Sustainable Development and the Future of Mineral Investment

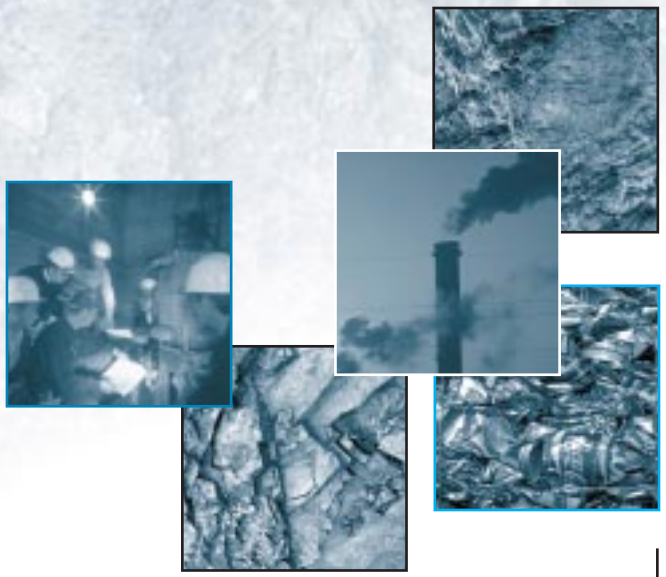
Edited by: ***James M. Otto*** *and* ***John Cordes***

A Collaborative Effort :

Institute for Global Resources Policy and Management, Colorado School of Mines

Metal Mining Agency of Japan

United Nations Environment Programme



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FOREWORD

While sustainable development is a term that is frequently used, its juxtaposition with minerals and metals is frequently viewed as a contradiction. This means that, to date, very little has been written on the sustainable development of minerals and metals. This book is an attempt to foster a discussion on this important topic. Through the eyes of several authors, this book explores and analyzes how sustainable development can be related to mineral enterprises.

As UNEP's mission is to provide leadership and encourage partnerships in caring for the environment by inspiring, informing and enabling nations and peoples to improve their quality of life without compromising that of future generations, we are pleased to collaborate with the Institute for Global Resources Policy and Management, Colorado School of Mines and the Metal Mining Agency of Japan in the production of this book. UNEP's Division of Technology, Industry and Economics (DTIE) is helping decision-makers in government, local authorities, and industry develop and adopt policies and practices that: are cleaner and safer; make efficient use of natural resources; ensure adequate management of chemicals; incorporate environmental costs; and reduce pollution and risks for humans and the environment. As minerals and metals products are significant contributors to society, we need to understand better the components of sustainable development so as to understand the future of mineral investment. Many countries need environmentally sensitive, socially responsible mineral development to provide the economic base for their other aspirations including poverty alleviation.

UNEP is pleased to collaborate in producing this publication. I trust that all readers will find it thought provoking and valuable in understanding sustainable mineral development.

Jacqueline Aloisi de Larderel
Director, DTIE

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Preface

The concept for this book originated during a meeting in Tokyo between senior officers of the Metal Mining Agency of Japan and Professor James Otto of the Colorado School of Mines. It was perceived that although there exist many books exploring the concept of sustainable development, none were available that considered the unique nature of minerals and other non-renewable natural resources. It was decided that such a volume would serve a useful purpose in exploring and analyzing how the concept of sustainable development can be related to mineral enterprises.

To assist in planning the volume a panel composed of multi-disciplinary experts in the fields of sustainable development, environment and mining met and outlined the types of topics that might be included in the study. This very knowledgeable group, composed of geologists, planners, mining engineers, social activists, lawyers and economists debated the preferred content for two days before arriving at the framework reflected in the table of contents.

The editors then recruited authors to write on each subject heading. Most of the authors teach and undertake research at the Colorado School of Mines, others were drawn internationally. Research for the volume took approximately six months to complete.

This volume is intended to reach a wide audience, and thus the content has been purposefully been maintained at mainly a non-technical level understandable by readers who are not expert in the specific subject matter. The subject matter addressed is diverse and is intended to act as an introduction, not as a comprehensive and complete treatment. We hope that the reader will find it enlightening, thought provoking, and most importantly, useful in understanding how the principles of sustainable development can be extended to mineral enterprises.

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Introduction

John A. Cordes

The related notions of sustainable development and sustainability have gained an international currency among social scientists, humanists and policy makers over the past decade. Its attractiveness is not difficult to understand. It is a positive notion in a world so full of negative information. No one supports unsustainable development. It touches a deep moral sense and yearning for a dignity and decency that seems far removed from the indignity, injustice, inequality and suffering so much in evidence around the world. It is also convenient in its ambiguity. It can be made to mean almost anything or almost nothing and thus can be interpreted to support a vast array of arguments, strategies and decisions. At the same time it has already contributed to a better world. It has elevated a variety of social-environmental issues to the forefront of academic, political and corporate attention. It has resulted in positive decisional and methodological trends that portend future improvements to the human predicament. At a rhetorical level the issue has been joined.

However because we do not know what it really means we have not established the basic consensus needed to convert it into a driving force for change. The architects of the idea provided only a broad vision of the goal, its rationale and some particulars on what needs to be changed. They did not provide a blueprint of proposed operational solutions. Nor should we have expected them to.

Any reading of the core documents will support at least four conclusions. First, the prevailing pattern of economic and political decisions is unsustainable in terms of social justice and environmental quality for current and future generations of the human species. Second, the pathway towards a sustainable future requires continued economic growth and technological advance. This growth and advance however must be restructured in ways that are more environmentally sensitive and distributionally fair. Third, since many of the required adjustments exceed the boundaries and discipline of traditional market forces, this restructuring will depend extensively upon political guidance and will. Finally, sustainable development requires fundamental changes in attitudes and the values that inform political and economic decisions. Thus sustainable development requires a reassessment of contemporary economic/technological rationality, political rationality and ethical rationality. As important it requires the motivation to undertake the reassessment and translate its results into operational or decisional content.

The core of these four conclusions reduces to needed changes in attitudes and values—these are ultimately what make current trends unsustainable. In this light it has been stated that sustainable development is an ethical position packaged for political purposes. More comprehensively it is neither an economic nor an ecological concept, not even a scientific concept, but an ethical demand. Unfortunately as an ethical position or demand it does not come to us with instructions for moral motivation. Each of us must decide what kind of individuals and society we want to be. This is the ultimate source of ethical motivation and the ultimate sanction behind our political and economic institutions for social ordering. Thus, while it is appropriate, and intellectually safe, to argue that sustainable development is about *what is to be sustained and why?* and *who*

should make the decisions and how?, Hans Jonas identified the central question even before the Brundtland report was drafted. He wrote:

> *What we must avoid at all cost is determined by what we must preserve at all cost, and this in turn is predicated on the image of man we entertain. Formerly this image was enshrined in the teachings of revealed religions. With their eclipse today, secular reason must base the normative concept of man on a cogent, at least persuasive, doctrine of general being: metaphysics must underpin ethics. Hence, a speculative attempt [must be] made at such an underpinning of man's duties to himself, his distant posterity, and the plentitude of terrestrial life under his domain. That attempt must brave the veto of reigning analytical theory against all attempts of this kind and indeed cannot hope for more than a tentative result. But dare it must. A philosophy of [man and] nature is to bridge the alleged chasm between a scientifically ascertainable "is" and morally binding "ought."*

Persistent inquiry at the ethical or philosophical level can of course deteriorate into esoteric abstraction. In the words of my students, it can make your head hurt. More seriously it can excuse prolonged introspection when constructive action is needed. Yet at a more practical level sustainability documents, and the enormous volume of supporting literature, present serious challenges to any significant conceptual and operational consensus. This can be made reasonably clear by assessing two of its central propositions. The first is the most frequently quoted definition of sustainable development—the achievement of a pattern of development that meets the needs of the present generation without compromising the ability of future generations to meet their own needs. How is it even remotely possible to address the needs of intergenerational justice if contemporary society is unable or unwilling to effectively deal with the more urgent problem of intragenerational inequality and unfairness?

The second challenge is subsumed in the presumption that the goals of an equitable pattern of economic growth are compatible with enhancing social-environmental quality. This assumption can be operationally and philosophically demonstrated, but only at considerable cost to received orthodoxy. In practice efforts to enhance social-environmental quality have been viewed as imposing additional costs and thus as an impediment to growth. Market discipline encourages firms to ignore or avoid these costs so only political intervention can force producers to recognize and accept them. Policy decision-makers however have been cautioned that they must recognize and assess the trade-offs between growth and social-environmental protection. Thus under traditional definitions economic growth and social-environmental quality have been seen as incompatible goals.

One proposed solution is through technological advance. It is surely possible that human ingenuity can discover technologies that simultaneously increase productive efficiency and decrease social-environmental degradation. In terms of most notions of sustainable development however this is at best a helpful but partial solution. It may resolve the traditional definition of the dilemma, but ignores the companion requirement for more equitable patterns of growth. Thus it has been argued that full compatibility

between these two sustainable development goals violates the central precepts of individualism and freedom that inform political and economic neoliberalism. In order to reconcile action with sustainability goals it is necessary to adjust the attitudes and values of society and its major decision-makers.

Thus the distinction must be made between sustainable development as an ambiguous, undefined concept and its translation into specific operational terms. If the notion was expressed strongly in terms of needed changes in values, institutions and outcomes it is unclear how much support would exist for sustainable development. When the ethical and political dimensions of sustainable development become fully engaged the burden of the concept becomes more apparent. This again raises the importance of ethical recognition and motivation.

None of this supports the argument that progress toward a better, more sustainable future must depend solely upon philosophical purity and internal consistency. The internal contradictions of contemporary society are obvious to any that take the time to reflect upon the distinctions between slogans, mythology and reality. Yet progress has and must continue to be our common goal. At the most practical level this progress is a question of economics as constrained or empowered by political decisions regarding acceptable conduct and outcomes. For economists sustainable development can usefully be expressed by the notion that it is essential to get the prices right. Thus it requires decisions and outcomes that conform to the notion of full cost pricing.

Mainstream economics focuses on the advantageous role of competitive market prices to induce a social welfare enhancing, efficient allocation of scarce resources. These efficiency gains are realized only when all producers and consumers are faced with the full costs of their decisions. When full costs of production are not reflected in market prices the outcome is inefficient and it both reduces and distorts social wellbeing from the exchange. Markets fail when third-party effects or negative externalities allow costs to be imposed on others without their consent.

Under workably competitive conditions markets can fail for a variety of reasons. Given the logic of economics—self-interested voluntary exchange based on well-defined property rights—markets are seen as failing when inadequately assigned property rights result in involuntary transactions. Producers are able to avoid certain real costs that are therefore imposed on involuntary third parties rather than on consumers. The resulting overproduction of underpriced goods is economically inefficient and inappropriately allocates benefits and costs of economic activity. In short, much of the edifice of conventional economics depends upon the recognition of full cost pricing. In its absence the social claims for market processes would have little meaning and markets would deteriorate into mechanisms of socially sanctioned exploitation.

While economists caution against replacing economic discipline with political commands, this advice is tempered in the case of market failures—when existing markets are so imperfect that efficiency conditions are significantly violated or when no appropriate markets exist. In both cases economists recognize the need for governmental intervention to compensate for or remove the source of failure and provide the appropriate incentives for full cost pricing. In the case where markets are absent the responsibility of government is to ensure that producers effectively internalize the cost of negative externalities through requirements for contingent market valuations. The goal is

to induce behavior that mimics or reasonably approximates what real market place values would impose if they existed.

Since realizing the benefits from internalizing external effects typically impose costs it may be that removing all social-environmental risks and negative impacts is neither possible nor desirable. From this observation has emerged the economist's notion of a socially optimal level of correction. The efficiency rule is that corrective actions should be required to the point where the marginal social costs of adjustment are equal to the marginal benefits obtained. There will always be some socially acceptable level of pollution and social dislocation which producers and consumers should not be expected to account for. The private sector should only be expected to take actions that prevent or mitigate impacts (when technically feasible) or compensate for unavoidable effects to the level defined as socially optimal. (This is consistent with the polluter pays principle applied before and after the fact.) Other negative impacts are ignored as transactions of adjustment costs even though public policy may choose to provide compensation from the state's treasury.

Thus at a very minimum sustainable development must deal with the problem of getting the prices right for those social-environmental costs not expressed in markets. It must, through social and political processes, made decisions concerning which of these costs should be recognized, how they should be measured, and how they should be integrated into actual decisions. These are not economic questions, they are ethical and political decisions that apply to all peoples, all nations and all industrial sectors. They must take into account, if sustainable development is to mean anything, concerns about intra- and intergenerational justice and equity.

This volume does not attempt to answer these questions in any conclusive way. Its more limited objective is to explore many of them in terms of issues raised by international mineral investment, production and trade. Since the authors are social scientists, and most are economists, the approach tends to investigate issues from the perspective of getting the prices right—from some view of full cost pricing. The objectives are to advance an understanding of the major concerns and to stimulate discussion of potential welfare enhancing solutions. To provide additional coherence the chapters have been organized to reflect three categories of inquiry. The first two chapters focus on the concept of sustainable development itself—generally and with specific reference to the mining industry. Chapters Three, Four and Five focus on the process of decision-making that determine how the industry operates and the outcomes that result. The first of these identifies the major interests and needs of the stakeholders. Chapter Four provides an assessment of the various regulatory mechanisms available to support efforts to achieve more sustainable outcomes. Chapter Five focuses on the negotiation process itself and explores how the various stakeholders can become effectively involved in decisions. The final two chapters address issues of methodology and measurement at project and the more aggregated levels.

Chapter 1

Normative and Philosophical Perspectives on the Concept of Sustainable Development

John A. Cordes

1. Introduction

In the hands of skilled analysts and advocates the notion of sustainable development has been interpreted to mean almost anything or almost nothing of importance. Beyond its inherent ambiguity as a product of political compromise, three factors have tended to prevent any consensus on its meaning, importance or application. The first is a tendency to focus on its operational rather than conceptual or philosophical attributes. From the perspective of pre-established interests and values there is great disagreement on what is to be sustained and how, and on how decisions should be made and by whom. The second impediment is to interpret sustainable development solely as an economic issue or more precisely as a competition between free markets and political regulation as a method of discipline. Discourse from this perspective tends to ignore the larger and more important values of concern to people and the potential for revised social ordering arrangements. Finally, progress is frustrated by a cynicism that views philosophy and ethics as rationalizations of economic or political power—the existence of a hierarchical structure that either utilizes its authority to frustrate and distort progress or represents a natural order of things that cannot be altered. These instincts, which Hirschman (1996) labeled the perversity and futility theses and to which he added the jeopardy thesis (we cannot afford the costs of change), call into question the existence of a motivation to act.

This chapter provides a different perspective on the importance and meaning of sustainable development. The approach is normative and philosophical in its selection of content.[1] It assumes that ideas are important and shape the concepts and vocabularies that we use to struggle with the problems of our time. It sees in the notion of sustainable development the skeletal structure for assessing a broad category of important societal issues and for identifying the adjustments and changes needed for a preferred future. This interpretation probably exceeds the intentions of its architects. But it is an umbrella that has established an international currency in an era when major problems are defined internationally.

Sustainable development is presented, interpreted and assessed in the context of the history of Western ideas. I assume explicitly that the notion of sustainable development is fundamentally a Western idea—indeed it is difficult to imagine it as the product of any other philosophical or intellectual tradition. More particularly the notion is

[1] The task of converting sustainable development into operational terms for the mineral industry is assigned to the other chapters in this volume. The reader should note that these authors might not accept the conclusions of this chapter. Each will define sustainable development sufficiently to derive its approach to the questions central to this volume.

seen as the contemporary vision of how best to achieve continuous progress or improvement in social relationships and human wellbeing. Its core optimism as a guide to a better future reflects the culturally unique Western vision of hope and the belief in progress. Similarly its emphasis on the energizing role of technological innovation and liberal political and economic institutions mirrors traditional Western prescriptions for progress.

At the same time sustainable development challenges many tenets of received Western orthodoxy or at least how they have come to be applied in today's globalized political economy. Its explicit conclusion is that prevailing attitudes, organizational structures, and outcomes are neither sustainable nor capable of promoting equitable future progress. The hope for continued progress, "*Our Common Future*," lies not so much in rejecting Western ideas and institutions, but in rethinking and modifying them—preserving what is good and useful and minimizing or neutralizing what is less desirable. Ultimately sustainable development is presented as an ethical or normative principle that challenges us to restructure our relationships with other humans and with nature in both the realm of knowledge and the arena of political and economic actions. Raised to this level, analysis of sustainable development must confront some fundamental issues and controversies its architects, and many of its proponents, have chosen to avoid or ignore.

The remainder of this chapter is divided into three parts. Part Two traces the culturally unique Western notion of progress from its origins to its modern day secular expression and describes/assesses the institutional structures that emerged to support it. The Third investigates the scope and content of sustainability by focusing on concerns that question the applicability or appropriateness of prevailing Western notions and mechanisms for progress. Part Four discusses the changes that need to occur if any reasonable measure of sustainable development is to be achieved.

2. The Western Belief in Progress

Every culture or civilization is built around an elaborate and complex structure of core beliefs that shape its values, norms and institutions. These shared beliefs are the cement that hold a society together, give meaning to existence, and provide the basis for answers to all important questions. The essence of a culture cannot be reduced to a series of slogans or phrases nor can it be understood outside the context of its history of ideas and experiences.

Box 1.1 The Gifts of the Jews

"When Abraham hears the Voice of God speaking the unexpected words 'Go forth,' the concept of an unknown future takes hold and Western civilization is born. From this insight the Jews evolve a new vision of men and women with unique destinies—a vision that thousands of year later will inspire the Declaration of Independence and our hopeful belief in progress and the sense that tomorrow can be better than today."

(He concludes that) "Most of our best words, in fact – *new, adventure, surprise; unique, individual, person, vocation; time, history, future; freedom, progress, spirit; faith, hope, justice* –are the gifts of the Jews."

(Cahill 1998)

Western society traces its origins to the ancient Hebrews and to Greece and Rome. It evolved through the Middle Ages, the Renaissance, the Protestant Reformation,

the Enlightenment, and the modern era under the strong influence of Judeo-Christian ideas and traditions. While it shares many ethical or moral principles with other cultures, the history of Western ideas has had a unique and special concern with the potential for persistent and cumulative human progress. Thomas Cahill (1998) argues that this worldview originated in Jewish mythology and is the "gift of the Jews" (see Box 1.1).

These gifts, combined with Greek notions of liberty and the good life, informed the great social awakening in Europe that emerged during the 15th century and culminated in the era of modernization. Over the intervening 500 years views on the definition, sources, measurement and mechanics of progress evolved significantly in response to perceived social needs and challenges. From within this turmoil of ideas the seeds of modern Western society, with its distinct optimism for continuous social, political and material progress, were planted in the 17th and 18th centuries, took root in the next century, and blossomed in the 20th century. As the phrase implies modern Western society is characterized by the merging of its cultural traditions and their secular manifestation in the form of modernization. The distinctions and implications of this coupling are important: "The West was the West long before it was modern. The central characteristics of the West, those which distinguish it form other civilizations, antedate the modernization of the West" (Huntington 1996, p. 69).

We have learned much from anthropologists, philosophers and social historians. Among these are four basic propositions. The first is that culture is the ultimate source of individual and group existence. It determines what matters and gives integrated meaning to life. . In most cultures the core belief is based on a creation myth and is enshrined with significant religious or supernatural powers. This gives it an unchallenged authority—we act in a certain way because we cannot imagine acting in a different way—and supports an internal sense of cultural superiority. The second is that culture is a complex structure of beliefs, values, norms and institutions that exist at two levels. At the explanation level each culture is ultimately grounded in a shared, unquestioned belief or myth. At the other level it is seen as a process or description of the values and institutions that fulfill the myth and permit it to continue as a shared, unquestioned belief. In this sense the insights of modern economics, sociology, psychology, etc. do not capture the reason for actions. They describe but do not explain. The explanation is in the myth. Different cultures exist because myths do not represent a universal truth; rather they are human inventions.

The third insight relates explanation to description. Cultural values and institutions evolve in response to ideas and experiences over long periods of time, but the integrity of the myth remains fundamentally intact. It is the source or bedrock of culture. If the core belief or myth is rejected, the integrity and vitality of the culture is eroded and it will dissolve or dramatically evolve into another, different culture. Finally, it is recognized that the attitudes, values and knowledge of traditional cultures differs from those of modern societies (Huntington 1996, p.68). Modernization is fundamentally a process of secularization—"the loss of metasocial guarantees in the legitimisation of society. The latter is freed…from its supernatural bonds (and is) subjected to the demands of reason" (Berthoud 1990, p. 22). In support of this we are told that the West's search for ways to guarantee the perpetuation of progress has usually been divorced from religious themes (Attenfield 1991).

