the issues to be addressed by the dissertation. The third section discusses the specific focus of the dissertation. The fourth section describes the organization of the dissertation.

The Problem of the Dissertation

Development as a process of social transformation has proved difficult to define, understand, and replicate in practical or applied terms. Since the study of

development was formalized roughly five decades ago, confusion and controversy have typified the debate over what actions and policies will facilitate strengthened economies and equitable living conditions for the citizenry of developing nations. Moreover, the debate does not appear to be progressing towards resolution as indicated by the current retreat by marxist-socialist nations and the apparent ascendancy of purporters of the "free market." This implies that developing nations will be expected by their financiers (industrialized nations and multilateral agencies) to participate in global transactions which are based on pro-growth policies, the same strategies which failed in earlier experiments. But life and the needs and aspirations of people and nations do not stop with debates. Rather, and regardless of their Sisyphean attempts at this elusive "development," developing nations push on.

Basic to understanding why development has proved so elusive requires consideration as to why some nations have more wealth than others and also what is the source of this wealth. While advocates of the "free market" will claim certain philosophical (and moral) origins of wealth, i.e., the unfettered interaction of supply and demand resulting in growing and distributable surpluses, historical evidence suggests otherwise. Although there are exceptions (e.g., Britain), the wealth of nations has generally been based on natural resources, including arable land, geographic location, topographic characteristics (e.g., hydro-power potential), and mineral resources.

However, possessing valuable natural resources is only part of the equation. As significant as natural endowment is how the resources are exploited. This is not a question of technology, although this can become important. Rather, the question of how resources are exploited is concerned with not only who exploits the resources, but more importantly how the surpluses or profits gained from their exploitation are distributed and then reinvested. In a global capitalist system, the accumulation of wealth to produce more wealth is fundamental to political power and economic survival.

Thus, Andre Gunder Frank (1978, **World Accumulation: 1492-1789**) and Immanuel Wallerstein (1974, **The Modern World System I**) have both described the role gold played in Portugal's and especially Spain's (mis)management of their colonies and their own economies. Frank shows that Spain financed its ascendancy to power and then subsequent high consumption levels for its ruling class through the expropriation of gold (and to a lesser degree, silver) from its Latin American colonies. Meanwhile, these colonies experienced "underdevelopment" as part of the same process, whereby the standards of living for the workforce at-large and non-monetized sectors deteriorated. Wallerstein discusses how this abundance of gold aided in Spain's decline and peripheralization. This occurred because imports became cheaper and domestic industries comparatively more expensive, which resulted in a loss of Spanish jobs. Hence, manufactures were purchased from the Netherlands and Britain, while domestic industry contracted. In other words, Spain's wealth was based on the

expropriation of natural resources from its colonies, and this wealth was then spent by its elite on personal consumption instead of being invested in the expansion of the Spanish economy. The result has been that Spain, until recently, has lagged far behind the rest of the industrialized nations and its former colonies are poor and underdeveloped relative to their wealth of natural resources.

Having made the assertion that natural resources play key roles in the accumulation of wealth for purposes of political and economic power, one must also ask how seemingly (and comparatively) resource-poor industrialized nations such as Japan, West Germany, and Great Britain have amassed their current levels of wealth and power. Although one could argue that their wealth has been acquired over a period of years and that it is based on wisely reinvested surpluses, there is also other evidence. Today, these nations obtain the natural resources of other nations in exchange for manufactured goods. Thus, Japan imports logs, fish, and minerals from the Philippines in exchange for cars and radios. However, it takes many fish to pay for a car and the price of fish fluctuates considerably while the price of a car is relatively fixed. This exchange then is not equal, and it has been unequal for many years.

Inherent to an unequal exchange is the notion of someone becoming "richer" and someone else "poorer." While the standards of living for much of the world's population have generally improved since the end of World War II, the industrialized nations and elites in all nations have fared far better than the developing nations and their workers. This type of unequal relationship follows

the schematics by dependency theorists which show the flow of resources from the periphery to the center within developing nations and then from developing nations to the center, or industrialized nations.

Within developing nations, there have also been unequal relationships, especially with respect to outlying rural areas and their interaction with the capital city. When a mining project is developed in a remote location which had most likely lacked infrastructure and services, the government and the mining transnational corporation present themselves as the benevolent providers of key benefits of development. However, evidence suggests that the local population is asked to bear most of the costs associated with minerals development. As a result, rural lifestyles are irreversibly altered and the population may not have experienced a material improvement in their living standards because of the outflow of mine-related wages to purchase food and other items which had previously been produced within the rural household (Australian Conservation Foundation, 1994:ii).

Perhaps more importantly, the local population has to live with considerable environmental disruption. It is worth noting that the Ok Tedi copper-gold mine in Papua New Guinea has caused the near "biological death" of 70 kilometers of the Ok Tedi River into which its tailings and waste rock are dumped (ibid.:i). The interesting point here is that the mine, which began operating in 1984, had been required to construct a tailings dam yet only began work on it in 1983. As a result, adequate slope stability tests were not conducted, and the dam

collapsed in 1984 (ibid.:6). The government, which is a shareholder in the project, then waived the environmental requirements of the mining agreement so that the company could proceed and mine without further financial loss. The result, as noted above, has been the destruction of the fishing grounds because of river bed elevation and chemical pollution.

Chemical pollution via the discharge of heavy metals (e.g., copper, lead, zinc, cadmium, mercury) has extremely harmful effects on biological organisms including humans (note: 33 percent of liver samples taken from fish in the Ok Tedi River over 50 km. downstream from the mine's discharge point had copper contents higher than standards set by the Australian National Health and Medical Research Council) (ibid.:10). Chemical pollution has affected not only the Ok Tedi River but a further 130 kilometers of the Fly River into which it flows. There is also concern that the chemicals and particulates could eventually cross the Torres Strait and damage Australia's Great Barrier Reef (ibid.:17). Thus, even with the best of environmental legislation and the most contemporary of mining agreements, environmental degradation remains a by-product of mining, which in conjunction with social dislocation, results in local communities bearing the costs while the transnational corporation and the government share the benefits.

In **Global Dreams**, Barnett and Cavanagh provide useful comment and state that "[t]he global economic system prizes the efficient production of goods more than the dignity of human beings" (1994:426). Discussing the globalization

of the world economy and the increasing power of transnational corporations, they elaborate:

The most disturbing aspect of this system is that the formidable power and mobility of global corporations are undermining the effectiveness of national governments to carry out essential policies on behalf of their people. Leaders of nation-states are losing much of the control over their own territory they once had. More and more, they must conform to the demands of the outside world because the outsiders are already inside the gates. Business enterprises that routinely operate across borders are linking far-flung pieces of territory into a new world economy that bypasses all sorts of established political arrangements and conventions. Tax laws intended for another age, traditional ways to control capital flows and interest rates, full-employment policies, and old approaches to resource development and environmental pollution are becoming obsolete, unenforceable, and irrelevant. (ibid.:19)

Transnational corporations have been able to achieve their increasing control through the development of new technologies and techniques such as project financing, which have become especially important to the global mining and finance industries. Project financing is defined as "[a] financing of a particular economic unit in which a lender is satisfied to look initially to the cash flows and earnings of that economic unit as the source of funds from which a loan will be repaid and to the assets of the economic unit as collateral for the loan" (Nevitt, 1983:3). What is required to establish "lender satisfaction" is the presence of a company with a successful performance record, which precludes small enterprises from the periphery. The transnational corporations have also been able to convince the governments of the industrialized nations to assist with their financing arrangements through the establishment of political risk insurance programs and the formation of the Berne Union, which establishes a framework

for the export (support) agencies to agree to limit competition between agencies and thereby set a range for the terms of the loan agreements (ibid.:36).

Transnational corporations are thus increasing their wealth, power and influence. Governments of the industrialized nations are supporting their efforts. The governments of developing nations are actively participating in the globalization of the world economy. Local communities, the periphery-of-the-periphery, are gaining some benefits but they are certainly expected to bear the bulk of the costs. Clearly, a set of unequal exchange relationships.

Given this characterization, a range of proposals have been mooted over the last several decades to alter the relationship between industrialized and developing nations, including the concept of a New International Economic Order. In addition, the power of transnational corporations (TNCs) has been challenged by developing nations through the nationalization of property and renegotiated contracts. Although developing nations now gain a larger share of profits, the overall results have been discouraging. Simply, the profits or surpluses from the exploitation of natural resources do not seem to have been reinvested in a manner which will lead to the generation of further wealth, including the development of social services and other economic sectors. This includes investment in the development of a healthy and literate workforce as well as the appropriate use of natural resources.

The reinvestment issue strikes at the heart of the debate on the global capitalist system because the appropriation of economic surpluses for investment

in order to generate further profits (or, surpluses) is a basic operative tenet of capitalism. Kuwait has been able to use its profits from petroleum extraction to develop downstream industries including chemical and fertilizer manufacturing and petroleum retail outlets. Other nations, such as Zambia, have attempted to develop metals industries based on the processing of its copper. However, Zambia has not been able to profitably operate its mining and refining industries-- it is a "price taker" for its products, with the prices being set by the global market, and its industries are beset by weak management and insufficient capital. Thus, Zambia has not been successful in its efforts to reinvest economic surpluses. Papua New Guinea has attempted to utilize minerals-generated revenues to pay for the development of infrastructure, education and other social services. While it has achieved some of its goals, it has become increasingly dependent on minerals revenues and thus subject to dramatic fluctuations in the price of minerals. In addition, high levels of minerals exports lead to a strong currency which negatively impacts agricultural and other labor intensive producers.

Similarly, local communities and traditional landowners have attempted to utilize their minerals revenues to develop businesses and social services. As evidenced by the strikes and shutdowns of mines, Papua New Guinea's rural population does not feel that it has received its share of the economic surpluses and, with the failure of locally owned air transport companies and retail stores, their view would seem warranted. In other words, they have not been able to successfully reinvest their share of the profits from mining. In sum, mining

transnational corporations are able to convince governments that they can assist in furthering national development efforts but the record suggests that this panacea remains troublesome at best, if not empty.

Focus of the Dissertation

Herein lies the subject of the dissertation: is it possible for a developing nation to utilize its natural resources to generate additional surpluses and, in the process, provide more social and economic benefits for its population? This differs from other studies which have focused on whether or not developing nations can increase their share of the profits from the exploitation of their natural resources (Cordes: 5, 6). Evidence indicates that developing nations have increased their share of the profits. But the use of this increased share of profits by developing nations does not appear satisfactory. The question then arises as to whether this unsatisfactory performance is temporal, due to the relatively limited absorptive capacities of their economies, or because of their relationship with TNCs and/or the industrialized nations. Inherent to this issue is a basic tenet of global capitalism: economic surpluses are appropriated and then reinvested in order to generate additional wealth including profits (or, revenue flows) and other assets such as a healthy literate workforce. In other words, capitalism is based on continued economic growth. If developing nations are not able to satisfactorily utilize their returns from minerals exploitation, then one could argue that this is a result of another characteristic of global capitalism: the tendency to concentrate wealth and power in the center.

Also significant is the issue of how (and why) local populations are impacted by mining. The periphery of the periphery has been largely ignored in the far-ranging debates over minerals exploitation and the appropriation of rents and surpluses by the various other players. With but few exceptions, local populations have not been able to receive notice by mining transnational corporations and even their own governments unless they take actions which interrupt or challenge the flow of profits.

In order to answer these questions, the dissertation will enter the realms of both policy and theory. In terms of theory, attention will be given to theories of development which are able to explain the processes and relationships between developing nations, industrialized nations and TNCs in respect to the lack of success by developing nations to accumulate and re-invest wealth gained from the exploitation of their natural resources. Dependency and/or global systems theory are assessed with respect to their applicability to the gold mining industry and developing nations in the 1990s.

Specific attention is given to Wallerstein's global systems theory and its forerunner, Frank's dependency theory. These theories are evaluated as to their validity and utility to explain the current structure and relationships in the global mining industry, and specifically, gold mining, with respect to interactions and exchanges with developing nations. Theories on transnational corporations are also utilized to described the operations and interactions of mining transnational corporations.

With respect to policy, the agendas and policies of specific nations are discussed and analyzed throughout the dissertation. The analysis provides insight into which policies and broader approaches to development have been successful and why. In addition, Chapter 7 recommends certain policy options for developing nations to utilize in their efforts to optimize the benefits of transnational mining.

The dissertation will specifically address whether developing nations can optimize mining-derived benefits from the exploitation of their mineral resources. If optimization is possible, then the government of a developing nation should be able to affect relations with mining transnational corporations (MTNCs) rather than vice versa. Implicit then is that if optimization is possible, certain theories of development such as dependency theory, can be disproved. Conversely, if it is demonstrated that the relationship between MTNCs and developing nations is based on the expropriation of economic surpluses and underdevelopment, then these theories can be validated.

Three key points of interaction between MTNCs and developing nations will be analyzed. First, the global gold mining industry will be assessed in terms of its impact on developing nations. Second, the macro policy frameworks that developing nations implement in order to capture more and/or attempt to optimize benefits from MTNCs will be analyzed to determine whether or not anticipated results have been achieved. Explanation for the successes and failures of these policy initiatives will include relevance to theories of development. Third, the

effects of these policy initiatives, the impacts of mining, will be assessed in respect to which groups benefit/disbenefit.

Organization of the Dissertation

The dissertation consists of seven chapters. Chapter 1 is titled *Introduction*. The second chapter is titled *The Political Economy of Development and Transnational Corporations*. *Mining Transnational Corporations and Developing Nations* is the title of the third chapter. Chapter 4 is *The Role of Gold in the Global Economy*. The fifth chapter is *The Evolution of Rocks to a Mine*, which discusses the phases of minerals exploitation. Chapter 6 is titled *The Globalized Mining Industry: Implications to and Impacts on the Periphery*. The seventh chapter is *Conclusions and Options*.

With respect to structure, the second chapter begins at a broad level discussing development and developing nations, in terms of both theory and practice. The chapter addresses both development and the role of transnational corporations. In the context of global systems theory, attention is given to presenting historical evidence on the evolution of capitalism and transnational corporations. The third and fourth chapters narrow the discussion to mining transnational corporations and specifically gold mining and gold. Mining transnational corporations have been able to successfully operate under a range of policies. The specific examples of Zambia and Papua New Guinea are offered as evidence of two small developing nations which are dominated by mining, and which have tried different policies to limit the influence of transnational mining.

In the fourth chapter, the role of gold in the global economy is analyzed. The fifth chapter provides a framework to understand how a mine is developed. Important here is a presentation of what decisions are required for a mine to be developed and who makes them. The sixth chapter discusses the impacts of transnational mining on local communities. Specific attention is given to why local communities and environmental impacts are not included in the decision making and planning processes as outlined in the fifth chapter. The final chapter addresses both very narrow as well as broader policy issues and conclusions. The chapter also comments on the theories applied in the analysis.

Chapter 2

THE POLITICAL ECONOMY OF DEVELOPMENT AND TRANSNATIONAL CORPORATIONS

Introduction

Since World War II, the global economy has experienced an array of politico-economic shocks including wars, recessions, and hyper-inflation, all of which were thought to herald its structural transformation through the decline of colonial empires (1945-1965), the emergence of a new global economic order to reflect the growing populations and wealth of developing nations (1970s), the failure of capitalism (1970s to early 1980s), and the retreat of communism (from 1985). These few decades have indeed been tumultuous but the predicted transformation has remained largely a prophesy: while colonial empires have disappeared in the strict sense of legal control, economic empires have emerged; while developing nations have more control over their destiny and are able to influence more events, it is also clear that politico-economic power remains beyond their grasp; and, while capitalism was once considered to be gasping and it now appears that the communist bloc has crumbled, neither of these trends are or were, final and conclusive. Instead, if the 'megatrends' of the last 40 years are

projected into the future, uncertainty, inconsistency, and occasionally, confusion will characterize the coming twenty-first century.

Uncertainty, as a factor in decision-making, has become a major, if redundantly termed 'unknown,' element in the relations between nations, between nations and transnational corporations (TNCs), and between TNCs. Germane to the discussion is that under conditions of uncertainty, TNCs have prospered while developing nations have not. Thus, in a period of megashocks, Solomon (1978:p. 3) notes, "The rise of the multinational corporation as a global force...ranks as one of the key features of the second half of the twentieth century."

How has it been possible for TNCs to accumulate vast wealth when scores of nations have acquired oppressive debt burdens? As perplexing, how have TNCs continued to gain entry for investment in developing nations when it has been clear that they control the distribution of profits? In order to tackle these questions, this chapter first considers the evolution of development theory and practice. The next section discusses the role of TNCs in developing nations. The third section outlines a framework to assess TNCs which will be utilized in subsequent chapters.

Unsuccessful Development: Theory and Practice

Although development as both a field of study as well as a public sector endeavor, can be traced to the period immediately following World War II¹, the

¹ For example, the British "Development and Welfare" grants which were enacted in the late 1940s to assist colonies develop indigenous social and economic infrastructure

current relationship between developing and industrialized nations which is based on the supply of raw materials and (relatively) inexpensively manufactured products to meet the consumptive demands of the affluent capitalist center, began in a much earlier period. The early wave of post-medieval European explorers such as Vasco de Gama and Columbus sought new routes for trade with the East Indies in order to satisfy the growing demand in Europe for spices and silks. With "discovery," the *conquistadors*, or literally, the "conquerors," appeared on the shores of the newly-found lands with the mission of gaining control over the resources desired in Europe. Thus, for example, the thriving Incan and Aztec cultures were decimated by Pizarro and Cortez respectively, and replaced by the slavery of the feudal-like *hacienda* system which produced leather goods, tallow, and gold² for Spain.

Several key issues appear. The first is the rising power of capitalist market demand. Wallerstein (1974:27-28) describes Europe's economic chaos and collapse during the fifteenth century as directly resulting in the decline (and disappearance) of feudalism and the subsequent rise of capitalism in the sixteenth and seventeenth centuries. Second, Europe sought new territory (Wallerstein,

as they moved towards independence.

² The *haciendas* produced agricultural products to feed the miners, whose product, gold, was then exported to Spain.

1974:38-39). Third, in order to finance the quest for expansion, taxes had to be collected, which led to the formation and centralization of power in state bureaucracies (Wallerstein, 1974:29, 38, 50-51, 132). Taken together, the quest for territory, the rise of capitalist market demand, and the need for additional taxes combined to form a vicious circle which could only be met through continued expansion. These factors will reappear many times as determinants in the relationship between developing and industrialized nations.

However, capitalism is the key to the evolving relationship between developing and industrialized nations. Frank states, "Capital accumulation and capitalist development are and always have been spatially/sectorally unequal and temporally uneven. Moreover, it is one of our principal hypotheses that the qualitatively major differentiations or radical shifts in spatial/sectoral development tend to occur during and are accelerated by, the periodic crises in the temporally uneven development" (Frank, 1981:1). Frank also provides elaboration on the unequal characteristics of capitalist development when he describes the contradictions of capitalism as the "the expropriation of economic surplus from the many and the appropriation by the few, the polarization of the capitalist system into metropolitan center and the peripheral satellites, and the continuity of the fundamental structure of the capitalist system throughout the history of its expansion and transformation" (Frank, 1967:3). Thus, the capitalist system is pervasive, based on unequal exchanges and the concentration of capital, and able to adapt and even thrive during periods of instability and dislocation. A final

quote from Frank describes the process whereby the weaker economies of the fifteenth, sixteenth and seventeenth centuries, as well as the small- and medium-sized landowners and merchant capital, declined relative to the larger economies and economies of scale:

During cyclical upswings, such as those which were relatively predominant in the sixteenth century, merchant capital also achieved a relative predominance, and contributed significantly through overseas trade (and of course, pillage) to metropolitan capital accumulation by the provision of external capital forcibly extracted from the colonial world. But during cyclical downswings, such as predominated during much of the seventeenth century, capitalist development (albeit perhaps not visible growth) was promoted predominately through changes in the mode of production. During the seventeenth century, while overseas trade stagnated and the extraction of surplus from the colonial world failed to sustain its earlier notable rate of growth, the previous expansion and accumulation of capital underwent a crisis of adjustment, in which the centralization of existing capital replaced the generation of new capital through concentration. Thus, while trade and profits declined and wages even rose during much of the seventeenth century, the expansive developmental and accumulative process of the sixteenth century underwent a process of international centralization of capital. (Frank, 1978:97-98).

Thus, the current unequal and uneven relationship between developing and industrialized nations is based on their interaction over the last five centuries: products and capital generated in overseas colonies were concentrated in Europe, the center of capitalism. During periods of economic expansion, the colonies and minor merchants flourished. However, during recessions, these peripheral areas and classes were the victims of capitalist retrenchment, which left them with demand for and dependent on imported goods without the income to pay for these items. This description of relations between Europe and its colonies during the

fifteenth through seventeenth centuries, would also be fitting for the current relationship between developing and industrialized nations. It is within the context of this relationship between developing and industrialized nations that development theories and practice have to be considered.

The Transitions of Development Theory

At the end of World War II, the major industrialized nations were confronted by several major facts: aside from the United States and Canada, their nations had been devastated by the War; their colonies were actively pursuing independence; and, there was considerable fear that socialism and/or communism would spread throughout the war-ravaged world. The solution to their own devastation was found in reconstruction programs such as the Marshall Plan enacted by the United States to revitalize Western Europe. This type of program required a major interventionist role for central governments, thus utilizing the Keynesian framework of the pre-War proposals to alleviate the 'Great Depression' of the 1930s through increased public sector spending and investment. The Marshall Plan in Europe and the democratization of Japan during MacArthur's military governorship, both of which led to and were based on the (re)emplacement of and integration with the world capitalist system, were perceived to have halted the advance of communism in these areas. However, questions remained as to what could be done in the colonies demanding independence as well as in other developing nations.

The non-industrialized states of the world gained global attention through struggles for independence in some areas, and also because the post-War industrialized nations established international agencies which were to include all independent nations. Prominent among these agencies were the United Nations (UN) and the International Monetary Fund (IMF). The formation of the IMF was a direct result of the Bretton Woods conference of July 1944, which established a framework for orderly currency exchange between nations, thereby providing a basis for greatly expanding international trade. The World Bank (formally, the International Bank for Reconstruction and Development) was also set up as a result of the Bretton Woods Conference. Established by the United Nations Conference on International Organization at San Francisco in 1945, the UN was set up to maintain global peace and security and to promote the social and economic conditions conducive and necessary to achieve this objective. Thus, these agencies, conceived and established by the industrialized nations, became the vehicles by which global trade and global integration expanded.

The programs and philosophies of the new international agencies as well as the bilateral programs of the industrialized nations, were based on the ideas and concepts which had been utilized in post-World War II reconstruction. Thus, for example, the economics of Keynes were thought to provide the solution to India's poverty. However, the prescriptions for these emerging nations often reflected not their realities but instead the paths that the industrialized nations were pursuing. Hence, the growth strategy as conceived by Harrod was considered as a

key to economic transition, as were other than current macro and top-down/'trickle down' development models such as Nurske's "big push" and Hirschman's "unbalanced growth" (promoting a leading sector). Based on these ideas, the period following World War II saw funds directed towards large infrastructure and industrial projects, with less than satisfactory results.

Lack of success led to debate as to what models were most likely to result in development and included the entrance of the social sciences beyond just economics and the acceptance of contrasting theories. These included the concept of dualism and the work of W.A. Lewis on substituting labor for capital. However, the neoclassicists were buoyed by Rostow's 1960 publication, **The Stages of Economic Growth**, which rationalized that for the development programs then being promoted by the industrialized nations to be successful, there first had to be a set of necessary "conditions," which, when present, would lead to economic growth.

Rostow's ethnocentric apology brought response. The 1960s saw the articulation and popularization of development strategies which attempted to address the inequalities resulting from the growth oriented policies promoted by the industrialized nations. Regional planning, as a model to correct spatially uneven development, and self-reliance became prominent development models. Latin American theorists were clearly leaders during this period.

During the global depression of the 1930s and continuing into the 1940s, Raul Prebisch sought an explanation for Latin America's and specifically,

Argentina's, dismal economic situation. Prebisch determined that the stagnation and/or regression of the Latin American economies during this period was primarily due to their loss of economic surplus through the purchase of imported items and because their exported and largely unprocessed products were highly vulnerable to fluctuating prices and demand in the stagnating/regressing economies of North America and Europe. Prebisch argued that self-reliance including the processing of primary products in order to reduce the negative terms-of-trade associated with the export of unprocessed products, was essential for the Latin American economies. Prebisch was joined at the Economic Commission for Latin America (ECLA) by other critics of the economic situation in Latin America.

With the economic slowdown in Latin America during the early 1960s, there was a realization that industrialization and self-reliance were not succeeding. Moreover, there was a global perception that the economic growth model proclaimed by the industrialized nations as the path for developing nations had failed. This led to questioning of this model by a group of Latin American social scientists, including those working for ECLA as well as with other organizations. Notable among the critics of the growth model were Furtado, Sunkel, and Dos Santos.

However, it was Andre Gunder Frank who devised a holistic system, now known as dependency theory, to explain the development process in Latin America. He argued that the economic, political and social relations between the developing and industrialized nations resulted in development in the core nations

and underdevelopment in the periphery. He stated in **Capitalism and Underdevelopment in Latin America** (1967) that "Economic development and underdevelopment are the opposite faces of the same coin" (p. 9). He elaborated on capitalism and its "expropriation of economic surplus by the few" and "the polarization of the capitalist system into metropolitan center and the peripheral satellites" (p. 3). Key to his analysis was, for example, the expropriation of Chile's economic surplus overseas because of the foreign ownership of its large copper industry (p. 99-101).

Frank's analysis indicated that development in Latin America could not take place given its current relations with the industrialized center. This suggested that if these relationships were broken, then development in Latin America could proceed. Frank's analysis and the call for action attracted considerable attention in the developing nations, both in governments attempting to pursue independent development and among the intelligentsia seeking alternatives to the Western intellectual tradition.

Tanzania, and Jamaica during Manley's first tenure as prime minister, attempted to implement the tenets of Frank's dependency theory. Both nations stressed self-reliance and in a well-publicized case, Jamaica renegotiated its bauxite agreements with TNC mining companies.

These bold actions were followed by other nations in their attempts to break the bonds with the industrialized nations. While some successes were achieved, especially in terms of developing nations attempting to alter relations

with the industrialized nations (e.g., the New International Economic Order), the overall results were less than expected. Simply, Jamaica and Tanzania did not prosper. Although it could be argued that their lack of success stemmed from the power of the industrialized nations, for example "financial dependency" (Bloomström and Hettne, 1984:114-115), the critique in the 1970s was that dependency theory was incomplete.

Dependency theory was replaced by strategies focusing on meeting basic needs and integrated area development, both of which had brief lives. However, the 1980s brought continued and expanded formalized study of development. Emphasis has been given to the processes of transnationalization (e.g., Sunkel) and the internationalization of capital. These theories and Wallerstein's world system approach represent attempts to analyze and reflect the obvious and increasing ascendancy of capitalism and its capacity to dominate the global economy.

Before discussing the current debate over development theory, some consideration of capitalism's current status is necessary. Although considerable attention has recently been focused on the disintegration of the Soviet bloc of countries in Eastern Europe, which is being trumpeted in the popular press as representing the victory of democracy, freedom and capitalism over communist dictatorship and slavery to the state, the ascendancy of capitalism over the centrally planned economies during the 1980s began with the elections of Reagan and Thatcher. Their administrations privatized state-owned enterprises as well as

traditionally state-operated services (e.g., the attempts to privatize prison services and, in the United Kingdom, water resources continue), enacted fiscal regimes which benefitted the wealthy and corporations, sharply reduced antitrust and other 'watchdog' functions of government vis a vis the private sector, and dictated that foreign aid to developing nations including that provided through multilateral agencies, should be used to promote the private sector. Other nations followed suit, including France under the Socialist Party regime of Mitterrand.

The industrialized nations emerged from the 1979-1982 global recession in debt, heavily committed to building up their defense establishments, jingoistic (e.g., the Falklands war and the Grenada invasion), and demonstrating opulence (e.g., Nancy Reagan's gowns, the fame of Donald Trump, and increasingly speculative stock markets). The developing nations emerged from the recession somewhat later (roughly 1984) with oppressive foreign debts and considerable economic dislocation. Moreover, the developing nations were confronted with the reality that the antagonists of Reagan-Thatcher, the socialist states, were in retreat: Deng and Gorbachev, and his successor Yeltsin, promoted economic liberalization programs which indicated movement towards capitalism, market determination, and consumerism. These were and are, also the policies of the United States, the United Kingdom, the IMF, the World Bank, and other multilateral agencies. The developing nations had heard these positions and found them wanting.

Although some of the Southeast Asian countries demonstrated that developing nations could successfully promote economic growth, their success has

been at substantial cost to the environment and, in certain cases, to human rights. However, the success of these nations over the last two decades cannot be denied, but many argue that these are exceptions rather than the rule among developing nations.

Development Theory into the 1990s

Dube states that the current practice of and the debate on development are in "disarray," which has thus resulted in a series of 12 dilemmas: 1) to pursue development or a non-development strategy, 2) should development be endogenously or exogenously-based, 3) should development utilize a strategy of self-reliance or interdependence, 4) should growth or distribution be the primary objective, 5) should development be planned or based on market mechanisms, 6) should industrialization be promoted or environmentalism, 7) should development be tied to the industrial sector or agriculture, 8) should foreign aid be accepted or favorable trade relations pursued, 9) should development funds be concentrated in physical infrastructure or human resources, 10) should state-of-the-art technologies be promoted or more widespread lesser technologies, 11) should development be evolutionary or revolutionary, and, 12) is there one or many types of development (Dube, 1988:6-10). Although the list of "dilemmas" is neither exhaustive nor especially original, it demonstrates the breadth and complexity of the questions confronting those involved in the debate. More significantly, these dilemmas have existed and not been resolved for several decades.

With dependency theory challenged by both Marxists and capitalists as well as the elections of Thatcher and Reagan, advocates of modernization and the successors to Rostow appeared. Stauffer notes that socialist theorizing has not countered the "seductive" modernist development model offered by Thatcher and Reagan (1989:25). Thus, Becker (1983) argues that enlightened TNCs can have positive impacts (p. xxi), the "modern businessman" avidly supports democracy (p. 271), and blames people for being poor with, "Yet, any real improvement in the quality of life of the people at large--the very definition of 'development'--depends upon their own political efforts, not the altruism of those in power" (p. 7-8). While Becker uses class analysis to analyze Peru's mining industry and rejects dependency theory, his conclusions are highly suspect. Several years after Becker's study, the price of copper collapsed and Peru's external debt skyrocketed, with the result that both the proletariat laboring in the mines and the "new bourgeoisie" which had established a medium-sized mining sector, became victims of one of capitalism's periodic crises. Perhaps, dependency had more relevance than Becker thought.

However, the rise of Thatcher and Reagan has not ended the debate. Dube presents an "internationalist structuralist model" which critiques the modernization development model espoused by Reagan et al. Dube states that 1) "underdevelopment is a created condition," 2) development "does not travel" from the center to the periphery, 3) capitalist development leads to international and national dualism, 4) dualism results in a small elite and a majority poor, 5)

international aid has had limited impact and has strengthened dependency on the industrialized nations, and 6) there is a demonstration effect (1988:42-44).

But Dube also indicates that there is an alternative to the modernization western-based development paradigm. He states that an alternative model should reflect that 1) economic growth is an acceptable goal but it should be promoted only when it is linked to human development, 2) economic growth should be defined to include increases of both gross domestic or national product, and distribution, 3) structural change is necessary, 4) there must be a larger role for the masses, 5) the masses should be responsible for the implementation of development programs, 6) development programs should respect the environment, 7) development should be sustainable, 8) development should be as self-reliant as possible, 9) equal interdependent relationships should be the basis for interaction with other nations, and 10) development should be future oriented (1988:62-64). Thus, Dube provides another list describing desirable components of both a theory and practice of development but he leaves to others the search for the elusive comprehensive alternative itself.

Frank's dependency theory has received considerable criticism, some of which is much more substantial than Becker's. Laclau (1971) provided a Marxist response by arguing that different modes of production could co-exist within an economic system which differed from Frank's more narrow focus (p. 31-33). More significantly, he challenged Frank's assertion that capitalism is based on the accumulation of the profits of production and instead argued that capitalism is

based on the sale of free labor (p. 25). To Laclau, Frank concentrated on exchange relations when he should have focused on the relations of production.

Warren (1973) also challenged Frank's argument that underdevelopment would be the rule in the periphery by noting that a number of developing countries had bright prospects for capitalist development. The successes of South Korea, Taiwan, and Singapore support his argument. Kay (1975:x) also continued the Marxist critique of dependency theory with, "Capital created underdevelopment not because it exploited the underdeveloped world but because it did not exploit it enough." Chilcote argues that the nationalistic interpretations of dependency theory, which emphasize the potential for the bourgeoisie and the working class to form an alliance against the industrialized center, are "doomed to failure" (1983:26-27).

Although Marxists have convincingly argued that class and the relations of production require analytical emphasis, they have themselves been guilty of a too "narrow conception of capitalism" by focusing on free wage labor rather than "the appropriation of value wherever and however it is produced for purposes of accumulation" (Johnson, 1983:237). Blomström and Hettne (p. 182) argue that it is difficult to differentiate and define specific individual modes of production and that "[T]he number of different modes of production has lately shown an alarming tendency to increase." Chinchilla (1983) continues with,

The missing elements in the evolutionary stagist conception of modes of production--a dialectical conception of interactions between modes, forces, and relations of production in the economic base, levels of

the mode of production (economic, political, ideological), and between cycles of production and reproduction--are in fact necessary elements for the description and explanation of change in Third World social formations.

The evolutionary Marxists are correct to posit an overall evolutionary direction to the development of societies from simple and undifferentiated to more complex and differentiated. But the pattern of development is not without temporary regressions and qualitative breaks, and the direction is generally linear but not unlinear. Not every society passes through feudalism, nor does it experience capitalism in the same way, given its variety of origins (external as well as internal), stages, and interactions with preexisting forms. (pp. 159)

Wallerstein's world system approach follows in the tradition of dependency theory but he eliminates Frank's differentiation between central and peripheral capitalism (Blomström and Hettne, p. 185) and focuses on the relations between core nations, semi-periphery nations, peripheral nations, and external states. Significant is the emphasis on capitalism as a global system, within which development and life become internal factors. However, the attention he gives global linkages is not matched by his analysis of class and modes of production.