This part draws upon these four insights to explain how the core belief or myth and its supporting values and institutions emerged and changed in the historical evolution

of Western culture from its religious origins to modern secularism. It provides an understanding of how and why the West has become what it is today. The material is presented in two sub-sections. The first argues that the unique core or sustaining myth of the West is a belief in persistent, cumulative progress. The second traces the evolution of those institutions that support confidence in this core belief and the role ethics or moral values played in defining their content and rules of conduct.

2.1.1. The central belief or myth of the West

The core belief or myth of Western culture is derived from its concept of time or the relationship between the past, the present and the future. From the tribes of Isreal and the stories of Abraham and Moses comes the notion that this relationship is linear, open and unknown rather than a circle or wheel of repetitive stagnation. Moses, like Abraham before him, hears "the Voice and is willing to put his trust in it." Moses remains full of hope, "hope in the Promise, hope for the future—that it will be something truly new, something full of surprise"(Cahill 1998, p.238). Cahill continues to summarize this unique source of Western civilization:

> *Under the surface events of this tribal story, new ideas are developing; time is becoming real; a real future is possible. And because of this, the choices I make individually are important; they make a real difference to a real future. And because all outcomes have not been predetermined in advance, the present is full of adventure and the freedom to make choices that will profoundly affect the outcome.*
>
> *The great, overwhelming movement, exemplified in the stories of Avraham and Moshe, makes history real to human consciousness for the first time—with the future really dependent on what I do in the present. This movement is the movement of time, which once past, becomes history. But the movement is not the movement of a wheel, as all other societies had imagined; it is not cyclical, coming around again and again. Each moment, like each destiny, is unique and unrepeatable. It is a process—it is going somewhere, though no one can say where. And because its end is not yet, it is full of hope—and I am free to imagine that it will not be just process but progress.*
>
> *But there are right choices and wrong choices. In order to make the right choices I must consult the law of God written in my heart. I must listen to the Voice, which speaks not only to the great leaders but to me. I must take the I seriously. And in this way, after many catastrophes, the people who became the Jews could begin to go from the I of David to the I of the spirit to the I of the individual to the I of compassion-for-the-I-of-others.* (p. 238-239)

This is the essence of Western culture, unique in its notions of individuality, compassion and justice, and most importantly in its hope for a better future. From it we derive the core and sustaining myth of the West—the belief in human progress. Combined with other influences this central belief spawned a supporting structure of values and institutions that kept the myth alive even through the Dark Ages of Western experience.

Initially belief in the future and in progress was tied to God's Promise for his chosen people. Confidence in the surety of some divine design greatly influenced the evolution of belief in progress through the Middle Ages. Belief that progress was assured and conditioned by God's Promise began to erode during the Renaissance and with it began the emergence of the modern West. Supported by the Protestant Reformation the great ideas of this era focused on political theory (the separation of secular and ecclesiastical authority), humanism (the centrality of humans in the universe and the supreme importance of individuals), and the philosophy of nature (the relationship of humans to the natural world). The latter set in motion the scientific revolution and combined with the others to focus on the role knowledge played in human progress. By the end of the 18th century rationalism had significantly undermined the religious underpinnings of belief in progress. This tendency continued so that by the end of the Enlightenment progress had become a completely secular idea.

The secularization of the core belief in progress transformed Western society and ushered in the changes in attitudes, values and institutions that gave rise to modernization. The confidence and guarantees needed to sustain the core belief shifted slowly but persistently away from a divine plan to optimism based on human knowledge and advances in scientific and technological innovation. With it was unleashed the significant attributes of curiosity and ambition that have come to characterize the West. But the transition from basing a core belief on the immutable, transcendent authority of the supernatural to secular sources implied serious philosophical questions even for a culture so human-centered as that of the West. Part of the story is found in the Biblical tradition that continues to influence the West even today—that man was made in the image of God, "just below the angels," and was given dominion over all the earth. With the desacralization of nature (the contribution of Bacon and Descarte) the natural environment lost all its non-instrumental value. Progress became increasingly defined by the human capacity to understand nature so that it could be conquered and harnessed for human, especially economic purposes.

But this alone probably would not have been sufficient to sustain the belief in progress. There is a great distinction between knowledge and wisdom. God's Promise implied an all-knowing, irrefutable wisdom, but even humans that are just below the angels are mortal and fallible. Some mechanism was necessary to provide a credible and continuing optimism to sustain the belief in progress. The West found this in the institutions of liberal political democracy and free markets. These institutions would provide the opportunities and incentives necessary for continual advances in knowledge and the capacity to effectively harness it in support of human progress. The invisible but constraining hand of the divine was replaced with the invisible and unconstrained hand of competitive markets. Human ingenuity through scientific advance supported by appropriate social arrangements provided the optimism, confidence and certainty needed to sustain the myth of progress. At the same time the dominance of secular rational empiricism and its associated materialism altered the definition and measure of human progress.

As the age of Enlightenment drew to a close the fundamental structure and attitudes of modern Western society were in place. Humans had become the measure of all things and the source of all value. Political and economic liberalism, based on notions of natural rights, granted individuals unheralded powers and elevated individual freedom

to the highest place in the hierarchy of social values. It eroded earlier social visions that subordinated the individual to the common good. Each individual rather than society was to determine what was good and what was bad. Value and ethics become personal and subjective and were increasingly expressed operationally in terms of market value. Freyfogle (1993) concisely summarized the worldview of a Western person on the threshold of the modern era.

> *As he surveyed to Earth, he saw an orderly, comprehensible scene. God was gone, as were the mysteries, legends, and special vibrations of nature. Humans were set apart from the Earth, and communal needs had come to mean nothing. Man was the measure of the Earth, and money was the measure of man. Man was the subject; the Earth was the object. With this mental framework, (he) could take full advantage of the new technology. With this framework, he could now tinker with the Earth in grand, unheralded Ways.* (p.119)

But secularism and the distinction between human knowledge and wisdom imply a strain on the ethical or moral fabric of society. It threatens confusion between ends and means in relationships and in the operation of social institutions. Advances in knowledge and technology do not automatically result in the moral, social or even economic progress needed to sustain the myth. They provide the potential but not the Promise. Unrestrained, science and technology tend to reduce humans and nature to an instrumental rationality—a fundamental confusion of ends and means. How do we assure that the "right choices" will be made? Cahill noted that to make the right choices each of us must consult the law of God written in our heart. But do different gods write different laws on the hearts of other cultures? In a world of secular knowledge what is the role of ethics in defining and sustaining belief in progress and in defining the structure and operation of social institutions? As the sociologist Peter Berger (1980) noted secularism replaces religious certainty with the necessity of heresy—a situation in which choices are imperative.

2.1.2. Ethical dilemmas in the "perfection" of mechanisms for progress

Secularization of the underlying belief in progress placed the future in human hands. Notwithstanding the starkness of Freyfogle's description, the Renaissance and Enlightenment accepted that individuals were social beings and that without appropriate social institutions there would be chaos and anarchy. From this grew up the notion of a social contract that links individuals to society and provides a definition and legitimization of the institutions for social ordering. At a minimum the social contract in the West has been founded on two fundamental ideas or values. The first is the value of liberty: the idea that will, not force is the basis of social arrangements. The second is the value of justice and equality: the idea that right, not might is the basis for the institutions of social order.

The relationship between ethics and political-economic institutions is often contentious. Yet we must be clear about our starting point. Economic and political institutions are social creations. They exist solely to serve human needs. They are means rather than ends. When they are seen as ends in themselves or fail to provide for the

common good, they violate the most fundamental values and instincts of Western culture and the nature of its social compact. As structures for organizing human activities they may be seen as objective, impersonal, even amoral. Their ethical or moral dimension arises in the context of permitted conduct, activities and outcomes. The ultimate responsibility of society as a whole is to ensure that its institutional creations serve their intended purposes

The difficulty is in the definition and measure of notions like human needs, wellbeing and the common good. All are somehow served by the great Western ideals of justice, liberty, equity, fairness, compassion, progress, and individualism. Yet in application terms there is often at least apparent conflict among these values. This is the essence of the social dilemma—how to choose from among different values each of which are desirable in themselves but appear to be in conflict? But we must choose individually and as a society.

In this sense ethics and institutions are inseparable in any society. Ethics itself is the systematic study of what we ought to do. When invested with divine origins it reliably informs us of what is good and what is evil and, at least as importantly, provides a reason or sanction for doing what is right. In a more secular sense it asks individuals and society what kind of people they want to be and suggests how to achieve that ideal. It is a discussion of the "ought to be" in light of "what is" and "what can be." It speaks to our higher instincts and humanity in order to provide a check on our baser instincts. Ultimately, in a free society some notion of ethics becomes the final judge of the acceptability its institutions.

The West's two dominant ethical traditions—utilitarianism and deontology—demonstrate the tension inherent is fulfilling the terms of the social contract. Utilitarianism has become the basic ethical theory of economics and public policy in the West while deontological notions inform its constitutional protection of civil rights and liberties.

Utilitarian ethics is based on two notions—a rule for judging all actions and a definition of the good. The evaluative rule stresses the consequence of any action regardless of its underlying intention or motivation. An action is ethically correct if it leads to good outcomes, but wrong if it leads to bad consequences. In this sense an action is never good or bad in and of itself—only the outcome can be judged. The standard against which outcomes are to be compared is maximizing the greatest good for the largest number of people. But how do we define what is good and how do we measure it?

The answer to the problem of definition was found in the concept of utility and the two notions of value that support it. The intrinsic value became the ultimate good—expressed as hedonistic or preference utilitarianism (satisfaction of wants). All other things were given instrumental value and assessed in terms of their capacity to serve the ultimate good. Thus decisions are judged in terms of their ability to produce good consequences measured in terms of maximizing aggregated satisfaction.

Deontological approaches focus on what is right rather than what is good. Motives are important and notions of justice, fairness and equity should guide decisions. Deontologists criticize utilitarian ethics because its emphasis on aggregated social utility is seen as reducing individuals to things or means in violation of human dignity. Additionally it makes the ethical character of actions dependent on factors over which we have little control. We can control our motives but not the outcomes of decisions. The

core distinctions between these views can best be seen in the choice dilemma between equity and efficiency. Deontologists argue that basic human rights should supercede any utilitarian measure of what is good for society. When basic rights are involved no trade-off is justified: "Each person possesses an inviolability founded on justice that even the welfare of society as a whole cannot override…. Therefore, the rights secured by justice are not subject to political bargaining or to the calculus of social interests"(Rawls 1971, p.3-4).

2.1.3. The triumph of economism

Early in the emergence of the modern West political and economic institutions were viewed as linked and supplemental—a part of the same structure called political economy. Further political economy was seen as an integral part of moral philosophy and therefore an expression of the ethical and moral foundations of society. The separate social science disciplines, with their distinct methodologies, jargons and spheres of insight, did not exist. Neither had the domain of ethics and morality been relegated to the care of clerics, philosophers and the humanities. Throughout the Middle Ages and much of the Renaissance, economic activity was a practical theology influenced by religious or moral notions.

From the insights of Adam Smith emerged an understanding and legitimization of autonomous, impersonal markets operating under an invisible hand freed from ecclesiastical and political interference. Smith's great genius was in demonstrating that under certain institutional arrangements the price system was capable of harmonizing the pursuit of private interests with the achievement of expanded social welfare. From that time onwards the burden of proof shifted to those who favored politically defined efforts to enhance the common good. Moreover the coincidence of private and public interests provided moral standing to self-interest and the profit motive. Self-interest was seen as a law of human nature that, when unleashed under competitive market conditions produces a Newtonian-like natural social harmony. Often forgotten in the years that followed were Smith's admonitions on the conduct of self-interest (it must be guided by the virtues of prudence, justice and benevolence) and the institutional conditions that harmoniously linked individual and societal interests (markets must be workably competitive and producers and consumers must be faced with the full costs of their actions).

The political economy for Smith was constructed on the framework of moral philosophy and described in an ethical context. As capitalism flowered economic impulses were held in check by Puritan restraint and the Protestant ethic. Individuals worked and saved because they were obligated by their God (the "calling" of predestination) and their covenant with the community. Jeremy Bentham, William Jevons, and Herbert Spencer destroyed the power of this linkage.

Bentham formalized the extreme individualism that guided Western ideas until reformulated by Friedman in the 1960s. In support of his utilitarian ethic he argued that the community was a fictitious notion—the only thing that mattered was the individual. Social interests were no more than the sum of the interests of its members. Individual freedom and rights became the highest values and were not to be restricted by any obligations to the common good. As individual interests became defined in terms of consumption the notion of cooperative individuals in society was replaced by that of

individuals in economic competition.In so doing he brushed away for economists and society the recognition that there is a real and important distinction between a social decision and the aggregated sum of individual decisions.

The writings of Jevons reoriented the discipline of economics to the mathematical, deductive and positive approach that it continues in ever more sophisticated forms today. Markets came to be seen as value-free devices for allocating scarce resources and efficiency became the proxy for social welfare and the measure of market performance. Normative questions concerning equity, justice, and income distribution (for which there were no scientific or objective standards of truth or correctness) were ignored or transferred to other social science disciplines. Economics focused on efficient markets and economic growth and left to others the task of dealing with the social dislocations caused by market processes. Eventually economists came to recognize that welfare improving policies generated sufficient benefits that could, at least in part, be used to compensate the victims of progress, but they did not suggest how this should be accomplished. Most economists cautioned however that attempts to redistribute income or benefits could reduce incentives and decrease the prospects of economic growth and therefore the prospects for progress.

Herbert Spencer provided the intellectual framework that justified the nineteenth century's extreme economic and social laissez-faire. He viewed society as driven by a natural evolution of increasing "individuation" similar to the Darwinian struggle for survival of the fittest among non-human species. It was the natural right of individuals to retain the freedom necessary to compete in this incessant struggle. The role of government was to uphold these natural rights—when it went beyond this minimal role it distorted the natural order of things and was harmful. The arena for this struggle was the competitive marketplace which, when unfettered, led to ever higher forms of social and economic progress. Contrary to Smith's harmonious social interactions, Spencer focused on disruptive change with winners (the fittest) and losers. The plight of losers was the price of progress, perhaps unfortunate but a part of the natural order of things. Now, freed from religious and political constraint the market place could work its magic and take full advantage of the burgeoning technological and industrial revolution. It would take years to realize that unfettered capitalism was not self-correcting or self-equilibrating and that the price of progress may be too high a price to pay.

Unbridled capitalism resulted in economic growth and technological advance until well into the twentieth century. But its contribution to progress could only be defended by adherence to a Spencerian notion of process. Polanyi (1944, p.33-34) describes and assesses this period as follows:

> *At the heart of the Industrial Revolution…there was an almost miraculous improvement in the tools of production, which was accompanied by a catastrophic dislocation in the lives of the common people…*
>
> *Fired by an emotional faith in spontaneity, the common-sense attitude toward change was discarded in favor of a mystical readiness to accept the social consequences of economic improvement, whatever they might be. The elementary truths of political science and statecraft were first discredited, then forgotten…. Such…truths…were in the nineteenth century erased from the thoughts of the educated by the corrosive of a crude utilitarianism combined*

with an uncritical reliance on the alleged self-healing virtues of unconscious growth.

Economic liberalism misread the history of the Industrial Revolution because it insisted on judging social events from the economic viewpoint.

These excesses set in train a sequence under which economic inequalities led to economic tensions that in turn resulted in social tensions and ultimately social conflict. The boundaries of an acceptable social contract had been exceeded and eventually the structure of classical liberalism collapsed with the Great Depression. The prescribed medicine of classical economics was socially unacceptable. The West faced a major challenge to its optimism for continued progress. Changes in structure and in its underlying philosophical rationale were required.

These were provided at two levels. The first reflected a rekindling of the social conscience in the West. Society reinvented the older idea that progress involved social responsibility and added the new notion that individuals were not solely responsible for their predicament. Confidence in a survivalist natural order was replaced by a self-conscious need to create a more humane social order. This required collective or political actions to regulate markets and to provide for a social welfare safety net. In the USA this transformation was attempted under slogans such as the "Square Deal," the "New Deal" and the "Great Society."

The challenge for economists was also significant. Traditional assumptions about the operation and outcomes of markets driven by self-interest could not be maintained in light of the evidence. They found their social redemption in a reformulation of individualism and in an expanded role for political activity. In their view the problem was not in the essentials of liberalism but in a misplaced optimism in aggregate demand and the nature of market corrections. In so doing economics was able to retain its central focus on allocative efficiency and markets without compromising its objective, positivistic methodological purity.

John Maynard Keynes and Paul Samuelson provided the edifice for revitalizing economic liberalism. Keynes recognized that market process were cyclical and argued that these cycles and their social dislocations could be controlled by selective use of governmental fiscal policies (taxation and public expenditures). Samuelson, along with Keynes, argued that the market mechanism was a mere mechanical vehicle that could be scientifically understood and manipulated through logical mathematical analysis. Beyond countercyclical or stabilization policies government was assigned responsibility for ensuring that markets remained or became workably competitive. For more progressive social scientists the notion of a scientific understanding of the market mechanism held promise for achieving other social goals through appropriate selection of policy instruments. Out of this resurgent optimism grew the idea of global economic development—the ambitious notion that progress could now be universalized and its benefits extended to all nations and peoples through the operation of market forces and the judicious use of scientific economic policies

Confidence that a new engine for humane progress had been discovered in the application of scientific manipulation of the market mechanism was short-lived both in the West and internationally. Political institutions lacked the willingness and capacity to fulfill their new responsibilities. Instead of providing social cohesion and expected

outcomes the result was an exploding bureaucracy, an ever-expanding cradle-to-grave notion of social responsibility, and increasing inefficiency. Politicians and bureaucrats lacked the political will to accept Keynes' fiscal discipline on both sides of the economic cycle. Social programs became excessively expensive and distorted private decisions. Even more importantly centralized decision-makers lacked the capacity to access and use the information necessary to make good decisions. Political will was unable to withstand pressures from special interest groups. Rather than root out economic inefficiencies to improve the functioning of markets, governments tended to respond to vocal, well funded special interests.

By the 1980s there was a conspicuous effort to rollback the level of direct governmental involvement in economic and social welfare issues. The discipline of economics returned as the central guide to decisions. The collapse of international communism introduced a revitalized process of globalization—a structural revolution marking the transition from national economies to a global economy under which markets in individual countries become increasingly dependent on one another. This largely irreversible phenomenon poses serious problems: "Creating the institutions and arrangements for handling globalization is the greatest intellectual challenge now facing the world" (Haass quoted in Longworth 1998, p.25A). This article then summarizes how globalization is being structured and the concerns it creates:

> *In private parlays (all over the world) close-knit bands of global planners are writing the rules that will govern the world economy into the 21st century and beyond. Most of these rules carry an American stamp….The message: Anyone who wants to do business in America has to play by American rules. All this work has two things in common.*
>
> *First, little of it protects workers or communities, or reins in the power of global markets. Instead, it is aimed at making the markets safer, more efficient and, hence, more powerful. Second, it is taking place virtually unnoticed and not debated by voters, politicians or the press….Groups representing labor or the environment say they have trouble finding out what's going on, let alone influencing it.* (p. 25A)

The emergence of modern globalization represents the most extreme form of economism ever produced by Western attitudes and institutions. While approaching the unfettered capitalism of one hundred years ago, it is now supported by a new vision and rationale. Rather than rewarding the fittest it now is the mechanism that supports belief in universal progress—everyone, admittedly with a "trickle-down" lag, will eventually share it the benefits. "Belief in progress has (become) a secular religion offering nothing less that the prospect of heaven on earth" (Nelson 1997, p.188). Economic growth stimulated by technological innovation is now synonymous with human progress and the pursuit of efficiency is the lifeblood of this progress. Importantly efficiency and markets are no longer justified only on technical grounds. Rather they are presented as value-neutral devices that are independent of any particular cultural or broader value circumstances. As Nelson (1997, p.196) concludes however globalization reflects a very specific set of social values. It represents "the assertion of a universal value system to which communities everywhere are expected to subordinate other ethical and religious

concerns…(if beliefs) are not grounded in salvation through economic progress, they become secondary."