Thus, the debate on alternatives to the modernization paradigm of development continues without providing either theoretical or practical guidance. Instead, the developing nations have chosen immediate pragmatic responses to current development issues (Dube, 1988:99) even though evidence suggests that the developing nations are functioning in a global economic system which seems to operate against their interests. Moreover, the alternatives to the modernist development model which have been offered, have generally been "co-opted" (Stauffer, 1989:32-33). The elusiveness of a comprehensive alternative theory of

development which can also be implemented, will be made apparent in following chapters.

Transnational Corporations

Although the origins of the transnational corporation (TNC) can be traced to the ownership of multiple manufacturing plants by a single company in North America and Europe during the 1880-1890 period (Chandler, 1986:31), as well as to the "capitalist imperialism" represented by the mercantilist/manufacturing/banking houses predominately in England and the Netherlands from the mid-eighteenth and into the nineteenth centuries (Jones, 1987:94, 126, 135), the term "multinational corporation" was not coined until 1960³ (Fieldhouse, 1986:9). However, it is also clear that TNCs began asserting their presence through vastly increased overseas foreign direct investment from the end of World War II (Solomon, 1978:22). Fieldhouse provides figures showing that total global foreign direct investment increased from (in 1972 constant U.S. dollars) \$72.5 billion in 1914, to \$91.8 billion in 1960, to \$257.4 billion in 1978, and adds that until the 1940s, most of this was located in Europe (p. 24). Solomon argues that for U.S. companies following World War II, "domestic factors not external factors, constituted the primary motivating influences" for overseas investment

³ According to Fieldhouse, the term was first used in April 1960 by David Lilienthal, Chief Executive Officer of the Development and Resources Corporation of New York. Lilienthal's agency was established to provide loans to developing nations.

because they wanted to expand beyond the size of U.S. market demand (p. 22).

However, as Solomon also stated "the rise of the multinational corporation ranks as one of the key features of the second half of the twentieth century" (p. 3), which, whether coincidence or not, parallels the rise of developing nations.

By definition, a TNC is "a business enterprise that owns and controls income generating assets in more than one country" (Fieldhouse, 1986:9).

However, this simplistic definition must be understood within the context provided by the quotes cited below. Barnett and Müller in their 1974 publication, **Global Reach: The Power of the Multinational Corporation**, discuss the organizational characteristics and perspectives which facilitate the success of TNCs:

The global corporation is the first institution in human history dedicated to centralized planning on a world scale. Because its primary purpose is to organize and to integrate economic activity around the world in such a way as to maximize global profit, the global corporation is an organic structure in which each part is expected to serve the whole. Thus in the end it measures its successes and its failures not by the balance sheet of an individual subsidiary, or the suitability of particular products, or its social impact in a particular country, but by the growth in global profits and global market shares. Its fundamental assumption is that the growth of the whole enhances the welfare of all the parts. Its fundamental claim is efficiency. (Barnett and Müller, 1974:14)

Cohen, Felton, Kosi and Van Liere in their introduction to the volume of Stephen Hymer's works they edited, describe the role of TNCs in the world economy:

The multinational corporation has become the dominant organizational form of modern capitalism. It now commands tremendous influence and power over the economic, social, political, and cultural lives of many nations and people. This development has given rise to many

conflicts, contradictions, and very often destabilizing forces within both the national and international economies. (Cohen et al., 1979:1)

Bornshier continues with an attempt to articulate how this new role for TNCs in the world economy has resulted in restructured economic relations:

Multinational corporations (MNCs) as central institutions of the modern world economy imply, owing to their internal division of labor across countries, an internationalization of economic relationships previously regarded as national. This means that one should look at MNCs not only as a new feature of the world economy, but as the emergent new organizational form of that system. The market forces that formerly mediated much of the core-periphery structure within the world economy have become less important owing to the direct organizational links by which essential control functions, i.e. entrepreneurial functions, are articulated. (Bornshier, 1982:59)

Gereffi and Newfarmer explain how this effects developing nations:

A variety of industrial structures in international markets, especially international concentration, accord economic power to relatively few corporations and these imperfections tend to result in oligopolistic conduct that works to the disadvantage of developing countries. In most cases, these multiple forms of international oligopolistic behavior bias the gains from trade and investment in favor of the transnationals and their home country stockholders since they facilitate higher prices of traded products and higher returns to their factors of production, and create or entrench dominant positions in overseas markets. (Gereffi and Newfarmer, 1985:407)

The above series of quotes offer insight on the complex of means by which TNCs are able to prosper in any component of the capitalist world system, even during periods of crisis and uncertainty. This pervasive and overwhelming capability has caused serious limitations to the analysis of TNCs. Thus, Fieldhouse notes that it is not possible to formulate a single definitive theory on TNCs and foreign investment because there is too much variation between firms

and too many motives for investment (pp. 26). Analysts of TNCs have traditionally based their work on the 'oligopoly hypothesis' which argues that "the most important driving force behind it⁴ is the maximization of corporate profit and growth and the drastic limitation of foreign as well as domestic free competition" (Martinelli, 1982:82). The oligopoly hypothesis has been interpreted from three theoretical perspectives: 1) the theory of the firm and imperfect competition, which is usually associated with Hymer and Kindleberger⁵; 2) the 'product cycle' theory and the 'technological gap' theory, with Vernon its leading proponent⁶; and, 3) the Marxist theory of capital concentration which is represented by the work of Baran and Sweezy⁷ (Martinelli:82-83). Although there are major differences between these theories, it is perhaps more useful to

⁴ "It" refers to the internationalization of the world economy as embodied by TNCs.

⁵ For Kindleberger see *American Business Abroad* (1969; Yale University Press; New London, Connecticut) and *Multinational Excursions* (1984; The MIT Press; Cambridge, Massachusettes). For Hymer see *The International Operations of National Firms: A Study of Direct Investment* (1976; The MIT Press; Cambridge Massachusettes).

⁶ *Vernon Sovereignty at Bay* (1971; Basic Books) and *Technological and International Trade* (1970; National Bureau for Economic Research).

⁷ For Baran see *The Political Economy of Growth* (1957; Monthly Review Press). For Sweezy see *The Theory of Capitalist Development* (1956; Monthly Review Press).

consider their common elements and complementarities: all stress that TNCs have monopoly advantages (from Kindleberger), that oligopoly competition is highly limited (from Hymer), that barriers to entry have aided TNCs (from Vernon), and that TNC strategy is global profit maximization (from Sweezy and Magdoff) (Martinelli:83).

TNCs and Relations with Developing Nations

Thus, these common elements provide a starting point from which to assess and understand TNCs. However, for the purposes of this chapter, it is necessary to focus on three additional sets of data. First, the operations of TNCs in developing nations will be considered in a context based on their global advantages. Second, the impacts of TNCs on local class formation will be presented. Third, the ability of TNCs to supersede national boundaries will be articulated. These will be discussed below and, collectively, will provide a framework to analyze mining transnational corporations (MTNCs) in subsequent chapters.

Although TNCs have benefitted considerably because of relations with their home country government (Makker, Martinelli and Smelser, 1982:10), they now more commonly pursue an "anational" image which stresses "good citizenship" rather than counting on intervention by their home country's military (Barnet and Müller:57). The reason behind this is simple: TNCs and the governments of developing nations have the same objective, stability (Solomon:127). However, it should also be stated that the spread of TNCs has enabled the "perpetuation and

intensification of hegemonic domination by the industrial capitalist powers" (Sklar, 1980:85). Implicit is that TNCs benefit from close relations with developing nations when it suits their purposes and similarly benefit from close relations with their home industrialized country when appropriate. This ability to "change stripes" is key to recognizing the success of TNCs to have evolved in as well as to have established a global economic system which is far stronger than any of its component parts (Solomon:40).

Pearson cites Girvan's⁸ assertion that the power of TNCs is derived from five basic concepts of the "multinational economy:" 1) TNCs are large, especially in respect to the size of many of the nations in which they operate; 2) TNCs are involved in a wide range of activities both in terms of products as well as geographically; 3) TNCs are on the "frontiers of technology;" 4) there is an "uneven distribution of power and authority spatially across the globe, reflecting the dispersion of subsidiaries and the centralisation of global headquarters;" and, 5) there is a collective power based on the TNC community "as a whole" (Pearson, 1986:340). Gereffi and Newfarmer also note that the dominance of TNCs is "rooted in monopolistic advantages protected by barriers to entry at home and abroad" (p. 386). They continue and state that TNCs compete only in

⁸ Girvan, N. 1975. "Economic Nationalists v. Multinational Corporations--Revolutionary or Evolutionary Change?" in **Multinational Firms in Africa**, C. Widstrand ed. Scandinavian Institute of African Studies. Uppsala, Sweden.

"certain markets for limited periods" because oligopolies are the rule, thus preserving the TNC community "as a whole" (p. 386).

Solomon argues that TNCs need growth and improving profits (not profit maximization) to survive (p. 27). Hymer also stresses that profit maximizing behavior is not a constant and that TNCs may not always be capable of maximization: "we certainly cannot assume that market forces compel firms to choose the optimum path" (Hymer, 1979:47). Chandler notes that TNCs are more interested in "long-term profits" than a quick return (p. 31).

Thus, TNCs have to be assessed from the perspective that they individually as well as collectively have power which generally exceeds that of the countries in which they operate. TNCs operate with a long-term perspective but have the capability to adjust and capture immediate opportunities. TNCs can optimize resources on a global scale, transfer technology and managerial skills, supply capital, and create and meet consumer demand (Solomon:4). TNCs are the cornerstone of international capitalist production and have established a de facto form of international government through their ability to exceed the power of individual nations and the strength of their community (Hymer, 1979:75).

With TNCs the primary component of the international capitalist economy, it is not surprising that a key characteristic of the global economy is that it results in the concentration of wealth (ibid.:90). As Bornshier argues, there is a "positive association between MNC penetration and income inequality" (p. 67) and the "disparities between sectors, i.e. uneven development, favor higher personal

income inequality" (p. 68). Thus, within nations TNCs have substantial impact on equity issues and class formation.

Idris-Soven et al. state that "Capitalism for the Third World has meant depriving peoples of their traditional means of subsistence in order to create a class of laborers for the production of crops and minerals for export" (1978:3). Kumar argues that there are four main classes in developing nations: peasants, land owners, workers and entrepreneurs, and that TNCs "have led to the transformation of peasantry into wage-earners in enclave economies" (1979:55-56). However, there is also considerable evidence that agricultural TNCs have caused agriculturalists to become landless and/or peripheralized in many developing nations.

Gereffi and Newfarmer assert that TNCs concentrate wealth in the urban areas of developing countries which causes a false increase in prices and thus a "regressive impact on income distribution" (pp. 423). They continue with "there is strong reason to believe that the net benefits accruing to low-income groups are probably substantially less under transnationally organized production than under domestic ownership" (pp. 424). TNCs also facilitate the creation of a bureaucratic elite (Sklar, 1980:89) and a labor elite (Kumar, 1980:9). TNCs form alliances with local landowners (ibid.:5) and the local entrepreneurial class, the lumpen-bourgeoisie (ibid.:16-17). However, there is evidence that local elites may oppose TNCs when they introduce competition (Solomon:94).

While it is clear that TNCs have considerable negative impact on class formation in developing nations, literature, for example, on their "effects...on peasantry" is limited (Kumar, 1979:55). This lack of a comprehensive set of data is highly significant when theories of development are considered: a basic criticism of dependency theory and the global system approach is that they do not address class relations. Scott in **Weapons of the Weak** does not analyze the origins of petty class relations which can be traced to the "boardrooms in New York and Tokyo," and instead focuses on local class relations (1985:xix). This represents an attempt to analyze the weak macro-micro linkages Dube found in developing nations (pp. 24). Wesley-Smith argues that even though MTNCs are relatively indifferent to class formation (1988:259) because of their focus on appropriating the economic surplus, transnational capital inhibits the transition to capitalism (ibid.:302) through the evolution of elites which cater to transnational capital rather than the development of a viable 'middle class.' From these perspectives, it would seem that one could argue that dependency theorists do not need to explicitly address class relations because while it is a given that a range of classes will emerge, these classes will, in all instances, be subordinate to the global capitalist system.

However, if one considers that since Papua New Guinea's independence (1975), the "most significant element of the national bourgeoisie to have emerged...is the bureaucratic bourgeoisie or technocracy" (Wesley-Smith:281) and that MTNCs dominate this nation's economy, it is apparent that TNC:class

relations in a specific country can be analyzed and at least some of the macro: micro linkages defined. Although this will be discussed in more detail in chapters 5 and 6, suffice to say here that if a primary function of the national government, which is comprised of the bureaucratic bourgeoisie, is to mediate between competing class interests (Wesley-Smith:286), and if the bureaucratic bourgeoisie is dependent on metropolitan or transnational capital (ibid.:294), then Scott's choice to ignore petty class relations appears logical: local elites and the emerging bourgeoisie are more closely linked to their counterparts in the industrialized nations than to local workers and peasants. Local class relations should then become an object of focus because it can be assumed that there are strong complementary interests between local elites, the emerging bourgeoisie and their counterparts in the industrialized nations.

With the bureaucratic bourgeoisie of industrialized and developing nations linked by class interests, often education, and dependent on transnational capital, it is not surprising to find that the national interests of developing nations are superseded by those of TNCs. TNCs have geographical spheres of influence (Gereffi and Newfarmer:401) which are accepted and, at times, utilized by developing nations (Wesley-Smith:167; Pintz, 1984:56). This will be discussed in more detail for MTNCs in Chapter 3. Important here is to note that the bureaucratic bourgeoisie in the industrialized nations are also employed to do the bidding of TNCs. With TNCs carrying the flag of capitalism for the industrialized nations since the end of World War II, the bureaucratic bourgeoisie

have reciprocated favors by establishing, in the United States, the Overseas Private Investment Corporation which provides insurance for U.S. firms investing abroad against "political risks," and, in Japan, the Ministry of International Trade and Industry, which serves as a vehicle by which Japan's TNCs coordinate their overseas initiatives. Although the rise of TNCs has been greatly facilitated by vastly improved communication and transport technologies and linkages, the ability of TNCs to marshall their home as well as overseas governments to insure and assure their investments, has to be seen as having an equal if not greater impact on transnationalization than any technological innovations.

Although Emmanuel argues that it is the capitalist system and not TNCs that cause underdevelopment (1980:149), TNCs have the power to create wealth and "to transform the world political economy (Barnett and Müller:15). TNCs, not nations, view the "world as a single economic unit" (Solomon:17-18), and are able to "alter the path of development" (Gereffi and Newfarmer:387). Attempts by developing nations to diminish the role of TNCs, such as the New International Economic Order, are "doomed to failure" (Burbach and Flynn, 1980:138) because of the pervasiveness of capitalism and the linkages that TNCs have formed among themselves and between the bureaucratic bourgeoisies which they have created.

Barnet and Cavanaugh comment that "[t]he combined assets of the world's 300 largest firms now make up roughly a quarter of the productive assets of the world" (1994:15). They continue and describe the current status of TNCs:

....[T]he multinational corporation of twenty years ago carried on separate operations in many different countries and tailored its operations to local

conditions. In the 1990s large business enterprises, even some smaller ones, have the technological means and strategic vision to burst old limits--of time, space, national boundaries, language, custom, and ideology. By acquiring earth-spanning technologies, by developing products that can be produced anywhere and sold everywhere, by spreading credit around the world, and by connecting global channels of communication that can penetrate any village or neighborhood, these institutions we normally think of as economic rather than political, private rather than public, are becoming the world empires of the twenty-first century. The architects and managers of these space-age business enterprises understand that the balance of power in world politics has shifted in recent years from territorially bound governments to companies that can roam the world. As the hopes and pretensions of government shrink almost everywhere, these imperial corporations are occupying public space and exerting a more profound influence over the lives of ever larger numbers of people. (p. 14)

Thus, TNCs continue to evolve as the leading force for globalization and global capitalism. TNCs have been able to establish the rules for the global economy and they are the ones benefitting from this evolution. As the Barnett and Cavanaugh quote illustrates, the TNCs are impervious to the wishes of governments throughout the world, and certainly distant from peripheralized groups throughout the world. The developing nations are especially vulnerable because they contain the majority of those marginalized by the process of globalization. As Barnett and Cavanaugh state [h]undreds of millions are now residents in the global village being created by the great corporations, but billions more are not and have no such prospects" (p. 21). A grim assessment of the global capitalist century in the 1990s.

A Framework to Analyze TNCs

Given the above, a framework to analyze TNC operations in developing nations should include 1) assessment of linkages between TNCs, between TNCs and home governments, and between TNCs and/or home governments and the governments of developing nations, 2) assessment of profitability of specific operations and the respective markets they service, 3) assessment of the linkages between specific operations and the local economy, including both the direct and indirect effects of TNC capitalism, and 4) assessment of the effects of TNC capitalism on the course of future local development. In addition, the specific sectors and industries in which TNCs operate should be evaluated. The objective of a TNC assessment is fourfold. First, it provides an indication of the costs and benefits which can be derived from a TNC operation. Second, it defines which groups and classes will be allocated specific costs and benefits. Third, it implicitly estimates the potential to alter these costs and benefits. Fourth, it provides a means to compare and contrast the objectives of the TNC operation with national development objectives in order to indicate conflicts.

However, and after describing a broad format to analyze TNCs, several qualifications to the above framework are necessary. In regards to linkages between TNCs, between TNCs and home governments, and between TNCs and/or home governments and the governments of developing nations, several issues arise. First, and with respect to gold mining, there are relatively "weak" linkages between TNCs because, on the downstream side, gold is sold on the global market

and is generally not processed by mining companies. Instead, specialty metals processing companies purchase gold on the world market and then transform it into products which can be utilized in jewellery, dental work, and electronics. In terms of upstream linkages, gold projects are usually much less expensive than the larger base metals mines which require a consortium of companies to acquire financing. Second, gold projects are often developed by a mining TNC following the successful exploration and preliminary definition of the deposit by a small company which is probably listed on one of the world's more speculative stock markets (where purchase of shares enables exploration). The TNC will "takeover" the operation either in a cash purchase or in an agreement which provides shareholders in the smaller exploration company a percent of future project earnings. This method of operations is similar to those practiced by the more widely known "wildcatters" in the oil industry. Third, the relations between home governments and TNCs have changed over the last several decades. As stated by Barnett and Cavanaugh (1994:424-425), TNCs still utilize their home governments but the linkage is not as strong as it once was because TNCs are finding it more appropriate and often required by developing nations, to establish local subsidiaries with somewhat greater autonomy. In other words, TNCs utilize home governments only when it is to their advantage. But it should be assumed that this qualification does not indicate that home governments will not support TNCs. Rather, the list of support mechanisms and agencies has increased and includes (for U.S.-based TNCs) the Ex-Im Bank, the Overseas Private Investment

Corporation, the Trade and Development Agency, and the Agency for International Development. In sum, one should assume that home governments will support but not control the activities of TNCs.

The assessment of the profitability of specific operations and their markets is also problematic because access to the necessary data is generally impossible. The data included in this dissertation is public information which does not include a detailed breakdown on costs and revenues for various profit centers. TNCs protect this information because its publication would show competitors where and how a company profits.

The framework also does not realistically address the interactions between the TNCs and local economies, including future development. As cited earlier in the chapter, there are very weak macro: micro linkages in developing nations. Combined with the absence of detailed data from the TNCs, the ability to accurately describe let alone analyze these interactions is near impossible. Furthermore, the analysis of TNC impacts on local economies began only over the last few decades and there is almost none on the longer-term impacts of gold mining. This lack of longevity limits the accuracy of the analysis as well as the available techniques.

Thus, the above analytical framework is "ideal," and will be problematic to apply to actual cases. The framework provides a system to organize and structure the analysis but its limitations are obvious. As a result of the above qualifications,

this dissertation focuses on linkages between mining TNCs, governments of developing nations, and local area residents.

Returning to the discussion of TNCs, from the perspective of the growth model of development, the benefits from TNC investment in a developing nation are the addition to the nation's capital resources (provided through the overseas borrowing by the TNCs), the added revenue flows to government generated from the profits on sales to overseas markets, and training. Disbenefits include negative impacts on class formation and uneven development, the loss of added revenues to imports and the additional salaries and other costs of a bureaucracy expanded to service the TNCs, an overall skewing of the development process which causes integration with the global capitalist system, and a loss of sovereignty to the power of TNCs. These broad criticisms as well as the above critique of and the framework to analyze TNCs will be applied in the next chapter which addresses mining TNCs in the context of the global capitalist system and national development.

Chapter 3

MINING TRANSNATIONAL CORPORATIONS AND DEVELOPING NATIONS

Introduction

Considerable controversy has swirled around minerals-led developing nations¹ since the 1950s. Minerals-led developing nations were among the first and foremost of those which nationalized foreign owned industries and other investments in the 1960s and 1970s. Notable here were countries such as Chile, Zambia and most of the oil-exporting nations. Cartels were formed in order to increase prices and thus benefits to these nations. While the Organisation of Petroleum Exporting Countries (OPEC) has had some success, the other cartels such as the Council of Copper Exporting Countries (CIPEC), have largely failed. Similarly, the nationalized minerals industries of some nations have performed well, while those of many have not. This led to calls in the 1970s for the transfer of technology and other requisite inputs, so that these countries could compete more effectively in the global market. These initiatives were part of what became known as the New International Economic Order.

¹ A minerals-led nation can be defined as one which has either a minerals industry that is among its four largest industries, or one which has a minerals industry that is the first or second leading growth industry.

However, while nationalization was taking place and some nations were calling on their industrialized and rich counterparts in the north to give them an equitable share in the global market and in global profits, other voices began to criticize the exploitation of minerals. Critics of minerals exploitation contend that two issues are paramount: minerals exploitation occurs in enclaves which results in a dualistic society, and thus benefits only the few at the expense of the rest of the nation; and, that even when a minerals industry has been nationalized, it remains dependent on the capitalist center thus limiting the autonomy of the nation to chart its course of development. Tironi, for example, asserts that minerals exploitation has "prevented a more systemized and balanced development effort" (1978:366). Although evidence has mounted in support of Tironi's conclusion, developing nations continue to opt for minerals exploitation when presented the opportunity. The question then arises as to what is the role of the state in minerals exploitation. Because of problems with minerals-led development, the 1960s and 1970s produced vastly differing forms of state involvement in minerals exploitation, reflecting the specific objectives (and, perceived benefits) of individual governments.

This chapter presents a framework defining and analyzing the relationships between mining transnational corporations, the capitalist center, and minerals-led developing nations. The chapter first discusses the role of minerals in the world economy. The second section considers the performance of minerals-led developing nations. The third section presents brief illustrative examples of how two minerals-led developing nations, Zambia and Papua New Guinea, have designed

policies to control the exploitation of their minerals resources. Especially prominent is the role of the state in these policies that enables comparison between state ownership of the mining enterprise and state partnership with TNCs. However, while it is argued that one nation has had a more successful experience with mining, both remain dependent on external forces in the capitalist center.

Minerals in the World Economy

The minerals industry is oligopolistic in structure and among the most highly vertically and horizontally integrated industries in the world (Pinera, 1978:465). As such, and also because of the number and different types of both producers and consumers, the industry is transnationalized and subject to a controlled global market (ibid.:467). However, within this controlled market which is dominated by large transnational corporations intent on maximizing world-wide interests and not only profits (Tironi:381), there are considerable differences between consuming and exporting nations. This section considers the minerals strategies of consuming nations in the capitalist center, those of exporting nations in the periphery, and recent trends in minerals exploitation in respect to the role of the state in developing nations.

Minerals in the Capitalist Center

Leontieff et al. note that non-fuel minerals account for less than one percent of national income and less than one percent of total employment in the United States. But, they continue, minerals are "the building blocks of a modern economy"

(1983:9). Thus, the strategy of the capitalist-industrial state is to ensure the access to and availability of raw materials (ibid.:10-12).

In order to ensure supplies, alternative sources have to be exploited or readied for development. While this promotes investment in developing nations, there are other factors which facilitate investment outside the capitalist center, including environmental legislation in, for example, Japan which has restricted certain types of minerals processing (Cordes, 1980:137-139).

However, far beyond arguments of exporting environmental pollution to and using cheaper labor in developing nations, the capitalist-industrial state is more concerned with seeing highly capital intensive investments with correspondingly high profits, occur in the center and from which it can derive more benefits than from basic mining. Simply, steel pipes and tubes earn 18 times the value of the ore used to produce them, and steel wire, a more highly processed product, earns 30 times the value of ore (Gluscke et al., 1980:24). The ratios for jet engines and microelectronics are obviously much higher.

Mining in the capitalist center is generally concentrated in sparsely populated regions of large nations such as Australia, Canada and the United States. Although minerals refining and processing is still common throughout the capitalist center, recent investments have greatly expanded processing capacity in the developing nations. However, new investments in minerals refining in the capitalist center are often directed to processing "high-technology" metals, such as those utilized in

computers, communications, and aviation. Again, increased capital intensity results in higher value products.

Thus, while the GNPs of the capitalist center reflect, in nearly all instances, a proportionately minor role for a minerals industry within their borders, their economies could not survive without the supply of minerals. Moreover, the capitalist center would rather have investments in capital- and technology-intensive industries within its boundaries where profits are higher and non-market risks (e.g., environmental disturbance) fewer than in the minerals industries.

Trends in the Center:Periphery Relationship

Prior to independence, colonial administrations typically had little interest in seeing minerals rents utilized for development in the periphery; rather, the colonial administrations allowed and facilitated very high corporate profits for mining TNCs (Garnaut, 1978:144). A classic example of a colonial administration serving the interests of a TNC would be Cecil Rhodes who secured minerals rights for what is now known as Zambia and Zimbabwe in 1890, the very year that the British began colonial rule of this area (Daniel, 1979:4).

With independence, developing countries realized that the major impact of minerals exploitation was via the "receipt and expenditure of resource rent" (Garnaut:156-157). By acknowledging that they were receiving low rents on resources controlled by foreign investors, developing countries were rejecting classical economic theories on the value of (foreign) investment (Cordes:33, 42). This led to calls for "permanent sovereignty over natural resources" (e.g., the Group of 77) and

"a fight against the inequality of developing states (versus TNCs)" (Cordes:42). In other words, nationalization of minerals industries or the renegotiation of minerals exploitation agreements became the policies of the periphery during the 1960s and 1970s (Cordes:44).

However, as Ogunbadejeo says, "nationalization did not end exploitation by the core" (or, center) (Ogunbadejeo, 1985:26). Tironi notes that since World War II, "there has seldom been any explicit policy for its (natural resources) development except for an erratic nationalistic general trend seeking to gain more control over multinational corporations" (Tironi, 1978:370). Thus, we find the national policies of the periphery aimed at controlling TNCs and not directed against the structural imbalances of the world capitalist system. Ogunbadejeo states that these policies ignored the process by which the center practiced "underdeveloping the periphery" in general terms, and specifically in reference to minerals, "selected underdeveloping," which he equates with imperialism (Ogunbadejeo:18-24).

While nationalization and renegotiation have produced different types of ownership and exploitation agreements, including management contracts for TNCs to exploit resources owned by the developing country, it is not altogether agreed that they have produced the desired results for the periphery. For example, Cordes cites Vernon who says that management contracts can produce as beneficial return to TNCs as would ownership (Cordes:52). Moreover, Tironi argues that the laws and policies (of the new types of agreements) often produce only limited benefits because of the failure to develop a "system of information and collection of appropriate statistics"

(Tironi:374). He contends that Chile's nationalization has been by-and-large "successful" because it was gradual, thus allowing the training of skilled personnel and the development of appropriate institutions to compete on the global market (Tironi:389).

While there have been successes and failures for the new types of agreements between developing countries and TNCs, it is clear that the state has taken a more activist role vis a vis the exploitation of its mineral resources, and specifically the oligopolistic TNCs. The TNCs have adjusted quickly to these changes as they now view agreements which are too favorable (or unfavorable) to them as being unstable, often requiring renegotiation within a few years (Tironi:388). In other words, the TNCs require that the *rules of the game* provide a stable and predictable operating environment (Cordes:66).

The TNCs have also made other adjustments. First, they now form consortiums to develop a minerals deposit in order to spread the financial risk, and place a premium on having the developing state as a member of the consortium to ensure long-term stability (Garnaut:14). In addition, minerals projects have become increasingly larger in recent years, reflecting technological advances enabling even greater economies of scale (Cordes:66). These large scale projects have resulted in the development of project financing in the 1970s, a technique which limits the investors' liability and uses the project's cash flows to repay loans.

While project financing enables large operations to be developed and provides the periphery with considerable foreign investment, the lenders require that the

borrowers include some with proven 'track records' (Cordes:92-93). This means that large TNCs have to be involved. Conveniently, the major depositors in the lending institutions during the last half of the 1970s, were also the potential borrowers for the development of non-fuel minerals. The oil TNCs were flush with profits as a result of OPEC-led price increases, and many of them acquired minerals companies as a result (Fortin, 1980:344). Thus, one could only conclude that although nationalization and renegotiations may have yielded more control over their mineral resources to the periphery than they had during the colonial period, they have also become more fully integrated into a capitalist system determined and controlled by TNCs with the support of capitalist-industrial states in the center.

During this period there were also attempts to establish producer cartels patterned after OPEC. Neither CIPEC (for copper producers) nor the International Tin Council have proved successful. Pinera notes that price raising and restrictions on production (by the developing state-owned mining company) have to directly benefit each specific nation, but that these actions are against the central government's objective to maximize revenue flows in the short-term (Pinera, 1978:465-467). Moreover, he asserts that "cartels could benefit larger and richer developing countries and not smaller and poorer ones" (Pinera:478). Thus, the periphery has not been able to establish unity of objectives nor actions.

The Performance of Minerals-Led Developing Nations

Developing nations generally seek three objectives from the exploitation of their mineral resources: increased fiscal revenues, increased foreign exchange

earnings, and increased employment. Although it is accepted that the major beneficial impact of minerals exploitation is the receipt and expenditure of resource rent (Garnaut, 1978:156-157), Nankani cautions that the ability to tax minerals exploitation also requires "an ability to invest productively" (Nankani, 1979:5). Daniel adds "In mineral-dependent economies of the Third World the determination of appropriate ownership arrangements, taxation policies and investment programmes has usually pre-occupied the attention of governments, to the exclusion of the employment and domestic income distribution aspects of mining developments" (Daniel, 1979:1). Implicit to these quotes is the notion that minerals-led nations fixate on the major benefits from minerals exploitation. While the costs of this fixation will be discussed below, key questions emerge: can a minerals-led nation still receive the major benefits from minerals exploitation and yet focus on "productive investments" which facilitate improved income distribution and expansion of social services? Or, does minerals exploitation inherently and structurally result in skewed and uneven development?

Returning to the major beneficial impact of mining, tax receipts, we find a two-edged sword. Inherent to dependency on mineral rents is the problem of fluctuating minerals prices, which produce cyclical (levels of) receipts and thus, instability (Garnaut, 1979:159). While instability in itself is a problem, it is compounded by several additional factors. First, the rapid inflow of additional revenues can quickly outstrip the capacity of government expenditure programs to productively utilize the receipts. This can result in considerable waste as in the case

of Indonesia and its oil revenues in the 1970s (ibid.). Second, the domestic expenditure of the increased revenues can produce future production and consumption structures which are heavily dependent on foreign exchange earnings (Cordes:128). Third, additional revenues during the debt-led growth of the 1970s enabled *bonanza borrowing* (Pintz, 1986), which is currently negatively impacting a number of developing nations through the combination of debt repayment and reduced revenues caused by low commodity prices. Clearly, if increased revenue is the major benefit, then the stabilization of its use is essential to realizing that benefit. While minerals revenue stabilization funds (MRSF) have been established in several countries (e.g., Jamaica, Zambia), only Papua New Guinea is considered to have an effective mechanism in respect to adjusting for fluctuating minerals prices and maintaining government expenditure programs (ibid.).²

In respect to foreign exchange earnings, a serious problem arises for minerals-led developing economies through what is known as the *Gregory Thesis*, a corollary to the *Dutch Disease* which will be discussed in more detail below. What this means is that the foreign exchange earnings from minerals effectively double

² The assessment of Papua New Guinea's MRSF would probably have been revised following the closure of the Bougainville copper mine in 1988. There have been criticisms that the MRSF was underfunded, and therefore could not adjust to major fluctuations in metals prices. However, the MRSF has continued to function, and has in fact grown with the development of the Misima and Porgera gold mines and the Kutubu oil fields. In addition to the MRSF, the government has established a corporation to reinvest revenue from minerals in a range of commercial investments. The MRSF's viability and effectiveness in combating minerals price fluctuations can only be measured over a period of several decades; but, it continues to operate, which is more than can be said of the ones established in Jamaica and Zambia.

export tariffs (or, costs) on other primary (e.g., agricultural) products because of an inflated exchange rate (Cordes:126). In addition, the high exchange rates produce a variable import tariff on consumer goods which is inversely related to metals prices, such as in the case of Chile and copper prices (Tironi:400-401). Thus, while minerals earn foreign exchange, their effect has negative impacts on farmers and facilitates consumption of imports for those with sufficient income.

Although minerals exploitation does provide some employment both directly and via the multiplier effect, Garnaut argues that the major negative macroeconomic impact is inflation on wages, especially in industries competing for skilled manpower, or those in the "modern sector" (1979:156-157). This inflationary impact on wages reduces profitability and employment in competing industries (ibid.).

In summation of the macroeconomic objectives, we find governments seeking revenue which can easily be wasted or misappropriated if the capacity to utilize it has not been developed. We find gains in foreign exchange earnings which disbenefit other primary producers and encourages consumption of imports. Finally, we find employment creation in the mining sector, which can destroy employment creation in other industries, thereby reducing industrial diversification. From this summation, it is clear that an outcome of minerals exploitation is dualism, the development of minerals enclaves at the expense of a now unstable economy.

Nankani cites a number of other indicators of performance for minerals-led economies. He notes that when compared to other developing nations savings rates are lower in minerals-led developing economies (1979:21-22), that school enrollment

ratios are lower (ibid.:35), that agricultural development lags (ibid.:42-44), and, that a fall in minerals export earnings causes inflation and not unemployment in minerals (ibid.:38). The poor performance of minerals-led economies in respect to these indicators is especially alarming because increased savings rates are generally considered prerequisites to economic growth. Furthermore, increasing school enrollment ratios is a common national development objective, which is usually limited only by the availability of public sector funds. However, minerals development increases government revenues and GDP; thus, there is a major contradiction between objectives and results.

Based on the above, one could only conclude that the performance of minerals-led developing economies has not been universally satisfactory. While some of the identified problems clearly reflect imbalances in the capitalist world system, other problems indicate inattention on the part of the developing state. This lack of attention warrants further discussion.