2.1.4. The domestication of ethics by economics

The largely irreversible and often beneficial drive to globalization is more than the logical result of technological innovations in transportation, communications and information systems. It is the product of an increasingly persistent political economism whereby the ethical and rational claim of democratic politics is being redefined in terms of categories of economic rationality. Today, the "unfettered, strangely anonymous dynamic of the rationalization of the economic system seems increasingly to be forcing its own (and arbitrary) logic on politics" (Ulrich quoted in Küng 1998, p.209). This is consistent with the historical evolution of liberal political and economic institutions during the past half-century. Within a broad structure of fairness and equal opportunity, the guiding principles have been utilitarianism and individualism; both defined under the banner of commercialism and expressed in terms of efficiency and cost-benefit analysis.

The end product has been what Küng (1998, p.192) describes as "no more and no less than the domestication of ethics by economics." Morality, he says, has come "to be completely and utterly instrumentalized" so that it is equated with maximizing profits and causes ethics to become "the economic theory of morality"(p.192). He and others trace this to the philosophical assumptions of liberalism and how they have been distorted in practice. Underlying this trend is the recent obsession with consumption driven by what Bell (1976 p.22) calls the "institutionalization of envy." As a result the "cultural, if not moral, justification of capitalism has become hedonism, the idea of pleasure as a way of life" (p.21-22).

In order to assess these claims it is necessary to identify the major ideas of liberalism, how they have been translated into practice, and what their prevailing consequences are for today's world. Traditional liberalism has been characterized both by its focus on individualism and individual freedom and by the distinction it makes between its two imaginary entities, civil society and the state. Individuals are joined in civil society to pursue their own interests within a system of rights that is fair to all. Individuals are joined as citizens of a state solely for the purpose of enforcing these rights. Properly structured the state should perform the same "self-effacing function as a policeman on point duty, who facilitates the motorists' getting to their several destinations without bumping into one another but does not have any power to influence those destinations" (Barry 1965, p.74). As originally conceived by Bentham the emphasis was on political freedom as a means to achieve economic freedom. Under the perceived threat of collectivism during the early 1900s, Hayek (1944) and others reversed this focus and economic freedom became the source and protector of political freedom.

Milton Friedman's classic book, *Capitalism and Freedom* (1962), provided the modern, neoliberal philosophical affirmation and justification for this view. Without ambiguity he declared that notions of the common good or the public interest have only a suspect place in the hierarchy of objectives in a free and democratic society. On the very first page he rejects the validity of President Kennedy's dramatic statement—"Ask not what your country can do for you; ask what you can do for your country"—with the argument that:

> *Neither half of the statement expresses a relation between the citizen and his Government that is worthy of the ideals of free men in a free society. The paternalistic "what your country can do for you" implies…a view that is at odds with the free man's belief in his own responsibility for his own destiny. The organismic, "what you can do for your country" implies that government is the master…the citizen, the servant. To the free man, the country is a collection of individuals who compose it, not something over and above them…But he regards government as a means, an instrumentality, neither a grantor of favors and gifts, nor a master…to be…served.* (p.1-2)

The function of government is to protect our freedom. This is possible only through a system of competitive capitalism that separates economic power from political power. Among the greatest threats to human freedom is that "coming from men of good intentions and good will who wish to reform us" (p.201). This view is confirmed by Barry (1965, p.66) who argues that in liberalism "the state is an instrument for satisfying the wants that men happen to have rather than a means of making good men."

Neoliberalism also provides definite views on the nature of businesses, individuals and ethics. According to Friedman, claims that companies have a social responsibility "shows a fundamental misconception of the character and nature of a free economy" (1962, p.133). Rather there is one and only one social responsibility of business—to use its resources and engage in activities designed to increase its profits so long as it obeys the law. In fact he argues that any other view would "so thoroughly undermine the very foundation of our free society" that it is "a fundamentally subversive doctrine" (p.133).

Companies are inanimate objects that maintain their existence by meeting legal requirements. Because they are inanimate legal fictions, they are amoral. Ethical questions of right and wrong apply only to individuals.

> *Indeed, a major aim of the liberal is to leave the ethical problem for the individual to wrestle with. The "really" important ethical problems are those that face an individual in a free society—what he should do with his freedom. There are thus two sets of values that a liberal will emphasize—the values That are relevant to relations among people, which is the context in which he assigns first priority to freedom; and the values that are relevant to the individual in the exercise of his freedom, which is the realm of individual ethics and philosophy.* (p.12)

The ultimate goal of neoliberal philosophy is maximizing individual freedom. It is the standard against which social arrangements must be judged precisely because the notion of a common good or public interest has no inherent validity in a free society. This view of individualism merged well with economic theory. Together they argued against governmental interventions except to ensure the fair and efficient functioning of markets.

> *Once liberalism is defined…as individualism, it merges easily with the value Premise on which many economists base the cost-benefit of efficiency criterion*

> *in public policy. 'The value premise…is that the personal wants of the individuals in the society should guide the use of resources in production, distribution, and exchange, and that these personal wants can most efficiently be met through the seeking of maximum profits by all producers.'*
>
> *Liberal political theory likewise, may construe values as 'personal wants of the individuals in the society'; thus it may regard public values as a peculiar kind of personal desire. In that case, political theory may dismiss idealistic, impersonal, or community values as illegitimate meddling in other people's affairs, or it may treat them as a weird sort of 'intangible' that deserves a surrogate market price.* (Sagoff 1995b, p.165)

But Friedman's formulation of liberalism is merely one view based on a specific hierarchy of value assumptions. Liberalism itself requires acceptance of no specific value assumptions. Rather it holds that many, even conflicting value assumptions and notions of the good may be compatible with free and rational decisions. "Liberal political theory cannot commit a democracy beforehand to adopt any general rule or principle that answers the moral questions that confront it; if political theory could do this, it would become autocratic and inconsistent with democracy" (Sagoff 1995b, p.181). What ultimately defines liberalism is its openness to individual views on what is good and what should be, rather than slavish conformity to any given expressions of rights or wants.

Indeed the greatest strength of applied liberalism has been its rejection of extremism in the specification of values. It has recognized that any single value, whether it be freedom or justice/equality or anything else, when viewed as an absolute or over-riding principle leads to excesses. In his *Four Essays on Liberty* (1969), Isaiah Berlin captured both the dangers of extremism and the difficulties of achieving a coherent social contract.

> *If the liberty of myself or my class or nation depends on the misery of a number of other human beings, the system which promotes this is unjust and immoral. But if I curtail or lose my freedom, in order to lessen the shame of such inequality, and do not thereby materially increase the individual liberty of others, an absolute loss of liberty occurs…Yet it remains true that the freedom of some must at times be curtailed to secure the freedom of others. Upon what principle should this be done? If freedom is a sacred, untouchable value, there can be no such principle. One or the other of these conflicting rules or principles must, at any rate in practice, yield….Still, a practical compromise has to be found.* (p. 126)

The internal consistency of the neoliberal construct stands in sharp contrast to reality. In practice individualism and freedom has conveniently disregarded the other part of Friedman's definition—the notion that government should not be a grantor of favors and gifts. Nor should we be surprised by this. Even Adam Smith (1937, p.128) noted that businessmen seldom meet "even for merriment and diversion, but the conversation ends in a conspiracy against the public." If labor unions and other single or special interest groups had existed in his time, he probably would have rendered a similar admonition to each of them.

As early as 1932 the theologian and Christian realist Reinhold Niebuhr, in *Moral Man and Immoral Society*, recognized that some measure of coercion is needed to establish the social contract. He stated that coercion is an expression of power and "any kind of significant social power develops social inequality" (p.7-8). Power "blinds the eyes of moral insight and lames the will of moral purpose. The individual or the group which organises any society, however social its intentions or pretensions, arrogates an inordinate portion of social privilege to itself" (p.6-7). He notes that the "literature of all ages is filled with rational and moral justifications of these inequalities, but most of them are specious…. The justifications are usually dictated by the desire of the men of power to hide the nakedness of their greed, and by the inclination of society itself to veil the brutal facts of human life from itself"(p.8).

> *The rise of modern democracy, beginning with the Eighteenth Century, is sometimes supposed to have substituted the consent of the governed for the power of royal families and aristocratic classes as the cohesive force of national society. This judgment is partly true but not nearly as true as the uncritical devotees of modern democracy assume….But the creeds and institutions of democracy have never become fully divorced from the special interests of the commercial classes who conceived and developed them. It was their interest to destroy political restraint upon economic activity, and they therefore weakened the authority of the state and made it more pliant to their needs. With the increased centralisation of economic power in the period of modern industrialism, this development merely means that society as such does not control economic power as much as social well-being requires; and that the economic, rather than the political and military, power has become the significant coercive force of modern society. Either it defies the authority of the state or it bends the institutions of the state to its own purposes. Political power has been made responsible to economic power.* (p.14-15)

More recently the eminent economist, Alan Blinder (1987, p.21) noted a similar bias in contemporary American policy formation—our "system of government by lobbyist guarantees us a form of taxation with representation that the founding father did not foresee: special interests get the representation while the broad public gets the taxation." This exists, he concludes, because "somehow the right to fleece the public has been written into our economic bill of rights. If we are to pursue a hard-headed economic policy based on the principle of efficiency, we must get that clause stricken" (p.21). President Jimmy Carter lamented this distortion in his farewell address to the nation (see Box 1.2).

In our nearly universal pursuit of progress through hedonism and consumerism, globalization supports a perverse form of

Box 1.2 President Carter's farewell address to the nation

We are increasingly drawn to single-issue groups and special interest organizations to ensure that whatever else happens, our own personal views and our own private interests are protected. This is a disturbing factor….It tends to distort our purposes, because the national interest is not always the sum of all our single or special interests. We are all Americans together, and we must not forget that the common good is our common interest and our individual responsibility.

President Jimmy Carter, 1981

"commodity fetishism" whereby people and the environment are treated as things and degraded. As described by Sen (1982) this fetishism substitutes market prices for wellbeing and assumed that welfare concerns can be valued and measured in monetary terms. Lost in the evolution of Western ideas, ideals and institutions is the notion that the purpose of affluence and material progress was to support the quality of life—a focus on the way we live rather than the goods we accumulate. In our educational system and in our collective ethos most of the West has forgotten the great insights of the Greeks—that freedom must be balanced with restraint and responsibility and that *eudimon* (the good life) involves following a middle path that balances individual interests with those of the *polis* or community. To the ancient Greeks unlimited wants and unrestrained self-interest constituted the sin of *hubris* that destroys the individual and threatened the *polis*.

Contrary to Friedman's version of neoliberalism, the viability and integrity of the social contract depends upon a balancing of individual and collective values and goals. The very foundation of liberalism is the willingness of individuals to compromise private wants and freedoms for the public interest or some concept of the common good. Individualism and freedom are important values for a liberal and democratic society to recognize and preserve. They must however share pride of place with other values like equality, justice and fairness. Ethics is more than reductionist philosophy; it defines what kind of people and society we are and want to be. It applies to individual actions. It also must inform policy and corporate decisions. Freedom for inherently social individuals requires recognition of the public or common good. If there is no room for shame in our collective view of outcomes we will have lost all sense of morality—only freedom and rationalization will remain to guide individual and public decisions. In economism—the view that only economic goals, values and interests are of principal or decisive importance—and an economic interpretation of morality the social contract is distorted. Lost are recognition of why economic growth is important and the grand ideas upon which human progress has been built.

2.1.5. Summary

Over the past several hundred years the seeds of Westernism and modernism have been sown all over the globe. Combining ethnocentric instincts with the need to satisfy an exploding appetite for resources and markets, the West imposed and attracted converts to its values and institutions. By any measure the West now defines the debate over the future of progress. It has established the rules of the game. Its legacy is bittersweet. On the positive side Royal argues that "despite its many shortcomings and occasional atrocities, this Western dominance is providential. No better champion of justice, fairness, liberty, truth, and human flourishing exists than the Western Civilization. Recovering and extending Western principles remain our best hope for a more humane world." On the negative side he concludes that the "spiritual, moral, and intellectual grounding on which (these values) were built is slipping away from us, despite our material success." He adds:

> *More worrisome, however, is that within the West technological ideology has come to separate us from the deeper bases of our culture. We see in…contemporary attitudes toward nature a reductionist view that no longer*

> *preserves the fullness of the West…We cannot reject insights into human action that the sciences may bring us. But the old Aristotelian notion of the patient formation of virtue—and the very belief that we are spiritual beings who can rule ourselves and therefore attain a certain dignity—finds few cultural institutions willing to encourage us in this always difficult task. The consequences have been devastating….*
>
> *We also need to recognize how the inhumane has entered our free economy. Plato once warned that if we forget the knowledge of the good life, shipbuilding will still provide us with ships, shoemaking with shoes, the other arts with their various products, yet without the science of the good life that all things are to be used for, we will find all the other arts have failed us.*

Like Polyani before him, Daniel Bell (1976) recognizes that society has again lost sight of the elementary truths of the social contract in pursuit of a "crude utilitarianism combined with an uncritical reliance on the alleged …virtues of unconscious growth." He concludes that:

> *economic liberalism has become, in corporate structure, economic oligopoly, and, in the pursuit of private wants, a hedonism that is destructive of social needs. The two can be sundered. We can reject the pursuit of bourgeois wants, as lacking a moral foundation for society, and insist on the necessity of public goods. Yet we need political liberalism to assure the individual of protection from coercive powers and…of rewards for his own efforts and merits. And the arbiter of both cannot be the market—which has to be seen as a mechanism, not a principle of justice—but instead must be the public household.* (p.277)

To revitalize belief in progress consistent with the broader ideals of the social contract it is necessary to redefine and refocus on the purposes that progress is to secure. We must shift attention away the individuals as consumers to include their roles as citizens and members of a community. We must question and rethink our underlying values and beliefs in the preconditions and sources of human progress—the notion of individual freedom without concomitant responsibilities, the minimal and derived notion of public interests, and the assumption that technological advance and economic growth will solve all problems. It is in this sense that the notion of sustainable development is explicitly normative—"an ethical position packaged for political purposes" (Dodds 1997, p.96). Rational decisions need not reflect only economic calculations. They may also be justified independently on moral and cultural grounds and expressed in a political process where values are discussed on their merits rather than priced in markets.

The values, beliefs and institutions of the West, especially when viewed from the perspective of their tremendous technological and economic successes, are very attractive. They have been built however on an implicit set of ideals and values often distorted in practice. It is now time to reconcile ideology and mythology with reality is the search for a better future. This is difficult because in articulation and assessment the contradictions become uncomfortably apparent.

3. The Scope and Contents of Sustainable Development Concerns

Modern western society has adopted an ideology of universal technological optimism. From the early 18th century onwards it never seriously challenged the notion of perpetual progress through scientific and technological innovation stimulated and encouraged by liberal economic and political institutions. While it suffered crises of confidence, Western society has come to believe unambiguously that human ingenuity through advances in knowledge will meet any and all challenges at home and abroad. Neither did it seriously entertain the possibility than progress was a threat to human wellbeing and survival.

This optimism has been well placed. The scientific, technological, economic and political successes of the West have been extraordinary. To a great extent they have freed billions of people from the scourges of disease and famine. They have made possible a quality of life far removed from the drudgery and brutishness of mundane existence. At the same time the benefits of progress have not been equitably distributed and they have been achieved at considerable social and environmental costs. This darker side of progress has forced us to confront a host of ethical, psychological, social, cultural, environmental, and economic questions. More basically it has caused many to rethink and re-examine the assumptions of benignity, universality and sustainability that have been accepted in our received model of progress.

In this sense the major underlying concerns of the contemporary notion of sustainable development can be captured in three questions. The first is whether or not the efficiency and growth advantages of the prevailing international system also provide sufficient opportunities for social and economic justice? The second is whether or not economic growth and modernization are culturally neutral? The third is whether or not the secular rationalism of modernization has broken the bounds of our ethical sense and sensitivity? The answers to these questions are unresolved—they reflect modern realities that were largely ignored or unrecognized as serious issues in earlier philosophical assessments of the human predicament. At the same time their consequences are of vital importance to the human race and to the prescriptions of sustainable development.

3.1.1. Globalization and economic justice

The central claim of neoliberalism and globalization is that the progressive expansion of market discipline and processes will increase and spread the benefits of economic progress. The empirical evidence is ambiguous. The single greatest statistical reality from five decades of a commitment to worldwide development and globalization has been the phenomenal increase in global output and wealth and the imbalance in its distribution. Less statistically secure is the evidence that this era has also produced significant environmental degradation and increased alienation as rising expectations have been frustrated. Much more contentious is the relationship between measures of economic growth and definitions of human progress.

The macroeconomic aggregates speak for themselves: “Industrial production has grown more than fiftyfold over the past century, four-fifths since 1950” (Brundtland Report 1987, p.4). Much of this is the direct result of technological innovation made possible by increasingly open economic policies and effective markets. The

disaggregated data also speaks for itself: "poverty has increased throughout the world: income disparities between rich and poor nations, and between the rich and the poor in both developed and developing countries, have become pronounced: the environment has been subjected to severe stress…and social demands have grown many times throughout the developing world" (Sagasti 1997, p.1563). Data for the United States is descriptive. Over the recent past there has grown the greatest gap in income between the top fifth and the bottom fifth of the population since statistics began. In the fifteen years prior to 1996 "three-fifths of all American households have had to accept a real drop in income, while the income of the top fifth has increased by 28% and that of the top 1% even by 91%! This 1%, which in the middle of the 1970s controlled 18% of private property, now controls an incredible 49%!" Richard Goodwin, former advisor to two presidents, concludes that America is experiencing the greatest period of income redistribution in favor of the wealthy since the 1930s. This reflects the fact that "political power is firmly in the hands of monetary power, in a symbiotic relationship which continues to encourage inequality and injustice" (quoted in Küng 1998, p176-178). Data for the rest of the world and especially for developing nations support similar conclusions.

This evidence has convinced many that the international political-economic system is fundamentally unjust and that any efforts to address environmental and developmental issues must begin with questions of international justice. Kothari (1994, p.231) suggests "the fact that a century of unprecedented material progress has also been one of sprawling misery and increasing domination of the world by just a few powers suggest that there is something basically wrong with our world and the global structures that have permeated it. Indeed, there is something basically wrong with the way modern humanity has gone about constructing its world." Others disagree. For them any sustainable future depends upon rapidly expanding economic growth through more open and free markets. The only perceived alternative is more political intervention. "Shed of its beguiling simplicity, sustainable development is a guise for political control" to discipline consumers and producers and limit economic growth" (Anderson and Leal 1994, p.216). "In the absence of growth, those at the bottom of the economic ladder can only improve their lot by taking from those at the top, so…consumption must be curtailed, risks must be limited, new environmental ethics must be developed, and wealth must be redistributed" (p.214).

Box 1.3 Brundtland Report views on growth and equity

1. "This inequality (in access to resources and control of international rule-making) is the planet's main 'environmental' problem; it is also its main 'development' problem." (p.5-6)
2. "Such inequalities represent great differences not merely in the quality of life today, but also in the capacity of societies to improve their quality of life in the future." (p. 29)
3. "Hence, our inability to promote the common interest in sustainable development is often a product of the relative neglect of economic and social justice within and amongst nations." (p. 49)
4. "Sustainable development involves more than growth. It requires a change in the content of growth, to make it less material- and energy-intensive and more equitable in its impact. …Income distribution is one aspect of the quality of growth…and rapid growth combined with deteriorating income distribution may be worse than slower growth combined with redistribution in favour of the poor." (p. 52)

Regardless of their ideological differences both sides agree that the historical evidence is unsustainable. Most would agree that improved social and economic justice lies at the heart of sustainable development concerns. Several quotations from the Brundtland Report (1987), under the title *Our Common Future*, make this abundantly clear (see Box 1.3).

Analysts disagree about the sources or causes of the inequality, its longer-term consequences, and the content of any corrective measures. At least four arguments have been offered to explain the past. Two focus on alleged perversities in the prevailing international capitalist market structure. The other two focus on alleged political and cultural impediments to progress. The problem, as they see it, is not in capitalism or markets but in the constraints and interventions that disrupt the equitable operation of the current system.

The first explanation goes to the heart of economic relationships under modern capitalism. It combines Aristotelian insights relating justice and equality with the realities of coercion and power introduced above by Niebuhr and Blinder. Aristotle states that injustice arises both when equals are treated unequally and when unequals are treated equally. Given the wide imbalance in control over resources and wealth:

> *There is sufficient concrete evidence to show that the poor nations cannot get an equitable deal from the present international economic structures—much the same way as the poorest sections of the society within a country and for much the same reasons. Once there are major disparities in income distribution…the market mechanism ceases to function…equitably….When we start from a position of gross inequalities, the so-called market mechanism mocks poverty, or simply ignores it….This is (particularly) true at the international level, since there is no world government and none of the usual mechanisms existing within countries that create pressures for redistribution of income and wealth.* (ul Haq 1979, p.180)

The Brundtland Report (1987) supports this view by noting that the current decade has seen a retreat from social concerns and that the distribution of power and influence lies at the heart of most environmental and development challenges.

A related explanation can be tracked through the Marxian notion of false needs, J.K. Galbraith's discussion of a revised sequence or dependence effect and the imbalance between public and private goods, and Bell's concern with economic liberalism. The argument has two basic strands. The first is that scale economies and mass advertising have undermined the logic of traditional economics to establish a culture of consumption that serves corporate interests rather than consumer needs (Galbraith 1958). Economics is grounded in the notion of consumer sovereignty and choice under the broad rubric that demand creates supply. Reality, this view alleges, is quite different because production determines demand and distorts the real meaning of choice. Advertising and want stimulation mean one person's consumption becomes his neighbor's wish—supporting the institutionalization of envy. When wants depend on output it can no longer be assumed that welfare is greater at an all-round higher level of production than at a lower

one. Samir Amin (1992) illustrates this position with an example.[2] He concludes by asserting that "sustainable development in nonsense unless we accept that the social system should be reorganized in such a way as to effectively base production decisions on needs defined prior to production, rather than basing needs on production decisions" (p.525). The further argument is that the fundamental needs of all people should be met prior to fulfilling ever-expanding psychological wants for those that can afford them. In this regard Mishan (1967, p.15) concludes that current economic growth patterns are "hardly more than a policy of drifting quickly—of snatching at any technological innovation that proves marketable with scant respect for the social consequences." In the policy arena this is equivalent to keeping our eyes "glued to the speedometer without regard to the direction taken"(p.7) A simple switch of the words want and need will serve to remind us that different approaches and policies are available.

The second part of this argument is that rising income and producer efforts (the first part of the argument) biases decisions towards private consumption and away from collectively enjoyed goods (including environmental quality) that must be communally provided. If balance between private and collective goods is important "the continued pursuit of economic growth by Western societies is more likely on balance to reduce rather than increase social welfare" (Mishan 1967, p.171).

Why, in a culture so thoroughly indoctrinated with the virtues of justice, fairness and compassion, is such gross inequity permitted to continue? Perhaps it is explained by Niebuhr who recognized the desire of powerful people to hide the their greed and the inclination of society disguise the brutal facts of human life. Or is it that self-interest and advantage "blinds the eyes of moral insight and lames the will of moral purpose?" Alternatively, it may reflect "the culture of contentment" (Galbraith 1992). The past teaches "that individuals and communities that are favored in their economic, social and political condition attribute social virtue and political durability to that which they themselves enjoy… even in the face of commanding evidence to the contrary…. There is an eager political market for that which pleases and reassures" (p.2). Galbraith goes on to demonstrate, through a variety of historical examples, that this is short-sighted. The contented however "do not contemplate and respond to their own longer-run well-being. Rather, they respond, and powerfully, to immediate comfort and contentment" (p.6). To reassure that advantage is based on individual merit, the role of the state is belittled. "Although intervention by the state on a wide and varied front once saved capitalism (1930s-40s), there is now a resistance to the state action that is necessary to ensure an economically successful and social tranquil future" (p.176). In addition, public servants are depicted as "bureaucratic, feckless, incompetent, on occasion self-seeking or corrupt and certainly ineffective" (p.177).

This erodes belief in political processes as a means for introducing changes that support social and economic justice. Change it seems may only come about if the

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[2] "Each year consumers are confronted with 200 models of automobiles, offered at given prices. But let us suppose that another production system had offered only 20 models, but at reduced prices through the reduction of costs associated with product differentiation. Who is to say that consumers would not prefer choosing among 20 less expensive models than the 200 models that arise in our present system?… Why then is society seeming forced to offer 200 models? The answer is obvious: because competition between car manufacturers leads to this product proliferation (useless and costly even in the eyes of consumers, if they were ever asked). The structure of production…determines consumption, in the sense that it determines the real framework within which choices are made" (p.525).

enjoyment of the contented is drastically disrupted or redefined. Some see this as possible. Nelson (1997, p.188) argues that in the USA there "is a contemporary crisis of belief in the redeeming powers of economic progress."

> *It is simply no longer possible for most people to believe that progress will solve all the problems of mankind, spiritual as well as material. As the value-foundation for the market mechanism is undercut, this does not mean…that the market as an institution will disappear. It does mean that the role of the market will have to be understood in new terms—in a new social value context—that will inevitably set new constraints and general parameters on its operation.*

More generally it has been observed that if the present economism continues to dominate "we must be prepared for serious social conflicts and crises…For we cannot assume that society as a whole would accept a lapse into nineteenth-century liberalism and pure capitalism without putting up any resistance" (Küng 1998, p.168).

The two other explanations reflect a conspicuously different approach to the causes of inequality. Sagasti (1997, p.1563) argues that the greatest lesson we have learned "consistent with the view that development can be considered as a reinterpretation of the idea of progress" is that "the capacity to acquire and generate knowledge…has been the most important factor in the improvement of the human condition." As a consequence he traces the problem of inequality to the great schism in technological capacity that divides "those peoples who have the capacity to generate and utilize knowledge and those who do not" (p.1564). These "two civilizations interact with each other in an asymmetric manner: the second civilization (largely non-Western) is dependent and deeply affected by the first (largely Western), but lacks the capacity of influencing it" (p.1564). The first civilization possesses a structure and worldview within which technology and science are closely integrated with production methods, social processes and life styles. By contrast the "second civilization is characterized by a low capacity to generate scientific knowledge, a broad traditional technological base on which a thin layer of modern imported technologies is superimposed, and a productive system with a rather small modern segment closely linked to the economies of high income nations and a larger traditional segment that is relatively isolated from the international economy" (p.1564). This divide is rapidly becoming an "impassable abyss" and "suggests that the limited science and technology capabilities of most developing countries—which are woefully inadequate to…the challenges of economic advance, social progress and environmental sustainability—are likely to remain at their present low levels for a long time" (p.1565-1566).

Much of the past and the predicted future he attributes to cultural impediments and a lack of political commitment and will. The developing nations "are characterized by the coexistence of disjointed and even contradictory cultural forms. They face difficult choices regarding the importance attached to tradition, with its hierarchies, codes and rites, in relation to the weight placed on reason—the foundation of modern science—with its capacity to create order and disorder, and to transform and destroy" (p.1564). In order to rewrite the future he renews the call made by the UN Advisory Committee on Science and Technology for Development in 1989:

> *Humanity approaches a new century confronting a fundamental paradox: we have never had so much power to influence the course of civilization…and to create an ever-expanding range of opportunities for human betterment—but we remain unwilling or unable to use this new-found power to achieve our full potential as human beings….(O)ur scientific knowledge and technological mastery have outstripped our collective capacity to manage advances in science and technology so as to enhance the opportunities and reduce the threats they create. A bold and imaginative effort in social and institutional innovation at all levels—from local to international—is now essential for survival and progress.* (p.1567-1568)

The final and most frequent pro-market explanation for existing patterns of inequality stresses the perverse influence of policy failures and governmental intervention in the market place. The problem is not the erosion of support for governmental action. Rather the problem is placing too much confidence in government action as a solution and thereby granting government too much power and influence. According to neoliberal thinking the government should not try to make people good, neither should it try to establish a good society. In the absence of any useful definition of the public interest the appropriate role of government is limited. In Friedman's (1962, p.27) view its principal role is to do those things "that the market cannot do for itself, namely to determine, arbitrate, and enforce the rules of the game" including the assignment of property rights. Beyond being a rule-maker and umpire the government should promote workably competitive and efficient markets, provide a limited number of public goods that would otherwise be under funded, ensure that producers and consumers face the socially optimal full costs of their decisions in the presence of non-market priced negative externalities, and a variety of other things like providing an appropriate monetary structure.

Others interpret liberalism more generously and pragmatically. "Many of the profound issues in economic policy are, at bottom, moral issues. Unfortunately, ideology is too often the handmaiden of mythology. The problem with true believers is that believe too easily" (Blinder 1987, p.20). Good economics should be more pragmatic and not dominated by T-shirt slogans. It supports "the market mechanism where it shines.., helps it along where its flaws are remediable.., and overrules it by government fiat where it fails" (p.27). As demonstrated by Box 1.4 Blinder captures very well the distinctions between strict and generous interpretations of economic liberalism. He continues by stressing that unfettered markets cannot do everything because the "market cares not for fairness, but only for efficiency" (p.27). Under its relentless discipline "the free market takes no prisoners. In the process, it generates great inequalities." This is the social price of incentives because "for a society to prosper, it must have big winners." At the same time the market system shows no mercy. "If there is to be mercy, it must be imposed from the outside" (p.27-28).

Strict neoliberals see political intervention to balance equity and efficiency as an inappropriate violation of the principles of freedom and individualism. The others are not much more confident that political institutions will make the appropriate and necessary choices. Several reasons support this presumption. The most obvious reason is that governments simply cannot acquire, categorize and process complex information as

effectively and efficiently as markets. Thus efforts to significantly replace markets without evidence that they are failing is a recipe for disaster. Beyond this however political decision-making is distorted by corruption and the "Three I's: ignorance, ideology, and interest groups" (p.197). For political reasons, good economics doesn't always mean good politics and "when conflicting economic advise is offered, only the worst will be taken" by politicians (p.4).

Thus from most reasonably objective perspectives the prevailing international system is awash in market and policy failures. Both must be corrected if sustainable development in any useful form is to emerge as a standard of practice. It appears to me at least that three conclusions can be drawn from this subsection. First, there is no real evidence in practice or in theory that unfettered markets will yield the distributional equity or fairness desired within a socially acceptable time frame. Nor could they be expected to produce these outcomes—product and financial market discipline is programmed to exploit cost savings and profit maximizing advantages for owners of capital. Thus external intervention is required if social and economic justice is established as a virtue defined independently of neoliberal economic values.

Box 1.4 Hard and soft interpretations of economic liberalism

Our market economy can usefully be thought of as a game with winners and losers in varying degrees. But the economic game is (not necessarily) fair. Some players have advantages….What are we to do about this inequality?

The hard-hearted attitude is that our wonderful market system is so essential and so fragile, that we must not tamper with it in order to aid the underprivileged, the shortsighted, the indolent, or even the unlucky. Let everyone compete on an equal basis…and let the chips fall where they may. If some players are lame or injured, that's a shame. But they must be left to nurse their own wounds, for efforts to assist them would be futile at best and harmful at worst….

The soft-hearted attitude holds that we ought to soften the blows for those who play the economic game and lose, or who cannot play it at all. That objective can be served by making the game less vigorous and risky….Or it can be done by making the victors share some of the spoils with the vanquished….

Which attitude is the correct one? Which attitude most nearly captures the ethical notion of fairness? There are no objective, scientific answers to these questions…But more than a knee-jerk reaction leads me and many others to find the soft-hearted attitude more appropriate (Blinder 1987, p.23-24).

Second, the economic and political failures of the past are widely recognized. The most dramatic evidence of this is the emergence of the "third way" in European nations. After decades of excessive social welfarism and more recent experiences with social retrenchment most European electorates are seeking to chart a new course between freewheeling capitalism and big-government socialism. In the words of Tony Blair this will move them "beyond outdated ways of thinking—beyond an old left preoccupied by state control, high taxation and producer's interests and a new, laissez-faire right championing narrow individualism and a belief that free markets are the answer to every problem" (Montgomery 1998, p.2A).

These two imply the third—that markets must be encouraged or required to serve a broad range of human needs. The market should supplement democracy not replace or define it. Reestablishing an appropriate social definition of market processes and outcomes will be difficult to achieve given the inherent distortions and biases that now

exist. Ultimately this result must depend upon more socially responsible and effective political and corporate decisions grounded in a more positive ethical framework.

3.1.2. Cultural neutrality

The linkages between Western cultural ideas and institutions and modernization are historically evident. Its equation for progress—the capacity of liberal democratic political and economic institutions to provide the incentives necessary for advances in knowledge and the capacity to harness them in support of human wellbeing—is built on a system of values, beliefs and experiences that began to emerge thousands of years ago. At the same time we are frequently reminded that the cultural preconditions for this worldview exist only in the West. The Euro-American tradition is the "unique source" of the "ideas of individual liberty, political democracy, rule of law, human rights, and cultural freedom" (Huntington 1997, p.6). They exist in other societies only by adoption or imposition. In an era when economic growth and modernization have become universal goals the relationship between modernization and cultural content becomes an urgent question. It is elevated to a higher level by globalization and the strong desire of non-Western societies to modernize and grow with cultural integrity. As noted by Sagasti (1997, p.1564) the "challenge faced by the nations of the second civilization…is how to integrate harmoniously the pursuit of modern science and technology…with the social and cultural heritage that provides us with a sense of identity."

At least in the West, the potential for modernization with cultural identity and its associated implications frames a new question. In the past the West used to boast that its technological and economic successes gave it the tools needed to dominate the world. When combined with a strong sense of ethnocentric superiority the West developed a potent formula for the exploitation of nature and other cultures. These instincts for global expansion were fueled both by the need for new resources and markets and by a culturally inherent civilizing mission designed to educate others to understand and appreciate the benefits of civilization. These good intentions were often implicitly informed by Cahill's distinction between linear and cyclical worldviews. Although written under the guise of colonialism, Allier (quoted in Berthoud 1990, p. 24) stated in 1927 that for "primitive societies" at a:

> *certain point in their development, a kind of halt seems to have taken place: further progress was not possible….left to their own devices, they would forever have remained fixed at the same point and that, in order to progress further, they need some kind of outside intervention…A hand must be extended to them that would lead them on to the upward path. Amongst civilized people there is infinite intellectual progress: there is the never-ending victory over things. Amongst the others, there is only stabilization without any change for the better, there is only monotonous and futile stagnation.*

In this statement we see elements of the West's traditional approach to the worldwide spread of progress—to supply or transfer the "missing links" of growth and progress to other societies. This approach combines an ethnocentric Western sense of cultural superiority and confidence in the universality of its traditional values and view of

human nature. "(T)he spirit of enterprise, free exchange and democracy are universal principles and are therefore perfectly applicable to all civilizations" (Sorman quoted in Berthoud 1990, p. 26). The perceived problem was that other societies had not yet been sufficiently exposed to the superior alternatives offered by the West and its model of progress. In its strong and until recently its dominant form, policies and practices by Western governments and corporations were based on the assumption that modernization and Westernization were inextricably linked. The prevailing view was that modernization is desirable and necessary, that the indigenous culture is incompatible with modernization and must be abandoned or abolished, and that society must fully Westernize in order to successfully modernize. Modernization and Westernization reinforce each other and have to go together. Hence economic development will "require a radical and destructive remaking of life and society, and, often a reinterpretation of the meaning of existence itself as it has been understood by the people who live in these civilizations" (Pfaff quoted in Huntington 1996, p.73). A similar viewpoint dominates social science thinking about development.

> *Economic development of an underdeveloped people by themselves is not compatible with the maintenance of their traditional customs and mores. A break with the latter is a pre-requisite to economic progress. What is needed is a revolution in the totality of social, cultural and religious institutions and habits, and thus in their psychological attitude, their philosophy and way of life. What is, therefore, required amounts in reality to social disorganization. Unhappiness and discontent in the sense of wanting more than is obtainable at any moment is to be generated. The suffering and dislocation that may be caused in the process may be objectionable, but it appears to be the price that has to be paid for economic development; the condition of economic progress.* (Sadie 1960, p.302)

In the economics of development the assumptions of this neoliberal process model continue largely unchallenged today. Rogue notions such as dependency theory, self-reliance and de-linking essentially reflect concerns about the outcome of international economic processes and the fear that trickle-up effects may persistently overpower promised trickle-down effects. Their focus is on equity, fairness and income distribution in market processes, not on the cultural content of political economy. The economism and positivism of economic theory have prevented efforts to confront the normative cultural aspects of development(Wiarda 1983).

Confidence in the appropriateness of these prescriptions for development is less obvious in the other social sciences and in international organizations. Increasingly it is being accepted that the "most important distinctions among peoples are not ideological, political or economic. They are cultural" (Huntington 1996 p.21). For many the cultural dimension of development and progress is emerging as a critical consideration. Cynics may attribute this to faint-hearted or soft-headed impatience with obstacles and challenges that the neoliberal model must overcome to be successful. Others may see it as an intellectual scramble to preserve confidence in the notion of universal progress given the persistent failure of other approaches to development. Still others may view this as an attempt to undermine the emergence of a universal culture defined as the increasing

acceptance of common values, beliefs, orientations, practices, and institutions by peoples throughout the world.

Support for cultural integrity as a condition of modernization and progress often rejects the relevance of Western ideas. Wiarda (1983) states that the criticism centers on the bias and ethnocentrism perceived in the Western models. "For societies cast in quite different traditions from the Judeo-Christian one, lacking the sociopolitical precepts of Greece, Rome, and the Bible, without the same experiences of feudalism and capitalism, the argument is that the Western model has only limited relevance" (p.62). He concludes: "It is not just the model itself that is now being challenged… but the larger, preeminently Western…parochial and ethnocentric, philosophical and intellectual tradition that went with it. What we in the West…assumed to be a universal set of norms and processes by which societies developed and modernized…has now been demonstrated to be somewhat less than that" (p.75).

But wishing for a form of development and modernization that preserves cultural integrity and identity is not enough. Neither does it answer the question of whether it is even possible. There are no persuasive contemporary models of success. How can legitimate cultural pluralism prosper in a world where the rules are so completely dominated by Western ideas and institutions? More generally, has continuing contact with the West eroded the very potential to establish alternative indigenous models based on cultural preferences? Most of the elite in non-Western nations have been co-opted and their status and rewards depend upon perpetuation of the prevailing model. The "Davos Culture" now controls "virtually all international institutions, many of the world's governments, and the bulk of the world's economic and military capabilities" (Huntington 1996, p.57). These people "share beliefs in individualism, market economies, and political democracy." Yet most of the people in non-Western nations subscribe to a very different cultural reality. "Outside the West West it is probably shared by less than 50 million people or 1 percent of the world's population and perhaps by as few as one-tenth of 1 percent of the world's population. It is far from a universal culture, and the leaders who share in the Davos Culture do not necessarily have a secure grip on power in their own societies." This "common intellectual culture exists…only at the elite level: its roots are shallow in many societies" (p.57-58).

In reality we know little about the role culture can play in development and modernization. We know even less about the meaning and content of development with identity. Are belief in progress and the virtues of individualism essential components? What are the irreducible minimum elements of culture that must be preserved to retain identity and integrity? We know that modernization imposes cultural change and adjustment, but how much is too much? Which new ideas and mechanics can be grafted on traditional or non-Western cultures to permit development, modernization, and identity?

We do know that any pathway to a sustainable future must seek to resolve these issues if any measure of global social tranquility is to exist. We also know that human existence requires the existence of cultural communities and therefore that cultural diversity should be a valued goal. The 1995 World Commission on Culture and Development report, *Our Creative Diversity,* makes this clear. It states that when development is defined as economic growth, culture has no intrinsic value and is reduced to a means to support economic advance. More aggressively it argues that the cultural

dimensions of human life are generally more important than economic growth which, even though important, is only a means not the goal of existence.

3.1.3. The relationship between humans and nature

One of the recurrent themes in Part 2 was that the evolution of Western belief in progress was supported and informed by strong philosophical dualisms. Three of the more important were those that defined relationships between humans and nature, between individuals and communities, and between economism and humanism. The creative tensions in these dualisms were progressively denigrated and deformed into superior-inferior relationships as Western society evolved. As indicated earlier Royal laments that the excesses of this reductionist view threaten to erode the fullness of Western ideals by undermining our ethical sensitivity and destroying the environment and our relationship to it.

Since I have already explored some of the consequences of the triumph of individualism and economism, in this subsection the principal focus in on the humans and nature dualism. The discussion stresses the origins of the Western notion of human mastery over nature as a source of progress, its consequences for environmental degradation and human alienation, and its continued legitimacy in the context of sustainable development. In so doing it must be remembered that views supporting human dominance over nature are only the necessary or driving force in this situation. The biases of individualism and economism strengthened, supported and in many ways defined the content of this domination especially in the context of utilitarianism, benefit-cost analyses, and the notion of economic rationality.