Garnaut argues that governments can use resource rents to reduce or increase inequalities (1978:162). Commonly what happens is that the beneficiaries are the urban elites (ibid.:163) and specifically, the bureaucratic and managerial bourgeoisie (Seidman, 1980:327). Ogunbadeje (p. 15) alleges that minerals exploitation promotes the development of a state comprador consumer class (i.e., bureaucrats). This class is allied to foreign capital (Ogunbadeje:16). Cobbe discusses these inequalities in respect to what he terms "domestic imperialism" and adds, that while

governments can choose a "social welfare function," it is common to see only the few benefit (1979:87-91).

Thus, within the framework of an industry dominated by TNCs, an industry which has strong ties to the center's defense establishments (Ogunbadejeo:38-44), and an industry which commonly causes severe disruptions and lends itself to inequities, several additional aspects on the role of the developing state can be discussed. These are aspects relating to the management of the minerals resource and rents derived from its exploitation.

First, developing states control the resource (Cordes:228). Yet, control is not equal to ownership and ownership does not guarantee increased economic returns (ibid.:226). While state ownership can produce effective management of existing operations, there are serious constraints on developing new mines (ibid.:249-250). These constraints include that developing nations have not been heavily explored for minerals (ibid.:74), and that there is roughly only a one in one thousand chance that a discovered minerals prospect will ever become a mine (Cunningham, 1981:265). This high level of risk has meant that "the role of the national corporation is more that of a regulatory authority than an initiator of investments or a risk taker" (Garnaut, 1978:141). In other words, the state and the TNC have recognized their symbiotic roles, in which they become partners (Cordes:264), and place less emphasis on formal expressions of ownership (ibid.:262).

In discussing the new generation of mining agreements which are more favorable to developing nations, Cordes states "one is struck by the apparent ability of

TMEs (TNCs) to remain one step ahead of LDCs from one stage of their relationship to another. This, itself, is reminiscent of a central tenet of dependency theory: the process of foreign direct investment is characterized by the investor's ability to create gaps or needs in LDCs which only they can fill" (p. 259). This comment accurately describes the symbiotic partnership and alludes to the fact that whether the state owns the mine, "rents" it to a TNC, or has developed downstream processing options, the structure of the capitalist world economy will continue to favor the TNC.

Minerals-led Developing Economies: Illustrative Examples

The experiences of Zambia and Papua New Guinea with non-fuel minerals exploitation to 1989³ are discussed below. Although the experiences of these countries will not exactly correlate to the framework presented above, there will be considerable parallels, especially in respect to dependence on the capitalist center. These countries are both copper producers--although Papua New Guinea has more recently become identified with gold mining--and have approached minerals

³ 1989 is used as a cutoff year for several reasons. First, the period from the end of 1988 to the first half of 1989 for Papua New Guinea is highlighted in Chapter 6. This was the period when the Bougainville Copper Mine was closed by the MTNC because of armed resistance by local area landowners. The mine is still not operating as of January 1995. This extraordinary event warrants specific attention because there have been no other identifiable incidents in recent history when a group of local area residents in a small developing nation were able to shut down the operations of an MTNC on a seemingly "permanent" basis. The mine's closure caused major short-term dislocations for the Papua New Guinea economy, which have only been short-lived because other mining projects were developed during the intervening years and their revenue streams have enabled the government to resume its pre-Bougainville closure level of operations. Second, for Zambia, there have been few major structural changes since 1989. The country remains dependent on copper export earnings and continues as a ward of the IMF and the World Bank.

exploitation from different perspectives and with somewhat different results. Zambia selected a policy course which led to the nationalization of its MTNC-owned mines after independence. Papua New Guinea pursued policies which attempted to attract foreign investment and then use a combination of taxation mechanisms and equity positions in the mining operations to secure increased benefits from mining. These two different policy positions provide the parameters for discussions of the case studies. However, it should also be noted that Papua New Guinea's more recent policy directions indicate that it is changing course from those described below, a fact that has led to its recent application for "standby" assistance from the multilateral lending agencies, as well as a change in its policies for investment in the minerals sector. Although the results are still inconclusive, it seems that much of the optimism and promise its economy once generated has now been largely dissipated through policy shifts and bureaucratic conflicts. However, the successes of Papua New Guinea illustrated below indicate that there are opportunities for developing nations to acquire increased levels of minerals rents. It should also be noted that the time period from which the example is drawn, does not include gold mining. Gold mining has only recently reemerged globally and in Papua New Guinea, which is to say that there are few cases on which a comparative analysis could be based.

Zambia

Zambia is a landlocked country in southern Africa of 750,000 sq.km. and a 1990 population of 8.1 million. Primarily a high plateau, Zambia experiences

moderate but seasonal rainfall, and is subject to heavy infestation by the tsetse fly, which constrains agricultural development. Zambia became independent in 1964 after 74 years of British colonial rule.

Copper generally accounts for 90 percent of total exports. In recent years, imports have risen faster than exports, producing a balance of trade deficit totalling over \$300 million in 1986. During the first half of the 1980s, the consumer price index rose at a rate of 16.1 percent per year, and the economy showed other negative trends including a declining savings rate, a fall in liquidity, and rising government deficits. Zambia's external debt (\$2.5 billion) was rescheduled in 1983 and it has received IMF standby assistance on several occasions over the last decade. GNP totalled \$1.8 billion in 1989, or \$241 per capita, and has been rising at a rate of 1.2 percent since 1987. Reflecting its situation (i.e., structural adjustment policies forced by) with the IMF and the World Bank, Zambia's public debt as a ratio of GNP increased from 61 to 133 percent from 1980 to 1985 (World Bank, 1988:75). This was caused in large part by the weak performance of its state owned enterprises, including mining and minerals smelting, which consumed nearly 80 percent of total investment for 1984 but contributed only 40 percent to GNP (*ibid.*:168-169). As a result, the World Bank and the IMF have stipulated that adjustment policies to corporatize/privatize these enterprises have to be implemented in order for Zambia to receive standby loans.

Zambia is the world's fifth largest copper producer and the second largest cobalt (a strategic mineral) producer. Daniel says that without copper, Zambia would

resemble some of its neighbors and be a "relatively poor agriculturally based, labour-exporting country" (Daniel, 1979:6). Ogunbadeje calls Zambia a "monoculture" based on copper (p. 36). Although Zambia has a higher per capita income than its neighbors, there are serious distributional problems as the poorest 20 percent of the population receive only 3.8 percent of household income (Nankani:34). These distributional problems reflect the fact that a majority of the population live in subsistence or quasi-subsistence agricultural areas, which are removed from the copperbelt (where the mines are located) and the rail lines which carry the copper exports (Cobbe:230).

However, these inequities and structural problems are largely a carryover from colonial rule. Two large TNCs, Anglo-American, a South Africa-based company, and Amax, a U.S.-based company, dominated mining and were not required by the colonial administration to generate much government revenue. This policy resulted in the fact that prior to independence, little was spent on educating Zambians and even less on rural development (ibid.:229-239). Thus, at independence, over 90 percent of labor force positions requiring a high school diploma or above were filled by Europeans earning on average 11 to 12 times the wages of Zambian workers (ibid.:230).

At independence, Zambia set forth as a primary goal, economic independence, and pursued a policy of "humanism" to provide equality of opportunity for Zambians (ibid.:231-232). Economic problems were complicated by the break with Ian Smith's

Rhodesia in 1965 and the need to establish alternative export routes (not going through Rhodesia), which led to a temporary fall in exports.

Although between independence and nationalization of the copper industry in 1969 government was removing the bulk of mining TNCs profits through taxes, it still felt it had to nationalize (Cunningham:293). However, nationalization was not necessarily motivated by economic reasons. Ownership by the TNCs was viewed as one of the "last vestiges of colonialism" (ibid.:269). Zambia also wanted to expand the copper industry in order to increase government revenues but the TNCs seemed reluctant to increase their investment in the country (Cobbe:245). But perhaps the most compelling justification for nationalization was the desire to Zambianize the mine labor force and thus end the power of the white mine worker unions (ibid.:233).

With the decision to abruptly nationalize in 1969, Zambia was forced to give the TNCs management contracts in order to continue mine operations. These management contracts were so lucrative for the TNCs that Anglo-American's stock value increased (on the London stock exchange) and they had to be renegotiated (for Amax) or bought out (for Anglo-American) (Cordes:238-240).

However, overnight, the state-owned mining enterprise became one of the 300 largest non-U.S. corporations in the world (ibid.:249). The mining enterprise became a subsidiary of the government's investment company, which also controlled large scale imports, wholesale and retail trade (Cobbe:234). Although they cannot be ascribed to too rapid growth (of the enterprise) or overdiversification, serious problems ensued for the mining industry.

Minerals exploration declined (Cunningham:280), there was a serious decline in the number of skilled personnel, especially engineers (ibid.:273), spare parts became in short supply (Bureau of Mines, **Minerals Yearbook 1989**, vol. 3, 1991:868), and perhaps most ominously, political considerations entered into the choice of management (Cunningham:272). The obvious effect was a drop in productivity (ibid.) which has continued into the 1980s and 1990s.

While these negative impacts of nationalization have had significant impact on an economy dependent on copper earnings, a new privileged class emerged which is reflected by government policies. Although the government has stated that reducing inequalities is a primary national goal and has espoused the value of rural development, these policies proved unacceptable to the urban elite (Cobbe:251). These urban elite were government employees who received sufficient income and fringe benefits to be able to enjoy a strong currency which provided cheap imports (Daniel, 1979:20). The currency was strong because of copper exports. Moreover, these urban elites had a vested interest in increasing government revenue and then spending it in urban areas rather than in less developed rural areas (ibid.).

Thus, one can conclude that Zambia made a number of mistakes in its nationalization and operation of the copper industry (Cobbe:259-261). Yet, the effects have not been limited to mining, rather they have left the country even more dependent on copper, constrained agricultural development and thus increased inequities, and have left Zambia under the direction of the IMF and the World Bank, which hardly meets the goal of economic independence. More ominously, an elite

has emerged which controls government's policies and operations, and this elite has become accustomed to the supply of western consumer goods and other accoutrements of power. Thus, while there are structural imbalances, it is highly doubtful that the elite would rectify these inequities even if they had the means to do so. Although Zambia can point to more educated Zambians (Nankani:77), one can only conclude that if these people enter the civil service or work for the state-owned enterprises, they will indeed be taking the place of whites during the colonial period in respect to not only position and profession but also in terms of lifestyle.

Papua New Guinea

Papua New Guinea is an island nation of 460,000 sq.km. and a 1990 population of 3.8 million. GDP was \$2.8 billion in 1989 but has since fallen because of closure of a key copper mine. Per capita income of \$741 in 1989 has also declined because of a population growth. Papua New Guinea became a copper exporter in 1972, when the Bougainville mine (hereafter, BCL) began operations. In 1984, Ok Tedi, another large copper-gold mine, began production. More recently, several gold mines have begun operations. In 1988, copper and gold accounted for 71 percent of total exports. However, the trade imbalance has been increasing, totalling \$141 million in 1986.

Papua New Guinea (hereafter, PNG) is an interesting case because it was the last major land area to be explored and colonized by the metropolitan countries (Connell, 1985:1), only since the beginning of this century. Because there is considerable poor agricultural land and a very rough topography, "white settler

colonialism wasn't a policy" of the colonial administration (Daniel and Sims, 1985:2; Connell:3). This left the country "unmodernized" and dominated by micronationalism directly related to the fact that PNG has over 700 spoken languages, or one-half of the world's total (Connell:2,4).

Although PNG gained independence in 1975 after a relatively short period of colonial rule, effective only since the end of World War II by Australia, it had been successfully penetrated by TNCs (e.g., the BCL mine), integrated into the global economy, and had become dependent on Australian aid (ibid.:5-7). This rapid transformation, occurring in a matter of decades, produced inequities, including the emergence of elites and a peasantry whose surplus value accrued to external states (ibid.:4, 16). But while this brief colonial period has caused some significant problems, it has also left the independent government with choices in terms of how the country is to develop (ibid.:125). It is this issue of choices which is discussed below.

Allan and Hinchliffe state "Papua New Guinea, then, became a politically independent country in 1975 at a time when comprehensive national planning was being discredited and when the economic development literature was (and still is) only just beginning to struggle with a set of alternatives" (Allan and Hinchliffe, 1982:6). The government decided to pursue a policy promoting economic stability rather than investment and growth (World Bank, 1982:i). Government policy included comparatively high expenditures on health and education, which were budget allocations criticized by the World Bank (Connell:24-26). The World Bank approach

to development was also criticized within PNG (ibid.:24) and the country pursued its stabilization policy and promoted decentralization and equity (Allan and Hinchliffe:18-20). In addition, PNG specifically developed and adopted a policy framework which would avoid control and "guidance" by the IMF (Daniel and Sims:91).

Before considering the policy framework, it is interesting to note PNG's view of the IMF for the 10 years following independence. Although there is a working relationship between government and the IMF, the government views the IMF programs, or policy directives, as "unsuccessful" (ibid.:107). The IMF is considered to not fully understand the complexities of the small open economy and to have thus made some miscalculations concerning PNG's capacity to borrow (ibid.:98-100). Specifically, IMF recommendations to revalue the currency are viewed as a "perverse redistribution against rural producers" (ibid.:100). Thus, PNG has pursued its own course. However, it should also be noted that the current government of Sir Julius Chan intends to follow policies promoting the private sector which have been proposed by the World Bank and the IMF. Thus, while PNG has been able to resist past interference by these multilateral agencies, it seems that a different course is being adopted which could yield results similar to those of Zambia and other minerals-led developing nations.

Because of the government's dependence on revenues from copper and gold, PNG's stabilization framework has been designed to lessen the negative impacts of minerals-led development. First, it has established a Minerals Revenue Stabilisation

Fund (MRSF) to combat the impacts of price fluctuations on budgeting and to avoid a *bonanza* mentality, or the *Dutch disease*, where high minerals prices lead to major increases in revenues which causes government to increase its budgetary commitments, as occurred in Zambia (ibid:6). Second, a tight wages policy has been established to control inflation (ibid.:18) and in recognition that the bulk of employment and employment potential is outside of the formal wages and salary sector and in agriculture (Daniel, 1985:6). Third, the government decided to pursue the policy of a strong currency in order to prevent the outflow of capital and as an instrument against inflation (Daniel and Sims:19). Fourth, the government determined that distributional objectives would be accomplished through the national budget (ibid.:20). Fifth, the government identified that the objective of minerals development should be long-term revenue maximization (Daniel, 1985:6).

The government's view of minerals is based on the understanding that minerals development could provide only limited employment opportunities, that nationalization efforts in other countries had not been successful, and that PNG lacked the capital but for a minority share in any major project (ibid.:5-6). Thus, government devised an additional profits tax (APT) regime and comprehensive minerals legislation which would provide the investor with a "reasonable return" on the investment, while at the same time taxing away the largest possible proportion of receipts without damaging the efficiency of resource use (ibid.:6-7). PNG's policy has established *rules of the game* which are known, stable, and thus attractive to investors and this in turn has

encouraged exploration expenditures by foreign corporations at a time when many are limiting these expenditures (ibid.:27).

However, the evolution of this position has not come without problems, anxious moments and risk. To begin with, the agreement with BCL, operated and majority-owned by CRA the Australian subsidiary of Rio Tinto Zinc, which had been formulated by the Australian colonial administration and had to be renegotiated in 1974 because the colonial administration had written a bad agreement which enabled the capital investment to be recouped in only 30 months (ibid.8). Although the new agreement proved satisfactory to both parties, it is interesting to note that at one time BCL offered the government a 50 percent share in the mine which was rejected because it was felt that ownership would not equal control (ibid.:10-11).

The BCL renegotiation occurred when there was self-government but not yet independence, a time when there was concern with what the new independent government would do. This was further complicated by negotiations with Kennecott over the Ok Tedi prospect. The government took a strong stand towards Kennecott which eventually relinquished rights, although Kennecott's decision was largely due to its fall in profits because of nationalization of its holdings in Chile, added operating costs in the U.S. because of recent environmental legislation, copper price controls instituted by the Nixon administration, and the U.S.-forced divestiture of its profitable coal subsidiary (Pintz, 1984:45). The government then took over the Ok Tedi prospect and begin looking for other foreign investors as well as carrying out a more detailed exploration program (ibid.:50-51; and, Daniel, 1985: 2, 40).

PNG eventually found suitable investors for Ok Tedi, although several possible companies declined (Daniel, 1985:17). The agreement with the Ok Tedi consortium included several initiatives which later became incorporated into legislation and policy. These include methods to avoid transfer pricing by setting an arms-length "norm price," establishing infrastructure user charges that the investor had to pay, taking a minority share in a manner which minimized costs and risk, and a very positive tax regime (ibid.:18-21). The renegotiated BCL agreement has enabled PNG to receive 65 to 70 percent of earnings on average (the TNC gets 30 to 35 percent) and the Ok Tedi agreement has increased this return to government (ibid.:25).

Still, there have been problems with minerals. There is a moratorium on expanding the BCL mine because local traditional landowners have attempted to prevent further social disruption (ibid.:30). BCL was forced to stop operating in late 1988 by a local secessionist movement, which is attempting to gain Bougainville island's independence from PNG. This is discussed in more detail in a later chapter. There have also been environmental problems at Ok Tedi and the government has temporarily closed the mine on several occasions because terms of the agreement had been broken (ibid.:32-34). Furthermore, there have been some recent difficulties with the MRSF because of sustained falls in minerals-derived revenues (ibid.:44).

However, PNG is not under the control of the IMF and the IMF. It has a functioning MRSF which has dampened negative effects and allowed the economy to develop in respect to both growth and equity far better than countries such as Zambia, Guyana, Guinea, and Jamaica (ibid.:47). The government has realized that ownership

does not equal control and that equity and board membership do not necessarily increase information or influence; rather, it has realized that legislation and contract can provide the means (ibid.:36). Importantly, the government realized that there are many reasons for a TNC's investment. Pintz describes the Ok Tedi consortium as emanating from political ties (the Australian minerals company which was encouraged to join by the Australian government), the need for raw materials (the German metals fabricator which received lucrative incentives from the German government), and corporate diversification strategies (the U.S. oil company) which reflect non-economic reasons for investment (Pintz, 1984:61). But a note of caution should also be added reflecting PNG's increasing dependence on minerals generated revenues (including its oil and gas fields), and its increasing application of World Bank/IMF promoted policies: PNG could be discarding measures which have served it relatively well in order to participate in the current jargon of the global economic system.

Conclusion

Clearly, non-fuel minerals are the domain of TNCs. Even when nationalization has produced generally positive results such as in the case of Chile, TNCs have still found ways to benefit albeit at different stages of processing. More often though, nationalization has not had the desired results as shown in the case of Zambia.

While it is not the intent to challenge Zambia's decision to nationalize, the government made mistakes especially in estimating the complex and long-term impacts of its takeover (Cobbe:259-261). Moreover, Zambia attempted to appear

reasonable to the world, and thus maintain its credibility, and so tried to negotiate decisions when its successes had been won through the unilateral decisions a state is entitled to make (ibid.:262). Failure to understand its strengths and weaknesses prevented Zambia from developing realistic policies and objectives and perhaps most importantly, to develop the comprehensive framework, including a specialized technical agency, which produced the positive results described by Tironi.

Zambia believed it did not have the time Chile had to develop that framework. While it is difficult to judge that assessment, it is sad to note a once promising developing economy has turned into somewhat of a disaster under the control of external agencies and administered internally by an entrenched import-consuming elite. These were the people who made Zambia's decisions and developed its strategies.

Papua New Guinea benefitted from the Zambia experience as hindsight often provides valuable lessons. PNG made concrete decisions to pursue equity over growth and adopted a conscious policy to avoid control by the IMF and the World Bank. While PNG clearly saw that the government would have to play a more activist role than it had under the colonial administration, it also recognized what it could and could not undertake. Thus, the decision not to nationalize nor be the majority partner, but to extract as much rent (taxes) from minerals development as possible. In addition, PNG was painfully aware of the less than successful record of public enterprises managing commercial investments (Daniel and Sims:32).

As a result, PNG has an economy which has performed comparatively well during the recent years of economic upheaval. Moreover, while there have been problems in attaining the goal of equity and there is a growing bureaucratic elite, it has still not achieved the status nor influence which typifies Zambia. Unfortunately, increasing emphasis is being given to growth, and the benefits of PNG's minerals policies are appearing in the form of the development of a number of gold mines and an oil field, which could cause considerable strain on stability initiatives and society as a whole.

This chapter has attempted not to determine whether nationalization or taxation is the best policy for a government to pursue. Rather, the chapter has attempted to present the decisions of two small open developing economies in the context of a global industry dominated by large TNCs. Zambia felt that the government could become an international player in minerals, and while some governments have been able to assume this role, Zambia clearly could not. Papua New Guinea recognized from the outset that it could not influence metals prices in London, New York boardroom decisions, or marketing arrangements negotiated in Tokyo. Instead, PNG assumed the position that it knew how it should develop.

Interesting is that both countries took major risks: Zambia with nationalization, and PNG with the BCL renegotiation and not accepting Kennecott's terms to develop Ok Tedi. Yet, these risks are very different because Zambia's meant long-term exposure and vulnerability whereas PNG did not increase its long-term vulnerability, even if Ok Tedi was not developed. While both governments

remain part of the periphery of the periphery, Zambia rejected a fundamental management or policy position of small states: emphasize stability and decrease vulnerability. The Zambian government assumed a major risk, gambling its autonomy on a proposition which it could not win in the hope of gaining bonanza returns. It should also be reiterated that MTNCs also pursue risk-aversion strategies.

However, the chapter's main conclusion is that within the framework of the global mining industry, dependency on TNCs is inescapable. Decisions impacting the economic performance of minerals-led economies are made in New York, London and Tokyo. State-owned mining companies in developing nations do not set metals prices, do not determine demand for metals, and do not set the parameters for the economics of mining. Thus, it is the interaction of TNC mining companies with the providers of capital such as TNC banks and multilateral lending agencies, and the major final consumers of metal products in the capitalist center such as the defense industry, which define the economics of mining.

Chapter 4

THE ROLE OF GOLD IN THE GLOBAL ECONOMY

Introduction

Gold is an element, with the Atomic Symbol Au, Atomic Number of 79, and an Atomic Weight of 196.9665. Gold is a metal which is malleable and shiny. The English word gold, is derived from the Teutonic word *gulth*, which means glowing or shining metal. The Atomic Symbol, Au, derives from the Latin, *aurum*, which comes from the Latin, *aurora*, meaning glowing dawn. This is a derivation of the Hebrew, *aor*, which means light.

Unlike other metals, obtaining gold has been the excuse for a multitude of robberies, murders, quests, and dreams since the recording of history. Specifically, gold has been a driving force behind major penetrations by Europeans into the periphery over the last five centuries. The Spanish *conquistadors* who ventured into the Americas sought gold, as did later immigrants to California, Alaska, Australia, Siberia and South Africa. Today, gold continues to be a vehicle for the center's expansion into and control of the periphery, whether in the form of a mining transnational corporation, a unit of international exchange, or as a commodity. This chapter provides a context for the role of gold and gold mining in the world economy. Specifically, the chapter shows that both supply and demand for gold are increasing and that developing

nations are attempting to capture opportunities to meet this increasing demand. In some cases, developing nations are succeeding but the recent expansion of the gold industries in the United States, Canada, and Australia has been even more impressive. Gold mining is a global industry and the exchange of gold, including investment vehicles, occurs in the global marketplace. While gold continues to be used as a hedge against inflation, a vehicle to "store" wealth during uncertain economic periods, the increasing consumption of gold jewellery is the major driving force behind the increasing demand for gold.

These are the parameters for those nations attempting to optimize benefits from gold mining. Because of these parameters and the major role played by other producing countries (e.g., South Africa, Russia, the United States, Canada, Australia), developing nations have not attempted to establish a cartel of producing nations such as OPEC. Instead, gold and gold mining have operated globally as a 'free market,' but one which has also been heavily influenced by the leading producers nations until only the last several years.

The history of gold mining from 4,000 B.C. to 1992 is briefly described in the chapter's first section. The second section defines current supply and demand trends. The third section considers the status of gold as a unit of monetary exchange. The fourth section discusses the role gold will assume in the 1990s.

A Brief History of Gold Mining

The mining and use of gold for jewellery, ornaments, and displays of wealth has been traced to over 4000 B.C. in Sumeria and Egypt. References to

gold appear in ancient Chinese, Hebrew and Sanskrit manuscripts. Gold coins began appearing in approximately 1000 B.C. (Govett and Harrowell, 1982:5).¹

Monetary exchange in ancient Greece was generally based on silver coins because of a lack of indigenous gold. However, Alexander the Great's conquests led to the acquisition of goldfields ranging from Egypt to India. The availability of gold resulted in the development of a major goldsmithing industry in Greece. A value ratio of 10 weights of silver to 1 of gold was established in 356 B.C., a ratio which continued until the 15th century (Govett and Harrowell, 1982:7; from Boyle, 1979).

During the Roman empire, gold mining was developed into a key industry through the use of slaves. Although alluvial deposits² in Spain provided the bulk of Roman gold, underground workings have also been identified. Perhaps not coincidentally, Spain was the last colony to fall from Rome's grasp, in 500 A.D. Evidence of gold mining in Asia during this period is very limited; however, it is

¹ Govett and Harrowell are used as the primary source for the data presented on gold mining between 4,000 B.C. and the 1970s. There are many other sources; however, the use of one source allows some consistency on gold production figures. This is important because there are numerous gaps for both the amount of gold mined as well as for the amount of gold in circulation. Thus, consistency is desirable.

Govett and Harrowell have utilized a number of sources in order to establish their database, which is widely accepted within the gold mining industry. Moreover, the intent of this section of the chapter is not to define with near 100 percent accuracy the actual gold production figures, but rather to show the long evolutionary role of gold and gold mining in the world economy.

² Alluvial and other types of gold deposits as well as additional characteristics of gold and gold mining are described in the following chapter. Alluvial, or placer, deposits are formed by water action transporting gold from its primary source in rock to form a concentrated layer of gold particles in another medium, such as mud or soil.

clear that workings of alluvial deposits and gold-quartz veins occurred in China and India. (Govett and Harrowell, 1982:7).

Table 4.1 shows gold mine production from 3900 B.C. to 500 A.D.³ The table indicates that Europe was the leading producer region, a trend which would be changed in future years. Implicit to the table is that the gold produced in a region was also largely consumed within that same region.

With the fall of Rome, Constantinople became the major gold trading center. However, the spread of Islam from the 8th century led to the establishment of Arab gold coins as an international currency. In contrast to the 2,572 tonnes of gold mined between 50 B.C. to 500 A.D., only 930 tonnes were mined between 500 A.D. and 1000 A.D., with 45 percent mined in Asia, 39 percent in Africa, and only 16 percent in Europe. From 1000 to 1500 A.D., 1,500 tonnes were mined throughout the world, with Europe accounting for roughly one-fourth of total production. (Govett and Harrowell, 1982:10).

The period of 500 A.D. to 1500 A.D. corresponds with Europe's so-called Dark Ages, a period when trade and commerce declined within Europe and a period when Europe-based empires were not pushing into other regions. Instead, Arabs from North Africa, Turks from the Ottoman Empire, and Mongols from Asia were pushing into Europe. Although gold was and is a highly valued

³ All production figures are in metric tonnes unless otherwise noted. Metric tonnes are the standard global measure used by the mining industry.

Table 4.1 World Gold Production, 3900 BC-500 AD (tonnes)

Region/ Country	Copper Age 3900-2000 BC	Bronze Age 2000-1200 BC	Iron Age 1200-50 BC	Roman Empire 50 BC-500 AD
Africa				
Egypt	700	570	410	30
Nubia	20	1,020	510	50
Ethiopia	10	50	50	110
West Africa	--	20	100	110
Other Africa	--	60	345	20
Total Africa	730	1,720	1,415	320
Europe				
Iberia	50	200	600	1,000
Gaul	--	30	500	50
Great Britain	--	30	30	30
Italy	--	15	50	100
Carpathians	--	35	50	130
Other Europe	--	90	530	400
Total Europe	50	400	1,810	1,710
Asia				
Arabia	20	30	30	20
Asia Minor	20	60	80	12
India	100	250	425	215
China	--	20	50	100
Siberia	--	--	10	5
Other Asia	--	165	300	190
Total Asia	140	525	895	542
Total World	920	2,645	4,120	2,572

Source: Govett, M.H. and M.R. Harrowell, 1982, *Gold: World Supply and Demand*, pp. 8-9, Australian Minerals Economics Pty. Ltd., Sydney, Australia.

commodity throughout the world, Europe clearly consumed more than other regions. This propensity to consume gold will become an important theme in Europe's expansionist period from 1500 A.D. Although the intent of Columbus was to find a more direct route to the "Spice Islands" of Asia, his voyages to the Americas led to a major gold rush which lasted two centuries. Notably absent from Table 4.1 is any mention of gold mining in the Americas. Gold artifacts, including jewellery and other ornaments, were used by indigenous Caribbeans as early as 500 A.D. The Aztecs and Incans were accomplished miners and goldsmiths well before the European intrusion following 1492. In fact, the first gold shipped from the Americas to Europe, "was stripped from indigenous Caribbeans and ancient Aztec and Inca shrines" by the Spanish. However, data on gold production in the Americas prior to 1500 A.D. is not available. (Govett and Harrowell, 1982:10).

Table 4.2 provides an historical perspective for gold mine production. The figure shows a fall in production during the 500 to 1500 A.D. period. The sharp rise in production during 1493 to 1680 corresponds to Spain's exploitation of the Americas. It was during this period that pivotal capitalist relationships were established. Wallerstein describes this period as the time when capitalism superseded feudalism (1974:27-28). It is also the period when Spain's global power and consumption of gold were at their heights, both of which were based on the expropriation of resources from its colonies through the use of slave labor.

Table 4.2 World Goldmine Production, 3900 BC-1992 (tonnes)

Period	Produced During Period	Cumulative Production
Copper Age 3900-2000 BC	920	920
Bronze Age 2000-1200 BC	2,645	3,565
Iron Age 1200-50 BC	4,120	7,685
Roman Empire 50 BC-500 AD	2,572	10,257
Dark Ages 500-1000	934	11,191
Middle Ages 1000-1492	1,538	12,729
1493-1680	8,163	20,892
1681-1850	3,072	23,964
1851-1900	3,523	27,487
1901-1950	34,172	61,659
1951-1980	31,341	93,000
1981-1990	13,208	106,208
1991-1992	3,615	109,823

Sources: for 3900 BC to 1980 data, Govett, M.H. and M.R. Harrowell, 1982, **Gold: World Supply and Demand**, pp. 17, Australian Minerals Economics Pty. Ltd., Sydney, Australia; for 1981-1992 data, Murray, S., **Gold 1991**, pp. 21, and **Gold 1993**, pp. 17, Gold Field Mineral Services Ltd., London, United Kingdom.

Notes: data from 1900-1992 excludes goldmine production from the U.S.S.R.; data from 1981-1992 also excludes gold production from China, North Korea and Mongolia; estimated total production from these four countries for 1981-1990 was 3,406 tonnes, and for 1991-1992, 755 tonnes.

It is noteworthy that the amount of gold produced (over 8,100 tonnes) during these two centuries equalled two-thirds of all the gold which had been previously identified as being produced (over 12,700 tonnes) since 4000 B.C.

The period between 1681 and 1850 shows a decrease in gold production and corresponds with Spain's decline as a world power. However, it should also be noted that while gold production declined, production of lower valued silver increased in the Americas to meet Spain's demand for a resource to satisfy the high consumption levels of its elite (see Chapter 1, p. 3). The exploitation of the gold and silver resources of the Americas through the use of indigenous slave labor by Spain provides the basis for Andre Gunder Frank's thesis on the underdevelopment of the periphery. He has convincingly argued that the Americas were worse off because of this relationship: a situation in which indigenous cultures were destroyed, the indigenous population forced into slavery, and the land left scarred and polluted.

During the last half of the nineteenth century, the gold rushes of California, Australia, New Zealand, Russia, South Africa and Alaska became prominent. John Marshall's discovery of gold nuggets at Sutter's Mill on 24 January 1848, led to the "Forty-niner" gold rush in California which lasted through the 1850s. Moreover, the gold rush brought thousands of immigrants, the vast majority of whom settled in California or in the nearby area of Nevada's Comstock Lode, a large silver bearing region.

Australia's gold rushes began in 1851 in New South Wales. However, the Victorian gold rush which began in the same year, was far larger, with more miners working there than in California during the 1850s (Govett and Harrowell, 1982:10). Queensland (1860s) and Western Australia (1890s) also had major gold rushes. New Zealand had several gold rushes during the 1850s and 1860s, including in the Coromandel Peninsula, the Thames region (Hauraki Goldfields), and the Collingwood and Otago goldfields on South Island. Canada also had a series of gold rushes, including in British Columbia during the 1850s, Nova Scotia in the 1850s, and Ontario in the 1860s. Alaska's first gold rush was in the 1870s, but was quite small compared to the Klondike rush of the 1890s. Siberia experienced a series of gold rushes, beginning in the 1830s and 1840s.

However, it was the development of South Africa's Witwatersrand region beginning in the 1880s which changed gold mining. Prior to the opening of the Witwatersrand, gold mining throughout the world had been very small scale, with individual shovel and pan miners working alluvial deposits, including streambeds, the norm. The gold-rich Witwatersrand deposits needed considerable site preparation including the movement of earth and tunnelling, in order to access the gold reef. This required capital and engineering skills which could only be obtained from larger companies. This introduction of large-scale capital has determined the shape of today's gold industry, and will be discussed in the next chapter.

Prominent players in the development of the Witwatersrand included Cecil Rhodes, who used the fortune he earned at the Kimberly diamond mines to finance Consolidated Goldfields of South Africa, and the London financial firm of Wernher, Beit and Company, which operated under the name, the 'Corner House' in South Africa, and later became Central Mining Investment Corporation. While Rhodes and the Corner House were rivals in the Witwatersrand, they had previously combined to form DeBeers Consolidated Company. Consolidated Goldfields still operates in South Africa and has spun off a number of independent subsidiaries. DeBeers still dominates the global diamond industry, and while remaining a separate company, it has been effectively merged with the global giant Anglo American Corporation by Sir Ernest Oppenheimer during the first half of this century. (Wheatcroft, 1987:8, 272, 276, 277)

Important to all of these gold rushes is that they provided the impetus and justification for the invasion and/or settlement of new territory. From Columbus' first voyage in 1492 to the beginning of the twentieth century was the period of European expansion into, colonization of, and expropriation of resources from much of the rest of the world. Regions which possessed gold were invaded and settled, much as were regions which possessed quality arable land, or which sat astride important sea lanes. Indigenous residents of these regions had their political and social institutions destabilized, and were themselves either physically removed, isolated in detention areas, or enslaved. Wheatcroft offers a comment on the impact of gold mining on South Africa:

[A] poor and unknown country became rich, famous and powerful all because of the mines. Governments were subverted and overthrown and bolstered up, because of gold. Every one of the social and ethnic groups in the country has seen its history changed by mining. There has been a direct connexion between gold and the political systems of the country, the relationships between rulers and ruled, the continuing success of white supremacy. All that South Africa has been and has become relates directly to this one industry. (p. xvi)

From this period of European expansion, contemporary capitalism was born. Financial markets were established, often in European capitals such as London and Paris, corporations evolved which were able to view and manage resources from a global perspective, and the wealth of the world became concentrated in the hands of those at the center of these operations. Meanwhile, the periphery was systematically marginalized.

Gold mining has had an active role in this process which has established and dispersed global capitalism. Interestingly, and returning to Table 4.2, it should be noted that the cumulative total of gold mined from 4000 B.C. to 1900 A.D. was over 27,000 tonnes. Excluding for the most part production in the Soviet Union, from 1900 to 1950, over 34,000 tonnes were mined; from 1950 to 1980, more than 31,000 tonnes were mined (Govett and Harrowell, 1982:17); nearly 15,000 tonnes were mined during the 1980s, and over 2,150 tonnes were mined in 1991 (Gold, 1992:21). Thus, consumption of gold has greatly increased, and especially during the evolution of a global capitalistic gold mining industry over the last two centuries. The key factor is that the physical supply has

increased and just as obviously, the gold mining industry as promoted its product so that demand for gold continues to rise.

Current Supply and Demand Trends

Table 4.3 shows the supply of gold in non-Centrally Planned Economies since 1950.⁴ Several major trends appear, including the near quadrupling of total supply over the last four decades. Increased mine production has accounted for slightly more than half of this jump. The other half of this increase has been provided by sales from Centrally Planned Economies (CPE), most notably the U.S.S.R., the recycling of gold scrap, and the supply from hedging transactions. All of these warrant further attention.

Table 4.4 disaggregates world mine production by country. Mine production in the United States, Canada, Japan, New Zealand, and Australia has

⁴ Supply and demand figures are taken from **Gold**, which is an annual publication from Gold Fields Mineral Services Ltd., and formerly published by a leading gold mining TNC, Consolidated Goldfields, Ltd. There are many other sources for annual supply and demand figures including the United States Geophysical Survey and the Bureau of Mines. However, the most current and widely respected source on data in the industry is **Gold**.

As noted elsewhere, there are substantial gaps on production and demand figures. Production figures for the CPE and South Africa are always subject to debate because the 'official' estimates of production may not necessarily be the actual amounts produced. Accurate data have been purposely withheld by these nations. Production figures for a number of developing nations (e.g., Brazil, Philippines) where the informal mining sector (e.g., pan and shovel miners) provides a significant contribution, are also questionable because it has been nearly impossible to accurately estimate the data. Demand is also difficult to assess because of the role of recycled gold in jewellery and the overall absence of recorded data for many nations, and especially in developing countries.

Table 4.3 World Supply of Gold, 1950-1992 (tonnes)

Year	Mine Production	Net Sales by Communist Nations	Net Official Sales (+)	Net Official Purchases (-)	Scrap Recovery	Total Supply
1950-1959	8,338	1,027	--	4,643	--	4,722
1960-1969	12,049	1,749	2,064	2,755	--	13,087
1970-1979	10,639	2,330	1,364	387	--	11,992
1980	954	90	--	230	461	1,275
1981	976	280	--	276	197	1,177
1982	1,025	203	--	85	236	1,379
1983	1,121	93	142	--	296	1,652
1984	1,170	205	85	--	294	1,753
1985	1,239	210	--	132	319	1,637
1986	1,300	402	--	145	492	2,049
1987	1,387	303	--	72	434	2,052
1988	1,552	263	--	285	353	1,883
1989	1,682	266	366	--	363	2,683
1980-1989	12,406	2,315	593	1,225	3,445	17,534
1990	1,746	412	7	--	493	2,685
1991	1,775	222	58	--	407	2,459
1992	1,841	66	599	--	435	2,941

Sources: for 1950 to 1980 data, Govett, M.H. and M.R. Harrowell, 1982, *Gold: World Supply and Demand*, pp. 26, Australian Minerals Economics Pty. Ltd., Sydney, Australia; for 1981-1992 data, Murray, S., *Gold 1986*, pp. 14, 61, and *Gold 1993*, pp. 5, Gold Field Mineral Services Ltd., London, United Kingdom.

Notes: a. No comprehensive records for scrap recovery are available prior to 1980.

b. Production from CPEs has not been included in the mine production column because of lack of consistent data (figures available only from 1981).

Table 4.4 World Gold Mine Production, 1975-1992 (tonnes)

Region/Country	1975	1981	1985	1990	1992
Europe	11.0	14.9	21.7	33.6	28.1
U.S.A.	32.4	44.0	79.5	294.2	322.2
Canada	51.4	53.0	90.0	167.0	157.4
Brazil	12.5	35.0	72.3	84.1	76.5
Chile	4.1	16.3	22.8	33.3	39.5
Colombia	10.8	17.7	26.4	32.5	29.9
Peru	2.9	7.2	10.9	14.6	15.6
Venezuela	<1.0	1.5	12.0	14.2	11.7
Mexico	4.7	5.0	8.0	9.6	9.9
Bolivia	<1.0	2.5	6.0	10.4	7.9
Ecuador	<1.0	0.8	3.0	9.3	6.8
Other Latin America	5.8	18.0	17.1	11.7	11.9
Indonesia	<1.0	2.1	5.6	13.3	40.4
Philippines	16.3	24.9	36.9	37.2	27.2
Japan	4.7	5.8	5.3	7.3	8.9
Malaysia	<1.0	0.7	2.6	2.9	3.5
China, Mongolia	na	53.0	59.0	100.0	122.0
North Korea	na	na	na	13.0	17.0
Other Asia	3.8	4.1	3.1	7.9	9.9
South Africa	713.4	657.6	671.7	605.1	614.1
Ghana	16.3	13.0	12.0	17.3	34.0
Zimbabwe	18.6	11.6	14.7	16.9	18.5
Zaire	3.6	3.2	8.0	9.3	7.0
Other Africa	1.5	12.0	17.0	25.0	33.2

Region/Country	1975	1981	1985	1990	1992
Europe	11.0	14.9	21.7	33.6	28.1
Table 4.4 continued					
Region/Country	1975	1981	1985	1990	1992
Australia	16.3	18.4	58.5	243.1	240.0
Papua New Guinea	17.9	17.2	31.3	33.6	71.2
New Zealand	< 1.0	0.2	0.9	6.0	10.2
Fiji	< 1.0	1.0	1.9	4.1	3.0
Soviet Union	na	262.0	271.0	270.0	237.0
World Total	952.9	1303.0	1569.2	2128.7	2216.5

Source: Gold 1982, pp. 16; Gold 1989, pp. 17; and Gold 1993, pp. 17, Gold Field Mineral Services Ltd., London.

Notes: a. na=not available; the Gold annual series did not publish estimates for these years.

b. 1981 figures include production estimates for the Soviet Union, China and Mongolia, which is the first year that Gold began publishing production estimates for the Centrally Planned Economies.

increased from 136.3 tonnes in 1981 to 766.8 tonnes in 1992. Mine production in developing nations has increased from 247.1 tonnes in 1981 to 459.6 tonnes in 1992. However, production in South Africa has declined by 10 percent, and, aside from China, Mongolia and North Korea, production in the CPEs has remained relatively flat. The implications of these figures include that capital for mine expansion has generally been locating in "politically safe" countries such as the United States and Australia. Similarly, as political problems have mounted within South Africa and the effects of global sanctions have restricted capital

inflows, existing gold mines have not received new injections of capital. In addition, a combination of low gold prices and rising production costs have resulted in the closure of marginal producing South African units. Production in the U.S.S.R. has also not been aided by internal political problems as well as marginal producing units.

In developing nations, major increases have been recorded in Brazil, Colombia, Indonesia and Papua New Guinea. However, of the 80 tonnes produced in Brazil during 1991, only 33 tonnes were produced by the formal mining sector, with the remaining 47 tonnes generated by the informal mining sector. This group is composed of "pick and shovel" operators and gold panners, with over 220,000 *garimpeiros* working during 1992, which is a decline from the 350,000 plus informal sector miners operating during the mid-1980s. Informal sector gold mining is widespread throughout the developing world and is an important component in total production, even if it is nearly impossible to accurately estimate its contribution. Brazil, the Philippines, Papua New Guinea have very active informal sectors.

It should also be noted that explanation for the above fluctuation in the number of *garimpeiros* in Brazil and which also occurs in other countries, is that during periods of recession or stagnation, there is an influx of miners seeking means to earn cash. Thus, it appears that the informal gold mining sector provides an outlet for unemployed urban populations, which probably reduces

some urban tensions and pressure on the government. Issues associated with the informal gold mining sector are discussed in more detail in Chapter 6.

However, the main conclusions drawn from the table need to be iterated:

- 1) between 1981 and 1992, gold mine production increased by over 70 percent;
- 2) during that time, production in Europe, the U.S.A., Canada, Japan, Australia and New Zealand increased nearly six-fold; and,
- 3) production in developing nations increased 86 percent.

Thus, gold mine production in developing nations is increasing but at a slower rate than in the leading industrialized nations. At a superficial level, this refutes arguments that the industrialized nations are exporting pollution to the developing nations. But this assertion would be misleading because mine openings and expansions in the industrialized nations require a detailed permitting process, while similar activities in developing nations do not utilize as detailed a process. In other words, gold mining could be "cleaner" in industrialized nations than in developing nations. Environmental issues will be discussed in more detail in Chapter 6.

However, the major conclusion remains that capital flows to the "safest" destination. The increase in gold mine output demonstrates that international capital (in the form of mining transnational corporations, or MTNCs) considers the industrialized nations "safer" investment destinations than other nations. Increased production in Indonesia, Papua New Guinea, and Fiji have been largely

funded through MTNCs. Increased production in Ghana, Mexico, Chile and Peru have been financed largely through both local mining companies (including state owned enterprises) and MTNCs. As indicated above, increased production in Brazil and the Philippines is a result of local "panners" and other small-scale operators plus local mining companies. These different levels of transnational penetration reflect policies which governments have adopted to either attract or limit foreign investment. Although the data are not conclusive, it is interesting to note that those nations which have tried to attract foreign investment such as Indonesia and Papua New Guinea, have seen their gold production increase over time, while nations such as Brazil and the Philippines which rely on local mining companies and "panners," have experienced fluctuations in output from year-to-year and have also recently experienced declines in production.

Special attention needs to be given to South Africa and the former U.S.S.R. as gold producers. South Africa has been the world's leading producer of gold during the 20th century. Gold was first produced in the Transvaal in 1871, and mining began in the famous Witwatersand in 1886. South Africa produced nearly 79 percent (1000.4 tonnes) of the non-Centrally Planned Economies' (i.e., non-communist nations) gold in 1970, 68 percent (657.6 tonnes) in 1981, and 33 percent (614.1) in 1992. There are several explanations for this major shift in South Africa's role as a gold producer. First and as will be noted below in reference to the gold standard, Nixon wanted to end the dominance of South Africa and the U.S.S.R. of the world gold market (Hellman, 1979:131).

Second, the international sanctions imposed on South Africa because of its apartheid policies negatively affected the inflow of capital and the presence of mining TNCs, with some MTNCs selling their operations to South African MTNCs. For example, capital investment in 1985 was 6 percent less than in 1981, which goes against the global industry trend of increasing capital investment (Gold 1986:64). The sanctions also resulted in a sharp drop in the sales of Krugerrands, a gold coin purchased for both its gold value as well as a coin for collectors. Third, mining costs have greatly increased as recoverable ore grades have fallen. Fourth, mining costs have also been pushed higher by labor unrest, although the highly centralized and government-backed Chamber of Mines has been able to suppress most labor initiatives. Wages have been increased so that black miners, who comprise over 90 percent of the work force, now earn roughly one-seventh the pay of white miners compared to one-twentieth in 1970, and the pay for black miners, many of whom are from neighboring nations, increased in real terms over 6 times between 1968 and 1985 (Gold 1986:66-67). Fifth, the underground mines are going deeper (over 2,000 meters deep), which raises costs. Sixth, as the leading foreign exchange earner, gold and the profits from gold mining are heavily taxed by the government, which is a disincentive for further investment. Thus, the end result has been that South Africa has gone from being the world's lowest cost to the highest cost producer of gold during the 1980s (Gold 1993:27).

Gold production in the former U.S.S.R. dates to 1000 B.C., with an industry established in the Urals during Peter the Great's reign (1682-1725), and a major goldrush in Siberia beginning in 1838. From 1917, production has primarily been in Siberia with smaller industries operating in Kazakhstan, Uzbekistan and Armenia. Official statistics have been difficult to obtain or are of questionable accuracy (Gold 1993:23). However, available data clearly indicate that the former U.S.S.R. was the world's second leading producer of gold during the 20th century, and the Commonwealth of Independent States was the world's fourth largest producer in 1992. Lenin recognized the role of gold as a necessary vehicle to pay for imports and argued for increased production as early as 1921 (Hellman:1979), and Stalin began a major expansion of the mining industry (Govett and Harrowell:27). Soviet sales to the non-communist nations varied from year-to-year, with 200-300 tonnes typical during the 1970s and 1980s. However, there have also been years (e.g., between 1965 and 1972) when little or no gold was sold. Gold sales appear to be based on the need for foreign exchange to pay for imports such as wheat when harvests are poor, and to compensate for low oil prices because oil was the U.S.S.R.'s other major foreign exchange earner. Gold is sold through the Zurich subsidiary of the Bank of Foreign Trade (Wozchod Handelsbank), which trades on the Zurich gold market.

Aside from gold mine production, the other major supply sources are from the sales of bullion and the recycling of gold scrap, or gold which has been obtained as process scrap (from the fabrication of jewellery and industrial

products), industrial recovery (from obsolete manufactures), old jewellery, and coins. Total global supply of gold was 3,480 tonnes in 1992, of which mine supply accounted for 64 percent, bullion accounted for 23 percent (810 tonnes) and old scrap 13 percent (453 tonnes). The total of above-ground gold stocks including all bullion, jewellery, coins, and other uses, was 121,500 tonnes, or roughly 35 years worth of total demand, or 55 years worth of mine production.

Gold 1993 (pp. 33-35) reports that the bulk of the bullion sold was by the central banks of the developed nations, especially those of members of the European Community such as the Netherlands and Belgium, which were attempting to reduce their budget deficits as required under the European Monetary Union. Iraq sold bullion in exchange for wheat from Australia and Israel sold bullion to ease its debt burden. Although data are inconclusive, it appears that China, operating through intermediaries, was the primary purchaser of the officially sold bullion.

The supply of old gold scrap has increased from 296 tonnes in 1983 to 435 tonnes in 1992. Nearly all of the increase has occurred in the Middle East (37 tonnes in 1983 and 181 tonnes in 1992) and South Asia. The increase in old scrap from these areas also reflects the marked increased in the use of recycled jewellery, rising from 190 tonnes in 1983 (64 percent of total scrap) to 392 tonnes in 1992 (90 percent of total scrap). Some elaboration on these trends is necessary. Traditionally, gold has been viewed as a commodity which will retain its value and which can be readily converted into other goods, services and

currencies. In a number of cultures, brides came into marriages wearing their inheritance or dowry in the form of gold jewellery. This tradition is still practiced in some cultures and has been augmented by the desire to exchange jewellery for new pieces and styles. The result is a greatly expanded and better organized recycling system. The role of gold as an investment will be discussed below. However, it is necessary to note that the increasing exchange of gold jewellery seems to be driven by fashion rather than necessity. One exception to this view is that in the former Soviet Union old jewellery is being exchanged for foreign currencies such as the US dollar because of the breakdown in the post-USSR economies. Thus, there have been some "distress" sales in order to meet demands which could not be otherwise be satisfied through official rouble transactions (Gold 1993:35-37).

Demand for gold for selected years between 1972 and 1992 is shown in Table 4.5, which disaggregates demand by end-use applications and developed and developing nations. The figures shown indicate demand in the nation in which semi-processed or finished products are manufactured. This could result in somewhat misleading analyses: for example, the fabrication of jewellery in Italy required 165 tonnes in 1981 but most of this amount was exported, especially to developing nations in the Middle East and South America (Gold 1982:31-33). In recent years, consumption and fabrication of gold jewellery has risen sharply in East Asia as evidenced by China becoming the world's largest gold consuming

Table 4.5 Gold Fabrication in Developed and Developing Nations, 1972-1992

(tonnes)

End-Use	1972	1973	1974	1979	1980	1981	1990	1991	1992
Developed Nations									
Jewellery	702	428	278	546	275	373	871	884	928
Electronics	105	126	91	97	87	89	139	142	130
Dentistry	61	64	54	83	60	62	50	52	55
Other Industrial	65	67	64	72	62	61	58	58	62
Medal Sales	32	19	12	16	18	12	9	9	6
Coin Sales	44	36	209	243	170	142	99	123	77
Subtotal	1009	740	708	1057	672	739	1226	1268	1258
Developing Nations									
Jewellery	297	90	-54	182	-149	222	1175	1247	1533
Electronics	—	1	1	2	2	1	9	10	11
Dentistry	5	4	3	4	2	1	4	4	4
Other Industrial	5	4	3	7	4	4	8	9	19
Medal Sales	10	3	-4	17	-2	15	13	17	22
Coin Sales	19	18	78	48	16	50	19	16	16
Subtotal	336	120	27	260	-127	294	1228	1303	1601
Total	1345	860	735	1317	544	1033	2454	2571	2859

Source: Gold 1982 for 1972-1974, pp. 32; Gold 1984 for 1979-1981, pp. 27; Gold 1993 for 1990-1992, pp. 41.

nation in 1992, with private consumption "conservatively estimated" at 350 tonnes (Gold 1993:38-53). Although the developed nations continue as the prime manufacturers of products utilizing gold, the increased demand for jewellery and the production of electronics in nations such as South Korea, Taiwan, China, Thailand and Malaysia is resulting in the rapid development of gold-based manufacturing in these nations.

Mentioned above was the notion that gold jewellery is currently not being utilized as a convertible asset by individuals as it had in the past, especially in the Middle East and South Asia, and is now more driven by exchanging old gold jewellery for more contemporary styles. However, the sharp drops in demand for jewellery between 1973 and 1974 and between 1979 and 1980 can be interpreted to contradict this view. Specifically, it should be noted that real (constant 1992 \$US) gold prices rose over 47 percent between 1973 and 1974, and more than 77 percent between 1979 and 1980. These price increases presumably triggered selling of gold jewellery and coins for personal gain. Because these high prices also occurred during periods of global recession, an unknown portion of these sales were probably triggered by "distress" sales, which is to say that people were forced to convert gold jewellery into cash to compensate for loss of employment and income. But it should also be noted that the high real gold prices in 1987 did not result in similar sales behavior--in fact, demand for jewellery increased in both the developed and developing nations.

The global economy was expanding in 1987 and not contracting as it had during other previous high price periods. The 1987 gold price was caused by several global economic issues including the stock market crash of 19 October ("Black Monday"), the rising US trade and budget deficits, and concern over the structure of debt throughout the world, and especially with respect to the ability of developing nations to maintain payment schedules on their sizeable loans. This uncertainty led to increased demand for gold by institutions (e.g., banks) as a hedge against potential currency devaluations and accompanying inflation. The role of gold as a monetary unit and as a convertible asset warrant further attention.

Gold as a Unit of Monetary Exchange

While gold is valuable as a conductor in the electronics industry and is much sought after for jewellery, the most prominent use of gold has been as a monetary unit. The weight of gold has been translated into currency units for many years (e.g., one weight of gold equals 10 weights of silver) and remains one of the major uses of gold. However, the role of gold as a monetary unit has undergone considerable changes.

Table 4.3 showed world supply of gold and included net official sales and purchases. "Official" transactions include those by central banks, institutions directly controlled by governments (e.g., mints), and international organizations such as the International Monetary Fund (IMF). Excluding holdings by current and former centrally-planned economies (especially Russia and China),

approximately 34 thousand tonnes were held by the official sector in 1992, including 3,217 tonnes by the IMF. The total amount held by the official sector has varied only slightly over the last several decades. Gold reserves are held by the official sector as a backing for domestic currencies.

The use of paper money or paper receipts as a substitute for gold bullion and coins appeared by the 15th century. The emergence of these paper receipts led to the establishment of the banking industry which was based on converting these paper receipts for gold on demand. The paper receipts and their convertibility provided the basis for the issue of paper money backed by gold. This became known as the "gold standard" and was introduced by Great Britain in 1816. National and international accounts including balance of payments deficits and budget deficits were financed and/or paid with gold or gold-backed currencies. The gold standard forced budget deficits, trade imbalances and inflation to be quickly rectified. However, a quick response could also result in significant impacts on a domestic economy. For example, the building of the Suez Canal (1859-1869), the bankruptcy of the Egyptian Treasury (1876), and the imposition of British control over Egypt (1882) are intertwined and well-documented (e.g., D.A. Farnie, 1969, *East and West of Suez*, Clarendon Press, Oxford; and, J. Marlowe, 1964, *World Ditch*, Macmillan Company, New York). Less severe impacts included devaluation and a contracted economy. The period 1870-1914 was termed the "Golden Age of International Monetary Relations" because of the relatively peaceful expansion by imperialist Europe into Asia and

Africa, and dominated by the Bank of England's hegemonic role in international finance (Chacholiades, 1981:550-551).

At the Genoa Conference in 1922, gold bullion was replaced as the medium of international exchange by the reserve currencies, the US dollar and the British pound sterling, which were both backed by gold reserves. The US dollar conversion rate to gold was set at \$20.67 per troy ounce. Because of rising unemployment and devaluations, the 1922 system collapsed in 1931 and the conversion rate was reset at \$35.00 per troy ounce in 1934, a rate which lasted until 1968. At the time of the 1934 devaluation, President Roosevelt also made private holdings of gold illegal, with the Department of the Treasury becoming the repository for all gold bullion in the United States.

In 1944, the Bretton Woods Conference established a mechanism for international transactions, the IMF. The IMF established "an adjustable peg system" which set a par value for domestic currencies against the US dollar and the official price for gold (US\$35 per troy ounce). The US dollar became the vehicle to correct currency fluctuations. The IMF required members to hold 25 percent of their quotas (or, international borrowing power) in gold or the US dollar, which was based on gold bullion (e.g., Fort Knox). However, the gold supply was not increasing at a pace comparable to the growth of the global economy. This led to the establishment of a two-tier gold price system, with one price set by market supply and demand forces, and the other price pegged at \$35 per ounce. The IMF followed this action by establishing the Special Drawing

Rights (SDRs) system in 1968 to replace the old quota system. Concurrent to the IMF action and because of its budget deficits and inflation, the United States incurred substantial balance of payments deficits with Germany, Japan and France. These nations resented the hegemony of the US dollar and refused to adjust their currencies because as in the case of France, "de Gaulle claimed that the US dollar standard required France to finance U.S. involvement in Viet Nam" (ibid.:560). This led to the flexible use of other currencies for international transactions and the ending of the gold standard and finally, the demonetization of gold in 1973. Nixon believed that it was essential to end the gold standard because the supply of gold was based on production in South Africa and the USSR (Hellmann, 1979:131). US citizens were able to own gold from January 1, 1975.

The impact of the end of the gold standard on gold prices is shown in Table 4.6, which indicates 1992 constant and current dollar values as well as a 1992 constant yen value for the period 1968 to 1992. Aside from the obvious price volatility, it should be stressed that typical supply and demand equations are not driving the price of gold in the same manner that other commodity prices fluctuate. Instead, gold prices increase when investors look for items in which they can store value against inflation, currency exchange rate fluctuations, and political instability (Kaufman, 1987:858). In addition, when prices increase as a result of these perceived phenomena, then speculators also enter the market in hope to gain from resale at an even higher price (ibid.).

Table 4.6 Gold Prices 1968-1992
(currency per troy ounce)

Year	Annual Average current US\$	Annual Average constant 1992 US\$	Annual Low constant 1992 US\$	Annual High constant 1992 US\$	Annual Average constant 1992 Yen
1968	39.26	158.39	141.75	171.85	1536
1969	41.11	157.31	133.94	167.71	1556
1970	35.96	129.97	125.61	141.66	1264
1971	40.81	141.36	129.27	152.31	1309
1972	58.20	195.23	146.67	234.80	1543
1973	97.22	307.13	201.88	401.23	2066
1974	159.13	452.82	326.53	562.01	2963
1975	161.05	419.81	335.61	485.50	2721
1976	124.83	307.85	255.25	346.13	1931
1977	147.71	341.82	299.45	389.12	1905
1978	193.29	415.75	357.70	524.07	1866
1979	305.85	591.29	418.65	1013.04	3035
1980	614.63	1046.65	807.18	1447.47	5735
1981	460.13	709.86	603.60	924.49	3982
1982	375.64	546.08	431.40	710.15	3599
1983	423.68	596.79	527.16	720.49	3793
1984	360.72	487.19	409.57	549.49	3147
1985	317.32	413.89	370.75	444.64	2727
1986	368.03	470.96	417.18	566.58	2213
1987	446.53	551.40	481.59	620.82	2313
1988	436.84	518.33	461.62	575.82	1993
1989	381.05	431.23	402.60	472.09	1828
1990	383.66	411.93	371.34	452.45	1873
1991	362.30	373.25	354.65	415.90	1594
1992	343.91	343.91	330.20	359.60	1400

Source: **Gold 1993**

However, it should also be stressed that in 1974, following the end of the gold standard and the first major gold price increase, "the industrial nations owned five-sixths of the world's gold reserves and that they also held almost 30 percent of their monetary reserves in gold at the official price, whereas the gold element in the developing countries' reserves amounted to only 4 percent" (Hellman:136). Given this disparity in the structure of monetary reserves, it is small wonder that the developing nations were highly vulnerable to international energy and commodity price increases during the 1970s. Filling the monetary gap vacated by the gold standard was the US dollar and, by default, the US banking industry. Parboni argues that the growth in GDP in the developing nations during the 1970s was largely due to the "abundance of international finance" which led to a tripling of public debt during the decade (Parboni, 1981:178). The effect of these debts on the management and autonomy of developing economies has been documented elsewhere: for example, "The IMF is perfectly correct when it tells governments that financial discipline, and occasional painful adjustments in the structure of production, are necessary for the health of the balance of payments. My quarrel with the Fund stems from the fact that by conniving in the rich countries' use of foreign aid as a bribe, the IMF is deliberately frustrating the very type of financial discipline and production adjustments which are most badly needed." And, "...historically speaking,...nations have failed to develop not because they have too little international money, but because they had too much" (Payer, 1974:210).

However, it is important to iterate that international debt has enabled TNCs to receive more generous investment terms from the developing nations and that the IMF, the World Bank, and bilateral aid programs have provided both "the carrot and the stick" to ensure that these terms are provided in the first instance and adhered to once agreement has been reached. The fact that international debts were honored by post-Shah Iran and Sandinista Nicaragua, indicates the pervasiveness of the international financial system (Lipson, 1988:16-17). Moreover, it must be stressed that TNC banks utilize the multilateral banks in the periphery as a vehicle to securely lend funds and ensure profits (Odle, 1981:106, 118-119). It should also be noted that most official lending during the period of the 1970s and 1980s to the end of the Cold War went to nations such as Brazil, Mexico, Argentina, Peru, Ivory Coast, Senegal, Morocco, Zaire, Egypt, and the Philippines because of geopolitical, ideological, or strategic mineral (e.g., cobalt from Zaire) importance (ibid.:165).

In reference to gold prices, it should be noted that the most commonly quoted (and industry standard) gold price is from the London Metals Exchange (LME). Gold prices are quoted in a range of currencies but the US dollar remains the basic unit for quotations. However, Zurich is the key market for actual physical transactions, with all of the gold sold by the former U.S.S.R. and over two-thirds of South Africa's sold on this exchange. In recent years, bullion markets have developed in Italy, Turkey, Dubai, Bombay, Hong Kong, Singapore, Taiwan and even Vietnam. Price movements have traditionally moved higher

during periods of high inflation, political uncertainty, and war. Conversely, prices have tended downward during low inflationary periods and political stability. However, other options (e.g., a range of insured bonds) have now been developed to replace gold as a "safe" destination for investment. In addition, the increased production of gold is being increasingly utilized for decorative jewellery rather than as an investment or hedge against inflation.

Thus, the significance of gold mining to a nation should be obvious from the above. First, although gold has been officially demonetized, it remains an easily convertible vehicle to store wealth and retain the value of that wealth. Second, in the debt-ridden 1980s and 1990s, there has been considerable demand for nations to demonstrate currency stability as well as the ability to pay for international transactions, and gold reserves and/or production will satisfy both of these needs. Third, industrial gold mining usually requires the presence of a mining TNC, which ensures international recognition and respectability in the eyes of multilateral agencies and bilateral aid relationships. This could be especially important to nations which are not geopolitically or strategically important because the presence of the gold mining TNC will provide some visibility in the capitalist center.

Gold in the 1990s

The following quotes from local newspapers provide an indication of how gold has been presented as an investment during the 1990s. The first quote

presents gold as a somewhat risky investment, especially because of fluctuating gold prices.

Ten years ago, investment advisers often suggested that clients put 5 percent of their assets into gold as protection against rapid inflation or other disaster.

The theory was that gold provides insurance against drops in stock prices because gold generally moves in the opposite direction of stocks. The theory worked fairly well, but as stocks soared, gold plummeted.

Today, financial advisers are sharply divided on the value of gold as an investment.

...new methods of mining gold could reduce the production price to near \$100 an ounce. That...will force gold's price down further...

For centuries, gold has been looked upon as the one substance that could hold its value no matter what happened to paper currencies.

...the decline in gold price over the last dozen years is merely a response to low inflation.

As inflation comes back, gold will climb in price...

Gold prices are a roller-coaster ride. Gold funds often are the top performers one quarter only to be the worst performers the following quarter. (Goldberg, S., April 22, 1993, "Gold's glitter tarnished by cheap mining, low inflation" in the **Honolulu Advertiser**, section C, pp. 1).

The second and third quotes present gold and gold mining stocks as a worthwhile investment for the 1990s.

"We have been attracted to gold, which has been an underperforming asset for 10 years" (John Hathaway, Oak Hall Capital Advisors); and,

"The time seems ripe for a new gold bull move" (James Dines, The Dines Letter) (Halpern, S., February 23, 1993, "Stock Tips," in the **Honolulu Advertiser**, section B, pp. 7).

The final quote from the popular press presents a longer explanation for why gold would be a good investment during the 1990s. The author is a widely read commentator on mutual funds.

The hottest funds of 1993 by far were gold-mining stock funds. For years, gold investors have watched their monies either lose value or remain financially comatose.

This year it was different. Even the mainstream speakers were waxing poetic about gold - but for different reasons. This year they were talking about supply and demand. For the first time in years, the argument to own gold and gold-mining share funds was based on sound economics instead of politics.

We live in a global economy. Gold skeptics point to the fact that there is no inflation here and therefore gold won't go up in value. This superficial view ignores the fact that we truly live in a global economy these days.

Inflation may be under control in the United States, but in other areas of the world inflation is a serious problem, especially in the underdeveloped countries. Much of the Pacific Basin (excluding Japan) as well as Latin America is experiencing serious inflation. This inflation combined with the economic emergence of these underdeveloped countries is creating a large new class of gold investors; newly wealthy entrepreneurs trying to hold on to the value of their wealth. Hence, the new demand for gold.

Capitalism creates wealth. We have witnessed the exciting rise of capitalism in Eastern Europe and in China. Former socialist economies are embracing capitalism and this movement is creating a whole new generation of investors with money looking for a place to put it. Many of these new investors choose gold. Why?

1. Immature or unstable banking systems. The truth is that in many of these countries, the citizens simply don't trust their banking system or their government - and with good reason. Nationalization and other confiscatory monetary policies have left many leery of putting their money into the banking system. And, of course, bank accounts can't protect you from inflation.

2. Protection against inflation. With high inflation rates, the quickest way to lose your purchasing power is to invest in interest-bearing investments. Sticking your money in the bank or into bonds is like throwing your money away. In these underdeveloped countries, the only widely available investment alternative that can protect against inflation is gold.

3. Wealth must be portable. The governments in these underdeveloped countries are anything but stable. Cautious investors protect themselves by making sure that they can move their money with them if the need arises.

Gold is ideal.

One of the most popular ways to own gold in these countries is by purchasing 23-carat jewelry. Cheap labor makes it possible to efficiently produce jewelry that is almost pure gold. (Donoghue, W.E., February

23, 1994, "Smart Investors Go For The Gold," in *Midweek*, section A, pp. 4).

A more respected publication on investment options, **Dunn and Bradstreet: Guide to Your Investments** (Dunn, 1992), discusses gold as an inflation indicator: "Rising metal prices mean rising inflation, which in turn signals rising interest rates" (p. 67). The publication also discusses gold as an investment option: "Some say it's a hedge against inflation; doomsayers swear it's our only protection against the inevitable downfall of our entire economic system. And in between are those who believe in diversification. Precious metals have a place in every portfolio *as long as one realizes they are a volatile long-term holding*" (p. 223).

Dunn notes that one should invest only 5 to 8 percent of one's portfolio in precious metals (ibid.). However, she also states, "Remember, gold vies with the dollar as the world's safest currency. When the dollar is strong, gold tends to be low in price and vice versa" (ibid.). Dunn suggests that gold could be a wise investment if there are problems in the global banking industry such as those which occurred during the 1980s (ibid.). The banking problems of the 1980s included the savings and loan scandals and, to a far lesser degree, bank failures in the United States, banking scandals in Japan, building society failures in Australia, and the debt crisis in many developing nations.

The Economist ("Survey: The Global Economy," 1 October 1994) states, "Some economists like to argue that inflation is dead, at least in the developed

world. But do their models take account of a third world boom in demand for oil and other raw materials?" (p. 28). **The Economist** is alluding to two major points of concern in developing nations. First, the growing populations and, in some cases, rapidly growing economies have an increasing demand for energy and imports; the question is how to pay for these items. Second, logic suggests that the development and transformation of the developing economies will be able to pay for imports and economic expansion, but this requires capital investment and there is a possibility that the developed nations may not have adequate financial resources to meet these demands (therefore a "capital crunch" will develop). Third, inflation remains a major impediment to economic development in a number of developing nations, and inflation impacts marginalized populations more severely than the elite. These arguments indicate continued fluctuations in the global economy, and a rationale for investors to seek a hedge against capitalism's cycles of "boom and bust".