The Western view that nature exists for human use was a well-established tenet of ancient Greek and Roman thinking—in the words of Protagoras "man is the measure of all things." Similar views were evident from the Scholastic period through the Protestant Reformation and beyond in the Judeo-Christian tradition. Passmore (1980, p.20) concludes that Christianity "encouraged certain special attitudes to nature: that it exists primarily as a resource rather than as something to be contemplated with enjoyment, that man has the right to use it as he will, that it is not sacred, that man's relationships with it are not governed by moral principles." As Western thought evolved through the Enlightenment this view became secularized and unleashed the scientific revolution that has come to symbolize Western belief in progress. Indeed, in almost all accounts modernization and belief in progress are now defined in terms of human capacities to harness and use nature for its own purposes. Thus the notion ascribing only instrumental value to nature and its uncompromised availability for human use is one of the fundamental concepts of Western thought:

> *Here we are faced not with a short-lived aberration, but rather with a remarkably consistent pattern of thought that has roots deep in the main cultural traditions of the Western society. It is a collective vision, not an individual thinker's idiosyncrasy…. The modern notion of mastery over nature carries the living force of this image, particularly the meaning bestowed on it by Christianity, into the present; to dismiss it as a terminological error is to deprive oneself of a valuable clue to the social consciousness of our*

time. (Leiss 1994, p.34)

At the same time the West has often been uncomfortable with this view. The tension between our desire to enhance wellbeing by dominating nature and a nagging guilt about the consequences has been one of the contradictions of modern civilization. This tension has increased with the intensified pace of environmental damage that accompanied the promise of universal development.

3.1.4. Origins

Professor Lynn White (1994) established the terms of the modern debate about the sources of environmental degradation and human alienation from nature during the mid-1960s. He attributed the "historical roots of our ecological crisis" to orthodox Christian arrogance. The argument was in two parts. The first was that "the present increasing disruption of the global environment is the product of a dynamic technology and science which…cannot be understood historically apart from distinctive attitudes toward nature which are deeply grounded in Christian dogma" (p.14). Thus while the scientific revolution, as guided by marketplace dictates of growth, is identified as the proximate source of the problem, it is more of a symptom than a cause. The second followed from this—since the roots of our crisis are religious in nature, the solution must be found in changed ethical or religious views rather than in technological remedies or fixes. "Today, around the globe, all significant science is Western in style and method" and is based on a single view that "man and nature are two things, and man is master" (p.7,9). As a result, he concludes that "we shall continue to have a worsening ecological crisis until we reject the Christian axiom that nature has no reason for existence save to serve man" (p.14).

White's paper generated a firestorm of protest and debate that continues unabated. Much of the protest centered on his characterization of prevailing human attitudes toward nature as representative of Christian doctrine—that is, are these views really Christian ideas or secular distortions? More importantly the debate focused on prevailing notions of human-nature interactions and the role of ethical/religious versus technological approaches as solutions for environmental problems. Both deserve some attention here.

Western views of the nature of humans are deeply influenced by the creation story recounted in the Book of Genesis. It announces the sovereignty of God over all things and provides a derived authority of humans over all other living creatures. God tells Adam to multiply and dominate the earth. While humans were created in the image of God traditional Christian doctrine maintains that "man does not rule over the animal kingdom because he is God's image: rather, he is God's image precisely because he rules over the animal kingdom, thus sharing God's universal dominion" (p.31). Further, as articulated by St. Thomas Aquinas, Christian doctrine has consistently held that, with work (the consequence of man's fall in Eden), humans were given full dominion over all plants and inanimate parts of nature. The Hebraic and Christian tradition declares that humans are sacred but distinctly rejects any trace of divinity in nature. At the same time nature was to be treated with respect as a product of God's miraculous creation and His providential care. As a part of creation nature was placed in the stewardship of humans.

This belief in a "natural theology" derived from Greek philosophy as interpreted by Augustine and Aquinas was preserved by clerical authority in the Christian West well into the seventeenth century. It was challenged initially by Francis Bacon and Rene Descarte—often said to be the intellectual fathers of the scientific revolution and modernity. Bacon led the charge by linking scientific inquiry to religion—both, he argued, were engaged in a complementary effort to compensate for the consequences incurred by man's expulsion from paradise. In his view "man by the fall fell at the same time from his state of innocency and from his dominion over creation. Both of these loses however can even in this life be in some part repaired; the former by religion and faith, the latter by arts and sciences" (p.49). Thus mastery over nature through scientific progress did not violate God's plan. Rather it was part of God's redemptive plan that rang true in an era when concern with this life was gaining equal footing with traditional concerns for the next life.

> *By casting his pleas for scientific progress in a familiar religious mold (Bacon) managed to win wide acceptance for a novel conception of mastery over nature…. His contention that science shared with religion the burden of restoring man's lost excellence helped create the climate in which earthly hopes flourished at the expense of heavenly ones. More important…was his coupling of innocence and dominion. Bacon claimed to have identified a way back to the latter—through science—which was quite different from the means available for regaining the former (of course in neither case would there be a complete recovery).* (p.53)

This attitudinal shift was profound and readily embraced by the rapidly expanding commercial class. Recovery from mankind's original sin no longer was based solely on moral progress and knowledge with its just rewards in the next life. Rather a partial recovery of paradise lost was possible in this life through scientific progress and knowledge. Earthly knowledge of nature would simultaneously provide material gains and freedom from the bondage of superstition and irrationality.

In order to set the stage for modern thinking Bacon, along with Descartes, needed to remove all value from nature, including the human body, to justify the unimpaired study and exploitation of the natural world. This was accomplished by separating the soul from the human body which, along with all other parts of the natural world, were described as mere machines or geometrical mechanisms. With these impediments removed their new method of scientific investigation took hold and unleashed a persistent era of discovery and mastery over nature.

Like most of the new ideas that emerged in this era the liberalizing reinterpretation of the human-nature relationship was seen as operating under the restraining hand of ethical/moral guides. As Bacon noted "Only let the human race recover that right over nature which belongs to it by divine bequest, and let power be given it; the exercise thereof will be governed by sound reason and true religion" (quoted in Leiss 1994, p.189). And just like the notions of individualism and political-economic institutions, and for similar reasons, this original balance was shattered by the Enlightenment and further distorted over the past fifty plus years by the excesses of self-interest and universal economic growth.

> *So long as Christianity remained a vital social force in Western civilization, the notion of man as lord of the earth was interpreted in the context of a wider ethical framework. Religion's declining fortunes, however, led to the gradual secularization of this notion…and in contemporary usage it reveals few traces of its Judaeo-Christian background. The identification of mastery over nature with the results of scientific and technological progress…dissolved the traditional framework. The purely secular version of this image… (has shed) the ethical covering that both sustained and inhibited it. In its latter-day guise, mastery over nature loses the element of tension resulting from the opposing poles of domination and subordination in the religiously based version and adopts a unidimensional character—the extension of human "power" in the world.* (p.35)

The Baconian formulation is internally consistent only in a religious or moral context. The domination of nature "conceived as the possession of power *over* nature by the human species as a whole, is an idea which makes sense only in relation to the absolute separation of spirit (God) and nature in Judaeo-Christian theology—and thus is an idea which cannot be secularized without losing its internal harmony" (p.188).[3]

3.1.5. Consequences

As commonly conceived the Baconian revolution contains one of the grandest ideas ever to emerge from Western culture. It has transformed our world and how we view it. Still Sagasti (1997) notes we have moved to a post-Baconian world that is forcing us to question the basic premises upon which our contemporary views are based. Reinterpreted in terms of secular individualism and economism Bacon's formulation was distorted and its supporting tension forgotten. Neither religion nor reason nor our social institutions have been strong enough to curb the excesses of our expanding power over nature. As C.S. Lewis (1946, p.40) concludes "what we call Man's power over Nature turns out to be a power exercised by some men over other men with Nature as its instrument." As a result Bertrand Russell (1924, p.7) opined that "whether, in the end, science will prove to have been a blessing or a curse to mankind, is to my mind, still a doubtful question." One is left to wonder how technological advances would have evolved if they had been informed by a greater respect for nature.

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[3] "In this theology, spirit dominates nature as the creator of nature. Man shares the privilege of domination inasmuch as he is the only natural being which participates in the realm of spirit. The fact of domination is an eternal condition, that is, it is without any reference to time or change, for time is created by spirit simultaneously with nature. In Christianity the great moment of the irruption of spirit into nature—the incarnation of Christ—occurs as a means of restoring the original foundation of God's work through the redemption of man from the consequences of the Fall. Domination over nature is *a priori*: man's portion of it is the gift of God rather than his own accomplishment. And this is related to another *a priori* condition, namely, the unity of the species which inherits Adam's prerogatives. Domination over nature as a religious notion pertains to "man as such," not to particular men in their desperate search for means of satisfying their mundane needs" (p.188).

During the Enlightenment the natural philosophy of preceding centuries was bifurcated into natural science (with its focus on identification, measurement, and mathematical calculation) and the philosophy of nature (which accept for clerical and some academic philosophers soon transformed into a philosophy or sociology of science and technology). Under the expanding pressures of commercial activities Aristotelian approaches that focused on understanding the why of natural phenomenon gave way to an emphasis on how the natural world could be transformed for profit. This change from a contemplative to a pragmatic approach to nature converted natural science into technical science—advancement of knowledge was driven by what practical or profitable use could be derived from it.

A massive and widely familiar literature traces the diverse consequences stemming from the secular transformation of the notion of human mastery over nature. It is sufficient only to note the degradation that has resulted from treating the environment as a free good whenever possible in economic calculations and the social dislocations that accompany the artificial separation of humans from their natural relationship to their surroundings. From any perspective one of the great ethical problems of our time relates to the question of how we should view human relationships to the environment.

3.3.3. Solutions

Many view the problem of social-environmental dislocation as an economic or technological issue. Sharder-Frechette (1981, p. ix) disagrees:

> *If environmental degradation were purely, or even primarily, a problem demanding scientific or technological solutions, then its resolution would probably have been accomplished by now. As it is, however, our crises of pollution and resource depletion reflect profound difficulties with some of the most basic principles in our accepted system of values. They challenge us to assess the adequacy of those principles and, if need be, to discover a new framework for describing what it means to behave ethically or to be a "moral" person.*

Along with White and many others she argues that fundamentally changed attitudes and values are prerequisites for technical solutions to succeed.

Two streams of argument emerge from those who accept this general view. One traces the problem not to secularism but to anthropocentrism and its reduction of nature to an object of consumption. Holmes Rolston (1993, p.60), for example, argues that "there is something un-Christian, something ungodly, about living in a society where one species takes itself as absolute and values everything else relative to its national or personal utility." Advocates of this view see the solution to environmental problems either in the rejection of anthropocentrism or in its extensive modification. They typically are attracted to the bio- or ecocentric values found in Oriental religious and cultural traditions or in the animism of non-modern, traditional cultures (Booth and Jacobs 1993). The distinctions are significant—"Orientals do not think of man, nature, and the divine primarily as realities or dimensions which are distinct and autonomous…Rather, their vision is non-dualistic, situated between monism (animism) and dualism

(anthropocentrism). The Oriental is more concerned with the union, harmony, and non-duality existing among all dimensions …(because) life resides rather in the harmony of the whole than in the difference of its parts"(Vachon quoted in Goulet 1993, p.28). Weiming (1993, p.74) views these alternative philosophies as "three kinds of spiritual resources" that must be integrated and mobilized if sustainable development is to succeed.

> *I am proposing that, as both beneficiaries and victims of the Enlightenment mentality, we show our fidelity to our common heritage by enriching it, transforming it, and restructuring it with all three kinds of spiritual resources still available to us for the sake of developing a truly ecumenical sense of global community.*

The other strand of argument accepts the logic of a human-centered approach but insists on the need to imbue it with traditional Judeo-Christian notions of stewardship and justice (Dobel 1994). More generally Ramachandra Guha (1994, p.244) argues that "invoking the bogy of anthropocentricism is as best irrelevant and at worst a dangerous obfuscation." The proximate causes of social-environmental problems around the world he believes are "overconsumption by the industrialized world and by urban elites in the Third World" and excessive military expenditures neither of which serve the best interests of humans (p.243). On its face the solution is simple, but few are ready to listen. The question of consumption is the "forbidden question. Over it hangs a nearly total silence.

The Brundtland Report (1987) accepts an anthropocentric approach to human-nature relationships. It also ignores the forbidden question, or more correctly assumes much of it away. Indeed perhaps the most revolutionary assertion of the document is its assumption that economic growth and social-environmental quality and justice are compatible goals or objectives. This assertion, while a political concession to diverse views, rebutted the orthodox view that accepting social-environmental obligations increased costs and reduced efficiency which, in turn, impeded the pace of economic growth. Traditionally social choices were cast in the trade-off between growth and environmental quality with poorer nations cautioned to defer the latter until a time of greater national affluence was achieved. The Report alleged that at least in certain situations the unfortunate trade-offs could be avoided.

Whether intended or not the visibility of this assumption has had two major consequences. One is support for the mechanics of considering economic and environmental effects simultaneously in investment decision-making. This recognizes or at least encourages recognition that return on investment has a double meaning—both financial and ecological criteria have to be satisfied in benefit-cost assessments (Rees 1994). Further it has forced us to consider nature as a two-part capital asset—both the traditional raw materials of nature and the environment are capital sources subject to concerns of availability and substitutability. This has in its more technical economic form fostered a distinction between weak sustainability and strong sustainability and a discussion concerning what should be sustained (strong sustainability supports maintaining physical levels of "natural capital") and why (weak sustainability supports traditional measures of wellbeing and capital substitution) (See Jamieson 1998).

The second and more important consequence for this chapter is that it places the human-nature dualism squarely in the context of the individual-community dualism. This nexus is developed cogently by Verburg and Wiegel (1997). They associate weak sustainability with traditional Western concepts of economic growth and its sources. The central value presumption of this notion is Peacock's view that economic freedom is the only material condition compatible with human dignity. This individual freedom is also a necessary condition for economic growth because it induces adjustments to the changing preferences of its members in response to market forces. Finally economic freedom is characterized by an ever spiraling transformation of desires and wants into needs that can and should be satisfied in the marketplace. Strong sustainability principles are linked to the Brundtland Report's concern for a global concept of needs in which the overriding priority is given to the essential needs of the world's poor. The purpose of economic growth is to meet the requirements of justice and equity in a global community that lives within the carrying capacity of the natural environment over time. In this worldview the purpose of economic growth is to serve a different balance between freedom and equity than that postulated by neoliberals. Rather that stressing individual economic freedom, the Brundtland Report values justice and equality in their own right and elevates them to parity. It "implies a concern for social equity between generations, a concern that must logically be extended to equity within each generation" (Brundtland Report 1987, p.43).

The authors state that "the concept of sustainable development may be said to bring to the fore the implicit antagonism with the Western conceptions of liberty (freedom) and solidarity (equity and justice)" (p.260). Their conclusion is clear:

> *Furthermore, our analysis reveals that the interpretation of the concepts of needs, limitations, liberty, and solidarity, in relation to the notion of sustainability, diverge from such interpretations in relation to the concept of growth, and consequently, that sustainability and economic growth cannot be simply assumed to be conceptually and normatively compatible…*
>
> *More specifically, the fundamental difference in the evaluation of the basic values of freedom and solidarity…require that the ideal foundations of our society be brought into the discussion in order to escape from the confusion that surrounds the debate on sustainable development. As long as this confusion remains, the discussion on sustainable development will remain vague, superficial, and unfruitful.* (p.260, 265)

4. Towards A Sustainable Future

The preceding pages have attempted to describe and explain the emergence of today's social ideology and the emerging concerns for the future that it has created. In the process it has indicated its strengths and accomplishments as well as some of its more perverse consequences. From among the more salient of these conclusions the following are noted. First, Western society lives in the legacy of the Enlightenment. From this baseline of ideas the dominant paradigm has come to be defined by a secular and materialistic rational empiricism. Notions of scientific rationality and social utilitarianism have come to dominate the fundamental measures of human progress. For all its contributions it has also distorted the creative tensions that define an acceptable and

sustainable social contract internationally and often within national boundaries. In short the prevailing patterns of decisions and outcomes have become unsustainable in the present and for the future.

Harvard Professor Tu Weiming (1993, p.67-68,69,71) summarizes well these basic arguments.

> *The Enlightenment mentality underlies the rise of the modern West as the most dynamic and transformative ideology in human history. Virtually all major spheres of interest characteristic of the modern age are indebted to or intertwined with this mentality: science and technology, industrial capitalism, market economy, democratic polity, mass communication, (etc.)…. Furthermore, the values we cherish as definitions of modern consciousness including liberty, equality, human rights, dignity of the individual, and due process of law are genetically, if not structurally, inseparable from the Enlightenment mentality….They have made our lifeworld operative and meaningful.*
>
> *We are so seasoned in the Enlightenment mentality that we assume that the reasonableness of its general ideological thrust is self-evident …. Enlightenment as human awakening, as the discovery of the human potential for global transformation, and as the realization of the human desire to become the measure and master of all things is still the most influential moral discourse in the political culture of the modern age (for the West and for the cultural elites of developing countries)….Despite impassioned reactions from the Romantic movement and insightful criticisms by the forefathers of the "human sciences," the Enlightenment mentality fueled by the Faustian drive to explore, to know, to conquer, and to subdue persisted as the reigning ideology of the modern West….*
>
> *Faith in progress, reason, and individualism propelled the modern West to engulf the world in a restless march toward modernity. As the Western nations assumed the role of innovators, executors, and judges of the international rules of the game defined in terms of competition for wealth and power, the stage was set for growth, development, and exploitation. The unleashed juggernaut blatantly exhibited unbridled aggressiveness toward humanity, nature, and itself. This unprecedented destructive engine has for the first time in history made the viability of the human species problematical ….(In the process) self-interest, expansion, domination, manipulation, and control have supplanted seemingly innocuous values such as progress, reason, and individualism….In the context of modern Western hegemonic discourse, progress means inequality, reason means self-interest, and individualism means greed.*

Turning to the future Weiming (1993, p.71-72) concludes that:

> *There is no easy way out. We do not have an "either-or" choice. The possibility of a radically different ethic or a new value system separate from and independent of the Enlightenment is neither realistic nor authentic…. We need*

> *to explore the spiritual resources that may help us to broaden the scope of the Enlightenment project, deepen its moral sensitivity, and, if necessary, creatively transform its genetic constraints in order to fully realize its potential as a world view for the human community as a whole.*

This is the context within which a sustainable future must be understood, defined and approached. It conforms with Royal's conclusion, presented earlier, that the best hope for a more humane world is in recovering and extending Western principles. The ancient Latin paradox, *Nova ex veteris* says it well—the new must be born out of the old. To this can be added the insight of Karl Marx (quoted in Keohane and Ooms 1975, p.209): "Men make their own history, but they do not make it just as they please; they do not make it under circumstances chosen by themselves, but under circumstances directly encountered, given, and transmitted from the past."

This constraint of course is not universally accepted. Much of the philosophical as opposed to operational literature on sustainable development advocates the adoption of some new ethical standard that differs conspicuously from Western norms and beliefs. This rejectionist approach is burdened by two seemingly insurmountable problems. First, it rejects the whole foundation upon which the concept's framers based their argument. While supporting the needs of cultural pluralism they recognize the dominance of Western influences and the fact that continued economic growth and technical advance are preconditions to any conceivable vision of a sustainable anthropocentric future. Similarly they accept that liberal political and economic institutions provide the greatest support for growth and innovation. Secondly, rejectionist approaches violate the conditions for successful change; i.e. that the capacity of ideas to persuade requires the existence of broadly shared assumptions. Thus only changes within the context of Western notions of progress are meaningful as a near-term guide to the future.

This part attempts to describe and defend those needed changes. It begins with a analytical perspective or model from which these changes can be structurally identified. It concludes with a discussion of what changes or adjustments need to be made, why they are important, and what effects they would have. In the process the discussion establishes my view of what sustainable development means to our globalized society

4.1. An analytical perspective

The dominant Western paradigm of progress has spawned a decision-making model that recognizes three notions of rationality—technological/economic rationality, ethical rationality, and political rationality (Goulet 1993).[4] Each rationality or mode of thinking provides valuable insights and perspectives that contribute to societal wellbeing. Technological/economic rationality, as I have already described in detail, is based on the epistemological foundation of objective or positive science. Its methods and derived knowledge of "what is" are directed to solving defined problems or to asserting control over nature, social institutions, or other obstacles that stand in the way of achieving material objectives. Its central logic emphasizes the means toward some stated end or goal guided by the calculus of efficiency in the assessment of time or the utility of any

[4] Goulet's paper provided the basic idea for the next several paragraphs, but his definitions and application is somewhat different.

object. Adherents claim the application of this form of rationality is largely or completely value-neutral or value-free. It leaves for others the tasks of dealing with normative values, concerns and societal preconditions under which goal-focused decisions are to be made.