While the above quotes may appear contradictory at one level, there is an implicit agreement that gold prices are and will continue to be volatile. Whether the demand and the price are as high as some anticipate is a separate issue which will be discussed in more detail in the next chapter. Price volatility is very important to nations, companies and individuals attempting to optimize their investment options. However, what can be assumed is that gold will continue to be an important investment option.

In sum, gold is an investment option whether in the form of jewellery, bullion, or more recent innovations such as futures trading (i.e., anticipating the price paid for a contracted amount at a specified future date). These investment options are subject to global market forces and are available to global investors. Gold is a global commodity and, as such, enables its owner (or, holder) to transact business throughout the world. Thus, it is important to iterate the conclusion which can be drawn from these characteristics which is that those nations with viable gold resources are promoting their exploitation. This is the case for both industrialized nations such as the United States, Australia, and Canada, as well as developing nations such as Papua New Guinea, Brazil, and Ghana. Gold establishes legitimacy for its owners and provides a tangible means of transacting exchanges.

However, what should be appreciated is that gold mining is a global industry and gold is traded on the global market. The supply of gold is provided by MTNCs financed by banking TNCs. The demand for gold is facilitated by the advertisements and wisdom presented in publishing TNCs (e.g., Time Life), investment TNCs (e.g., Merrill Lynch), and retail TNCs (e.g., Seiko). In this context, developing nations are at a clear disadvantage to develop any other role than to "be mined."

Chapter 5

THE EVOLUTION OF ROCKS TO A MINE

Introduction

While the previous chapters have focused on the roles of gold and mining in the world economy, attention must also be given to the role of mining in the local economy. In order to gain an understanding of mining in a local economy, it is first necessary to describe and evaluate the evolution of mining projects from minerals deposits to actual mines. The rationale for this prologue is that the evolution of a mine involves and requires a multitude of individuals, inputs and decisions. By identifying these actors and the processes determining their roles, it enables the disaggregation and identification of the actions, interests, benefits, and costs which both contribute to as well as are affected by the mine's impacts. Specifically and simply, the evolution of a mine links the boardrooms of Tokyo, New York and London with the governments of developing nations and with the local population at a mine site. Decisions on financing, marketing and purchasing mine outputs, engineering and other technical issues are based on the linkages between these far-flung groups of actors, and dominated by those in control of capital and technology. Moreover, because international capital requires that these linkages are prerequisites to a mine's development, a vehicle for (inter)dependency is created, which is another way to say that the capitalist world system is able to continue and strengthen its pervasive control over the periphery.

This chapter examines the phases of a mine's development with the specific intent of identifying the various actors, their roles, and their objectives. The chapter first presents a framework to understand the processes by which a mining company determines whether it is in its "best interests" to build and operate a mine, as well as an identification of the broad policy response options available to the government of a developing nation. The chapter's next section addresses the factors which determine whether a mineral resource will be developed. From the perspective of a MTNC, these factors include geology, technology, and other investment options. However, key issues including project financing, the planning and construction of a mine, and the emerging relationships between the TNCs, government, and area residents are addressed in the following chapter.

A Framework for Project Development Stages and Government Policy Options

The proposed development of a mining project produces an electric-climate charged by the professional and personal commitments, conflicts and biases of geologists, engineers, lawyers, economists, nearby residents, environmentalists and major corporations. Regardless of perspective, the aim is to optimize a range of benefits from the exploitation of resources, including the non-development of the mineral resource. However, meeting the specific objectives of these various parties becomes difficult if not impossible in the ebb and flow of a mine's evolution because interests diverge, roles become clouded and overlap, and focus is fixed on the mining project itself rather than its broader implications. More

specifically, the development of a large mine can include 1) project design decisions based on insufficient data including a lack of understanding of local conditions, 2) key policies implemented after the fact, 3) areas of responsibility between the mining company and government not clearly defined, and 4) the scope and intensity of impacts grossly under- or overestimated. In other words, mines become separated from the rest of the country because of both intent and omission.

Figure 1 schematically depicts the development stages of an "ideal" mine. Although not always as concisely delineated as in the figure, a mine's development from the perspective of an MTNC follows a staged process with the successive stages triggered by the attainment of specific criteria. For example, within the exploration stage, an MTNC does not proceed from rock sampling and geochemical testing to a preliminary drilling program to an extensive drilling program without receiving positive results at each intensity level of exploration. Similarly, the MTNC will not conduct a Prefeasibility Study without having ascertained the existence of a deposit with sufficient size and ore grade to yield "likely" viability.

A government also follows a staged process in respect to its inputs into the development of a mine. However, a government's trigger mechanisms (for action or response to actions by the MTNC) are often not as explicit as the MTNC's because:

- 1) in a developing economy there is often a lack of familiarity with developing a mine;

Project Development Stages and Requirements for Government Data, Policies and Relations with the MTNC	Project Development Scenarios and Government Policy Options
EXPLORATION Significant Increase in MTNC Activity Data: establish environmental and socio-economic baselines Policies: develop capability to analyze resource assessment Relationship: promote and facilitate understanding of country beyond minerals sector	WORST CASE: Early closure of the mine ENCLAVE: Increased dependence (e.g., on revenue flows from the mine) ENCLAVE: Limited dependency because of investment strategies
PREFEASIBILITY (PFS) Order of Magnitude Estimates of Project Data: workforce, infrastructure, land use based on production "base case" Policies: incorporate PFS estimates within national development objectives Relationship: active participant with MTNC, assist with project design concepts	INTEGRATION: Backward linkages established INTEGRATION: Failed backward linkages INTEGRATION: Forward linkages established
FEASIBILITY STUDY "Unpackage the Package" Data: specific plans and rectify gaps Policies: establish framework for implementation and administration machinery Relationship: equal information transfer	LAISSEZ-FAIRE: Enclave AD HOC: Issues dealt with case-by-case= potential for non-optimization
CONSTRUCTION AND OPERATION Implementation Data: develop monitoring capability Policies: wages and prices, landowners, land use, industrial development, medium term investment strategies Relationship: recognize roles and responsibilities	NO DEVELOPMENT

Figure 1

Project Development Stages and Government Policy Responses

- 2) the financial and personnel resources necessary to positively impact the possible mine are not always available;
- 3) objectives have not always been determined; and
- 4) negotiations with the MTNC can produce, on the part of the government, a reluctance to assume responsibility for issues which it considers will or should be included in a mining agreement.

Figure 1 indicates that a government can increase its inputs at various stages of a mine's evolution. More importantly, the figure implies that a government can assume a more proactive role in a mine's development. This is based on the premise that if the government recognizes the role a mine can play in meeting national development objectives, then increased benefits can be realized. This also implies that a government can determine in unison or opposition with an MTNC the role of a mine in the national economy. Whether facts support these assumptions and broad value judgements will be discussed in the following two chapters. However, suffice to say that if a government assumes a more proactive role, then it can also court economic and/or political disaster, as evidenced by the examples of Zambia and Allende's Chile.

If a government decides to assume a proactive role, then the timing of its initiatives vis a vis the MTNC's actions becomes very important. While the obvious reference to timing implies coordinated or, if opposed, concurrent actions, there is another issue involving time which warrants elaboration. The time horizon of the MTNC is governed by its investment: a gold mine is typically assessed within the context of a 5 to 15 year cash-flow, while a large copper mine

will be judged over a 20 to 30 year life (note: this assumes the industry standard commercial payback period of no longer than 7 years for either type of mine). Unfortunately, governments have often viewed minerals exploitation as having an "infinite time horizon" (Nankani:7), which leads to the use of minerals revenues as a substitute for other taxes in the recurrent budget. This "infinite" perspective immediately places the government in opposition to the objectives of MTNC, and forces the government away from optimizing the use of minerals revenues for medium-term investments similar to those of the MTNC.

As used above and in the figure, medium-term describes government investment strategies based on minerals generated revenue. Investment in nations substantially lacking 1) revenue from non-minerals sectors, 2) administrative and physical infrastructure, or 3) social and economic services, will parallel needs. Thus, the development of a mine will become a major component in the government's expenditure program, and could become by choice or default, a government-backed enclave. If one assumes that revenues will be used to meet needs in other sectors or regions, then the use of these revenues has to be focused on providing positive returns (whether socio-economic or financial) within a time-frame similar to that used by the MTNC. In other words, minerals revenues should be viewed as a "windfall" and treated with fiscal caution. The timing, time horizon, and windfall themes will be discussed below and are recurring points of conflict and diversion between the MTNC, the government, and mine area residents.

Returning to the figure, the worst case scenario would be for a mine's closure in the first few years of operation. The construction stage would create wage and price spirals, production bottlenecks, and a generally overheated economy. This would be followed by the mine's closure within a few years or before the economy had time to adjust (to the mine's closure). This would result in overbuilt production sectors and capital markets which had expanded scale of operations in order to capture the business opportunities created by the mine. The end result would be a destabilized economy. However, it should be noted that it is very uncommon to see a mine closed after only a few years of operations.

The "no development" option has been used by oil producing nations such as Kuwait to ensure the availability of oil. Kuwait has an oil production policy which is based on ensuring that production will be at the same rate it is today in 150 years. However, it has been argued that for other minerals and especially metals, then once a project is assessed as viable, it should be built because projected long-term prices indicate a downward trend which could result in a currently viable project becoming uneconomic (Mikesell, 1975, "Rate of Exploitation of Exhaustible Resources: The Case of an Export Economy"). It should also be noted that Kuwait has developed downstream (from basic oil production) industries which capture additional profits. These downstream industries include petrochemical manufacturing and fertilizers. In addition, Kuwait owns thousands of retail outlets (gas stations) primarily in Europe. The gas stations have been especially lucrative and have enabled the evolution of a long-term perspective on

the market for petroleum products. It is interesting to note that the only other oil exporting nation which has developed this range of downstream industries is Venezuela, which has only recently entered the retail market and in a much more limited market position than the Kuwaitis. It should also be noted that production costs to extract Kuwait's oil and gas are lower than in many other regions. Thus, Kuwait is almost certain to have access to a natural resource at cost which will be less than costs for other producers, which is to say that it should have extremely competitive products for export.

The question then arises as to whether the Kuwaiti experience could be transferred to metals and specifically gold. Current evidence indicates that downstream processing of metals must be based on commercial criteria which shows that a processing plant would provide a competitive rate of return. There are a number of examples with Zambia being the most obvious. Zambia attempted to develop downstream industries by processing copper ore into copper wire and bar for export. In addition, at one time, Zambia felt that other manufacturing industries which use copper as the main industrial input would locate in the country. The track record has been dismal, with copper wire barely competitive and few other industries locating in the country. In other words, deciding to process ore because the raw material is available and using as a justification that further profits can be captured through downstream processing should not be the rationale if optimized returns on the investment is the objective. Instead, the commercial viability of the downstream opportunities should be the basis for

further investment. If commercial viability is not used as a basis for decision making, then a money losing investment could well result, which would negate the original justification for developing downstream options. In sum, the capitalist center is in a "win-win" situation: if successful downstream industries are developed (e.g., Kuwait's petroleum-based investments and Chile's copper refining industry) then they are price competitive with products from other parts of the world; if unsuccessful downstream industries are developed (e.g., Zambia's copper refining) then products still have to be exported and sold at competitive prices, which results in losses for the source country (e.g., Zambia). The country then has to find financing mechanisms to support its industrial losses. Financing for industrial losses can be domestically located, but if not, may well result in IMF/World Bank assistance and control over the economy: this is Zambia's situation.

With respect to gold, it is interesting to note that the world's largest gold exporter, South Africa, never developed downstream industries. This can be explained by the shortage of skilled labor and apartheid (i.e., the government's unwillingness to educate the black majority). However, a jewellery industry utilizing domestically produced gold has developed or is developing in India, the United States, China-Hong Kong, Thailand and Indonesia. In addition, the use of gold in high technology industries has been practiced in the United States for several decades. But in all of these instances, these downstream industries have

been based on their commercial viability and not simply a decision to further process a metal.

Returning to the figure, the "ad hoc" and "laissez-faire" options would most likely not occur in a real situation to an absolute degree as a government would be expected to have inputs into a mine's development. As noted at the beginning of this chapter, TNCs require government inputs before a project can be developed. However, because of staff shortages and other resource deficiencies, developing nations have often remained on the sidelines while MTNCs defined the project. Developing nations were largely bystanders to the development of minerals projects in the period up to the 1960s, when more active roles were assumed including the nationalization of minerals projects.

In a small developing economy, establishing capital intensive forward and backward linkages to a mine are nearly impossible. Certain nations, such as Zambia, noted above, which are major producers have established forward processing industries such as copper refining, to increase the value added component. However, these have not always proved viable. Infrastructure and agricultural production provide backward linkages. In a small developing nation which is mindful of the windfall nature of minerals revenues, the linkages should be based on net economic viability and not solely to increase value added or employment.

An enclave is a common result of mining. This policy option involves a choice by the government as to whether mine generated revenue will be a major component of recurrent expenditure (and greatly increase the tax base) or the

revenue will be primarily used to develop other sectors. The question is how should a government and a nation use its revenue? Options include decreasing national debt, investing in financially viable projects with payback periods of under 7 years, investing in infrastructure projects and social services such as education and health which have long gestation periods, or some mix of these.

Developing nations have utilized a range of policies with mixed or unclear results as to which is the best course. What is apparent is that the objective of the MTNC is very straight-forward: optimize the investment. Governments find it very difficult to define "optimal" and "investment" because their definition of returns or profits becomes clouded by conflicts between its economists, financial advisors, geologists, engineers, and politicians.

The Decision to Develop a Mineral Resource

It typically takes 10 to 15 years for an ore deposit, once discovered, to become a mine. As noted above, only one out of one thousand ore deposits become mines. The length of this process and the low probability of actually developing a mine suggest the complex nature of mine development: communities have to be developed, toxic wastes disposed, an economic resource has to be determined through the use of technologies which produce less than guaranteed results, and companies and nations can mortgage their futures. These characteristics infer that mining can be a risky investment. While the MTNC decides whether there will be a mine and thus assumes the risk of its investment, the government of a developing nation also assumes a risk because it might not be

able to afford the failure of a mining investment any more readily than the MTNC. This section discusses the technical issues affecting the investment decision. Geology and exploration are addressed first, and followed by discussions on technology, investment options, and assessment and evaluation.

Geology and Exploration

Gold is an element which occurs naturally. Although it is highly valued because of its color and brilliance as well as the fact that it is corrosion-resistant and malleable, it is also prized because of its rarity. Geologists divide the earth into six zones beginning at its center and proceeding outward: inner core (solid), outer core (liquid), mantle, upper mantle, asthenosphere, and lithosphere. The lithosphere consists of solid rock, with its outer part (5 to 60 kilometers in depth) the earth's crust. The earth's crust has the following composition by weight: oxygen (45.2 percent), silicon (27.2 percent), aluminum (8.0 percent), iron (5.8 percent), calcium (5.1 percent), magnesium (2.8 percent), sodium (2.3 percent), potassium (1.7 percent), and titanium (0.9 percent). In addition, a number of more highly valued elements account for a total of roughly 1 percent of the earth's crust and include copper, lead, zinc, uranium, gold, silver, and carbon, as well as other metals. The occurrence of these elements is not measured as percent of the earth's crust but in parts per million, or one gram per tonne. Thus, copper is found, on average, in 70 parts per million of the earth's crust, lead 16 parts, zinc 8 parts, uranium 3 parts, and gold 0.01 parts per million (although some estimates have been as low as 0.003 parts per million). (Harris, D.P., 1985, "Mineral

Resource Information, Supply, and Policy Analysis," in **Economics of the Mineral Industry**, W.A. Vogley editor, American Institute of Mining, Metallurgical, and Petroleum Engineers, Inc., New York:189-193).

As found in nature, gold occurs primarily in its native state, which is to say that it is unaffected by oxygen, water, sulphur, or most single acids. Gold also occurs in compounds with other metals such as copper. Most of the mined gold is from primary gold or gold-silver deposits. However, it is also produced as a coproduct from the processing of sulphide ores such as copper.¹ Native gold is found in a range of forms including nuggets, flattened grains, and fine particles. When a primary gold deposit is being mined, the terms lode, vein and reef are used to refer to the ore deposit.²

With respect to deposit types, placer, or alluvial, gold deposits are those which have been formed usually by water action moving the gold away from its source rock, and have concentrated the gold in a layer of loose particles. The California Gold Rush image of gold miners panning in streams or using sluice boxes to find nuggets or grains of gold is based on the exploitation of placer

¹ Papua New Guinea's Bougainville copper mine earned more from its gold production than from copper during the period from the mid-1980s to its closure in 1989. The ore deposit is a copper porphyry type, which is to say that it is a large-tonnage low-grade ore deposit with relatively uniform ore dissemination.

² These terms can be used synonymously, and refer to a mineral deposit which has filled a fissure or space in the basic rock structure. California's Mother Lode and South Africa's gold reefs in the Witwatersrand are examples. (Thrush, P.W., editor, 1968, **A Dictionary of Mining, Mineral, and Related Terms**, Bureau of Mines, U.S. Department of the Interior, Washington, D.C.:654).

deposits. These placer deposits are termed "young placers" which are less than 65 million years old (Cenozoic era, Tertiary period). However, the Witwatersrand reefs are also alluvial deposits but are found in association with PreCambrian rock which is over 600 million years old, and the reefs are mined at depths of between 1.6 and more than 4.0 kilometers. Because of the major role of South Africa in gold mining, placer deposits have accounted for roughly two-thirds of gold production over the last half century. Hydrothermal (formed by high heat and high pressure) and epithermal (formed by low temperatures at shallow depths) deposits are associated with volcanic activity. Hydrothermal deposits such as the Mother Lode in Grass Valley, California, were formed during the PreCambrian period (over 600 million years ago), while epithermal deposits such as at Virginia City, Nevada, were formed during the Tertiary period (roughly 65 million years ago). Hydrothermal deposits have accounted for roughly one-fourth of gold production over the last half century, with young placers and byproduct gold production accounting for the remainder.

The epithermal deposits were relatively unexploited until the last few years because of technological changes (see below). However, these deposits have now become very important to nations neighboring the Pacific Ocean's "Rim of Fire," which is the band of volcanic activity ringing the surrounding continents. New Zealand, Papua New Guinea, Fiji, Peru, California, Japan, Indonesia, and the Philippines all have epithermal deposits which are now being mined or are being assessed for potential mining operations.

Year	Stage	Size of Concession (maximum in 1,000 sq. km.)	Ranges of expenditure (US\$ mil- lions)
-13	Regional Appraisal/Reconnaissance literature studies selection of favorable area land acquisition	1,000	<0.3
-11	Prospecting regional geologic, airborne geophysical, geochemical surveys	100	0.4-1.2
-10	Focus on Ore Body detailed surveys: geologic mapping trenching preliminary drilling laboratory mineralogy and metallurgical testing	10	2.5-50
-7	Delineation of Ore Body pattern drilling bulk sampling metallurgical assessments geological ore reserve esti- mates	1	2.5-50
-5	Feasibility Study mine planning pilot plant tests full technical and economic assessments financing	<1	5-25
-4	Mine Construction/Development detailed design engineering infrastructure development mill construction equipment procurement mine development	<1: mining lease	
0	Mine Production lifetime of mine: 10 to 30 years	<1: mining lease	

Figure 2 Typical Stages in the Exploration and Development of a Mine
Sources: adapted from Caraghiaur, G., 1985; and, Uranium Institute, 1982.

The types of deposits and their associated characteristics provide a basis for understanding the evolution of a gold mine. As noted previously, only one out of one thousand ore bodies are developed into mines. Through a series of techniques and technologies, ore bodies are "discovered" and then determined economic. Figure 2 shows the detailed stages of a mine's evolution, which, from the time of discovery of a potential deposit to an operating mine, typically lasts between, as noted above, 10 to 15 years. The figure indicates that at the early stages, concentration is given to identifying an ore body (years -13 to -10), then defining its characteristics (years -6 to -10), and ultimately determining its economics (year -5). The gross or macro techniques utilized in the initial stage requires the analysis of geologic survey maps and other broad indications that a resource may be present. Second stage techniques require more detailed surveys including geochemical and airborne geophysical surveys, to determine whether it is likely that a resource exists in a specific area. Once a resource has been indicated, then the ore body is identified (stage 3). If results which indicate the likelihood of an economic resource are positive, then a detailed assessment of the ore body is undertaken (stage 4). The information available at the end of this stage will enable an evaluation of the ore body's economics and will serve as a basis for a full feasibility study (stage 5).

Stage 4 is especially important because it is rare for a MTNC to expend the funds required for stage 5 unless the company intends to build the mine. There have been occasions such as the Sua Pan salt and soda ash project in

Botswana and the Cerro Colorado copper project in Panama, when full feasibility studies were conducted and projects were not built after the expenditure of several hundred million dollars. There have also been occasions when tens of millions of dollars have been spent on studies and the mines either have not been developed or were developed sometimes more than a decade following the completion of the feasibility study. These include the Namosi copper deposit in Fiji, the Ramu River copper deposit in Papua New Guinea, and the Sar Chesmeh copper mine in Iran. It should also be noted that multilateral funding (e.g., World Bank, UNDP, UN Revolving Fund) had a major role in several of these projects, with MTNCs playing only a minor or no role in the investment and management of the exploration and evaluation.

The issue remains that the cost to proceed from broad resource assessments to a feasibility study is substantial and it has largely been left to the MTNCs to provide the required funding, skilled personnel and technology. Exploration for gold totalled \$1 billion in 1992, which represents a decline of 60 percent from record levels in 1988. Over time, roughly two-thirds of all exploration funds were spent in the industrialized nations and one-third in developing nations (Crowson, P.C.F., 1988, "A Perspective on Worldwide Exploration for Minerals":27) . As evidenced by the considerable upsurge in gold production in the United States, Canada, and Australia since 1980, the allocation of two-thirds to the industrialized nations could well have been exceeded during this period. However, there is a shift occurring with an increasing share of exploration

budgets now being allocated to developing nations. "Reflecting the change in geographic emphasis, there was a notable shift in 1992 away from the established large mining countries, where exploration has been retarded by concerns about environmental issues, land access and royalty payments, in favour of the developing world, especially Latin America, where exploration expenditure has risen in response to reforms in mining legislation, tax regimes and rules governing foreign ownership" (Gold 1993:29).

It would be worthwhile to reflect on the preceding quote. Latin American nations were at the forefront of the nationalization of minerals industries, including Mexico's appropriation of TNC oil industry operations in the 1930s and Chile's appropriation of TNC copper mining in the 1940s. Latin American nations implemented import substitution policies during the 1950s and 1960s in the hope that local industries would be developed and linkages to former colonial powers and the industrialized nations more equitably established. Latin American nations were leaders in the non-aligned movement of the 1970s. Latin America became the world's leading debtor region during the 1980s. However, it is only after the reforms promoted by Reagan and Thatcher were adopted under the direction of the IMF/World Bank, that MTNC exploration money began to arrive. The presence of MTNC exploration activities is a significant indication that mineral resources will be developed in the future--providing, of course, that the commercial viability of the deposits can be established. As noted in preceding chapters, one of the constraints to minerals exploitation in developing nations is

that they have been relatively 'unknown' geologically, and it requires international agencies and MTNCs to provide this knowledge. Thus, MTNC exploration activities are a crucial precursor to mining.

Moreover, it should also be understood that the finance, skilled personnel, and technologies required to identify, define and determine a mineral resource are the property of the MTNCs. While developing nations may be able to support some exploration and development activities, it is the MTNCs which are able to secure international loans and access international markets. Attempts by developing nations to break this monopoly have not succeeded as evidenced by the quote.

Technology

Until well into the 1970s, the technologies utilized for mining and processing gold had changed little for many years and, in some instances, were more than 100 years old. However, the discovery and assessment of the numerous epithermal gold deposits required different technologies. The result has been the development of environmentally improved processing technologies. In addition, there has been an upsurge in the development and application of new exploration technologies. These trends and their significance are discussed below, beginning with exploration and ending with processing.

With respect to exploration, regional airborne geophysical surveys have become increasingly important. Although low level photos from aircraft are used for geologic mapping, the key addition has been the use of Landsat or Skylab images which show undistorted geostructural features covering a region as large as

180 square kilometers at a cost of \$3 per square kilometer. Aeromagnetic methods enable the detection of features up to 20 kilometers below the earth's surface and are unaffected by surface material and characteristics such as lakes and swamps. However, techniques to interpret this data are still evolving. Reflection seismics and electromagnetic testing (using electromagnetic fields to map subsurface features) have also been used to discover gold deposits. All of these technologies provide data from which deposits can be identified and then evaluated using more intensive methods such as pedogeochemical surveys (i.e., collecting and analyzing soils). The more detailed surveys provide the data necessary to determine whether or not a deposit actually exists, and if so, whether or not it should be drilled. Finally, it should be noted that the collection and analysis of drilling boreholes has become much more detailed and sophisticated with depths exceeding 5,000 meters. In sum, these new or adapted technologies have had a major impact on the discovery of epithermal gold deposits which are often located in very difficult and otherwise inaccessible terrain. (**Mining Journal**, "Gold Exploration," September 12, 1986, Gold Supplement:13-17).

Before discussing processing, some attention should be given to changes in mining technologies. Placer deposits have been mined with pans and sluice boxes for centuries. Underground mining of deep gold-rich seams or veins such as in South Africa, has been practiced for over a century. However, only since the 1970s has open pit or strip mining of epithermal low-grade surface gold deposits

been practiced. The technologies used in the open pit mining of other metals such as copper have been adapted for the smaller surface (open pit) gold deposits.

The exploitation of the low-grade epithermal deposits could not have occurred without the introduction of new processing technologies which increased the rate of recovering the gold from the ore as well as reducing costs. The oldest processing technology has been by small scale gold miners using pans and other gravity technologies (e.g., sluice boxes). These are still common throughout the developing world but these technologies cannot recover gold under 0.05 mm grains, so that at least 50 percent of the gold is lost (**Mining Journal**, "Gold: Lost Opportunities," October 5, 1984:237). The next oldest processing technology is mercury amalgamation which has been used from approximately 1000 B.C. Mercury amalgamation is being quickly phased out because of associated environmental damage and because it is very expensive. However, it is still used in some operations such as by some small local operators in Brazil. (**Mining Journal**, "Gold Processing," September 12, 1986, Gold Supplement,:30)

However, it has been the development of heap leaching which has enabled the exploitation of the surface epithermal deposits. In heap leaching, the low-grade ore is crushed, placed on an impermeable substance such as clay, and then a weak solution of sodium cyanide, calcium carbonate and sodium hydroxide is sprayed on the ore pile. The solution leaches out the gold and flows into collection ditches lined with polyethylene, and the ditches are routed to a plant where the solution is filtered through carbon (carbon-in-pulp) where the gold is precipi-

tated. Potential sources for the carbon include coconut shells and hard fruit pips which can be transformed into a high activity hard granulated carbon. Carbon-in-pulp leaching has a smaller yield (65 to 70 percent recovery) than smelting and mill extraction (90 percent recovery) but without the much higher capital costs. Bacteria cultures are also now being used in bio-oxidation heap pre-treatment (before leaching). Prior to the development of carbon-in-pulp leaching, heap leaching relied on the use of zinc dust to precipitate the gold (the Merrill/Crowe process). (*Mining Journal*, "Gold Processing," September 12, 1986, Gold Supplement:30-31).

It should also be noted that in cases such as with complex sulphide ores and highly refractory ores (high heat required to break down the ore) where heap leaching is not appropriate, there have been technological advances. Traditionally, ore roasting has utilized direct heat. However, because of environmental requirements which limit emissions from industrial plants and the production of harmful wastes, autoclaves are now being used in place of roasting facilities in California. The autoclaves utilize superheated steam under pressure to break down the gold-bearing ore. (*Financial Times*, "Equipping for the Next Gold Rush," 28 October 1988:40).

Technological advances have changed gold mining. The deep shafts associated with South Africa's Witwatersrand represented a dramatic shift from the sluice boxes and hydraulic mining of California's Gold Rush. The development of heap leaching has enabled the exploitation of numerous low-grade gold

deposits throughout the world. The introduction of carbon-in-pulp leaching has led to increased recovery of gold. Leaching is based on cyanide compounds which, although still toxic, represent a major improvement over the use of mercury with respect to public health and environmental safety. The use of satellite imaging and electronic digital seismic instruments have facilitated the discovery of many of these deposits.

Technologies such as carbon-in-pulp leaching could easily be adapted by small local mining companies in developing nations. However, evidence suggests that technology advances have led to increased industrial concentration. For example, it has been estimated that only four companies could control 50 percent of U.S. gold output by the end 1990s, which would be a decrease from 11 companies during the end of the 1980s (*Mining Journal*, "Changing Fundamentals for the Gold Industry," February 15, 1985:110). While some of the technology advances such as satellite imaging would be too expensive for smaller operators, leaching technologies would not. The problem is that smaller operators do not have spare capacity or capability to be able to identify and modify new technologies as they become available. Instead, small operators continue to utilize proven but less efficient technologies. Thus, there is widespread panning, indiscriminate hydraulic mining, and the use of mercury in developing nations. In addition, the governments of developing nations have not been able to introduce measures which would facilitate or force small operators to work together and thereby achieve the economies of scale required to utilize some of the new

technologies. The result is business-as-usual: the MTNCs are the most efficient and most profitable exploiters of the gold resource and provide the host nation with a (relatively) "guaranteed income," while the numerous small operators are generally the most dangerous (to workers and the environment) and most inefficient. Utilizing deductive reasoning, would the government of a developing nation choose to have an MTNC develop a gold resource or encourage a number of small local operators? The logical answer again reflects the pervasiveness of the global capitalist system and its domination by large transnational entities.

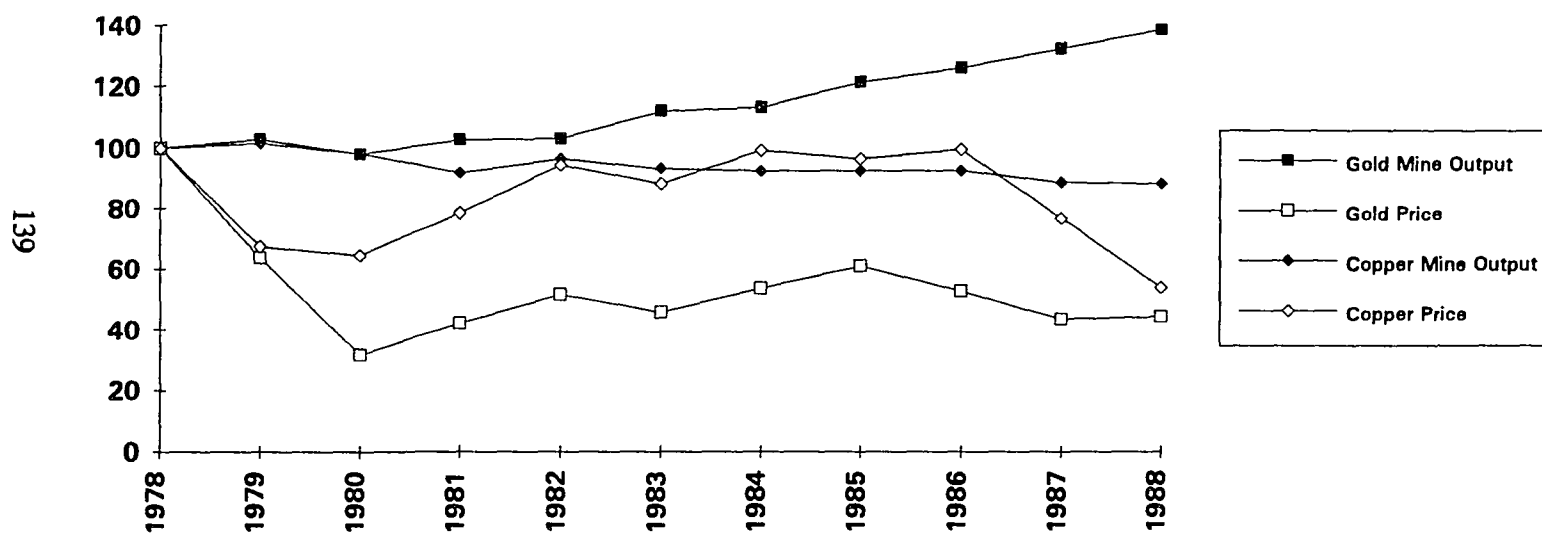
Investment Options

An MTNC does not decide to develop a mine in a vacuum. The MTNC has to examine its own ability to develop and manage a mine; it has to determine if there will be a market for the mine's products for the next 10 to 30 years; and, it has to assess whether the mine will be an attractive investment compared to other investment options. The discussion that follows attempts to provide an understanding of the decision making utilized by the MTNC and contrast the MTNC's perspective with that of a "typical" government in a developing nation. Important to iterate is that mine financing issues will be discussed in the next chapter.

Several sets of data provide the MTNC with the information required to make its investment decisions. First, there is the geological data which will indicate whether an ore deposit has the sufficient grade of gold required for development. Second, because gold is sold on a global market, gold price data

(see Table 4.6 Gold Prices 1968-1992) and market forecasts are readily available. Third, based on the geology, mining and processing technologies are selected and when combined with the geological data, provide a basis for estimating production costs (see below). Fourth, data on the host nation's laws and policies, including on taxes, royalties, environmental considerations, wages and salaries, and any other item which could affect costs and profitability are evaluated. In addition, the political risk or stability of the host nation is assessed. Fifth, the MTNC collects data on and evaluates the availability of international finance and financing options. Finally, the MTNC compares the potential mine with other investment options including other mines and other acquisitions such as companies or bonds.

Figure 3 shows indexed prices and mine output for gold and copper between 1978 and 1988. The data indicate that gold prices and gold mine output had increased over the period. A logical conclusion would be that the higher prices were triggering increased investment by MTNCs in gold mining, whereas copper prices and output lagged behind. Other metals such as tin, bauxite (ore from which aluminum is made), and lead experienced a general downward trend in prices during the period. However, output increased for tin and bauxite, which indicates both a loss of profitability for the mining operations, and the time required to develop a mine (note: tin and bauxite prices were increasing during the mid and late 1970s, the time when decisions were made to develop mines which led to the increased output of the 1980s).



**Figure 3 Index of World Mine Output and Prices for Gold and Copper,
1978-1988 (1978 = 100)**

Loss of profitability is a crucial issue. MTNCs allocate considerable resources to assessing market conditions including prices, supply and demand, competitors' costs of production, and the structure of supply contracts for the estimated life of a mine before the mine is developed. When prices show a downward trend over a period of years, while at the same time production is increasing, then it is obvious that profits will also fall. Gold mining production costs play the central role in this equation. It is interesting to note that during the 1980s, South Africa went from being the lowest cost gold producer to the highest because of wage increases, especially for blacks, and the mining of lower grade ores. However, the lower grade ores are currently not being mined which means that production costs have fallen but the lower grade ores may not now be economically recoverable.³ Papua New Guinea, on the other hand, has the world's lowest production costs, with the Porgera mine the lowest cost producer in the world at \$92 per ounce in 1992. Porgera is an epithermal ore deposit.

(Gold 1993:25-27)

Figure 3 indicates the attractiveness of gold as investment option compared to copper. However, comparisons between minerals are only one set of the

³ When higher grade ores are mined and lower grade ores are left behind, there is a substantial risk that these lower grade ores will not be mined because of the loss of economics. This is termed "high grading" and has major implications to a nation which espouses policies emphasizing the optimal use of resources. An MTNC will mine ores which yield a specific rate of return on its investment, or profit. By leaving lower grade ores, the nation may not be able to ever capture any rents from these ores. Instead a nation, once it has decided that a mine is an appropriate development, should be concerned with ensuring that both high and lower grade ores are mined so that the nation can optimize its returns or profits.

options which an MTNC has to consider. In addition, bonds and equities or the stock market, are also considered. Bonds and their relationship to lending rates determine the cost of financing a mine, and, whether the money could be invested in "safe" investments such as U.S. Treasury Bonds at a rate of return similar to that earned by a proposed mine. The stock market is an investment option with respect to the purchase of another company's shares or for the MTNC to buy back its own shares. In simple terms, if the MTNC can earn higher returns from stocks purchases than developing a mine, then it would have to have very good reasons for developing a new mine. The reasons that an MTNC might have to open a mine in the face of higher returns from other investments include 1) retaining market share, 2) entry into a new region, 3) technology or market development, 4) political (e.g., the Australian government pressured the Australian-based BHP into investing in Papua New Guinea's Ok Tedi mine), 5) tax advantages (e.g., avoiding taxes on profits), and 6) to preserve the company's reputation as an industry leader.

However, the above implies an invincibility which the MTNCs cannot claim. Following the 1979/1980 oil price shock, transnational oil companies were flush with money and a number invested in mining companies. The oil companies believed that they would be able to merge with the MTNCs because both exploited natural resources and operated on the global market. The record of the oil companies as mining companies was less than satisfactory and by the early 1990s most of the MTNCs had been sold or spun off. The point is that the MTNCs

themselves could be an investment option for other companies. And, to complete the circle, a loss of profitability could render a company worthless or very vulnerable to a takeover.

In sum, an MTNC operates in a global marketplace and considers a range of global investment options before it invests in the development of a specific mine. On the other hand, a developing nation typically has a much more limited range of investment options, generally limiting itself to investments within its borders. A developing nation may attempt to utilize a mine as rationale to invest in infrastructure for the area in which the mine is located. Papua New Guinea has a national policy which purports investments in health and education (in addition to infrastructure) in the area in which a mine is located. The development of local industries also receives investment funds. While there is nothing wrong with these types of investments, what must be understood is that the developing nation is dependent on the mine for its successful investments. The MTNC has a far broader perspective and is able to compare the mine to other investment options and, if warranted, pursue these other options.

Assessment and Evaluation

The development of a mine is a complex process impacting the environment and the lives of many people for years to come. As with all major projects, there are regions more affected than others in terms of positive and negative impacts. Table 5.1 provides a possible framework to assess a mine's develop-

ment, including how different regions and by implication, different groups of people, are impacted. Before discussing the table, several points should be discussed.

First, "most project appraisals are post hoc exercises triggered once a number of critical decisions have been made" (O'Riordan, T. and W.R.D. Sewell, 1981). The timing of data collection, impact statements and other evaluation mechanisms is crucial. In the case of Fiji's Namosi copper deposit, major decisions on offshore tailings disposal (hundreds of millions of tonnes) were being made based on but a mere week's worth of oceanographic data (Rizer et al., 1982). Similarly, tailings from the now-closed Bougainville mine completely destroyed fishing and hunting grounds and altered the course of a river. Planning for worker housing and the communities in which they would live, was also left until the last possible moment. Some of these effects were later corrected but some of the consequences cannot be erased. It is within this context of inadequate data and pressure to demonstrate a positive investment that local area residents are asked to passively or vocally support the development of a mine. Few people would agree to drinking poisoned water, having their diet radically altered (see the next chapter), or changing their lifestyle for Rio Tinto Zinc, AMAX, Homestake Mining, or Placer. Unfortunately, this is often exactly what transpires during the development of a mine.

Second, the table does not explicitly indicate costs and benefits, however it is interesting to note that most of the perceived benefits from a mine will accrue at

Table 5.1 Possible Framework to Assess Mines and Mining Impacts

Parameters for Analysis	Levels of Analysis and Origin of Effects					
	National		Regional/ Subregional		Project Site/ Local Area	
	Direct (Project)	Induced	Direct (Project)	Induced	Direct (Project)	Induced
Employment	X	X	X	X	X	X
Revenue	X	X			X	X
Foreign Exchange	X	X				
Export Diversity	X					
Migration	X	X	X	X	X	X
Environment	X		X	X	X	X
Training	X	X	X	X	X	X
Political			X	X	X	X
Business Development		X		X	X	X
New Industries		X		X	X	X
Land Use		X	X	X	X	X
Agriculture		X	X	X	X	X
Urban Planning			X	X	X	X
Housing			X	X	X	X
Infrastructure			X	X	X	X
Health & Nutrition			X	X	X	X
Education			X	X	X	X
Traditional Agriculture					X	X
Traditional Leadership					X	X
Values					X	X
Social Organization					X	X
Use of Money					X	X

the national level rather than at the local level--and, the local level will be subject to the potentially most damaging environmental impacts. Mines are sought by a nation because of the economic benefits they promise. Employment, taxes, foreign exchange, linkage industries, and regional infrastructure are but a few of the economic benefits which are associated with mines. In evaluating these benefits, it is important to differentiate between economic benefits that are wholly compatible with one another and benefits which may conflict. For example, in a capital intensive activity like mining, the maximization of government tax receipts may be incompatible with the maximization of employment. As many developing nations have belatedly realized, the substitution of labor for capital often takes its toll on profits and taxes. Similarly, pursuit of high employment agricultural projects like oil palm or sugar may be highly desirable but contribute little in taxes. On the other hand, both export agriculture and mining are foreign exchange earners. The point is that economic expectations have to be geared to developmental realities, and no single sector or project can successfully provide a path for the development process.

At the national level, economic planners and neo-classical theorists discuss development in terms of people moving from traditional subsistence activities to cash-generating activities. While the benefits of this transition have been loudly trumpeted, the costs are often ignored. If, for example, a mine is developed in a rural area, earnings from agriculture could be low which would mean that wage employment could be a reasonable alternative. But there are also costs to this

alternative. Although jobs mean cash income, the question is cash-income for what purposes. To earn wages, workers have to drastically reduce their subsistence production, which means that a substantial part of the wage packet goes to purchase relatively expensive processed food. Furthermore, the development of a mine could require the relocation of these workers, which could also lead to increased cash expenditures. Thus, the worker shifting from a subsistence lifestyle to the cash economy could have an altered lifestyle, a less than ideal diet (and health), and very little cash left at the end of the day.

In sum, the most important issue is to define costs and benefits vis a vis the most affected groups. Table 5.2 provides a broad breakdown of the costs and benefits of a mine. The table indicates that benefits such as taxes or foreign exchange flow mainly to the national government or the general economy, while costs such as pollution and cultural disruption tend to be concentrated in the local communities neighboring the mine. Under such circumstances it would seem desirable to transfer some of the benefits from the national level to the local communities. However, it is amazing how often such transfer mechanisms are omitted from project proposals or, more insidiously, simply assumed to take place as a result of some vague national policy. An example would be that it is quite common to require that preference be given to hiring workers from the mine area. While such policies are probably well intentioned, they could have only minimal

Table 5.2 Benefits and Costs of Developing a Mine

BENEFITS	COSTS
<ul style="list-style-type: none"> ●jobs ●government revenue ●foreign exchange earnings ●economic diversification ●training ●infrastructure development ●increased internal linkages ●increased rural development options ●potential to increase regional distribution 	<ul style="list-style-type: none"> ●inflation: wages, prices, land values ●production bottlenecks ●dependence on commodities vulnerable to severe price fluctuations ●increased presence of MTNCs ●concentrated growth and migration ●resource use conflicts (mining vs. forestry) ●environmental degradation/destruction ●adoption of western consumption patterns and leakage of earnings ●altered lifestyles ●social dislocation ●labor displacement

impact because local area residents may not be able to meet basic education or health requirements for employment. Here, the presumption that employment preference will increased local benefits may not produce the desired results. Arguably, where fundamental barriers to labor force participation exist, the unrealized promise of employment could lead to the replacement of these false expectations by backlash and resentment. Although obviously oversimplified, the Bougainville case is an example of resentful and unhappy communities.

None of the preceding frameworks clearly delineate the increased and fluctuating vulnerabilities which evolve as a result of mining. For example, during periods of low gold prices, increased government revenues (from mining) could be exceeded by government expenditures, especially if major infrastructure investments are concerned. Implicit to this example is that there could be substantial hidden costs. More attention is given to these issues in the following chapter. However, it must be emphasized that understating costs of minerals development seems inherent to mining and, based on Table 5.2, it would seem that these costs are primarily paid by local area residents.

Conclusion

This chapter has described the key parameters affecting the development of a mine. The issues and decisions confronting both an MTNC and the government of a developing nation have been discussed. From the above, it should be clear that both parties assume risks. It should also be implicitly clear that if both are exposed to risks, then it is in the interest of both parties to have a successful and

supportive working relationship. Little attention has been given to the local populations most affected by a mine's development. The rationale for this lack of attention is straight-forward: local area residents are not brought into the process until exploration and development decisions have already been made. This will be discussed in more detail in the next chapter.

The relationship between the MTNC and the government of a developing nation could be termed "mutually dependent." However, the discussion indicates that it is weighed heavily in favor of the MTNC. The MTNC operates globally and is able to sell its investment in a particular nation (or, if there is political upheaval, to be reimbursed by government-backed investment insurance agencies such as the United States Overseas Private Investment Corporation), while the government of a developing nation is *stuck* with a mine--whether or not it is profitable, environmentally responsible, or makes a positive contribution to the nation's economy. Some may argue that a mine can be shut down or that a government can force an MTNC to operate a mine along specific guidelines. These negative responses to an MTNC have not proved beneficial to developing nations which have attempted provocative actions in the past, for the simple reason that MTNCs have been able to utilize the capitalist world economy as an enforcement weapon.

However, the evolutionary stages of a mine's development indicate some opportunities to reduce some of mining's negative impacts, and, in certain cases, even increase benefits. These opportunities can only be realized through

1) expanded data collection and analysis, 2) collection of data earlier in the mine's development, and 3) the inclusion of impacted populations in decisions affecting the mine's design and planning. These are discussed in more detail in the final chapter.

In sum, the evolution of a mine appears logical and transparent. Unfortunately, this is not always the case: it is not unusual for impacted populations and even governments to be unaware of the stages in the development of a mine. The decisions required to progress from one stage to the next can be hidden behind complex sets of geological, economic and engineering formulas, and the rapid arrival and departure of many consultants and experts. Within the context of trying to first determine that a mine is commercially viable, and then to develop the mine, it is understandable that key issues concerning the environment and local populations are neglected--whether by design or accident. But when issues are missed, the MTNC will usually choose not to correct the oversights and will instead proceed as though it had satisfied all parties on all accounts--a rarely accurate description of the actual situation.

Chapter 6

THE GLOBALIZED MINING INDUSTRY: IMPLICATIONS TO AND IMPACTS ON THE PERIPHERY

Introduction

As evidenced from the preceding chapters, mining is a complex industry which because of its magnitude, has far-reaching impacts. While one can argue over what a government's position on a specific issue should or should not be, or what equity position a MTNC or locally-owned company should assume or that for any of a multitude of interest groups, the fact remains that there are groups and individuals who gain more of the benefits and those who assume more of the costs. Unfortunately, there are always "winners" and "losers" associated with a mine's development--and, these designations tend to be long-lasting, as in several decades if not longer. Mining is a "dirty" industry: planning and technology can reduce negative environmental impacts and there is no doubt that MTNC-operated mining today is more environmentally conscious than it was 50 or 100 years ago. But the scale of mines has also increased and, whether the technology has improved or not, hazardous chemicals are still used in large quantities and thousands of tons of ore tailings require disposal--both of these have negative impacts. But the negative impacts affect most severely the population living near the mine site as well as those living downstream from processing facilities and tailings disposal sites. Government officials and

politicians living in a national or provincial capital experience few if any, negative impacts. Nor do MTNC executives.

Beyond environmental damage are the people affected by a mine's development, including local landowners, mine workers, government officials, politicians, MTNC executives, and international consultants. Similar to improved environmental performance, the mining industry has attempted to reduce negative impacts on affected populations and, often in concert with the government, to increase the flow of benefits. However, and again similar to the environment, mining has "dirty" implications. For example, people's lifestyles are dramatically changed when a mine is opened nearby.

Previous chapters have assessed transnational mining corporations at a global level, including overviews of the global gold mining industry and the processes of mine development. These chapters have established a framework by which to analyze the impacts of MTNCs on nations in the periphery and more specifically, impacts on local communities. While impacts are often presented in terms of environmental and socio-economic damage, there are other types of impacts which are no less harmful but are more difficult to isolate and identify. These include the processes by which MTNCs establish, maintain and exercise their control of their global industry. This chapter presents an analysis of the mining industry's impacts on local communities. The impacts include results of the attention given to these communities by government.

The first section discusses the local environmental impacts of mining within the context of broader resource management issues. Local is defined as the physical area in which a mine and/or processing plant operates, as well as the surrounding region which is affected by, among others, tailings disposal, increased vehicular traffic, loss of subsistence agricultural production, and loss of habitats. The second section assesses mining's impacts on local political and economic structures. The third section presents data from Papua New Guinea's Bougainville crisis on the interactions between government:MTNC:local area inhabitants, with the intent of demonstrating the peripheralization of local residents because of the expressed interests of the MTNC and the government. The fourth section concludes the chapter.

Mining and the Local Environment

"The environmental considerations implicit in international resource issues can be made explicit through an examination of three very broad, but basic, resource questions. Is the world resource base of modern society adequate to sustain its future? What are the international implications regarding the use and management of that resource base and its proven reserves¹ in light of the best available knowledge?

¹ Proven reserves indicate the quantity of an estimated resource which has been estimated as viable for extraction under current economic conditions. In order to establish a resource as a "proven reserve," considerable testing is required; for gold deposits, this includes a number of exploratory holes have to be drilled. Probable reserves are based on broader assessment measures and may include some drilling. Possible reserves are based on broad exploration measures and generally do not include any drilling but rather reflect the results of, for example, aerial surveys and other geologic mapping techniques.

Are the benefits of the developed resources of the world distributed equitably according to appropriate criteria of need or merit?" (L.K. Caldwell, **International Environmental Policy**, Duke Press Policy Studies, Durham, North Carolina, 1984:154). With specific reference to gold, the first question does not seem especially relevant because the major applications of gold include jewellery, gold coins, and gold bars--all non-essential end uses. In addition, gold is recycled, including reclaimed gold from industrial applications. However, the gold resource of a particular nation may be "mismanaged" so that not only future generations lose the benefits but also that the current generation loses its share because of wasteful and inefficient mining and processing (or, recovery) methods. The question concerning the equitable distribution of benefits clearly relates to gold mining, both from the perspective of material benefits such as increased government revenue and increased wage employment opportunities, as well as in terms of costs or disbenefits such as polluted water. This section attempts to focus on the environmental disbenefits of mining, and specifically on the distribution of these disbenefits.

"....[I]t is doubtful that a relationship between a Third World country and a foreign mining firm can ever be wholly satisfactory no matter what benefits may accrue to the host nation. The presence of foreign mining companies introduces social and economic influences--including consumption patterns, structures of compensation, and life-styles--that may contrast sharply with those of the local population." (Caldwell:158-159)

One view of mining based on the experience of the developing Pacific islands region is: "Mining operations have left behind them nothing but ruin" (Doumenge, F. "The Viability of Small Intertropical Islands" in **States, Microstates and Islands**, E. Dommen and P. Hein eds., Croom Helm, London, 1985:97). The mining experience in the Pacific islands ranges from one of the world's largest copper-gold mines (Bougainville) which polluted over 1700 hectares of land along the banks of the Jaba River and the river and coastal ecosystems, to the alluvial gold shovel and pan miners who ruined numerous streams on Mt. Kare in Papua New Guinea's Highlands. The medium-sized Emperor Gold Mine in Fiji had a number of instances when cyanide-laden overflow from its holding ponds as well as inadequate sewage systems poured into the Nasivi River, which is the main water supply for Tavua town, leaving the water "unfit for human consumption" (Plange, Nii-K, "Emperor's Gold in Fiji" in **Mining and Indigenous Peoples in Australasia**, John Connell and Richard Howitt eds., Sydney University Press, Sydney, 1991:103).

Mt. Kare: Shovel and Pan Mining

The Mt. Kare example warrants additional discussion because it represents an alternative to mining by a TNC. Mt. Kare is located in Papua New Guinea's Enga Province but the area's inhabitants are largely *Hulis* from the neighboring Southern Highlands Province, and in fact claim it as their traditional home. The region is extremely rugged, with elevations rising to over 3,000 meters, rainfall is very high, and there are no roads connecting Mt. Kare with the rest of country: traditional foot

trails were used until people found gold, then supplies were brought in by helicopter. The Mt. Kare gold deposit is interesting in that one area is a very rich alluvial deposit caused by a landslide (termed a "colluvial deposit"), which is the area exploited by the shovel and pan miners. However, there is also a sub-surface deposit which had originally led Conzinc Rio Tinto Australia (CRA, the Australian subsidiary of the major mining TNC Rio Tinto Zinc) to purchase the exploration and development rights for Mt. Kare. CRA "allowed" the exploitation of the alluvial deposit by pan and shovel miners with the hope that it would eventually be able to develop the larger sub-surface deposit. The peak of the gold rush was during the 1988-1989 period. Because of continuing attacks or threats of attack against CRA personnel during the 1991-1992 period, CRA withdrew from Mt. Kare in 1991 and has not reopened its exploration camp as of October 1994.

Caldwell's three questions on the environmental implications of resource use and management provide a framework to assess small-scale, or non-mechanized, mining. Ryan writes "A very conservative computation suggests that there must have been at least 20,000 holes (3-4 meters deep) dug....If the object of working a gold-field is to recover the highest possible proportion of the precious metal present in the ground, few operations could have been less efficient than Mt. Kare during the rush. All the overburden and the waste soil above the layers of gold were simply piled around the mouth of the hole. This, in effect, made each shaft deeper than it need be, and unhandy to work; it also increased the danger of cave-in. But chiefly, the practice meant that around every hole was a gold-bearing area twice the size, ren-

dered unworkable by the rubbish piled on top of it." (P. Ryan, **Black Bonanza: A Landslide of Gold**, Hyland House Publishing Pty. Limited, South Yarra, Victoria, Australia, 1991:46).

Beyond the inefficient and wasteful recovery methods, this type of mining could have led to more dangerous and even more waste through cave-ins. "The operation seemed frightfully dangerous, for not one hole was shored up with timber....there were sights even more terrifying, where cliffs and enormous boulders had been undermined to get at the wash dirt. One trembled to think of the consequences of an earth tremor, and they happened often; frequently a whole family would be working under one of these precarious excavations" (ibid.). A landslide would have buried miners, buried the gold resource, and continued to dramatically alter the landscape of a very fragile environment.

Ryan also comments on the pollution caused by the uncontrolled development of a town which housed well over 7,000 during the peak of the gold rush.² "All they could think of was gold. Every daylight moment not employed with shovel and pan was not only time wasted, but time during which potential rivals might snap up some

² Ryan states that there were "7,000 diggers at the height of the rush in 1988" (pp. 50), and also notes that the settlement contained "some 7,000 people" (p. 49). While there is not a clear contradiction in these estimates of the population, these two approximations reflect the difficulty in acquiring and/or presenting anything beyond very broad order of magnitude assessments of the population, the number of miners, the quantity and value of the extracted gold, and the amount of displaced waste rock and soil associated with the pan and shovel mining operations. Reports on the number of pan and shovel miners working in the Philippines, Indonesia, and Brazil indicate similar conditions and a similar difficulty in determining populations, values and quantities.

rich piece of dirt. There was no thought for tidiness or hygiene and no government to enforce them. Bottles and tin cans littered the area, sinking in successive layers beneath the all-surrounding sea of black mud. No one bothered to dig even the most primitive pit latrine, and all defecated at need and at large all around the dwellings" (ibid.:44). These conditions caused typhoid to become endemic to the Southern Highlands Province (ibid.:78-79).

These negative comments invite the question as to what were the benefits to Papua New Guinea from the Mt. Kare pan and shovel operation. The answer is complicated. First, the Mt. Kare sub-surface deposit would have been small, requiring a capital investment of less than \$20 million, employing fewer than 150 people, and probably would have been mined-out in the matter of a few years (ibid.:136). Although the CRA mining operation would have paid at full corporate tax rate (35 percent for resident companies plus the additional profits tax), the pan and shovel miners through their intermediaries (gold buyers flying into the Mt. Kare region by helicopter) only paid a 5 percent export tax on the gold which was declared (and a high proportion of Mt. Kare's alluvial gold seems to have been smuggled out of the country), very little tax had been paid. In addition to the lost revenue, the surface of the land was described with "[it] still resembles a soggy slice of gruyere cheese" (ibid.:131).

However, some people made considerable sums of money out of the roughly \$300 to \$400 million extracted from Mt. Kare (ibid.:66). Typical of "boom-bust" communities, the price for goods and services was highly inflated, with beer selling

for more than \$5 per bottle, rice more than \$1.50 per pound, and prostitutes charging 10 times the going rate in other towns (ibid.:62, 82). Some local entrepreneurs made small fortunes, such as the Managing Director of Nationair, one of the primary operators of helicopter services (ibid.:64). Local gold buyers paid one-half the world market price of gold to miners at Mt. Kare (ibid.:83). Certain miners also reaped major rewards, as evidenced by the man who "bought four Toyota cars (not 4-wheel drives); four women and a chicken farm" (ibid, pp. 88). But most miners earned less than \$25 per day, which was still quite a bit more than people had previously earned in Papua New Guinea's remote rural areas (ibid.:82).

Additional comments provide further insight as to the "winners":

In September 1988, the then acting Prime Minister, Mr. Akoka Doi, quoted the Bank of PNG as saying that for every tonne of gold exported with tax paid, *four* tonnes was exported illegally. At about the same time, the Chief Collector of Taxes, Mr. Nagora Bogan, estimated that smugglers had cost the government K..14 million in lost revenues.³

It was no wonder. The only prosecution for smuggling which achieved publicity had shown how seriously the government would tackle the problem. An Australian business man had tried to smuggle 6.1 kg of gold out of the country, worth some K.40,000. He was given a 'slap on the wrist' fine of K.1500 in the Port Moresby District Court, *and allowed to keep his gold*. Gold tax would have cost him K.2000, so he showed a profit of K.500 for the offence.

When the PNG parliament assembled for the first sitting in 1989 it was startled by a statement by Mr. Paul Pora, Minister for Finance and Planning. He believed, he said, that K.40 million worth of gold had been smuggled out of the country from Mount Kare alone. Then he added that he intended to grant a two months' exemption from tax on alluvial gold. This, he said, was to make it fair to legitimate and honest dealers and exporters. Mr. Pora himself had business interests in and around Mount Kare.

It takes a moment for the truly bizarre quality of this to sink in, but it rests on the same rationale as the abolition of gold buying licenses. Such

³ A Papua New Guinea *Kina* was worth approximately US\$1.15 in 1989.

policies, translated into plain talk, mean this: If rich men and powerful interests simply defy the law, then the government will bend the law to accommodate them. The law is simply to express what they happen to be doing at the time. (ibid.:85).

In other words, the amount of gold and currency circulating throughout the economy greatly contributed to the use of political and legal institutions as vehicles to enhance the wealth of individuals. This implies that a "culture of corruption" was at minimum aided as a result of Mt. Kare. Although the preceding discussion began by focusing on environmental implications of the uncontrolled pan and shovel mining on Mt. Kare, it has ended by describing examples of greed and corruption. Thus, it is necessary to make a connection with Caldwell's assertion that resources have to be wisely managed for future generations and benefits to be equitably distributed: resources and the environment cannot be effectively managed within the context of institutions which are being manipulated for personal gain.

While the direct environmental impacts of Mt. Kare have largely been limited to disturbance of land and the watershed, both of which are recovering, it is fortunate that chemicals such as mercury were not needed to process the gold. Applying the reasoning to a "culture of corruption," if chemicals had been needed, then their use would have probably been uncontrolled and resulted in severe and lasting environmental damage. Mercury is used in Brazil by the hundreds of thousands of *garimpeiros*. The uncontrolled aspect of pan and shovel gold mining in Bolivia is evidenced by this report: "At least 75 bodies were recovered by last night and it was feared that hundreds of miners and their families were buried by the estimated 700,000 cubic feet

of mud. Miners have stripped many hills of trees and vegetation, making them more susceptible to landslides during the rainy season. We estimate that only 10 percent of the camp's population (approximately 1,200) survived" (Honolulu Advertiser, 9 December 1992). A similar commentary is "Prospectors are digging so many ditches and holes in their search for gold along Venezuela's Caroni River and its tributaries that the river's present course is endangered....63 per cent of the territory is accessible only by helicopter and is outside the control of the law. Prospectors from Venezuela, Brazil, Colombia and Guyana have contaminated the local water supply by using mercury to refine the gold. They also leave behind pits of stagnant water where malarial mosquitoes breed. And they destroy the jungle, with a consequent loss of wild flora and fauna...." ("Tunnelling into Trouble," South, March 1989:13).

Small scale or non-mechanized mining has provided employment for millions of people throughout the developing world. Through this employment in typically isolated rural areas, economic, political and physical pressures on other urban and rural systems have been reduced. However, non-mechanized mining is largely uncontrolled and as with all mining, causes environmental degradation. As importantly, the proceeds from uncontrolled mining circulate in "a culture of corruption," which prevents the development and institutionalization of reasoned and appropriate environmental and resource management regimes.

Are Mining TNCs Better Resource Managers and More Environmentally Sensitive?

The question begs for a comparison between MTNCs and pan and shovel operations. The analysis can be presented through a complex of issues or simplified into a discussion which focuses on several key issues.

First, the issue of whether MTNCs export pollution by locating in developing nations needs to be considered. "American experience also suggests that companies are not, in fact, much inclined to set up shop in one place just because its environmental standards are lower. In most industries, compliance with these standards accounts for only a fraction of capital costs, which in turn account for only a fraction of product prices. Differing rules on, say, social security are likely to be much more important when a company wonders where to go." (*The Economist*, 14 October 1989:24). Similarly, "But companies are frequently chary. They say that regulatory and financial frameworks often remain unattractive to western capital. Many have chosen to play safe and invest in the industrialised countries." ("Rising Gold Fever," *South*, March 1989:8-9). The second quote, by omitting any reference to environmental legislation, corroborates the first quote which asserts that other factors determine where a company invests. But if these conclusions are correct, then why is there a debate on MTNCs and their impact on the environment?

In order to answer this question, consideration has to be given to the types of impacts gold mining can have on the environment. These impacts include disturbances to land, surface waters, downstream coastal areas, and the air.

With respect to land disturbance, several components are involved. First, at the site of the mineral deposit, or the mine, topsoil is removed and the ore-bearing rock is excavated for processing. This results in a near-permanent loss of the native habitat, although there have been some restoration projects which developed parks and recreation areas on former mine sites. Neighboring the mine site will be the mine processing plant and its associated transportation network. If this area is not chemically polluted, it could theoretically be returned to its native habitat. The sites of other infrastructure such as power plants and worker housing could be restored. However, these other sites could also involve near-permanent damage. For example, the Porgera mine in Papua New Guinea is supplied electricity from a power plant which uses its neighboring natural gas field as a fuel source. Larger mines have had hydroelectric dams built to supply the power, often at a huge cost in acreage (many times greater than the acreage for the mine site itself) to the native habitat. In both of these instances, the loss of native habitats is a very long-term proposition. The waste disposal sites, where the waste rock covering the ore deposit and the tailings from the ore processing are kept in "holding ponds," are also near-permanent losses because of the probable presence of heavy metals and other chemicals. The changing use of land can lead to potential conflicts with other sectors such as tourism when visual or aesthetic views are disturbed, or when downstream agricultural and fishing activities are impacted because of increased water run-off and sedimentation. A major result of changing land use patterns around a mine is soil erosion and increased slope instability.

In terms of surface waters, streams are diverted, physical pollution through sedimentation is greatly increased, and chemical pollution becomes a major concern. Stream diversion greatly alters the native habitat; however, it does not necessarily result in a permanent degradation of the environment. Stream sedimentation may result in water becoming undrinkable or, for its aquatic residents, unlivable if the turbidity and/or streambed build up are extreme. With chemical pollution, the results are severe. The case of the Jaba River was mentioned above. In rivers downstream from the Ok Tedi mine in Papua New Guinea, the loss of fish and other aquatic life has been severe. With flooding, the river deposits its pollutants on the flood plain, making it also near useless. Removing heavy metals from river bottoms requires generations.

In terms of chemical pollution, the leaching of heavy metals from waste rock dumps and possibly tailings storage areas is a potentially more serious long-term problem than any other. Leaching is the process whereby solid materials are chemically dissolved and removed in solution. Much of the waste materials consist of sulphide and oxide minerals. Compared with in situ ore materials in the ground, waste rock and tailings are more porous and have a much greater surface area and thus a freer exchange with the atmosphere. Under conditions of relatively high temperature and humidity, free oxygen and bacterial activity, sulphides may readily oxidize to produce acids. These acids once formed further attack sulphides to form heavy metal salts which pass into solution under prevailing low pH (acidic) conditions. This can be a serious problem since, even in minute concentrations, ions of

metals such as copper, lead, zinc, arsenic, and molybdenum are toxic to many forms of aquatic and terrestrial life, including humans. Thus, unless leaching can be prevented, perhaps through the addition of lime to neutralize any acids, or controlled by special waste dump construction methods which treat effluent, a continuous supply of acidic water containing metal contaminants could reach the watershed drainage system, and, under certain conditions, disperse over a wide area.

Air pollution associated with mines is generally related to two sources: power plant emissions and the dust generated by the mining and processing operations. In both instances, the impacts are usually limited to the immediate vicinity and do not cause irreparable damage. There is also some noise pollution in the immediate vicinity of mining activities which would disturb some habitats.

Reference has already been made to impacts to the marine and coastal habitats caused by sedimentation and chemical pollution. However, it is essential that the concept of non-sourcepoint contamination be understood in the context of the mining industry: those downstream from a mine site could experience even greater impacts than those in the area surrounding the mine site. Many of the impacts described above are also caused by pan and shovel mining as evidenced by the earlier references to land degradation and chemical pollution.

In sum, gold mining is a polluting industry: it alters the landscape and poisons water. The sheer magnitude of a mine operated by a mining TNC dictates that it will have major impacts on the environment. As an educated guesstimate and in terms of per unit of gold produced, the MTNC operation probably causes less land disturbance

than do pan and shovel miners. This would also be correct with respect to the value of gold produced or the value of government revenue generated. But in terms of employment creation, the pan and shovel operations would be less damaging. To some degree, this is an "apples and oranges" argument which uses a common unit to compare unlike activities. Simply, both scales of operation are harmful to the environment in terms of their short- and long-term impacts: one creates more jobs while the other leads to more government revenue. Employment creation and increased revenues are the primary objectives of governments, while protecting habitats is at best secondary. Thus, returning to Caldwell's questions, both scales have similar failings and strengths as resource managers: by inference, both create inequities, both cause pollution, and both do not provide for future generations.

However, in making the above comparisons it should also be noted that MTNCs usually do not compete with pan and shovel mining for the same deposits. In fact, a number of developing nations reserve alluvial deposits for small scale local miners while at the same time trying to attract MTNCs to develop sub-surface deposits. Commenting on the small versus large MTNCs in the context of Papua New Guinea, Jackson notes

In short, small miners and large projects are not realistic alternatives to each other, and each requires different government management strategies. Whilst in terms of employment generation and politics small miners may be attractive, in economic terms they have much less to offer the government--almost the antithesis of large-scale projects. Moreover, local landowners such as the Biangai have been swamped by small miners who continue to be in a strong position to influence the decisions on the Hidden Valley project. (R. Jackson, 1991, *Villages, Companies and Government in Papua New Guinea*, in *Mining and Indigenous Peoples in Australasia*, J. Connell and R. Howitt eds.:27).

Finally, given the above parameters, the sheer magnitude of the MTNC-operated mines leads to damaging pollution. Even under "ideal" conditions with the best technologies and the most environmentally-conscious MTNC, the fact is that the land and water are impacted at rates which at minimum cause considerable harm if not destruction to existing ecosystems. And, conditions are rarely "ideal."

The Context for Resource Management

The introduction of large amounts of money results in the use or manipulation of institutions for individual gains. Whether as direct bribes or via the appointment to a corporation's board of directors, the cause and effects are similar. This has direct consequences as to how resources are managed. In addition, the fact that governments have priorities other than management of resources further complicates the issues, and by knowing that mining is a polluting industry, governments can more readily rationalize the acceptance of environmental degradation.

Pan and shovel miners may know that cutting down forests (in order to get to the deposit) is harmful to the environment but they may also feel that they are but one among thousands, and so have but minimal responsibility. MTNCs are usually concerned about their public image and will attempt to act as a "good citizen." Thus, they will attempt to act with some degree of environmental consciousness, even though they acknowledge the fact that mines pollute. However, the actions taken by the MTNC to limit environmental damage are, as in the case of governments, secondary to mine production, profits and shareholder satisfaction.

Because concern for the environment is of secondary importance to MTNCs and governments, attention is not given to environmental issues until the probable economics of the project are determined. This means that issues such as slope stability and sedimentation are not seriously considered until after mining and processing technologies have been selected and rates of production set. The result is the sedimentation of the Jaba River mentioned above as well as the collapse of the tailings dam at the Ok Tedi mine because shortcuts were taken in regards to slope stability. Returning to Caldwell's questions, MTNCs may be "good" managers of the gold resource, and especially if governments force them into optimizing economic production and prohibiting the "high-grading" of the deposit (see Chapter 5). However, MTNCs are not good managers of a broader definition of the resource, that is the environment.