Ethical rationality stands in juxtaposition by its emphasis on normative concepts of what "ought to be." In the modern context it asks individuals and society what kind of people they want to be and suggests how to achieve this stature. As noted earlier it speaks to our higher instincts and humanity in an effort to constrain our baser and socially disruptive instincts. Its goal is the creation, nurturing, promotion and defense of values as the ultimate standard for evaluating decisions, motivations and outcomes. Its measures are concepts of good and bad and it stresses the relationship between rights and responsibilities in civil society. While ethical rationality is subjective and normative it must be distinguished from the arrogance of moralism. To be rational it must represent an internally consistent and achievable holistic belief system rather than a partial rationalization of self-interest. To be legitimate it must define core rights and responsibilities universally so that those prerogatives and conditions claimed should be equally available to all others. Thus it is necessary to note that adherents to technological/economic or political rationality may be ethical as individuals but their decisions are not typically defined by adherence to any comprehensive notion of ethical rationality.

In democratic societies political rationality represents the middle ground between the other two forms. It balances individual rights with collective interests and responsibilities by establishing appropriate rules of societal interaction. Its standard is principled accommodation and compromise rather than slavish adherence to any interest group or sub-set of values. In its best form it becomes the functional architect and protector of the social contract.

Social reality is greatly influenced by how these three forms of rationality are perceived and utilized in decision-making. Common sense and the needs of an acceptable social contract suggest good decisional patterns will be informed by balanced integration of all three with political rationality acting as the fulcrum. Imbalance is likely to result in outcome trends that are unacceptable and socially unsustainable. For example, excessive reliance on technological/economic rationality threatens a legacy that will become politically unacceptable and ethically unworthy. Similarly, decisional patterns informed by one or another ethical litmus test quickly deteriorate into moralistic conflict and the paralysis of technological/economic and political rationality. At the same time it must be recognized that each form of rationality impinges on the logic and values of the others. To advance their short-term interests, adherents of each rationality will attempt to impose their views on the entire process by establishing the boundaries of discussion and the rules of the game. In this conflict arena the arbitral and mediating role of political rationality is elevated to its central importance.

Conflicts over environmental policy issues may assist in seeing these rationalities at work (see Cordes 1998). Advocates of ethical rationality are likely to view environmental degradation as a basic human rights issue that should not be reduced to crass dollars-and-cents calculations. They view the imposition of environmental risk and damage as an act of disrespect by powerful commercial interests who benefit at the expense of those who have little effective voice in decisions. These involuntary victims

of progress have a human and ethical right to be protected from this abuse. No aggregated utilitarian measure of public interest can be used to undermine this fundamental right regardless of the cost. Rather society has a collective responsibility to create and support those political institutions and public laws that protect these rights and regulate the exploitation of powerless communities and persons. As importantly, public policy should shift the burden of proof away from victims and governments to those that wish to impose risks and damages on society.

Advocates of technological/economic rationality, to the contrary, argue that environmental degradation is an economic problem involving economic growth and benefit-cost trade-offs rather than human rights. The correct answers are found in getting the prices right consistent with the notion of some socially optimal level of pollution. To achieve this policy measures should be imposed that charge firms for the socially unacceptable damages they cause. These put a price tag on degradation and provide incentives to reduce or minimize damages to avoid fiscal penalties. Essentially this view, as indicated by Box 1.5, substitutes self-interest for rights as a motivating vehicle.

Box 1.5 Ethical versus economic views of pollution

Some environmental activists think it is important to stigmatize the act of pollution. They want polluters to be criminals in the eyes of the law. And they want businesses to reduce pollution because it is the "right thing to do," not because it is in their financial interest. Clean-up should be considered virtuous, not profitable.

To economists, these are not very useful attitudes. We think society will fare better by using the invisible hand to goad self-interested companies into socially responsible behavior than by using the visible hand of the criminal justice system to slap polluters across the knuckles. And economists care more about results…than about motives. (Blinder 1987, p.148)

environmental damage would be permitted without compensation or permission. In contradistinction others focus on the goal of economic growth and the sacrifices necessary to achieve it. Significantly both attempt to influence political decisions and decisional methodologies. The former attempt to buttress their position with reference to basic human rights and the specter of exploitation. The latter attempt to elevate their position and influence valuation methods by suggesting that economic growth and environmental quality may be competing objectives.

It should be noted that even this simplified example under represents the typical range of conflicts associated with most decisional arenas. Since environmental quality and costs are not priced in existing markets both sides recognize and accept the central, unavoidable role of political decisions. In many cases however the very role of political rationality is itself challenged, making the analysis much more complex. Thus there is a tendency for competing rationalities to become arranged effectively in some vertical rank order hierarchy rather than retain the desired balance and integration of these countervailing perspectives. Arithmetically a variety of hierarchical structures are possible. Which one rises to dominance is the product of many factors not the least of which are the distribution of power and influence.

In traditional, pre-modern and theistic societies some form of comprehensive ethical rationality is likely to dominate the decisional hierarchy. In totalitarian societies a perverse form of political rationality is likely to prevail and impose its own dominion over decisions. Part 2 described the pathway by which technological/ economic rationality has come to dominate contemporary Western approaches to decision-making and to establish the global rules of the game. As we have noted much of its success reflects its capacity to generate enormous advances in technology and material production. Simultaneously, adherents to this form of rationality have succeeded in undermining the perceived role and validity of political and ethical modes of rationality.

Box 1.6 The dangers of economic ultraliberalism

Law, politics, science, culture and religion are not only analyzed with economic instruments(which is justified), but are in practice subjected to the economy, domesticated by it and depotentiated. However, a domesticated and depotentiated ethic puts at risk its very own values and criteria; it serves only as a pretext and remains inefficient. And at the same time, as is already proving to be the case in many areas and regions, a total market economy has devastating consequences:

the **law**, instead of being grounded in universal human dignity, human rights and human responsibilities, can be formulated and manipulated in accordance with economic 'constraints' and group interests;

politics capitulates to the market and the lobbying of pressure groups, and global speculation can shake national currencies;

science delivers itself over to economic interests, and forfeits its function of achieving the most objective and critical control possible;

culture deteriorates into being a contributor to the market, and art declines into commerce;

ethics is ultimately sacrificed to power and profit, and is replaced by what 'brings success'and 'gives pleasure'; and finally

even **religion**, offered as a commodity on the supermarket of ideas along with much that is para-religious or pseudo-religious, is mixed at will into a syncretistic cocktail for the convenient stilling of religious thirst which sometimes overtakes even h*omo oeconomicus.*

(Küng 1998, p.212)

4.2. Rebalancing and reintegrating rationalities

I have persistently averred that economic and political institutions are social creations whose mechanisms, rules and resulting outcomes must be judged by how well they serve human needs. They can and should be adjusted when market and political failures distort these ends. The focus however should be on adjustment rather that replacement. Competitive and free markets are necessary to any conceivably sustainable future. Similarly free democratic political institutions based on effective citizen participation are essential and should be strengthened everywhere. What needs to change is our collective understanding and interpretation of how these institutions should operate. As a consequence we need to change our attitudes and the values that are rewarded in the operation of social institutions. Ultimately ethical standards and wisdom must be the final judge of the acceptability of prevailing institutions in a free society.

In this sense liberal social institutions should be understood in ethical terms and evaluated by reference to a social contract that is fair to all and grounded on a consensus demanding basic human rights and responsibilities for all people. The market economy is not an end in itself. It must serve people's needs rather than subject them to the logic of its particular discipline. Further markets must supplement democratic political institutions and not replace, reshape or control political rationality. The triumph of technological/

economic rationality tends to create "conditions unworthy of humanity." As Kung (1998, p.212) states technological/ economic rationality provides important insights but "it must not be absolutized: it is justified only in relative terms." He continues by alerting us to the dangers of Friedman's "economic ultraliberalism" that elevates the sub-system of market economy to a total or dominant system with devastating results (see Box 1. 6).

The evidence presented in this chapter confirms that these dangers are real and present the context within which sustainable development was concieved and must be interpreted. Thus the central challenge of sustainable development is how to rebalance and reintegrate social rationalities so that a more equitable and sustainable future can be achieved within geographically bounded societies and globally. This challenge can be seen analytically as a two-step process. First there is a need to rebalance the authority and influence of the three modes of rationality by strengthening political and ethical inputs and loosening the strangle-hold of technological/economic rationality. Second, given the dangers inherent in any distinct hierarchy of rationalities, it is necessary to reintegrate them into a more circular, reciprocal and holistic model or approach to decision-making.

Professor Hans Kung (1998, p.214) suggests two premises that should be considered as a starting point:

- First, the primacy of politics over the economy: the economy must not function only in the service of the allegedly rational strategic self-assertion of *homo oeconomicus*; rather it must be at the service of higher ethical and political goals, expressed in measure of a political order.
- At the same time the primacy of ethics over the economy and politics: fundamental though the economy and politics may be, they are individual dimensions of the all-embracing world of human life which…must be subjected to ethical and humane criteria for the sake of human beings. So neither the economy nor politics comes first, but human dignity, which must be unassailable in all things: basic human rights and basic human responsibilities, and therefore ethics, must be formulated for the economy in an appropriate ethic.

4.2.1. Rebalancing political and technological/economic rationalities

I have argued that sustainable development is an ethical position packaged for political purposes. At the same time it is obvious that ethical appeals will have little effect unless sanctioned and combined with political will and action. The Brundtland Report (1987, p.9) is explicit in this regard when it concludes that "in the final analysis, sustainable development must rest on political will." Further, the purpose of this political will and the justification for strengthening political rationality must be clearly stated—it is necessary in order to establish an economic order that is politically obligated to humane and social goals at both national and global levels.

Assertion of legitimate and appropriate political authority is impeded by three basic realities. The first is the power of globalization that persistently undermines and overpowers the traditional prerogatives and authority of national governments. In fact, while globalization promises the numerous benefits and challenges of interdependence, it also raises the dangers of independence and expanded market dominance over political rationality. The second is the distorted, but persistently pursued demonization of political

authority and rationality. Rather than visionary leaders and protectors of national and social interests politicians and regulatory personnel have become viewed as self-interested, often corrupt, rent-seekers interested primarily in their own wellbeing—perhaps a natural consequence of the triumph of economism and its view of decision-makers at all levels. The simplistic dichotomy between market and political discipline as the only alternatives to economic decisions has enhanced this negative perception. The final reason is that this attitude has often been earned—generally and by the co-opting of political rationality by powerful interests. The demotion of integrity in political rationality is serious and offers few obvious solutions.

A prerequisite for legitimate authority, as I will explain below, is the rekindling of ethical motivations. More generally it requires a strong restatement of the content and role of political rationality.

Political rationality is not an alternative to technological/economic rationality as depicted in the market-versus-state intervention choice model that has dominated thinking. Neither is political rationality an unacceptable constraint on human freedom and individuality. Rather it is an enabling rationality that gives life to the social contract and provides for a sustainable balancing of liberty and equality. It is a complement not a substitute for market processes. Thus efforts to reassert political rationality should not be seen as an attempt to establish a new form of state interventionism that would only lead to new bureaucracies and economic inefficiencies. At the global level it is not a call for a world government or a planned world economy. Political rationality is not a synonym for state planning at the national or international levels. Rather the reemergence of political rationality should be seen as responsive to the need for national and global markets that are politically obligated to humane and social goals—to overcome the tendency to view political action in reductive economic terms. Democracy should be understood ethically as a social contract (in Kant's sense) which is fair to all, grounded in a basis consensus on universal human rights and responsibilities. "On this basis a rational politics will not one-sidedly strive for the greatest possible freedom for the individual citizen (in which those with lesser opportunities come off worse), but at the same time strive for just social conditions even if this is difficult" (Küng 1998, p.211).

The case for enhanced political rationality is based on the concept of community and its supporting logic of participation and collective choice. This elementary notion has been too frequently forgotten in the seductive but distorted unideminsionalism of neoliberal thinking. Indeed, "the unintended negative consequences of the rise of the modern West have so undermined the sense of community implicit in the Hellenistic idea of the citizen, Judaic idea of the covenant, and the Christian idea of universal love that it is morally imperative" to reformulate and reinvigorate this basic concept (Weiming 1993, p.73). In order to correct for the ideological distortions of the Cold War and the philosophical mischief espoused chronologically from Jeveons through Hayek and Friedman it is necessary to reestablish the notion of individual freedom as a social commitment. We must conspicuously reject the two bases of its crude utilitarianism—that concepts of community and the common good are fictitious, even dangerous ideas and that aggregated/averaged welfare measures provide structural or motivational fairness just because they count gains and losses to everyone in the same way.

Ronald Dworkin (1996) poses the fundamental question is a paper titled "Do Liberty and Equality Conflict?" He notes that in practice both conservatives and liberals

attempt to define these terms in such a way that "they do indeed conflict, steadily and relentlessly" (p.40). He rejects these definitions as crude theories that express no useful values—"On the contrary, they convert what are supposed to be political virtues into vices" (p.41). When properly conceived these virtues are not competing ideals but are compatible and mutually necessary. They are only different aspects of the fundamental "ethical individualism" that lies as the "heart of liberalism" and the social contract (p.57).

Ethical individualism is defined by two basic principles. The first is the principle of equal value which holds that it is intrinsically and objectively important that "human beings lead successful lives; important that once any human life has begun it flourishes rather than founders, and, above all, that it is not wasted" (p.42). That does not mean that all human beings are equally good or deserve to be equally successful. " It insists only that it is equally important, from an objective point of view, that all human lives flourish" (p.42). This principle is grounded in the ethical proposition that each person should want to make something out of his or her life and therefore that it is objectively important how each of us lives. From this Dworkin asks the question that leads to the second principle—"Is there anything different about you that could make that true for your life but not everyone's?" (p.42). This is the principle of special responsibility. It "declares that the connection between you and your life is nevertheless a special one" and "insists that this special relationship is best understood as on of special responsibility, that living is an assignment we can execute well or badly" (p.43). Further this assignment "requires both personal commitment and a social environment in which that commitment is encouraged and respected" (p.43). The virtue, the rationale, and the potential of community and a viable social contract lies in recognizing that these two principles are not in conflict. "The first does not contradict the second because it does not require that I accept responsibility for the success of any life but my own; it requires only that I acknowledge that from an impersonal point of view—the view appropriate to the government, for example—my own fate should matter no more than any one else's" (p.44).

The case is further strengthened and defined when Dworkin's arguments are linked to the discussions in sections 3.3.3. (concerning the compatibility of economic growth with social-environmental integrity) and 3.1 (concerning economic growth and international justice).

Sagoff (1995a) has translated this philosophical premise into everyday terms. He laments the excessive emphasis of civil over political liberties, the rights of privacy and property over those of community and participation. In the process the tradition of Rousseau has been supplanted by that of Locke and Mill. The utilitarianism of economic/technological rationality, with its emphasis on willingness to pay and benefit cost analysis, has caused political rationality to neglect the ideals of citizens in favor of the psychology of the consumer. To the question "What is wrong with that?" he answers that "not all of us think of ourselves simply as *consumers*. Many of us regard ourselves as *citizens* as well. We act as consumers to get what we want *for ourselves*. We act as citizens to achieve what we think is right or best *for the community*" (p.393-374). With only mild humor he describes this dichotomy between consumer preferences and citizen judgments in terms of his own "schizophrenia."[5]

[5] "Last year, I fixed a couple of tickets and was happy to do so since I saved fifty dollars. Yet, at election time, I helped to vote the corrupt judge out of office. I speed on the highway; yet I want the police to enforce laws against speeding. I used to by mixers in returnable bottles—but who

From this perspective, in a number of articles, he provides a more probing assessment of this dichotomy by comparing the utilitiarian ethics of economic/ technological rationality with the Kantian or deontological ethics that informs political rationality. The former advocate benefit/cost mechanics as the best guide to public policy decisions because the anointed goal is to maximize the production of things people wish to buy while minimizing the costs that people have to pay for them. "On this view, the value of a policy or decision may be measured by the amounts individuals are or would be willing to pay for (less the costs they would pay to avoid) its consequences" (Sagoff 1985, p.2). This notion of a "social profit" measure of value is objective or value-neutral only because the analyst has first imposed a theory of what value is. The only value that counts is how much individuals are willing and able to pay for what they want—"Those who are willing to pay the most, for all intents and purposes, have the right view; theirs is the more informed opinion, the better aesthetic judgment, and the deeper moral insight" (Sagoff 1995a, p.378).

By contrast in the deontological worldview the individual "is a judge of values, not a mere haver of wants, and the individual judges not for himself or herself merely, but as a member of a relevant community or group" (p.379). This approach also recognizes that some values are more reasonable than others and make a higher claim on the desires of the community. Thus the Kantian approach to value is constructed in the context of cognition rather than psychology. It argues that a person "who makes a value judgment—or a policy recommendation—claims to know what is *right* and not just what is *preferred*" (p.379). Social decisions cannot and should not be analogized to those of a business firm. Rather political rationality and public policy should tend to serve goals that may be justified independently on moral and cultural grounds. In sum political rationality must recognize and reflect that the values we believe in and seek as a community are often distinctly different, even opposed to those we might pursue as individual consumers.

Since people think of themselves ethically and politically as a community, not merely as a market participant, reliance on economic/technological rationality in public policy decision-making will lead to undesirable outcomes. In strong terms he condemns the domination of traditional economic/technological rationaltiy in public decision-making. He argues that it represents (p.380):

> *a theory that is impartial among values and for that reason fails to treat the persons who have them with respect or concern. It does not treat them as persons but only as locations at which wants may be found. And thus we may conclude that the neutrality of economics is not a basis for its legitimacy. We recognize it as an indifference toward value—an indifference so deep, so*

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can bother to return them? I buy only disposables now, but, to soothe my conscience, I urge my state senator to outlaw one-way containers. I love my car; I hate the bus. Yet I vote for candidates who promise to tax gasoline to pay for public transportation. I send my dues to the Sierra Club to protect areas in Alaska I shall never visit….And of course I applaud the Endangered Species Act, although I have no earthly use for the Colorado squawfish of the Indiana bat. I support almost any political cause that I think will defeat my consumer interests. This is because I have contempt for—although I act upon—those interests. I have an "Ecology Now" sticker on a car that leaks oil everywhere it's parked" (p.374).

studied, and so assured that at first one hesitates to call it by its right name.

Sagoff appears to accept Blinder's view that most profound issues in economic policy are ultimately moral issues. All forms of rationality must be brought to bear on their determination. There is an appropriate place for economic rationality but in public policy debates this rationality is best viewed as a constraint or an input measure of possible trade-offs. The fundamental determinant of political rationality is a balance between community and individual interests—it must emphasize knowledge, wisdom, morality, and taste that admit of better or worse, right or wrong, true or false—and these concepts differ from that of economic optimality.

Thus for philosophical and practical reasons (the enormous inequalities in control over resources) it is essential that an appropriate political rationality emerges to counterbalance the dominance of economic/technological rationality. This, including its expression both in laws and regulations as well as in expectations of conduct, is the only first line of defense for a sustainable future. Only political rationality can enforce the delicate balance between freedom in the marketplace and social justice and encourage a greater measure of social responsibility among companies.

Existing evidence does not support much optimism that national governments are constructively responding to this challenge. Rather a preferred future is likely to depend upon expansion of the trend towards political decentralization and local empowerment. The Brundtland Report (1987) and most other sustainable development documents support this as a necessary step.

In another more narrowly focused paper (Cordes 1998) I argued that this growing trend was induced by the persistent failure of political and market institutions to provide for the common good. The notion begins with the argument that development "can only occur when the people it affects participate in the design of the proposed policies, and the model which is implemented thereby corresponds to the local people's aspirations"(Peet and Watts 1996, p.242). This general theme implicitly recognizes that development depends upon ordinary people learning how to take charge of their lives. Thus true development cannot be achieved when it rests largely in the hands of political and company officials because of the disconnect between the views and aspirations of ordinary people and the "Davos Culture" that influences decision-making elites.