Finally, who are the environmental "winners and losers?" The "winners" are those who can utilize and/or manipulate institutions for their personal gain. The "losers" are those who live in areas in which the environment is negatively impacted, meaning those who live near or downstream from the mine site and are asked to bear the majority of the costs of development. MTNCs adapt to specific contexts for resource management and provide promises of benefits and good citizenship to both "winners and losers." This capacity to adapt is central to the success of MTNCs, and reflects their magnitude compared to smaller companies and governments. The obvious conclusion is that after decades of discussion, the attention given to the environment is inadequate.

Mining and Local Communities

As noted above and in previous chapters, an MTNC mining project is complex and large in respect to its scale of operations, financing, and impacts. Communities neighboring the project look forward to the employment and business opportunities which the project will generate. In addition, improved social services, schools and infrastructure will be welcomed side-effects of an MTNC mine. While expectations are raised because of these potentially positive benefits, the results have been somewhat less than ideal. At issue is that "...the social, political and economic impacts of mining are principally about distribution and redistribution of benefits" (R. Gerritsen and M. McIntyre, "Dilemmas of Distribution: The Misima Gold Mine, Papua New Guinea," in **Mining and Indigenous Peoples in Australasia**, J. Connell and R. Howitt eds., op cit:36).

Describing the process by which benefits are distributed, Connell and Howitt write:

Throughout the world the intersecting interests of mining companies and indigenous peoples are woven into complex webs of social, political, and economic relations, which shape development opportunities and constraints for each group. Neither consists of homogeneous, easily defined groups. Because of the growing significance of mining in many countries, relations between them are critical to the development strategies of many national and local governments within the Australasian region....In a world economy that includes substantial international trade in mineral commodities, most mining projects in the region are oriented towards distant, usually international opportunities (and constraints) rather than local development priorities. Mines in Australasia have usually been financed with foreign capital, developed and managed by foreign corporations, and dependent on foreign markets.

Mining's injection of capital and infrastructural resources into previously neglected areas may give better access to the benefits of national economic development, but there have been no circumstances where the indigenous groups' development goals have been successfully linked to those of the

mining corporations. On the contrary, the increased marginalization and disempowerment of local indigenous peoples as a consequence of mining developments has illustrated the difficulty of matching development outcomes to local aspirations, and it has focused on the frequency with which goals are in conflict. (J. Connell and R. Howitt, "Mining, Dispossession, and Development" in *Mining and Indigenous Peoples in Australasia*, J. Connell and R. Howitt eds, op cit:1-2).

Connell and Howitt also articulate the situation(s) and dilemma(s) confronting traditional landowners when they decide whether or not to accept large-scale mining:

As indigenous peoples endeavour to secure a future consistent with their changing goals, values and visions, mining is an ambivalent phenomenon, presenting, on the one hand, opportunities for production of substantial wealth from traditional tribal lands, and on the other hand, threatening destruction of those lands and the social fabric woven from them. For many people in previously marginalized regions, it is not a question of ideology, of being 'pro-' or 'anti-' development or 'pro-' or 'anti-' mining. The dominant imperative is survival, which generally includes the notion of survival with cultural integrity. (J. Connell and R. Howitt:4)

Once traditional landowners have decided to accept large-scale mining, they come to the 'negotiating table' with one asset, their land, access to which is sought by the MTNC and the national government. However, within this framework, the landowners look towards the government to help represent their interests and to ensure that the MTNC compensates them for the use of their land as well as for any destruction of habitat. Unfortunately, the MTNC often comes to the negotiations with a very limited knowledge and range of interests, which can be summed up with the term 'profit motive.' The national government is similarly guilty, with its interests focused on national objectives and not representing the landowners. Connell and Howitt comment:

Conflicts over land use and land rights have often been exacerbated in situations where indigenous peoples, transnational corporations, and governments have been unequal protagonists....Transnational corporations, often with little historic connection to the country or the land, have provided the crucial capital and technology, invariably with government support. In the changing relationships between states and transnational corporations, indigenous people have been only of marginal consideration until they have elevated their concerns to the national and international agenda, usually through their own actions. Indigenous peoples have often been succoured by political rhetoric but undermined by the comprador bourgeoisie within the mine administrations or by compelling national goals of economic growth. Invariably they have been the weakest party in discussion and negotiation. (ibid.:6)

Howard agrees that the national government does not represent indigenous landowners but defines the relationship from a different perspective:

Increased state intervention however, has not resolved many of the political and social questions facing the mining sector. There remains, for example, questions of in whose interests the state functions in regard to the mining industry, and in the newly independent states of the South Pacific this is often a hotly contested issue. In most states in the region, indigenous elites groomed by colonial authorities simply assumed power upon independence. All too often, such elites appear to have formed an alliance with mining interests primarily for their own benefit rather than that of the broader population. (M. Howard, 1991, *Mining, Politics, and Development in the South Pacific*, Westview Press, Boulder, Colorado:2).

Complicating the respective interests of the MTNC, the national government and landowners is the issue of timing of project decisions, which Gerritsen and McIntyre term 'capital logic.' By 'capital logic,' they refer to the need for the MTNC to operate within the rules and covenants detailed in their financing agreements, the foremost of which is the schedule of loan repayments. The national government also recognizes that if the MTNC's loan is not repaid as scheduled, then it will have a mining project which is probably not only operating at a loss but also

not contributing the eagerly anticipated taxes to the national treasury. Landowners have been marginalized in this process.

Governments have placed great importance on the macroeconomic advantages of mining projects. But it is our contention that the cause of situations, such as at Bougainville, where governments seemingly override the feelings of local villagers, is more complex than suggested by a governmental priority to maximize taxes and royalties. The political failure of such projects stems mainly from decisionmaking processes engendered by the 'capital logic' of each mine's implementation timetable. Our hypothesis is that it is the imperatives of implementation, not economic greed or political ill-will, that make governments steamroller the villagers.

The 'capital logic' of a mining project is molded by its financial flows. The source of the money, the timing for repayments of loans, the need to make a profit, all force a particular negotiating outcome and timetable and as a consequence provide a characteristically 'legalistic' regime that encourages deferred dissatisfactions among local people. These dissatisfactions eventually lead to apathy, hostility or, in extreme cases such as Bougainville, revolt. (Gerritsen and McIntyre:37).

In addition to being marginalized in the decisionmaking process, landowners are further marginalized through inadequate returns on the use of their asset, the land. Gerritsen and McIntyre describe the interactions between the MTNC, government and landowners with respect to how landowners not only receive inadequate compensation but also how this results in their further marginalization from the decisionmaking process, and may even result in serious conflicts between landowners.

A mining project involves three types of parties: miners, government(s) and landowners. Landowners....are temporary monopolists, but they may not secure the rents that monopoly usually guarantees, for two reasons: the mining company has bargaining power, usually as the monopsonist purchaser of access to the land required for the project ('monopsonist' meaning a single buyer from a large number of sellers); and for macroeconomic reasons the national government needs the mining monopsonist more than the land monopolists. Power relations are unequal, with local villagers at the bottom of the influence ladder. Landowners are under pressure from governments and companies whose timetable for a mining project is based on financial flows.

These pressures create haste, which threatens the efficiency of the impact assessment process and allows localized misunderstandings and intemperate resentments.

These misunderstandings and resentments have a temporal dimension. Firstly, the claimants to royalty payments will differ over time, while the beneficiaries may not. Because of the difficulties of determining land relationships, the definition of beneficiaries of the compensation and royalties will usually be initially narrower than is acceptable in the long term. Later, new groups will advance claims, sometimes for reasons that have little to do with land or immediate disadvantage, whilst the inheritors of the original claimants will often discover that compensation payments have been consumed although damage to the land and society continues.

Secondly, the long-term consequences of mining are impossible for villagers and landowners to comprehend fully, and this eventually leads to disagreement amongst the villagers. This is usually expressed in terms of disbelief that such an obviously rich entity as the mining company cannot countenance new, apparently trifling, claims. The company views the relationship as an immutable legal one, to reduce its capital exposure risks; the villagers view it increasingly in terms of the traditional 'hospitality' etiquette between visitors and host.

Thirdly, the advent of the mine puts old policy and political agendas into new frameworks. Complaints long-neglected, such as the state of Bwa-gaoia station's public amenities or Misima's roads, now become relevant to the impact of the mine. The mine promises the easy resolution of pre-existent conflicts over land and access to funding from the provincial government's budget. What results is 'garbage-can anarchy' in organisational decision-making--that is a new situation has had old problems grafted upon it. Matters irrelevant to the mine become part of the politics of managing mine impacts. This is because, for the villagers and local bureaucrats, the mine seems to offer a 'technological' breakthrough (in the physical as well as the fiscal sense) out of existing constraints, fiscal or administrative and infrastructural. This phenomenon affects local reactions to policy implementation and intergovernmental relations.

These three temporal aspects interact, producing accelerating tensions over time unless sensitively addressed. (Gerritsen and McIntyre:40-41)

While attention has been given to the processes by which landowners and local communities are marginalized, the discussion must also consider the costs and benefits of a mine's development. A primary result is that the area of the mine and its associated processing complex becomes a "cash-rich enclave" (Gerritsen and Mc-

Intyre:51). However, non-landowners in the area receive very few benefits from mining, beyond some additional amenities and services and the prospect for some cash-earning opportunities, which is to say that inequalities (between residents) greatly increase (Gerritsen and McIntyre:49). Howard (1991:4) comments that "[b]roadly, the debate has focused not simply on the level of compensation from mining but, moreover, on the distribution of the revenues between local and national or elite interests."

Advocates of mining often cite the opportunities created for local business development as a justification for and benefit from a mine's development. However, these local business development opportunities have "not lived up to expectations" (Gerritsen and McIntyre:50). More specifically, MTNC operations tend to result in a decline in the local production of cash crops (ibid:45). Connell and Howitt offer one explanation of the causes and effects of declining local agricultural production:

...wage employment has contributed to the decline of local agricultural systems. The success of the minerals sector in generating export income has made it more difficult for other sectors of the economy to be competitive. The social, economic, and environmental impacts of mining are all most extreme around the mine site itself, a situation that has sometimes engendered dramatic contrasts between those who have been able to obtain excellent access to the new sources of income and those who have not....it is too early to talk of class formation...mining has led to the restructuring of traditional social orders, new forms of social stratification, and friction within and between communities. (Connell and Howitt:11)

Wage incomes have contributed to the consolidation of a money economy and rapid changes in the patterns of consumption. Diets have often been transformed away from their historic subsistence orientation and...a growing dependence on imported foods has accelerated the epidemiological transition from infectious diseases to non-communicable diseases such as obesity, hypertension and diabetes..." (ibid.:12)

However, the process of declining local agricultural production and its effects can also be described with a five-step sequence:

- 1) the men leave subsistence farming to work for wages with the mining company;
- 2) subsistence production falls as the women and children cannot maintain production levels;
- 3) part of the men's wages are used to purchase imported foods which are not understood in terms of their dietary implications (V. Lucas, 1978, **Malnutrition in Pre-school Children in Fiji**, Foundation for the Peoples of the South Pacific, Suva, Fiji:97-98);
- 4) another part of the wage packet is used to purchase alcohol which results in anti-social behavior and community problems (R. Jackson, C. Emerson, and R. Welsch, 1980, **The Impact of the Ok Tedi Project**, Department of Minerals and Energy, Government of Papua New Guinea:257, 266); and,
- 5) the result is a disunified community which has increased malnutrition and other health problems, degraded subsistence plots, and only limited, if any, residual cash income (savings).

In summation, one would have to conclude that "[l]ocal communities have inevitably faced the burden of the heaviest costs, in environmental and social and economic terms" (Connell and Howitt:9). However, if solutions can be identified and implemented to remedy the unequal distribution of the costs and benefits of mining, then it is also necessary to understand the above issues in the context of the interrelationships between the main players. These can be summarized under the headings of the role of government, government:landowner relations, government:MTNC relations, and landowner:MTNC relations.

The Role of Government

Government is usually given the task of implementing public projects (e.g., high schools, health clinics) with the increased revenues from a mine. However, the implementation record of government indicates that few projects were actually built (Gerritsen and McIntyre:45). Government is additionally expected to manage the mineral resources in a manner which optimizes their value, which includes negotiating mining agreements with potential investors. Government is also expected to represent and protect the interests of local communities and landowners. The evidence cited above and reiterated below indicates that government has failed on both of these counts.

Perhaps one of the most telling comments on the role of government, and more specifically government's interest in mining, comes from Zambia, where the state owns the mining operations. "Zambian researchers fear that labor losses due to AIDS could cripple their nation's copper mining industry....(because mining companies provide retirement and medical benefits there is a fear that) the financial drain of AIDS could jeopardize the entire mining sector" (L. Heise, "Responding to AIDS" in *State of the World 1989*, Worldwatch Institute, W.W. Norton and Company, New York, 1989:120). The researchers mentioned work for the Zambian government.

Problematic with this description of government's role as well as with the brief characterizations outlined below, is the fact that "government" (or, "landowners" or the "MTNC") is presented as a unified voice, with one set of objectives and a group of bureaucrats and politicians who fully support and follow these objectives. In the

"real world," this unified voice does not exist. Rather, there are often considerable disagreements within and between government departments, between civil servants and politicians, and between politicians over what actions and policy options the government should undertake. One may assume that if an MTNC proposes to invest hundreds of millions of dollars in a nation then the government, regardless of the internal debate, will likely accept the proposal provided certain requirements (e.g., tax agreements, provision of infrastructure, etc.) are satisfied. While this assumption may be generally correct, the internal debates which occur within governments and within local communities are important components in a project's evolution. Debate can delay action to the detriment of government or the local community, or to the mining project itself. But debate can also resolve a number of outstanding issues and, if properly sequenced, can even result in improved project planning and implementation, and ultimately the project's economics.

The following example of Bougainville is a case in point: there was very limited internal debate, either within the then colonial government or within the local communities. In hindsight, this lack of interaction and debate had serious consequences to the mine, which has now been closed because of landowner dissatisfaction. The actions taken by landowners against the mine stemmed from generational conflicts, conflicts between "haves" and "have nots" in the local communities, conflicts between landowning clans, conflicts between landowning and non-landowning clans, and conflicts between Bougainilleans and off-islanders, amongst others. In addition, there was a similar range of conflicts within the national government. Thus,

presenting simple descriptions on the role of government and relations between the various parties is, in reality, far more complex than what is offered here, and each component requires separate studies. However, the generalization remains that if an MTNC proposes a large investment, then the philosophy of most governments during the 1990s will be to accept the proposal. Similarly, most local communities will also probably accept the MTNC's proposal. This issue will be discussed further in the conclusion to the Bougainville example presented below.

Government:Landowner Relations

Landowners look to government to defend their interests but the government is focused on increasing its revenue flows (Gerritsen and McIntyre:51). Specifically, "...national interests are in several respects antithetical to those of the landowners" (Connell and Howitt:4). Once landowners realize that government has not protected their interests, the result is considerable dissatisfaction which can ultimately lead to the violence and rebellion associated with the Bougainville mine.

Government:MTNC Relations

Based on the discussion provided in Chapter 3, governments are generally inefficient players in the global mineral industries, and usually lack the capacity to deal with mining and mining companies. In addition, intergovernmental rivalries lead to a situation which cannot yield positive results for government in its relations with a MTNC (Gerritsen and McIntyre:52). Government needs to improve its decision-making to correspond with the needs of the MTNC (ibid).

MTNC:Landowner Relations

In order to establish a more equitable distribution of benefits from mining, landowners need to participate in mining, including being able to purchase shares in the mining company and to have increased involvement in decisionmaking (R. Jackson, in Connell and Howitt:22-23). However, landowners have not been able to exploit their position vis-a-vis the MTNC because the costs of mining have not been defined for and articulated to them, with the result that "...the failure to address the impact of these changes on the local people's ability to participate in the mining project marginalized them from a process they would otherwise be willing to contribute to" (Connell and Howitt:10). This is ironic because there is "...generally a warm local welcome for mining companies" because they bring business and employment opportunities to a previously isolated area (R. Jackson, 1991, in Connell and Howitt:21).

MTNC, Government, and Local Residents in the Bougainville Crisis

Based on the above discussions, it should be clear that local communities are subjected to pollution and environmental degradation, social and economic dislocation, and political marginalization as a result of mining. Governments and MTNCs have repeatedly demonstrated unwillingness to systematically include local communities and landowners in the decisionmaking process, thereby excluding those whose lives will be most changed as a result of the decisions. Options for local communities and landowners are few. One view: "It often seems to take a crisis before perceptions

change sufficiently to support an effective political response" (L.R. Brown, C. Flavin, and S. Postel, 1989, "A World at Risk" in **State of the World 1989**, Worldwatch Institute, Washington, D.C.:5). Bougainville provides an example to apply this perspective to an actual crisis. Weekly articles in the **Times of Papua New Guinea** for the period October 1988 to July 1989 are the primary source of data. The **Times of Papua New Guinea** is the major newspaper in Papua New Guinea and generally attempts to provide for dissenting views to be aired--it is the most commonly quoted media source on Papua New Guinea affairs. However, other sources have also been used as references to verify the articles, including **Pacific Islands Monthly** and **Islands Business**; both publications are monthly journals on Pacific island issues. Bougainville Copper, Ltd. (BCL) is the company which owns and operated the mine, and is registered in Papua New Guinea. BCL is a subsidiary of Conzinc Rio Tinto Australia (CRA), which is an autonomous subsidiary of Rio Tinto Zinc (RTZ), the British-based MTNC. Both CRA and RTZ are among the world's largest MTNCs.

The use of Bougainville as an example requires some additional explanation. As a large copper-gold mine, Bougainville does not represent the gold mines which have recently been developed in Papua New Guinea and other nations. Unfortunately, these recently developed gold mines have not operated long enough (generally less than 5 years) to enable the analysis of MTNC:government:local community relations. While a gold mine's impacts will be somewhat less severe than Bougainville's because of scale alone (the Bougainville mine was processing ore at a rate of nearly 140,000 tonnes per day compared to the 2,000 to 10,000 tonnes processed by a gold mine), it

can be argued that the impacts of either an MTNC-operated gold mine or copper mine will have substantial serious impacts on neighboring communities (Filer, 1990:87). Thus, Bougainville is used as an example of how MTNC mining can disrupt local communities as well as how the government is unable to successfully manage conflicts with landowners.

It should also be noted that since the eruption of the Bougville crisis, there has been a major expansion in the literature and debate on the effects of MTNC mining in Papua New Guinea and elsewhere. The debate on Bougainville has centered on two conflicting views. The first is the argument by Griffin (1990:12-13) that Bougainville is a "special case," and the ensuing conflict has resulted from Bougainville's unique society and other characteristics. Griffin does not believe that the Bougainville experience will necessarily be replicated elsewhere in Papua New Guinea or in other nations. The opposing view by Filer (1990:1, 1992) contends that large-scale mining will seriously disrupt Melanesian communities. Based on the evidence presented in earlier chapters, it is difficult to accept Griffin's argument. Each mine and each community may have a set of "unique circumstances," and a "unique history," but the facts that lifestyles are changed, communities and households moved, and pollution becomes a visible effect of mining, are not unique to Bougainville--rather, these impacts are "typical" of MTNC mining around the world. The manner in which Bougainville residents responded to these impacts may be unique at least at this point in time, but this should not deter the extrapolation nor the applicability of the Bougainville example to other mining projects.

Filer notes that mining speeds up the rate of social change and undermines traditional communities (1990:87). He also comments on the inability of MTNCs and governments to effectively interact with local communities because of their shared objectives with "[n]evertheless, despite the differences in their immediate goals, the central government departments and the mining companies do share the immediate problem of determining the lowest reasonable cash cost to themselves, of purchasing the support and cooperation of each new mining project being proposed," and they approach the problem in the same way (1990:101). Within this context, the MTNC and the government work together and the local community is not treated as an equal partner.

Prelude to a Crisis

"First we thought the Panguna mountain was the only sacrifice that was to made for the rest of the country. Then we started seeing dead fish on the banks of our giant Jaba River and along the southern coastline of our villages. The river even went permanently brown and muddy, when BCL started mining there. Now we find that our wild animals are disappearing, including our birds and our flying foxes. We cannot continue living with a threat over our lives" (**The Times of Papua New Guinea**, 20 October 1988).

Connell writes about the resettlement of landowners who have leased their land to the mining company so that a mine can be built. "In many villages planning for resettlement was inadequate, attention to the concerns of resettled villagers declined over time, and provision of services was lacking. Relocation held out the promise of

a new life which might have put them on the same footing as the urban residents of Panguan and Arawa, but this never materialized as BCL insisted that villagers maintain their own houses to make 'productive' use of compensation payments....In many respects BCL lost the opportunity, at a relatively low cost (compared, for example, to the cost of a truck tyre), of creating a series of model villages, creating goodwill and demonstrating good old-fashioned benevolent paternalism" (J. Connell, 1992, "'Logic is a Capitalist Cover-up': Compensation and Crisis in Bougainville, Papua New Guinea," in *Resources, Development and Politics in the Pacific Islands*, S. Henningham, R.J. May, and Lulu Turner eds., Crawford House Press, Bathurst, Australia:44). A further example of landowner:MTNC relations is:

There might have been another outcome. Days before violence erupted, one of the most militant of the landowners simply commented of BCL, 'why didn't they show more goodwill?' BCL could have continued to emphasize a form of benevolent capitalism, constructing model villages, raising compensation payments, ensuring better liaison with landowners and so on; it could even have found employment for more of the disenchanted school-leavers. Yet the *comprador* bourgeoisie within the mine administration was singularly unable to implement such policies and BCL itself was placed in a 'no-win' situation; BCL had become the single highly prominent and visible target to blame for all forms of discontent in Bougainvillean contemporary life. Elements of a handout mentality and cargoism were encapsulated in ever-increasing and finally unrealistic demands, based on divergent opinions on the extent of profits, environmental damage and so on. This dispute was exacerbated by conflicts within society over the distribution of compensation payments between generations and through the RMTLF (Road Mine Tailings Lease Trust Fund), and by the rapidly rising population pressure on resources. Underlying all grievances has been the crucial role of land, increasingly recognized to have gone forever; worsening environmental damage proved the final straw (ibid.:53).

Connell also discusses government:MTNC relations and the interest of the national government:

Though BCL was always the obvious target for voicing discontent, this focus was sharpened by the decline of the national government's mine liaison office and the withdrawal of both the national and provincial governments from discussion of mine-related issues. Politicians, whilst pragmatically seeking the substantial revenue provided by the mine were politically supportive of the aspirations of the landowners in their struggle against a multinational corporation. BCL, which had continued to adhere to the legal provisions of the 1974 agreement with the Papua New Guinea government, consequently faced political problems. In 1981 when the agreement was reviewed, BCL argued that the provincial government should be a direct participant in the review, since there was much resentment in the province over its share in the mine revenue. But the Papua New Guinea government accorded the provincial government only observer status, and there were no amendments to the agreement. Though BCL expressed its willingness to participate in a 1988 review, as was required in the agreement, the Papua New Guinea government was again unwilling to allow the provincial government to participate directly, and no review was ever held. (ibid.:52).

In sum, both the Papua New Guinea government and the MTNC allowed the Bougainville crisis to develop because they did not substantively respond to requests by local area residents and landowners to improve the distribution of the mine's benefits. There were numerous opportunities to increase the benefits allocated to local landowners as well as to reduce the negative impacts to which they were subjected. Instead, the MTNC focused on its short-term profits and the government became fixated with trying to attract other MTNCs to develop the nation's substantial mineral resources. The result was a crisis which, within this context, could not be successfully managed.

Crisis Mismanagement

After two weeks of violence, five days of lost production due to the closure of Panguna mine, and millions of kina in lost revenue, all eyes are centered on the national government to see how it resolves the BCL issue and the implications on all future mining operations throughout the country.

Coming only three months after similar problems halted operations at the Ok Tedi mine in Western Province, the violence and sabotage targeted against company facilities at the mine site and Arawa township have shaken the confidence of the mining industry here, and shareholders and financial backers abroad. (*The Times of Papua New Guinea*, 8 December 1988:1).

Continuing with the discussion on the likely effects of the mine's closure, a second element is added, namely what landowners want from both the MTNC and the government, which is participation in the development process:

If BCL ceased exporting copper concentrate, the import cover figure will reduce drastically.

Another implication concerns government revenue. PNG as a whole - the national government, provincial governments, and landowners, receive K1.50 from BCL operations for every K1 of dividend earned by overseas shareholders.

The idea that mineral development is that money earned is used for providing other forms of development, such as schools, roads and health centres.

The national government receives most of the financial benefits as the distribution agency. But the provincial governments and landowners receive some direct financial benefits.

The national government must also consider those who do not have mines. The time has come for some tough talking.

One question the national government might be asking is how the K60 million of royalties to the provincial government and landowners has been used to satisfy the landowners' demands for services and projects....

The whole concept of compensation stems from four different ideas: Preservation, conservation, compensation itself, and participation. Some leaders have expressed sentiments of preservation. The whole process of development is not preservation - it is change. The two do not go together. The basis of compensation is measuring the alternative economic value of what is being lost or taken up in the process of change.

Bougainville landowners want participation, not necessarily compensation.

They want roads and bridges built in their area....(ibid:2)

However, because the mine's closure represents such a major financial loss to the MTNC and the government, confrontation was allowed to develop, and the government presents the rebel landowners as "terrorists":

Defense Force communication assistants and explosives experts will be flown into Panguna from Warak today to assist Police efforts to disarm and detain a rebel Panguna landowners faction still in hiding after a spate of violent attacks on the Bougainville Copper company property....

"This is no longer a game. There are 60 to 70 terrorists in a group with mobile telephones in their 4-wheel drive vehicles monitoring all our movements. They have hand-grenades, pistols, submachine guns and explosives. These guys are armed to the teeth, they know how to use these arms and explosives....," he (Commissioner for Police, Paul Tohian) said. (ibid:21)

The government also attempted to negotiate with the landowners, but again presented the rebel group as being 'not one of us':

The national government's plans for the benefit of the Panguna landowners and the development of the giant Bougainville copper mine through a review of the current mining Act has finally been realised and accepted by the elderly landowners but their children at large are yet to be convinced....

"We had talks with the landowners and knowing the people I don't think they would jeopardize their opportunity after we have clarified our position to them. This must be the action of former disgruntled BCL workers who have taken it into their heads to capitalise on the situation. The landowners are innocent of this incident," said Mr. Tsamalili (Chairman of the North Solomons Peace and Good Order Committee) (ibid.).

Finally, it is acknowledged that the rebel landowners are justified to resist 'business as usual,' and that the government and the MTNC should be held to blame for the crisis because of their inattention to legitimate complaints by area residents:

The national government and Bougainville Copper Limited must be held responsible for the problems now occurring at the Panguna mine. This is

the view of some long-time Bougainville watchers. And the sentiments are shared by many Bougainvillians, including the landowners.

It has now become apparent that both the national government and the company had misjudged the sentiments of the people. The seeds of violence and sabotage were sown many years ago, and if BCL and Waigani (government) were more vigilant, and acted accordingly, what is now happening could have been averted especially if concessions were made to accommodate at least some wishes of the landowners in particular, and the whole Bougainville population generally.

In fact what is now happening can be traced back to the late 1960s when the initial mining agreements were drawn up. The Bougainvillians never really consented to what was going to happen, especially if one looks at the mine operation today which has resulted in the disruption of the whole pattern of their lifestyle.

The current problems can be attributed to several factors:

- With only about ten years before the resource is exhausted, the people are worried that they will be left with only an enormous hole in the ground;
- They are questioning whether they have been justly compensated;
- They are very concerned about the large numbers of non-Bougainvillians (squatters and workers) on their island who they say are causing problems; and
- They are also worried about the level of cash benefits to them and their provincial government, to maintain the same standards of services once the mine is shut. (ibid.)

Some of the above message seemed to have an impact, with the government and the MTNC both pledging to make additional investments to redress the issues raised by the landowners:

The Bougainville copper company BCL will spend K3 million to build community projects and infrastructure for landowners who disrupted mining operations recently, the Deputy Prime Minister Akoka Doi revealed this week....

Mr. Doi said he discovered through negotiations with landowners that the company and previous governments had overlooked their grievances in the last 16 years.

....more assistance [should be] provided by the company to the landowners through various community projects such as schools, health centres, connection of electricity and water supply...

For the first time, Panguna landowners representatives will be allowed to sit in on negotiations between the government, North Solomons Provincial

government and the mining company. (**The Times of Papua New Guinea**, 15 December 1988:2)

The landowners, having been neglected for years, presented the MTNC and the government an impossible demand: compensation totalling K10 billion. "Land-owners have given the company and the government this week as the deadline to meet their demand of K10 billion compensation for damages done to their land, food gardens, rivers and environment or face more trouble (**The Times of Papua New Guinea**, 12 January 1989).

The following week there was a series of incidents including the dynamiting of power pilons and the Arawa township's water treatment plant. The result was a government-imposed curfew which ultimately led to the introduction of considerable numbers of police and the national Defense Force to Bougainville (**The Times of Papua New Guinea**, 19 January 1989).

But the rebel leader, Francis Ona, was also given some positive attributes:

"The people see him as some kind of folk hero and champion of the Panguna landrights cause," said North Solomon's premier Joseph Kabui....

His former school mates at St. Joseph's Rigu say, "He's a very considerate person. Always helpful to teachers. Outspoken on things he believed were wrong."

In November 1988, Francis attended a meeting that addressed the preliminary finding of an environmental study carried out on the Jaba river.

Halfway through the meeting Francis walked out in disgust.

The study claimed that tailings from the mining operation running into the Jaba river had not affected the environment and the water was quite safe to drink... (**The Times of Papua New Guinea**, 26 January 1989).

Having seen the effects of the mine tailings on the Jaba river, it is small wonder that Ona "left in disgust." Significantly, this attempt to further mislead area

residents also contributed to a hardening of attitudes, and the prospect for a negotiated resolution became further distant. The former North Solomons premier and an ex-diplomat, Dr. Alexis Sarei said "I would have put a stop to the commotion when it started boiling, called a round table discussion immediately, and resolved the problem straight away before it got this far....the situation was almost beyond control" (**Times of Papua New Guinea**, 2 February 1989:1).

The government attempted some moderation with "[i]t is our desire to impress on and appeal to Francis Ona and his followers that no real progress can be made on issues of social justice if there is absence of direct communication. We hope that Francis Ona can respond in the interests of the landowners." But in the same statement, the government also indicated that there would be no amnesty for the rebels and that the curfew would remain in effect (**Times of Papua New Guinea**, 9 February 1989).

In the midst of the intensifying crisis, BCL announced a K108.6 million profit for 1988, even though the mine had been closed for 6 weeks during the year. The profit represented a 16 percent increase over 1987's profits. Also significant, total direct receipts (taxes and, as a shareholder, dividends) to the national government exceeded K150 million for the first time in the mine's history (**Times of Papua New Guinea**, 16 February 1989:8).

Ona indicated that he would "not surrender" and claimed that a "white mafia-type network operating within CRA" had links to the national government (**Times of Papua New Guinea**, 16 February 1989). The local police commander responded by

saying that "his men would go into the bush and 'flush them out'" (ibid.). However, it was clear that Ona was winning the public relations war because people mistrusted the government and BCL to represent their interests.

The "war" therefore in Panguna and the general "Nasioi Crisis" which has drawn much attention from everyone including foreign investors, is not just a war of words between the local landowners, BCL, and the national government. It is both an economic and a social war.

In a society where land is passed down through the females in a family line, the "Nasioi Crisis" must be addressed in that context. Women must be asked what is happening to their land.

Perpie Serero, a mother and wife, is the president of the Panguna Landowners Association. But she recently admitted in Arawa when the troubles started that the issue has now got out of control and was now in the hands of the menfolk.

She said the women have tried their best to persuade their men to "wait a little bit longer" before continuing pressure on the company (BCL) and the government, but "they (men) can no longer wait."

For so many years the company has dug our land and has left a huge hole in the middle of our village. It has taken out the minerals and sold them for millions of kina and has left us homeless like nomads.

"Our social values and our customary practices are now in disarray.

"Our rivers are polluted and no longer have the fish we used to have in abundance, our hunting grounds are deserted, our gardening sites are poor and no longer yield the food crops we used to have because of the damage to the environment, and our own black-skin race is losing its real identity fast because of the intermarriage and sometimes unwanted mixed-race children." (Times of Papua New Guinea, 23 February 1989:4).

In early March 1989, the conflict escalated following the damaging by rifle fire of a BCL helicopter. "...[P]olice retaliated by sending 13 vehicles filled with riot policemen...The lawmen reportedly ransacked 10 houses, burnt down one and stole property and cash worth about K1,800" (Times of Papua New Guinea, 9 March 1989:1). Interestingly, the North Solomons provincial government continued to support the national government during this period and stated that in the national

parliament "[t]here is too much struggling for power, petty politics and parochial interests. Leaders who are involved in these adverse and subversive activities only do so for their selfish and corrupt motives...We are being threatened and will continue to feel insecure under the Opposition leadership (ibid:5).

But the Bougainville crisis had already had a major impact on the nation:

Papua New Guinea is at present experiencing what may be considered a national crisis. And unless the government does something drastic, or comes up with an acceptable solution to stop the trend, the situation may further deteriorate to a stage where there will be a complete disintegration of civil order throughout the country.

What has begun as a purely economic, environmental and cultural issue in Bougainville has now developed into a situation reminiscent of the period prior to independence in 1975. Regionalism has again come to the fore and we are now experiencing everything bad that goes with it....

The economic realities of today, as evidenced by workers and Panguna landowners protesting to get what they believe to be rightfully theirs, is coupled with an increasing realisation by groups of their environment and society being polluted by outsiders, as is evidenced by tensions coupled with outbreaks of violence between different ethnic groups in Bougainville and Port Moresby.

The question that must be asked is what is going to happen if the Highlanders respond in kind? It has happened in the past and it could happen again.

The Bougainvilleans, once considered a peaceful people, have now turned violent because they feel they are not duly compensated for their resources and that their environment and society are being polluted by outsiders.

The same can be said of the Papuans in Port Moresby and Central province. They feel that they are now being pushed aside and their livelihood and society threatened by outsiders.

And in order to counter the increasing civil disorder, members of the already dissatisfied Police force are becoming more militant, as witnessed by the unlawful acts the lawmen committed against Bougainvilleans since troubles began there at the end of last year. (*Times of Papua New Guinea*, 23 March 1989:1)

The above quote followed a week of violence on Bougainville. Most of violence seemed based on ethnic conflicts between Papua New Guinea's many groups. On 16 March, a nurse was killed by a villager. On the 17th, five Highlanders were shot by a Bougainvillean, with two dying. On the 18th, laborers attacked Bougainvillean-owned businesses in one area. On the 19th, the laborers attacked other areas including the airport. On the 20th, Air Niugini halted flights into Bougainville, all business and government services stopped, and villagers burned 200 of the laborers' homes. On the 21st, villagers are caught by police with bombs heading for the laborers' housing area, two are killed and three wounded during the ensuing shootout. Finally, on 22 March, Defense Force soldiers are deployed on Bougainville. (ibid.)