Structurally this approach recognizes that local communities, as "a repository of rights, participation, and associational life," occupy a "critical mediating space between (the) state and (the) market" (p.233). As a result "when the state fails to deliver public goods, insurance, management of externalities, minimum basic needs and democratic rights, civil organizations may fill the vacuum. The same holds…where market failures lead to the emergence of (civil) institutions, many of which take the form of organizations" (p.236 quoting de Janvry, Sadoulet, and Thornbeeke). The creation of these institutions "arise from the intersection of political-economic plunder and local demands for participation and justice" (p.245). These new associations and organizations are informed and strengthened by their appeals to populist sentiment that "goes beyond democracy to consensus." The driving force of populism is that it "calls on the state to inaugurate restoration, but it distrusts the state and its bureaucracy and would minimize them before the rights and virtues of local communities" (p.237, quoting Macrae). It is largely consistent with the thrust of political ecology that emphasizes local issues and

"often focuses on efforts to take resources out of the marketplace, to construct a sort of moral economy of the environment" (p.247).

Emerging trends however are seldom unambiguous. While expanded local participation is generally a step in the right direction, it is not without its dangers or excesses. Carried to an extreme it places a wide variety of productive activities in a hostage position. Some balance must be established that can "separate legitimate exercise of local power from cases where local obstructionism" leads to outcomes "that undermine the overall public good and local community values" (Norton and Hannon 1997, p.243). It is unacceptable to accept a locally determined form of economic NIBYism that is "overly selfish" and "degenerates into a game to ensure adequate compensation" (p.243). It is much easier to articulate a philosophically sound notion of ethical NIMBYism than it is to translate it into practical guidelines. Philosophically the appropriate standard for local participation is one that confirms that those rights granted to any one community should be available to all other communities, at least within a nation. Such a standard avoids the noted problems of elitism and the influence of political and economic power. Achieving it presupposes a level of political fairness and ethical clarity that is not always evident.

4.2.2. Strengthening ethical rationality

This discussion reinforces the importance of Kung's second premise—the primacy of ethics over economics and politics—as a necessary precondition for a more sustainable future. The greatest trauma to Western ideals and its concept of human progress has been the domestication of individual, corporate and political ethics by a perverse form of economistic ethics—itself a byproduct of the erosion of a sense of community. This has been expressed in the "willingness to tolerate inequality, the faith in the salvific power of self-interest, and the unbridled affirmation of aggressive egoism" that has "greatly poisoned the good will of progress, reason, and individualism" (Weiming 1993, p.72). In response it is necessary to recognize that sustainable development is neither an economic nor an ecological concept, not even a scientific concept, but an ethical demand. The search for a sustainable future therefore must begin with the search for an appropriate and sustainable global ethic—an ethic that provides for economic growth and technical advance but is also environmentally sensitive and compatible with the full

Box 1.7 Versions of the Golden Rule

---Confucious: "What you yourself do not want, do not do to another person." (Analects 15.23)
---Rabbi Hillel: "Do not do to others what you would not want them to do to you." (Shabbat 31a)
---Jesus: "Whatever you want people to do to you, do also to them." (Matt. 7.12, Luke 6.31)
---Islam: "None of you is a believer as long as he does not wish his brother what he wishes himself." (Forty Hadith of an-Nawawi, 13)
---Jainism: "Human beings should be indifferent to worldly things and treat all creatures in the world as they would want to be treated themselves." (Sutrakritanga I, 11,33)
---Buddhism: "A state which is not pleasant or enjoyable for me will also not be so for him; and how can I impose on another a state which is not pleasant or enjoyable for me?" (Samyutta Nikaya V, 353, 35-343,2)
---Hinduism: "One should not behave towards others in a way which is unpleasant for oneself: that is the essence of morality." (Mahabharata XIII, 114,8)

requirements of human dignity. To be viable it must reflect a system of irreducible values shared by almost all peoples and cultures.

The need is neither to invent or articulate a new global culture that would displace the norms, beliefs and values of existing religions and cultures nor to establish a comprehensive ethical consensus. Rather the quest is for the active identification, acceptance and application of core values already recognized as universal. It is the search for and effective validation of universal ethical maxims that have sustained cultures since time immemorial even though the process and application has become dulled in today's world. It accepts that there are right choices and wrong choices and, with Cahill, recognizes that in order to make the right choices each of us individually and collectively "must consult the law of God" that is written in our hearts. These fundamental ethical truisms must also merge notions of basic human rights with basic human responsibilities because it has become evident that stressing rights without concomitant responsibilities leads to deleterious consequences. It is useful to remember that the ethical tenants of the Ten Commandment delivered by Moses focused on duties and responsibilities rather than rights.

Perhaps surprisingly one does not have to search very long to identify two ethical maxims that are universally accepted and that are both ancient and contemporary. The first is the principle that all people must be treated humanely with dignity and respect. The second is the Golden Rule—do to others what you would want them to do to you. These two intimately connected principles should be the irreducible, unconditional norm for all decision-makers in each of their decisional roles. They are, I believe, the ethical core of a sustainable future. The Golden Rule is the cornerstone of all great religious, cultural and ethical-philosophical traditions (Box 1.7). Not only is it the ultimate social cement it is an admonition against the excesses of egoism and self-interest. It provides vitality to the other core ethical maxim—in fact the Golden Rule presumes that all humans deserve to be treated with respect and dignity or in the profound words of American Declaration of Independence, "We hold these truths to be self-evident, that all men are created equal." Combined these maxims demand that humans must never be treated as means, but only as the goal or end of decisions. They are bundled in Kant's categorical imperative and required in Dworkin's reconciliation of liberty and equality in the notion of ethical individualism. Properly defined neither the utilitarian ethic of consequences or the deontological ethic of motives can avoid the power of these two ethical principles.

I believe that almost every reader of this subsection accepts the notion that these two maxims establish the cornerstone upon which any acceptable and sustainable vision of civil and political society should be built. Upon reflection it would be evident that, if applied, today's world would be quite different than it is; that our institutions for social ordering and the decisional trends they support would also be quite different. Inculcation of such an ethic into the fabric of our personal, corporate, national, and international decisions might help humanize the impersonal workings of bureaucracies and markets and constrain the competitive and self-serving instincts of individuals and groups. We would be living in a world that was much closer to our deeper visions of the people and society we want to be. The power and impact of translating these two principles from slogans to decisional guides can be seen clearly in a simple example. If these maxims prevailed the standard (political and corporate) for acceptable social-environmental

degradation would be straightforward—acceptable practices would be defined as those that would be implemented if the principle beneficiaries (company and government officials, investors, financiers, and consumers) and their families lived downstream from the producing facilities.

Why then has reality strayed so far from this philosophical norm? The difficulty is that ethical principles in a secular world do not come with instructions for moral motivation. Ethical principles, good intentions, longer-term interests and the like become caught in a Machiavellian trap: "There is nothing more difficult to take in hand, more perilous to conduct or more uncertain in its success than to take the lead in the introduction of a new order of things" (discussed in Cordes 1998). If I take the lead, but others do not follow, both I and my principle will suffer—a notion similar to Berlin's concept of "negative liberty" quoted earlier. Fear, survival instincts and self-interest cumulatively engender achievement of the lowest common denominator. Even the most progressive, courageous and ethical among us want to be in the rear guard of the vanguard from the perspective of self-interest.

What is needed is creative and courageous leadership, infused with this ethic, at all levels of society in all regions of the world. As recognized by the architects of sustainable development, without such leadership even the best designed institutions and social structures will fail to meet the needs of the present and the future. This is a time for the international community to be bold, to explore new ideas, to develop new visions and to demonstrate commitment to values. In order to this effort to hold any promise of success appropriately articulated modes of political and ethical rationality must achieve greater pride of place in decision-making.

4.2.3. Integrating rationalities

Box 1. 8 Individualism, self-interest and social responsibility

The system promoted self-interest as a universal motivating principle and thus was based on egoism to motivate people to participate in the system….This pursuit of self-interest balanced in a competitive system assured that the society would be better off from the standpoint of material wealth that some alternative system. The system was given an ultimate utilitarian justification from an ethical standpoint, as individual egoism was swallowed up in utilitarianism, so to speak. People were not encouraged to develop a sense of social or community responsibility that would relate to marketplace behavior, as the system itself would assure that community interests were adhered to in marketplace transactions. People were thus encouraged to pursue their individual self-interest without any kind of external controls on their behavior that might promote the welfare of the community. People were let off the hook, so to speak, as the system itself would take care of any ethical concerns related to broader responsibilities to society. (Buchholz 1998, p. 342)

Any human-centered or anthropocentric interpretation of sustainable development must recognize that economic/technological rationality will play a central role in future progress. Strengthening political rationality is required as a guide or constraint on this decisional perspective not as a substitute for market decisions. Similarly ethical rationality provides a vehicle for focusing attention by political and economic actors on the motivational and consequential attributes of their decisions. Thus it is necessary to recognize that a sustainable future will depend upon the business community and the extent to which their decisions are influenced by the notions that inform legitimate political and ethical rationality. In this sense the notion of corporate social responsibility becomes an

essential ingredient of any vision of sustainable development.

While not everyone accepts Friedman's conclusion that corporate social responsibility is a subversive doctrine, the prevailing Western view has been that businesses are inanimate and amoral legal fictions. As economic institutions they are obligated only to maximize shareholder wealth consistent with the limited social requirement that they obey the law. This view is consistent with the broader assumption that a competitive system driven by utilitarian self-interest makes society better off and resolve objectively its ethical concerns (see Box 1.8).

Increasingly however it has become recognized that business activities have social as well as economic impacts. Indeed many of the concerns raised by the environmental revolution and sustainable development are the direct product of the singular pursuit of economic/technological rationality—the drive to efficiency and cost reduction induced by the fierce logic of product and financial market discipline. While the quest for an ethically based theory of corporate social responsibility has thus far been unsuccessful, several fundamental principles of good behavior are now generally accepted (Buchholz 1998, p.344-345):

1. Corporations have responsibilities that go beyond the production of goods and services at a profit;
2. These responsibilities involve helping to solve important social problems especially those they create;
3. Corporations have a broader constituency than stockholders alone and this includes a wide variety of voluntary and involuntary stakeholders;
4. Corporations relate to society in diverse ways and have impacts that go well beyond those of simple market place transactions; and
5. Corporations serve a wider range of human values than those that can be captured by traditional economic analysis and decisional methodologies.

The problem is how to encourage or induce patterns of behavior under the rubric of competitive economics.

Over the past four decades three distinct approaches to corporate social responsibility have been put forward. The first was most popular during the decades directly preceding and following Earth Day in 1970. It is often referred to as the corporate social responsiveness model and combined the urgency of the environmental revolution with the reality of traditional views on economic functions and market discipline. Chamberlain (1973, p.4-6) provided the core argument by noting that every business is trapped in the system it has helped to create. As an individual entity it is incapable of transcending the system. Because they are not collectively organized they cannot easily meet the pressing needs of society even if they wanted to. Rather, "such direction could only occur through the intermediate agency of government rewriting the rules under which all corporations operate." In terms of our previous discussion, corporate social responsibility is caught in a Machiavellian Trap that can only be released by enhancing political rationality—by asserting the primacy of politics over economics. Thus if corporate responsibility for social wellbeing is to have any operational content it must be found in the redefinition of the rules of the game and a changed, but level, playing field.

The effectiveness of this approach has been frustrated by systematic policy failures when seen from the internal and comparative perspectives of national and transnational regulatory structures. While still relevant as a consequence model, it has been increasingly supplanted by what might be called the benchmark or welcome model. Corporations have been voluntarily adopting codes of best practices as guides to their diverse and widespread operations. Similarly industrial groups have negotiated industry wide codes of acceptable conduct. The underlying motivation stems from recognition that regardless of existing regulatory standards their long-term success will be greatly influenced by their perceived performance and reputation. These approaches, discussed in considerable detail in latter chapters, typically stress economic rather than ethical considerations but can combine both (See Cordes, 1997). Shrivastava (1995) has begun the effort to build a new more ethically driven concept of corporate social responsibility that, when combined with those existing, shows promise of supporting a more sustainable future.

4.3. Conclusions

The preceding pages have attempted to establish a normative interpretation of a sustainable future. While progress has been made, much, much more needs to be accomplished. Most of the evidence suggests that to date sustainable development has been adopted as a rhetorical principle rather than as an ethical mandate embraced and invigorated by political will. Progress is frustrated by the allure of self-interested individualism supported by powerful, often contented, interests as more than a century of rationalized habit. As Jamieson (1998, p.189) notes, today at a global level "there is too little by way of shared beliefs and values to provide enough content to ideas of sustainability to make them effective." This chapter has attempted to reduce this impasse under the assumption that ideas ultimately are important and shape the concepts and vocabularies needed to address our common problems. The task was inspired by the words of Hans Jonas (1984, p.x):

> *What we must avoid at all cost is determined by what we must preserve at all cost, and this in turn is predicated on the image of man we entertain. Formerly, this image was enshrined in the teachings of revealed religions. With their eclipse today, secular reason must base the normative concept of man on a cogent, at least persuasive, doctrine of general being: metaphysics must underpin ethics. Hence, a speculative attempt is made at such an underpinning of man's duties toward himself, his distant posterity, and the plenitude of terrestrial life under his domain. That attempt must brave the veto of reigning analytical theory against all attempts of this kind and indeed cannot hope for more than a tentative result. But dare it we must. A philosophy of (man and) nature is to bridge the alleged chasm between a scientifically ascertainable "is" and morally binding "ought."*

The task is formidable. Its success will ultimately be determined at the local level on a project-by-project basis and thus, as much as anything it depends upon the collective

wisdom and participation of companies and local communities. If they and all of us cannot transcend the narrow wisdom of traditional economic calculus the "rally against commodity fetishism will remain ineffectual"(see Davis chapter, below). In a world of such pervasive secular economic/technological rationality "it is not the ecologists, engineers, economists, or earth scientists who will save spaceship earth, but the poets, priests, artists, and philosopher" (Hamilton 1993, p.1). Science, technology and economics can play a useful role, but the roots of the issue are found in notions of stewardship, equity and justice. Religious and ethical values provide the keys necessary to change attitudes and behaviors.

We are all familiar with the distortions that result from not seeing the forest because of our attention to the trees. Toynbee (1965) has demonstrated the inverse relationship that tends to exist between a society's level of cultural attainment and its technological sophistication. He rediscovered what the ancient Greek philosophers had known all along—there is a useful notion of the good life and the need to live it, but when so much social energy is devoted to solving technological problems too little is available for those things that give meaning to existence. The search for sustainable development is both about human survival and about human dignity.

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Chapter 2

Sustainable Development and the Mineral Industry

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1. Introduction

Sustainable development, broadly defined, reflects the desire that human beings act in ways that simultaneously sustain, or even enhance: the natural environment, including both environmental quality and the stock of natural resources; economic well being; and social justice. The concern is that we are *not* acting sustainably—that is, economic progress is coming at the expense of such significant social injustice and damage to natural resources and the environment that future generations will be worse off than the present generation. Regardless of how one views this concern, it is hard to disagree—at a broad philosophical level—with the goal of sustainable development.

But in practice, striving toward sustainability in all three areas (environmental, economic, and social) inevitably involves conflict and tradeoffs. Activities that sustain or enhance purely economic well being often come at a cost of environmental degradation. Enhancing environmental quality, at any point in time, involves spending money that could be spent elsewhere to improve economic well being or social justice. Commercial activities, such as mining, may benefit a national economy but at the expense of harming cultural values of local communities.

Over time, to be sure, technological changes and improvements in how we manage our activities hold forth the possibility of avoiding at least some of these conflicts and tradeoffs. Nevertheless, improvements in technology and management are not panaceas. Striving for sustainable development will inevitably involve conflicts among environmental, economic, and social goals. The challenge is how to balance desires in these areas.

This chapter sets the stage for later chapters that examine in detail the implications of sustainable development for the mineral sector. Section 2 reviews the different dimensions of sustainability in general. The rest of the chapter focuses more narrowly on minerals and the mining industry. Section 3 discusses environmental sustainability, section 4 examines economic sustainability, and section 5 reviews socio-cultural sustainability.

2. A Multidimensional Concept

Sustainable development, as noted above, is multidimensional—more precisely, three-dimensional. The first dimension emphasizes the sustainability of the natural environment, including both environmental quality and the stock of natural resources. The natural environment is an asset. As such it can be thought of as providing life-sustaining and aesthetic "services": air and water necessary for all life forms, energy and mineral resources essential to modern society, habitat for plants and animals, scenic vistas, and so on. Thus, this dimension of sustainability emphasizes sustaining the ability

of the natural environment to provide these services. It also embodies the belief that the natural environment should be preserved for its own sake; that is, the environment would be worthy of preserving even if it did not provide these services. Hereafter, this dimension of sustainability is referred to as physical sustainability, as it can be measured in physical terms. For example, sustainability for a forest, fishery, or other renewable resource requires that the rate of regeneration at least equal the rate at which the resource is harvested. Physical sustainability also applies to groups or sets of resources, such as ecosystems containing plants, animals, water, soil, air, and other natural resources. Maintaining biodiversity is an important issue here. Physical sustainability is not possible—in a strict sense—for the nonrenewable mineral and energy resources we use, which are fixed in quantity in the earth's crust. Nevertheless, as discussed later in the chapter, sustainability is possible for these resources over extended periods of time as long as technological innovation and the development of previously undeveloped or unknown resources offset the ongoing depletion of mineral and energy resources at existing mines and other production facilities.

The second dimension emphasizes the economic sustainability of human living standards. Measuring human living standards, of course, is fraught with difficulty. Gross domestic product per capita—the estimated value of a nation's output of goods and services per person—provides a starting point. A broader measure would be the Human Development Index of the United Nations Development Programme, an index incorporating gross domestic product, education, life expectancy and other factors related to economic development. Another (harder-to-estimate) measure is the stock of capital, the inputs to the production goods and services, such as natural resources, labor, and equipment. The stock of capital determines the capacity of an economy to generate income or well being. In any case, economic sustainability requires that the measure of human living standards be either constant or rising over time.

An important issue in economic sustainability is substitution—to what extent is it possible to substitute man-made capital for natural capital? Natural capital includes the air, water, land, minerals, and other natural resources that serve as inputs to the production of goods and services and more generally influence human well being. Man-made capital includes human skills and physical buildings, equipment, and machinery; as such it embodies advances over time in knowledge, education, and technology. To the extent that substitution is possible, depletion of natural capital is consistent with sustainable development, as long as this depletion is offset by an equivalent increase in man-made capital—in this case, the overall capital stock, which as noted above represents the ability to generate economic well being, remains constant. More specifically and for example, depletion of mineral or energy resources or damage to the environment is consistent with sustainable development—as long as this depletion or damage is offset by an increase in the stock of man-made, reproducible capital such as human skills and technology, which can continue to generate income or human well being into the future. This view sometimes is referred to as *weak sustainability*—the idea that no resource (natural or man-made) is unique; what matters is that the overall stock of capital remain at least constant, even if composition of this stock changes over time (e.g., more man-made capital, less natural capital). Others, sensing less possibility for substitution, argue for *strong sustainability*—requiring that both the overall capital stock and the natural-resource stock remain at least constant over time.

Sustainability's third dimension emphasizes social and cultural sustainability—the quest for social justice noted earlier. The major issues here relate to distribution and process. The distribution of the benefits and costs of human activities rarely is equal across society. Some people benefit proportionately more and others less; some bear proportionately more or less of the burdens. A national economy, for example, may benefit on balance from the development of a mine; at the same time, local communities or indigenous peoples may bear a disproportionate share of the burdens associated with mine development, including social disruption, environmental damage, or loss of cultural identity. Process refers to how decisions are made and the role that various entities play in this process. Many observers emphasize the importance of involving all so-called stakeholders in achieving sustainable outcomes. For example, decisions regarding mine development would involve not just mining companies and national governments, but also representatives of local governments, environmental organizations, indigenous peoples, or any other entities potentially affected by mine development.

Not surprisingly, many individuals focus on only one dimension or another of the concept of sustainable development. The broad and general (three-dimensional) definition allows room for many different perspectives and viewpoints. This all-inclusiveness is both a strength and a weakness of the concept—a strength because there is room for nearly every viewpoint in discussions about achieving sustainability, a weakness because there is little agreement on what exactly the problems are and what should be done.