However, there also seemed to be a positive impact of Bougainville on the thinking of the national government: "...from now on landowners and provincial governments will be given equal share of the national government's equity in any future mining project, on top of royalties, land compensation and whatever other benefits they are currently getting." (Times of Papua New Guinea, 6 April 1989:1). Unfortunately, Panguna landowners would not be able to benefit from the policy change because they were operating under legally binding agreements (ibid.). But BCL countered that it was ready to review the agreement in order to come to some resolution (Times of Papua New Guinea, 13 April 1989).

But the behavior of the police seemed in conflict with new policy initiatives as evidenced by a series of beatings given Bougainvilleans (ibid). And, it was clear that the escalating violence was diverting attention from the landowner issues which had

prompted closure of the mine (ibid). Columnist John Guise comments that the Bougainville unrest could "be seen as a civil war with national and international repercussions" (ibid). He continues and notes the growing "inequalities between peoples, between provinces" and states that there are "large gaps between the salaries of general workers and the elite foreigners and national leaders" and "that most business opportunities are granted to foreigners" (ibid).

Tensions increased with the burning of 22 houses at Anganai village by police angered over an attack of a policeman at Kobuan village (**Times of Papua New Guinea**, 20 April 1989). A number of islands politicians including the former North Solomons premier Leo Hannett spoke out against the rebel movement, and stated that "secessionist sentiments should be seen as treason" (ibid.). However, Hannett also noted that the national government had not responded to his proposals to increase landowners benefits and participation in the mine during his 1981-1984 tenure (ibid.). Anonymous sources asserted that the reason more Bougainvillean politicians did not speak out against the rebels was because they "feared for their lives, family and property" (ibid).

In this context, the intensity of verbal confrontations also increased as evidenced by statements by police such as "I'm going to get my rifle and spray you Bougainvillians with bullets" (ibid.). The government also entered the arena, with the Justice Minister Bernard Narokobi stating that "[w]e will call in another developer to take on the operations" after noting that the MTNC had "continued to ignore the landowners' basic social and economic needs" (ibid.).

Quite understandably, the MTNC, which had a multibillion dollar investment in place and was earning record profits, decided 1) to sign a new five year K200 million development package for Bougainville, of which it would pay 40 percent and the national government 60 percent, 2) to include in the new agreement the inclusion of revenues from the sale of gold and silver in its payments to the Bougainville landowners, which is significant because although the Bougainville mine is referred to as a 'copper mine' over half of the sales during the 1980s were from sales of gold produced at the mine, and 3) to cease payments owed to landowners until the crisis could be resolved (**Times of Papua New Guinea**, 27 April 1989). Beyond the apparent contradiction of actions between the first two points and the third, is the obvious issue that landowners were only receiving a portion of the revenues they should have been receiving because of the exclusion of gold and silver sales. It is small wonder that many people were confused with what was evolving and were distrustful of the MTNC.

Finally, a truce was proposed by Bougainvillean community leaders on 23 May so that rebels, government, and the MTNC could negotiate their differences (**Times of Papua New Guinea**, 25 May 1989:1). The Prime Minister, Rabbie Namaliu, declared the period 24 May-8 June a truce period, but the terms and conditions of the accord "were not spelt out" (**Times of Papua New Guinea**, 1 June 1989:1). The rebel leader, Francis Ona, wanted a withdrawal of police and military personnel but instead the military continued helicopter patrols and aircraft surveillance (*ibid.*). Ona responded to the truce initiative by declining to participate (**Times of**

Papua New Guinea, 8 June 1989:1). The Prime Minister then gave orders for 2000 soldiers and 600 police to be deployed with the aid of Australian-provided helicopters to "flush out Ona and his supporters" (ibid.). The government's action also resulted in the evacuation of 1,000 Highlanders from Bougainville (ibid.), and the withdrawal of public servants (**Times of Papua New Guinea, 22 June 1989:3**).

The fact that government was not successful led to a proposal by a member of parliament for the MTNC to give a 10 percent equity in BCL to the landowners at no cost, provided Ona accepted "a 14 year jail sentence, for the taking of lives and destruction of property during the 8 month Bougainville crisis" (**Times of Papua New Guinea, 15 June 1989:3**). Simbu premier, David Mai, was also frustrated with government's performance, stating that the "Bougainville crisis will go down in history as the first example of gross mismanagement of the nation's affairs since independence (in 1975)" (ibid.). In response, the government declared a 'state of emergency' on 26 June.

In 1994, there is still no happy ending: the mine remains closed, there is still a large presence of soldiers on Bougainville, and the lives of landowners have deteriorated in the context of war. Since 1989, two national governments have fallen--with the governments' lack of success in handling the crisis contributing to their defeat, the health of Bougainvilleans was seriously affected by the absence of medical supplies and doctors in a malaria-prevalent environment, and the crisis became international with the involvement of Amnesty International (which criticized government's handling of prisoners and the population) and other regional govern-

ments including the neighboring and culturally-linked to Bougainville Solomon Islands, the major aid-donor and home of the MTNC Australia, and other island nations (Fiji, Tonga, Vanuatu) which sought a "Pacific" resolution to the crisis. The mine may reopen but it will cost hundreds of millions to repair and replace the damaged facilities. However, the fact remains that the issues which brought about the crisis have still not been settled.

Conclusion: Winners and Losers

The mismanagement of the Bougainville crisis resulted in a major loss of fiscal revenues and employment for Papua New Guinea, a large drop in profits and share prices for the MTNC, and the loss of their health, lifestyle and culture for the landowners. The government has survived and is now buoyant with new revenues from other mines and petroleum fields. The MTNC has made other investments and continues to operate as an industry leader. The landowners have obviously not been as fortunate. Two questions arise: why did the crisis happen? and, how could the crisis have been avoided? The second question will be addressed in the next chapter.

In order to answer the first question, attention must again be given to understanding the dynamics of the interactions and relationships established between MTNCs, governments in the periphery, and finally, local area residents and landowners who seem to be readying to fall off the edge of the periphery. The objectives of developing a mine for the MTNC and government have been clearly articulated and are largely transparent. The working relationship between the MTNC and the government may not have been based on an equal footing, but there is recognition

that both need each other and have common interests in ensuring a successful venture. Decision making by the respective parties is based on promoting these shared interests, even though there may be disagreements and confrontation over some issues. However, decision making is by the MTNC and the government. Seldom, if ever, are local area residents asked to participate in discussions on financing and development strategies. Seldom, if ever, are local area residents asked to be partners in developing a mine. Instead, local area residents are given the opportunity to gain benefits from the mine as an afterthought. While some may argue that this was the intended outcome (and may well have been the case in a number of instances), others may argue that it is characteristic of an industry which is global in scale and perceives resources as being exploitable and accepts that there will be some damage as a by-product.

The handling of the Bougainville crisis during its first few months is an example of these dynamics and relationships. The environmental damage and dislocation of local communities may be acceptable costs to the MTNC and the distant national government but these perspectives do not change the inequitable relationships and distribution of benefits. Not only are local area residents expected to receive fewer benefits from a mine's development, they are also expected to bear the majority of the costs.

TNCs have established themselves as the most successful components of the global capitalist system, and MTNCs in particular have shown that they can operate with regimes of every political and ideological persuasion. TNCs have demonstrated

that they can benefit from "boom-crash" periods (R.M. Pyle, *Wintergreen*, Charles Scribner and Sons, New York, 1986:301), even when the structure and composition of communities are permanently and negatively altered. The record of MTNCs is that there have been clear "winners and losers," and the "losers" have generally not included the global capitalist system nor the MTNCs.

Given this analysis it is somewhat surprising that local communities continue to accept mining projects. However, given the shared objectives of the government and the MTNC, it becomes apparent that local communities do not receive sufficient nor realistic information on the types and scale of impacts which they will have to endure. Instead, the government and the MTNC push to develop a mine at the lowest cost, in order to obtain more profits and taxes. The local communities are promised considerable new wealth and opportunities, which, unfortunately, seem either not to materialize or to be far less than anticipated. Thus, the MTNC is focused on increasing profits, the government is focused on increasing revenue flows from taxes, and the local communities are going in the opposite direction--receiving fewer benefits and confronted with higher costs. In other words, local communities are not able to acquire sufficient economic surpluses for reinvestment.

Chapter 7

CONCLUSIONS AND OPTIONS

Introduction

This chapter attempts to tie together the preceding discussions on theory and practice with the purpose of drawing conclusions from the analysis. There is a range of weaknesses inherent to any analysis, including weak data, superficial analytical techniques, and lack of dynamic time functions, many of which have been previously noted. However, analytical weaknesses should not be used to detract from a more important issue: what should be apparent is that there is a continuing gulf between theory and practice which could by definition be unbridgeable. However, it is still necessary to attempt to utilize these two perspectives for the purpose of providing direction, or in this case policy recommendations.

The chapter begins with a discussion on the evolution of the global political economy and the role of TNCs in this transition. The second section discusses issues related to the theoretical framework utilized in the preceding analysis. The third section attempts to provide alternatives to the examples used in the first section and based on the theoretical framework presented in the second section. The conclusion offers a final comment on the broader context of the dissertation.

Context: The Changing Global Political Economy

This section discusses changes in the global political economy. Specifically, the section addresses the evolution of the global capitalist system, the role of

transnational corporations (TNCs) in that evolution, and uses the gold mining industry as a vehicle to assess the role of TNCs. The section attempts to provide applied examples of global systems theory and the role of TNCs which are discussed in the following section.

Recent years have witnessed major changes in the global political economy, including a virtual disappearance of the communist bloc, recessions affecting all of the leading industrial nations, and the further transformation of transnational corporations (TNCs). TNCs have added to their ability to view the global economy as a single market by also becoming able to utilize the comparative advantages of various countries as sites for different production processes, and then selling a final product which is based on the assembly of components produced from around the world. Although many countries continue to recognize the costs of dealing with the seeming omnipotence of the TNCs, the quest to attract capital and jobs in an increasingly integrated global economy has left the TNCs with apparently only themselves as serious threats to their existence. For example, GATT and NAFTA will probably increase the role of TNCs because of their ability to acquire and manage global resources, even if these trade agreements also lead to the creation of more small and medium-sized local companies (*The Economist*, 10 December 1994:23-24). Many would argue that this result is a 'win-win' situation, with the TNCs and local companies both benefitting. However, the 'winners' will be found only among those able to supply goods and services at a globally competitive cost. The 'losers' will be found among those living in 'uneconomic' areas, working in 'uneconomic' industries,

or using 'uneconomic' technologies.

Mining, including gold mining, has long been dominated by TNCs. The scale of operations and the requisite technology and expertise combine to produce large investment requirements which only major mining companies operating in concert with large TNC banks, have been able to manage. Although some medium-scale mining operations have evolved, their combined contribution to a nation's GDP or to global minerals production is generally not that large. In many nations, small-scale mining based on pan and shovel workers, makes a major contribution to the local economy in terms of employment creation. However, evidence suggests that the pan and shovel miners do not necessarily provide sufficient economic benefits to offset their costs with respect to 1) the environment through deforestation and the use of toxic materials such as mercury; and, 2) their practice of exploiting high concentrations of gold and leaving aside or burying lower grade concentrations which could have otherwise been economically mined if combined with the higher grade concentrations.

During the 1990s, gold is forecast to be a metal for which there is increasing demand, while its supply from mining operations may remain relatively flat. The major source of the growth in demand is from the jewellery industry, especially in Asian markets. Recycling of jewellery is also one of the major sources of supply of gold. However, the total global supply from mines may remain flat because production in Russia and in other former Soviet republics, is expected to decline because a number of operations are uneconomic and/or are suffering the effects of

little additional capital investment over recent years. The world's largest gold producer, South Africa, is afflicted by similar problems. In addition, wages for black workers, by far the largest ethnic group working in the mines, have risen quickly with the dismantling of apartheid. These factors have combined to make South Africa one of the highest cost gold producers in the world, whereas at the beginning of the 1970s, it was one of the lowest cost producers. The 1980s saw growth in mine production primarily in the United States, Canada, Australia, and Brazil. However, other nations also became important gold producers, including Papua New Guinea, the Philippines, Indonesia, and China. The trend for increased production from developing nations is expected to continue throughout the 1990s.

Mining TNCs (MTNCs) have developed and utilized new technologies during the last decade which enable the exploitation of gold resources in traditionally ignored or neglected regions. Satellite mapping and geochemical testing are examples of the new technologies and techniques which have greatly facilitated the exploration of regions which were previously unknown with respect to their minerals resources. Heap leaching technologies and the recognition that epithermal deposits contained valuable minerals have led to the development of gold mines throughout the world but especially in the Asia-Pacific region.

The development of a mine occurs through a series or progression of 'milestones,' with each new mark resulting in the emergence of an increasing complexity of issues for decision. In the case of developing nations, multilateral agencies and bilateral aid donors of major mineral producing nations, often provide

resources to map and determine geologic resources. Occasionally MTNCs proceed directly to the next stage of identifying and defining a mineral deposit. However, and as is common in the case of gold, a small exploration company will sell shares for capital on the highly speculative "penny stock" markets in, for example, Vancouver or Sydney, with the capital being used to finance exploration in the field including the identification and preliminary definition of specific ore deposits. Once a deposit has been identified, an MTNC is likely to enter the picture and will provide the capital and expertise to more fully define the economics of the deposit. The small exploration company becomes a junior member of the new mining company. If the economics of the deposit are sufficient, then a mine is developed following a series of negotiations with government and often with neighboring residents.

With apparently few exceptions, negotiations between the MTNC and the government, between the MTNC and local area residents, and between the government and local area residents usually provide the MTNC and the government with the desired results. The MTNC seeks a mining agreement which allows early depreciation, tax credits for infrastructure investments, a non-discriminatory tax structure, and repatriation of profits. The government seeks an additional revenue source, job creation, and increased export earnings. Although the presence of MTNCs once yielded considerable public debate, current disagreements between these two parties usually reflect conflict based on the issue of how much (e.g., different tax rates) rather than on the subject matter (e.g., whether or not there should be taxes). When both sides agree that 1) the concept of taxes is acceptable and 2) that the

concept of 'punitive' taxes is unacceptable, then it becomes a relatively straightforward exercise to negotiate an agreement.

By contrast, disagreements between the MTNC and local area residents can include irresolvable conflicts over subject matter, including whether or not a mine should be built. It should be clear from this depiction that the government has more in common with the MTNC, and thus it pursues options which enable it to meet its goals and objectives. Although local area residents may look to their government to represent them in their negotiations with the MTNC, the government places its priorities first; and, in certain nations (e.g., the United States, Fiji), the government will not represent local area residents.

The negotiations over the mining agreement are significant because aside from determining whether or not a mine will be developed, they also determine how costs and benefits are distributed. As discussed in Chapter 6, local area residents tend to accrue more of the costs while the MTNC and government acquire more of the benefits from the development of a mine. Recent attempts (e.g., Ok Tedi in Papua New Guinea) to increase the flow of benefits to local area residents through equity participation have not been convincingly successful. One explanation for this weak performance is that local area residents continue to be excluded from the decision making process. As a result, their benefits are determined for them by the MTNC and government. This *fait accompli* yields predictable results: project design decisions are undertaken without the benefit of local knowledge leading to, for example, destruction of important habitats by siltation and alteration of stream flows

caused by improperly sited and/or inadequately constructed mine waste disposal systems. In simple terms, the MTNC and government give more credence to a theoretical stream sedimentation model than to the recollections of elders about a flood which occurred 50 years ago. There are usually very sound environmental reasons why subsistence cultures developed certain areas for specific uses, and the MTNC and the government are too often both ignorant of these reasons and to hurried to incorporate this knowledge base into their project design decisions even if it is made available.

Once a mine has been developed, there are few options for change, aside from closing the mine. The MTNC focuses on satisfying the expectations of its shareholders through the distribution of profits. The government collects and spends its revenue. Local area residents have their lives dramatically altered and their environment polluted.

In sum, as global integration has increased, the role of TNCs has also increased. It is interesting to note that the commercial loan agreement for the Ok Tedi gold-copper mine was roughly 1600 pages in length, and based on the involvement (and signatures) of several of the world's largest mineral resource exploiting TNCs, several of the world's largest banking TNCs, multilateral lending agencies (e.g., the World Bank), multilateral aid agencies (e.g., UNDP and UNCTC), and the former colonial power which also happened to be the host nation for the head mining TNC. Within this context, it seems relatively easy to understand why the role of TNCs has increased: they write the rules, make the agreements, and are able to

get governments and multilateral agencies to perform a range of tasks for them. Governments of industrialized nations assist because it is in their interests to see TNCs operating in their nation succeed. Governments of developing nations assist because they are attempting to gain the benefits of development.

But the benefits also bring costs and increased vulnerabilities. Increased export earnings can lead to currency appreciations which can damage exports from other less capital-intensive industries such as agriculture. Metals price fluctuations can result in periods of large deficits when revenue derived from mining falls. Government expenditures jump quickly when mines begin to contribute their revenue, thereby fuelling inflation. The developing nation, the periphery, assumes a high risk if it pursues MTNC-led development. Thus, the periphery is further marginalized. As noted above, the areas where mines are developed, or the periphery of the periphery, are even further marginalized. Throughout this process and throughout the 'boom-bust' cycles of capitalism, the TNC adapts to and thrives in a changing global system.

Theoretical Framework and Mine Avoidance

This section attempts to discuss the theoretical basis of the dissertation. As discussed in earlier chapters, Wallerstein's global systems theory provides the overall framework for the analysis. In addition, a broad selection of sources on transnational corporations and especially those involved in mineral resources, are utilized to provide both focus as well as examples on the interactions of TNCs, governments, and individuals. While this section summarizes the key theoretical issues within this

framework, it also provides a vehicle to shift from the academic to applied arenas. Specifically, the theories utilized in the analysis provide the justification for the conclusion that mines should be resisted by local populations under current development scenarios. However, the weakness of theory is that realistic alternatives have not been provided.

Theories of development have provided only limited successful policy guidance over the last several decades. Where attempts were made to transform theory into policy, the results were unsuccessful. Tanzania under Nyrere and Jamaica under Manley attempted to utilize Andre Gunder Frank's dependency theory as a basis for establishing self-reliance policies and programs. Neither was successful. Raul Prebisch had earlier advocated self-reliance as the cornerstone for Latin American development without demonstrating successful application of the theory. Although arguing from an opposite political perspective, Rostow's 'conditions' for economic growth also proved inadequate as a policy guide.

However, theories of development have also been criticized for their weaknesses as theories. For example, in 1971 Laclau criticized dependency theory for its focus on exchange relations rather than on the relations of production, and argued that Frank's assertion that capitalism is based on the accumulation of profits ignored the role of labor. Warren and Kay also criticized dependency theory by arguing that capitalism had successfully fostered the transition of developing nations into industrial states, and that the reason that there was underdevelopment in the periphery was because the capitalists had not sufficiently exploited these areas. But

these marxists were also criticized for their focus on the role of labor and the evolutionary modes of production.

Wallerstein utilized both Frank's dependency theory and its numerous critiques to develop his global systems theory. While still lacking adequate discussion of class and modes of production, the theory argues that capitalism is a global system, within which development and life are internal factors. Based on 1) the preceding chapters' analysis of TNCs and, in particular, MTNCs and the gold mining industry, 2) the ascendancy of capitalism over the last decade, and 3) the increasing integration of the global political economy, it would seem that Wallerstein's assertion that capitalism is a global system is valid, and that the relationships between the center and the periphery which he describes, are also valid.

However, there remain several weaknesses to Wallerstein's theory. As noted, he does not adequately address class issues and modes of production. This is especially important in analyzing the effects of global capitalism on developing nations because one of the key results is the evolution of bureaucratic bourgeoisies and local elites who are more closely linked through education and personal behavior (e.g., consumption) to the staff of TNCs than to their fellow citizens living subsistence lifestyles in the periphery of the periphery (Barnet and Cavanagh:22). Also as noted above, the bureaucratic bourgeoisies and local elites are primary agents of TNCs, and greatly facilitate the spread of global capitalism.

Wallerstein, among many others, recognizes that with the breakup of the centrally planned economies of the former Soviet bloc, global capitalism has entered a

transition phase which could provide the promise of a new and more egalitarian global system, but he also states that global capitalism could transform into something "far worse" and more inequitable than the present system (Wallerstein, 1988:597). Amin (1994:341) asserts that a more inequitable system is emerging with his comment that the new hierarchy is "more unequal than ever before, subordinating the industries of the peripheries, reducing them to subcontracting." Corroborating this view is Palat, who offers "...any state unwilling--or unable, as is the case over large swathes of sub-Saharan Africa, for instance--to provide conditions conducive to the transnational expansion of capital faces marginalization..." (1994:32). Vaitos argues that "the emerging system is effectively a dual structure of world economics that largely match the interests of the technology leaders" (1989:182).

These pessimistic perspectives on the current and emerging global systems offer little optimism to policymakers and planners attempting to promote national "development." The "ceaseless accumulation of capital," which Wallerstein states is the "driving force of the global capitalist system" (1990:288), has seemingly triumphed over the marxist-socialist system. As a result, Wallerstein argues that there is a need to conduct "research on the historical choices that are before us in the future (ibid.:291). But this research void remains to be filled.

Thus, one is left very much wondering how the periphery of the periphery can develop beyond the limited numbers of individuals who are able to acquire higher education and access health services provided either because of the 'profit' or 'value' objectives of national elites or because of capitalism's, in the words of Adam Smith,

'invisible hand.' For those involved in the process, the discourse would seem remote and academic; yet, there remains the issue of how a global system can include outsiders. This becomes important because, in the examples given in previous chapters, of the costs of capitalism to local area residents. However, it would seem that some individuals and groups (e.g., the Bougainville situation) have been willing to accept major personal economic losses by forcing a mine to close, and thereby reject capitalism.

TNC theorists have provided considerable insight on the objectives, operations, and impacts of global capital. TNCs are viewed as the embodiment of the global capitalist system. However, we are now observing an evolution which suggests that TNCs are becoming not only more powerful than the leading industrialized nations, but also the architects and managers of the global capitalist system. The recent examples of GATT and NAFTA as well as the liberalization of, say, India's trade and investment regulations (which opened the doors for dozens of previously excluded industries and TNCs such as auto manufacturing and soft drinks), were promoted both by TNCs and their agents, the governments of the industrialized nations and the multilateral financial agencies. TNC theorists may have argued that under global capitalism, wealth and power would be concentrated in the hands of the few and in particular, TNCs. However, it would seem that the possibility now exists that instead of witnessing an evolution of global capitalism which could be considered almost as a 'natural progression,' we may be now watching a process which is being controlled by specific TNCs and/or groupings of TNCs and/or individuals. If this argument is

correct, then the evolution of global capitalism could become or be reduced to a very personal level, where these individuals could make choices to promote a more egalitarian (or, a more inegalitarian) society (Wallerstein, 1988:597; Barnett and Cavanagh, 1994:429-430).

Implicit to this argument is the concept of individual freedom or liberty, which has been one of the philosophical bases for capitalism. Individual liberty suggests personal choices, including those which could lead to the rejection of some or all of capitalistic theory, practice and dogma. Is it at this level that global capitalism sows the seeds of its own destruction because of dissatisfaction with its impacts such as was the case on Bougainville? Or, will there be further adaptations by the global capitalist system? To some degree, we are already experiencing the evolution of global capitalism into a very flexible and adaptive system. The forms of capitalism operating in Singapore, New York City, Taiwan, China's special economic zones, Moscow, Warsaw, and Rome are all very different. Profit may be the motive but it is clear that as practiced in these different countries, global capitalism has moved beyond the Western intellectual tradition.

Combined, these somewhat disconnected arguments raise the question of where theory can and should go. The global capitalist system exists but its theorists have, as noted, not adequately addressed class formation and class movement. Unfortunately, this neglects the growing numbers of individuals and regions which have been dislocated by movements of global capital and the periodic 'boom-bust' cycles which seem inherent to capitalism. The dislocated have experienced more than just being

marginalized by the global capitalist system, which recalls the stories of 'sweat shops,' child labor, and the semi-feudalism of the 19th century. Thus, is capitalism evolving into a very cruel and graphic form of social Darwinism? The new wave of successors to the Reagan-Thatcher legacy seem to be validating this argument. Wallerstein and others are trying to provide a more comprehensive explanation of what is going on and what the future might be, but clearly there need to be alternatives to the Reagan-Thatcher positions, which form the basis of the Republican Party's current pronouncements.

Mixing theory with reality often results in an ambiguous articulation of personal experience and goals. What the theories on the global capitalist system and TNCs have demonstrated leads to the conclusion that an MTNC developed mine will result in benefits to those groups which are able to gain employment and income but at very large costs to those groups which have their lifestyles, including their production systems, significantly altered. The examples corroborate the theories. However, we are also left with the reality of a mine's development and what these marginalized groups should advocate. It would seem that under current scenarios, and in combination with the examples and theories cited, local area residents should resist a mine's development because they are forced to bear too many of the costs for too few benefits. But is this a realistic response by marginalized groups? Alternatives are still needed.

Options for Development

This section utilizes as a starting point, the dissertation's contention that while

the presence of an MTNC offers many benefits to the government of a developing nation, the presence of a mine has negative consequences for residents of the mine area. The following discussion focuses on what steps can be taken by a government to ensure that local area residents are able to increase their benefits and reduce the negative impacts of a mine. The rationale for this focus is based on the premise that although a mine will result in more costs to local area residents under current development scenarios, it is likely that a mine would still be built because of the combined strength of the MTNC and the government plus the aspirations of residents to provide their families with more services and opportunities than they had previously enjoyed. Moreover, local area residents are generally unaware of the scale of mining and the magnitude of its impacts; thus, optimism about the mine's impacts tends to be an initial reaction. Therefore, the discussion attempts to establish a framework which could be utilized as an alternative to current development scenarios which have resulted in the pollution and dislocation noted above.

The development of a mine by a MTNC brings infrastructure and social services to an area which might otherwise not have access to these facilities. The mine also brings employment and monetization. However, it also leads to pollution and political and cultural dislocation for area residents. The record of MTNC mines has been consistent with respect to these costs and benefits, although the quantity or severity of these impacts will vary between mines. Only in recent years have there been concerted attempts to reduce these costs, and based on the preceding discussion, it should be somewhat obvious that problems remain. Several key issues which

require definition and resolution are discussed below, and include the environment, compensation, equity participation, future investments, and the evolution of a viable local political economy.

As noted in previous chapters, environmental damage is one of mining's major, and often lasting, impacts. There are no current technologies or techniques which can alter the basic fact that mining is a 'dirty' or a polluting industry. However, as discussed in sections relating to the project development cycle (Chapter 5) and on 'capital logic' (Chapter 6), the MTNC and the government do not address environmental issues until planning and design decisions have progressed to the point where detailed economic assessments of the mine's commercial viability have been completed. In other words, environmental issues are secondary to the investment decision. The result is that there is insufficient data on local conditions. Thus, the planning and design decisions are not going to fully reflect the range of possible impacts but instead will be based on very preliminary assessments. The consequences to the environment have already been noted. As a policy response or action, the government must insist not only on an environmental impact statement (EIS) but that data (Chapter 6 outlined the issues for which data is required) for the EIS begin to be collected at least by the time the first core samples (drilling) are taken. Based on available data, this recommendation is not required. In addition, there is the continuing need to upgrade the EIS and its review by government. However, what does alter the current development scenario is the establishment of longer-term and broader environmental baseline data, which can then be incorporated into planning

and design decisions.

A second key issue is compensation to local area residents for the loss of their property. The current development scenario includes compensation but at rates which have been insufficient to offset costs. Inherent to establishing a viable compensation system is the need for the MTNC and the government to increase their knowledge of local production and decision-making systems. This requires baseline data at a relatively early stage of the mine's evolution. It would seem that the recommendation proposed regarding environmental baseline data could also be applied here because some of the information collected during an assessment of local production systems could be directly applicable to the EIS. In addition, there should be an attempt at a similarly early stage to establish a mechanism to arbitrate compensation claims and grievances, which would include representatives from the local community, the MTNC, and the government.

The third issue, equity participation provided by the MTNC to local area residents, is currently practiced in a number of countries. In some respects, equity participation in the mining company is a form of compensation. However, it is also far more than giving shares as a form of compensation or 'goodwill,' and the provision of stock purchase options. Important here is the opportunity for local area residents to become active participants in the development and ownership of the mine. In the case of Bougainville, the local area landowners insisted on a stake in the mine and the company rejected the concept until after there had been conflict. Mines which were developed after Bougainville have provided increased opportunities for

residents to become shareholders. However, in Papua New Guinea, it is only with the most recent minerals development, the Kutubu oil fields, that landowners have been given the opportunity to purchase up to a 10 percent equity position. But more important than the actual level of equity is the fact that Chevron, the manager of the oil project, has established its landowner affairs division as the largest single operating unit in the company. Employees in this division have been provided with the resources which have enabled them to work closely with local landowners from early in the project development cycle. They have focused not only on collecting data but also providing information on how the development would occur and what landowners needed to do in order to increase their opportunities from the project. Mining companies have not yet applied this experience, and the current scenario is to treat local area residents as afterthought. Governments need to ensure that MTNCs utilize the Chevron-Kutubu model.

The fourth issue concerns future investment options for local area residents. The current development scenario is that opportunities are provided for investment in the mining company. Structures and mechanisms to assist with longer-term financial planning are nonexistent unless local area residents secure their own advisors. While, for example, Merrill Lynch may be global, they would not have penetrated the periphery of the periphery. Local area residents need to have access to the best advice if they are going to be able to optimize the investment options derived from their mining-related income. In other words, the periphery of the periphery needs to be able to diversify income sources including low and high risk investments. One

might ask whether this is important. In Chapter 3, it was noted that the ability to wisely invest minerals generated income was the core issue in assessing whether nations benefit or lose as a result of mining. Also noted was the fact that most of the evidence indicates that minerals-led developing nations had not successfully applied minerals generated income. If this argument is correct, then it would seem that it should also extend to the periphery of the periphery. If mechanisms are not established to ensure the longer term view and avoid 'bonanza' behavior, then when the mine closes there will be nothing left. If an MTNC adopts the Chevron-Kutubu model, then it should be able to include provisions to assist local area residents prepare for their future. To do otherwise is to condemn the local area residents to the current scenario where the costs of a mine's development outweigh the benefits.

The final issue, the evolution of a viable local political economy, implies a level of vitality and opportunity which are the basis of global capitalism. However, it must again be stressed that the option of not developing a mine is not considered realistic under most current scenarios. Thus, if we are left with only the option of the global capitalist system, then developing opportunities to optimize participation seems the logical direction. Under the current development scenario, local area residents are provided with insufficient compensation, equity, and opportunities to develop and invest in other options--whether stock markets or local schools or health services. The above recommended policies are to increase the available resources in order to reverse this situation. Thus, ideally we would find local communities with a level of wealth and expertise enabling the establishment or empowerment of a local decision

making system which could successfully represent community concerns at a national level. This may sound extremely naive but it would seem possible that if local communities have sufficient wealth and expertise then they could successfully counter the current development scenario which is to dismiss them. The recommended policy is basic: the government must listen to local communities--which, as the Bougainville case demonstrates, is not its usual practice.

If implemented, the above recommended policies will not guarantee that local area residents will still not have to bear the burden of the costs of mining. However, they provide a framework to combat current inequities. The recommendations are essentially straight-forward and often relatively simple; however, the complexity could increase over time. What needs to be appreciated is that the recommended policies imply an altered relationship between the MTNC, the government, and local communities. Instead of the local communities considered only as an afterthought, they can become more active participants. In addition, the recommended policies respond to the very basic issue that development theory is a 'young' field of study and the assessment of project impacts is much more recent with the U.S. Environmental Protection Act of 1973 its watershed. The progression in Papua New Guinea from Bougainville to Ok Tedi to Misima and Porgera and finally to Kutubu shows failure and promise. The failures and successes were generally caused by the very simple actions described as policy recommendations. This suggests that even in the face of a global capitalist system, there are measures which the periphery of the periphery can utilize to acquire more benefits. But it should also be restated that Papua New

Guinea has reversed its policy course, and has now become a member of the club of nations receiving structural adjustment "assistance" from the multilateral agencies, which is a sign of both a weakened economy as well as weakened resolve, and its future appears less promising than at independence in 1975.

Conclusion: The Future of the Global Capitalist System

The dissertation has attempted to demonstrate that global systems theory aided by theories on TNCs, accurately describes the current gold mining industry. The dissertation has also attempted to straddle both the arenas of theory and practice. In addition, the conclusions of the analysis include that under the current development scenario, local area residents should reject mining because of the disproportionate costs they bear. However, it has been suggested that a rejection of mining is unrealistic. Thus, a series of recommendations have been offered as steps to reduce negative impacts and increase benefits to local communities affected by mining. The dissertation also outlined certain weaknesses in global systems theory which need to be addressed.

However, there remains a challenging aspect implicit to the discussion: the pervasiveness and strength of the global capitalist system suggest tremendous invulnerability which is contradicted by the severe dislocation now being experienced by an increasing number of marginalized regions, industries, and individuals. Do the policy recommendations suggest mechanisms to facilitate a further and more responsive adaption of global capitalism, or are they mechanisms which can be used to destabilize the system?

As argued above, the global capitalist system is leading to the increasing concentration of wealth and power in the hands of the few. With wealth and power held by limited numbers of people, names and faces can be attached and behavior becomes more personalized: through their executives, the leading transnational corporations have the opportunity to provide leadership and options for local communities. If the TNCs only concentrate on profits and shareholders, then the system described in the analysis cannot survive. The periphery of the periphery has successfully challenged the global system on occasion. With dislocations increasing, the incidence of challenges and successful ones will also increase.

As Barnett and Cavanagh conclude:

More and more people who are bypassed by the new world order are crafting their own strategies for survival and development, and in the process are spinning their own transnational webs to embrace and connect people across the world. On dreams of a global civilization that respects human diversity and values people one by one, a global civil society is beginning to take shape--mostly off camera. It is the only force we see that can break the global gridlock. The great question of our age is whether people, acting with the spirit, energy and urgency our collective crisis requires, can develop a democratic global consciousness rooted in authentic local communities. (p. 429-430)

While Barnett and Cavanagh offer some hope, the evidence presented in the preceding chapters suggests that we will remain quite distant from a "democratic global consciousness" for many years. In the interim, the process of globalization will accelerate and the wealth and power of TNCs will continue to increase.

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