Superimposed on the three dimensions of sustainable development—physical, economic, socio-cultural—is the issue of scale. We can consider the goals of sustainable development from the perspective of the world as a whole, from the viewpoint of individual communities or ecosystems, and all scales of activity in between. At all scales, the appeal of sustainable development is in the desire to integrate diverse physical (including environmental), economic, and socio-cultural objectives. The difficulty is knowing what to do to pursue these objectives simultaneously, including how to evaluate tradeoffs when pursuing one type of objective—say, physical—conflicts with another type of objective—say, economic.

Two key issues influence how one evaluates tradeoffs, as noted by Toman (1992). The first is how to be fair to future generations, or how to incorporate time into evaluating decisions made today that have consequences both today and in the future. Brennan (1995) asks, "How much do we care about people whose lives won't begin until long after ours have ended?" Economists typically answer this and any other question involving time through the process of discounting. For any decision, all benefits and costs—now and in the future, financial and more broadly social—are identified. Future values are discounted (reduced in value) before being compared with present values. Discounting is justified in part by observing that human beings are impatient and thus prefer benefits received today rather than in the future. Beyond impatience, human beings prefer current benefits over future benefits because current benefits can be invested and grow in value over time (the capital-growth justification for discounting). Critics of discounting argue that the first justification, impatience, is simply unethical—inherently unfair to future generations. Critics also object to the second justification, capital growth, arguing that subjecting environmental resources (including environmental degradation and biological diversity) to discounting is wrong for resources that are

critical for the survival of life on earth and severely limited in quantity. Still other critics dismiss discounting because of the prominence it gives to human values.

The second key issue is the magnitude of human activity relative to the earth's capacity to support this activity and its associated environmental damage (the earth's carrying capacity). At relatively low levels of human activity, most observers would agree that the natural environment has the ability to absorb environmental degradation and regenerate itself. Many also believe, especially economists, that the current scale of human activity and associated environmental damage are not close to exceeding the earth's carrying capacity, and moreover that over time technological innovation is likely to help increase this upper limit on human activity. Many ecologists and others, however, are not so sure, arguing that we are approaching the earth's carrying capacity and are less optimistic about technology's ability to mitigate future environmental damage.

With this general introduction to sustainable development, the rest of the paper focuses more narrowly on mineral development and how it fits into physical, economic, and socio-cultural sustainability.[1]

3. Mining and Physical Sustainability

Two issues are important here—physical sustainability of mineral production, and the sustainability of ecosystems and the environment in mining areas.

3.1 Mineral production

Upon casual inspection, mineral production would seem to be the quintessential unsustainable activity. Individual mines have finite reserves that once mined are gone. The earth's crust contains only a limited and fixed amount of any mineral. Yet such a perspective is misleading, and mineral production is more sustainable than it appears, for at least three reasons. First, through mineral exploration and development, companies replace mineral reserves that mining depletes. Reserves—minerals that are known to exist and are capable of being profitably mined under prevailing economic and technologic conditions—represent only a small portion of the mineral resources in the earth's crust. At and near existing mines and processing facilities, companies discover and develop new reserves that extend (or sustain) the lives of these operations. The quantity of reserves delineated when a mine opens almost always is only a fraction of the ultimate reserve. Given the cost of developing reserves, it does not make economic sense to determine the complete size and quality of a mineral resource before mining begins. On a broader scale, exploration and development activities also sustain mineral production by leading to the discovery and proving up of reserves at previously unknown mineral deposits.

Second, through technological innovation, mining companies sustain mineral production. Advances in techniques of mining and mineral processing allow companies to mine resources that previously would have been either technically difficult or

[1] For an introduction to sustainability and sustainable development, see World Commission on Environment and Development (1987); Dixon and Fallon (1989); Darmstadter (1992); World Bank (1992); Pearce and Warford (1993); Pearce, Atkinson, and Dubourg (1994); and Serageldin and Steer (1994).

commercially unfeasible to mine—resources at greater depths below the surface, of lower grade, or of greater metallurgical complexity. Such advances make it feasible to develop previously known but undeveloped deposits and to explore for poorer-quality mineral deposits than would have been attractive previously. Advances in exploration technology also are important, serving to increase discovery rates and to reduce discovery costs. Data on mineral reserves over time suggest that discovery and innovation together have more than offset the effects of depletion over the last half century (Box 2.1).

Box 2.1 Mineral reserves as a dynamic concept

Reserves, as noted in the text, are minerals that are known to exist with a high degree of certainty and can be mined at a profit with existing technology and under prevailing legal and political conditions. Thus reserve estimates *at any point in time* reflect the economic, technologic, legal, and political conditions of that time. Over time, as these conditions change, so too do reserve estimates. Higher mineral prices or lower production costs—often the result of technological advances in mining, or mineral processing—convert known (uneconomic) mineral resources into reserves. Higher prices or lower costs also provide incentives to discover and develop previously unknown mineralization. Over the last fifty years or so, reserve additions have more than offset the depletion of minerals at operating mines, as shown in the table below. These data, it must be noted, are crude estimates and subject to many uncertainties. Nevertheless they clearly illustrate the dynamic nature of reserves and the extent to which these reserves have been "sustained" over the last half a century.

Estimated world reserves of selected minerals and metals, 1940s-1990s (million metric tons of contained metal, end of decade)

	1940s	1950s	1960s	1970s	1980s	1990s
Aluminum (gross weight of bauxite)	1,605	3,224	11,600	22,700	23,200	28,000
Copper	91	124	280	543	566	630
Lead	31-45	45-54	86	157	120	120
Zinc	54-70	77-86	106	240	295	430

Sources: Data for the 1940s through the 1980s are from Phillip Crowson (1992), *Mineral Resources: The Infinitely Finite*, International Council on Metals and the Environment, Ottawa, Canada, who bases his estimates on data from the U.S. Bureau of Mines. Data for the 1990s represent 1997 estimates from the United States Geological Survey (1998), *Mineral Commodity Summaries*, obtained from the website http://minerals.er.usgs.gov/minerals/.

The third reason mineral production is more sustainable than it appears is recycling. To be sure, recycling does not make mine production itself sustainable, but recycling sustains the benefits provided by the materials for which mining provides the raw materials. Recycling is an important source of many metals (Box 2.2). In addition, recycling is becoming increasingly important as a source of many nonmetallic materials, such as cement and construction aggregate.

Box 2.2 Recycling as a source of supply

Recycling of metal scrap is an important source of supply for many metals. New scrap is material generated in the manufacturing process. An example is steel trimmings left over after the stamping of automobile doors. Old scrap, on the other hand, is material in discarded final products. Examples here are aluminum in used beverage containers and steel in junked automobile bodies. Metal from new scrap generally is not considered a source of supply in addition to metals produced from mineral ores. Rather it is metal that takes a little longer to make its way from the mine to final products. As long as nearly all new scrap is recycled shortly after it is created (which is the case in most instances), metal from new scrap is not a substitute for mineral ores.

The data indicate that old-scrap recovery is an important source of metals in the United States.

Old-scrap recovery as a percent of U.S. apparent consumption of selected metals, 1960-1997 (percent)

	1960	1970	1980	1990	1997
Aluminum	7	4	11	22	25
Copper	27	25	28	25	15
Lead	40	37	55	67	68
Zinc	6	5	6	9	8

Sources: U.S. Bureau of Mines, *Minerals Yearbook* (various years), Government Printing Office, Washington, D.C.; and U.S. Geological Survey, *Mineral Commodity Summaries* (1998), obtained from the website http://minerals.er.usgs.gov/minerals/.

3.2 Mining and the environment[2]

As noted earlier, the natural environment, including environmental quality, is an asset that provides life-supporting and aesthetic services to humans, plants, and animals. Sustainability here refers to sustaining or enhancing the environment's ability to provide these services.

Mining, by its very nature, disturbs the natural environment, although the form and extent of this disturbance vary both by stage of production and from location to location. During mineral exploration and mine development, environmental damages typically are localized and relatively easy to minimize. Drill sites can be rehabilitated. Roads in remote areas can be revegetated, or not even required if helicopters are used to deliver drilling equipment. During mining and the initial stages of mineral processing (often called milling or beneficiation), environmental effects are more extensive although generally limited to the mine site and surrounding region. The most significant effects are land disturbance, creation of solid waste, and generation of acid-mine drainage. Mining, data generally suggest, uses much less land than agriculture, urban development, transportation systems, and many other types of activities. Johnson and Paone (1982) estimate that only 0.25 percent of the total land area of the United States was used for surface mining and disposal of wastes from surface and underground mines and

[2] This section draws heavily on Eggert (1994) and National Research Council (1996).

associated processing facilities between 1930 and 1980. Solid wastes (including overburden, waste rock, and tailings) by themselves cause largely only aesthetic damage. But when they interact with water, they often contribute to acid-mine drainage, affecting water quality and the habitats of plants and animals. Once mining ends, environmental damage—especially acid-mine drainage and the aesthetic damage of unsightly landscapes—can continue if mine sites are not rehabilitated. Habitat that mining may have destroyed often can be restored. Further stages of mineral processing, especially smelting and refining, can lead to air pollution over much larger areas of land and affecting many more people than mining itself.

The site-specific nature of environmental damage from mining is important to understand (Eggert 1994, p. 9). High-grade deposits generate less solid waste than low-grade deposits. Underground mines typically create smaller volumes of waste than surface mines. Arid regions will have less of the water necessary to create acid-mine drainage than wetter regions. Sulfide-poor deposits generate less of the sulfur needed to create sulfuric acid than sulfide-rich deposits. Mines using the most up-to-date technology typically will be less polluting than mines with older technology.

Sustaining the natural environment in mining areas requires: in the short term, finding the appropriate balance between the benefits and costs of protecting the environment; and over the longer term, developing new and better ways of mining and mineral processing that simultaneously enhance production efficiency and reduce the environmental consequences of mining. This is not to suggest that sustaining the natural environment is a purely economic exercise—it most certainly is not. Identifying the benefits and costs of environmental protection, for example, requires scientific and technical information on the environment's carrying capacity. If current or proposed mining activity results in degradation that exceeds an area's carrying capacity, the "costs" to the environment of this activity are high. The "benefits" of environmental protection include the avoided physical damage, such as increased sickness or premature death.

Small-scale and artisanal mining deserves special note. It is important in many developing countries. The United Nations estimates that this type of mining involves some five million people in China, more than one million people in Africa, and about half a million people in Brazil and in Indonesia (anonymous 1997, p. 7). Small-scale mining often has serious environmental consequences, especially gold mining. Hollaway (1997) notes three important problems. The first is the danger from unprotected pits into which people fall, leading to many injuries and deaths. The second is damage to human health from inhaling mercury-containing gases during amalgamation of gold using mercury. The third problem is both environmental and social—the set of problems associated with "unplanned gold rush villages" (Hollaway 1997, p. 46), including almost complete lack of sanitation, clean water, education, and medical care.

4. Mining and Economic Sustainability

Economic sustainability, as noted earlier, focuses on maintaining or enhancing the economic well being of human beings. Using mineral production to sustain economic well being is important for local communities, regions within nations, and entire nations for which mineral revenues are a significant share of the total output of goods and services. As Tilton (1992) notes, the extent to which mineral production contributes to

economic well being depends on three factors. First, mineral wealth must be developed; minerals in the ground are a dormant asset. Second, to sustain the benefits of mining after mineral reserves are depleted, an appropriate portion of the returns from mining must be invested in activities that will generate income or well being in the future, such as education, technological research and development, and social infrastructure (including roads, sanitation systems, and electric-power systems). Third, governments need to control the potentially negative macroeconomic consequences of mining booms, sometimes are referred to as the "resource curse."

4.1 Development of mineral resources

Whether a nation's mineral wealth is developed depends critically on the nation's institutional framework governing business activities in general and mining ventures in particular—the entire package of policies, regulations, and other characteristics that define a nation's business environment. An important part of this framework is a nation's overall legal, fiscal (tax), and regulatory environment, which influences the attractiveness of doing business in any sector of an economy for both domestic and foreign companies.

Focusing more narrowly on mining, the institutional framework includes public policies affecting the *availability of basic geologic information*, which in turn influence whether mineral exploration occurs. Examples of this type of information include regional geologic maps and regional geochemical and geophysical baseline data. Economists usually argue that the private sector alone will under-collect this type of information from the perspective of society as a whole, for two reasons. First, private companies may be more risk averse than society at large. If so, they spend less on activities with rewards that are uncertain and far in the future—such as collecting basic geologic information—than is socially optimal. Second, the benefits of collecting this information are difficult for private companies to fully appropriate or capture. Other entities, which have not paid for the information, may capture some of the benefits. The benefits of basic geologic information are difficult for an individual firm to capture because they are diffuse. Basic geologic information, among other things, contributes to our understanding of a region's geology and influences perceptions of a region's geologic potential for commercial mineral deposits. The benefits of later-stage exploration such as detailed drilling to delineate an undeveloped mineral deposit, on the other hand, are much easier for a firm to fully capture; the benefits come largely in the form of profits from mining or selling a developed deposit. Thus, governments have an important role to play in either carrying out (usually through geological surveys) or funding the collection and dissemination of the basic geologic information on which firms base their exploration programs.

The institutional framework includes *national mineral policy*. Although the scope of mineral policy varies from country to country, it typically covers legislation and rules governing: (1) ownership of mineral resources and equity in mineral-producing facilities; (2) land access and security of tenure for mineral exploration and development, including permitting and the approval process prior to production; (3) mineral royalties and taxation; and (4) environmental protection. Where rules in these four areas appear varies from country to country. In some cases, a single, comprehensive document contains all

relevant rules. In other cases, such as the United States, national mineral policy represents the combination of rules in many separate policies (for example, environmental regulations, tax policy, land-use rules).

National mineral policies, in general and overall, have evolved over the last decade or so to facilitate or encourage investment in mineral exploration, mine development, and mineral production, especially in developing countries and in the former centrally planned economies (see Clark, Clark and Naito 1998; Eggert 1997; Eggert and Otto 1997; Otto 1998; and Smith and Naito 1998). In most nations, ownership of mineral resources is vested in the state and remains so. What has changed, however, is the possibility of private ownership and control of mines and mineral-processing facilities. Most mineral policies now permit—even encourage—private ownership, and many eliminate previous restrictions on foreign ownership. In the area of land access and security of tenure, many policies attempt to streamline the process of obtaining approvals for mineral exploration and mine development; most policies give discoverers of a mineral deposit the preferential right to develop a mine, as long as they meet requirements for environmental protection. As for mineral royalties and taxation, there has been a move toward greater reliance on income-based taxation, although royalties based on gross value (or some similar measure) of mineral production still are common. Finally, in the area of environmental protection, environmental impact statements are part of the mine-development process nearly everywhere. The polluter-pays principle is generally accepted. Many policies require bonding or some form of financial assurance to ensure that mining companies reclaim or rehabilitate lands after mines close. To be sure, national mineral policies are not identical around the world. Nor are they panaceas for private investors in the mineral sector. In many developed countries—such as Australia, Canada, and the United States—some would argue that public policy discourages mineral development. Nevertheless, Otto (1998, p.79) concludes that the net effect of recent changes in national mineral policies "has been to reduce barriers to entry and lower risk, thus encouraging increased investment in an ever-increasing number of countries."

A final aspect of a nation's institutional framework for mineral development is the perception of *risk* or *stability*. Part of this issue relates to policy stability, that is, what is the likelihood that specific policies will change? Equally important is the issue of constitutional stability, that is, what is the likelihood that a nation's form of government or that the rule of law will change? Even if national mineral policies generally have become more favorable for private investment in the mineral sector (as noted above), there still are considerable risks associated with mineral exploration and development in many countries. Private property rights are not well defined in all political jurisdictions, leading inevitably to land disputes. Rules for environmental protection will become increasingly strict every where; but to what extent will these rules changes bring with them increased costs for mining companies? More generally, once a mine is developed, it becomes a logical target for those who want to change the rules governing, for example, taxation. This is the so-called obsolescing bargain: Prior to mining, bargaining power tends to be in the hands of private investors, who can choose not to invest. Once investment and mining commence, bargaining power switches to host governments, who know that it is much more difficult for investors to walk away from a project at this point (see Vernon 1971; Smith and Wells 1975; and Moran 1992).

4.2 Investing for the future

Once mineral development occurs and mining begins, a key to making this activity economically sustainable is investing an appropriate portion of the proceeds in activities that will continue to create economic well being after mining ceases.

Drawing on Hartwick and Olewiler (1998), it is relatively easy to imagine economic sustainability associated with the use of a renewable resource, such as a fishery. The stock of fish, and thus its ability to generate human well being, simply needs to remain constant. This situation will be achieved as long as the rates of harvest and regeneration are in balance; that is, as long as the fish stock is not over-harvested. For nonrenewable resources that are fixed in quantity and consumed in use, on the other hand, achieving economic sustainability is more complicated. Sustainability is possible only if there are alternatives to the nonrenewable resource being depleted. For example, as oil is depleted, sustainability from the world's perspective requires that alternative sources of energy be found. Or from the perspective of a national economy or local community, as a particular oil province is depleted, sustainability requires that alternative sources of income be found. In either case, the key to achieving sustainability is investment—in alternatives that will substitute for the depleting natural resource.

These compensating investments can take a variety of forms. Most narrowly, investment in mineral exploration and development has the potential to sustain income and the benefits from mining. Investment in technology, including not just better machines and processes but also management, has the potential to enhance the efficiency of discovering, extracting, processing, and using minerals. From the perspective of local communities and national economies dependent today on mineral and energy production, investment in what might be termed social infrastructure has the potential to sustain human well being: for example, education, human health, roads and other transportation facilities, electric-power systems, and public-sanitation systems. From the perspective of the world as a whole, investment in alternative sources of energy, alternative materials, and recycling has the potential to yield substitutes for those energy and mineral resources now being depleted.

4.3 Potential macroeconomic consequences of mineral development

At the scale of an individual nation, investing for the future (discussed above) is only part of a larger set of issues—handling the potential (negative) macroeconomic consequences of mineral development and dependence. The consequences can be so significant, it sometimes is argued, that an economy can be worse off in the long run with mineral or energy wealth than it would have been without it. This is the "resource curse" (see Auty 1993, and Davis 1998).

The curse can take a number of forms. One is called the Dutch disease, in which a booming mineral or oil sector leads to (1) a shrinking of non-boom sectors of an economy, often agriculture or manufacturing, but (2) an overall increase in GDP. After the boom ends, an economy returns to its initial structure. The problem is one of dealing with changes in the structure of an economy, both during and then after the boom. A critical issue is: Is the temporary increase in overall income worth the "cost" of structural

adjustment? For more on the Dutch disease, see Gregory (1976), Corden and Neary (1982), Neary and Van Wijnbergen (1986), and Davis (1995). An extension is the possibility that human capital (the stock of skills embodied in people) develops more in manufacturing, which shrinks in a mineral boom, than in the mineral sector. Thus, in the long run, an economy would have less human capital and in turn less economic growth, as a result of the mineral boom, than otherwise (see Sachs and Warner 1995).

Another form of the curse relates to instability in income due to instability in commodity prices. Part of the problem stems from lack of diversification in an economy (i.e., excessive dependence on mineral production), and from commodity prices being more unstable than prices for manufactured goods and for services. The proposition is that unstable earnings are difficult to manage; the result is lower long-run economic growth than would occur with more-stable earnings with the same mean. This argument applies to dependence on all primary commodities, not just mineral commodities.

A third form of the curse is rent-seeking rather than rent-creating behavior. Mineral production often produces "surplus" revenues due to high-quality (low-cost) mineral deposits. High-quality deposits earn significant rents, whereas marginal deposits earn only a minimum acceptable profit. Many of the Chilean copper deposits, for example, earn these rents. The presence of the rents invites efforts by special interest groups to share in the distribution of these rents, diverting efforts away from activities that otherwise would create rents.

A fourth form of the curse relates to the illusion of plenty created by the presence of mineral wealth. The result is irresponsible economic and political decisions, usually too much consumption and too little investment.

Although the empirical evidence is mixed, the predominant wisdom is that the "curse" is avoidable with appropriate public policies (see Daniel 1992; Mikesell 1997; and World Bank 1994a, 1994b, 1996). These policies focus largely on taxation of mineral rents and then re-investing these rents in other forms of capital such as technology, education, human health, and social infrastructure.

5. Mining and Socio-Cultural Sustainability

The third dimension of sustainable development is social and cultural. It is the most difficult to measure and define because it involves what is fair or just, concepts over which reasonable people may disagree. Most discussion here, as noted earlier, focuses on distribution and process.

Mineral development generates benefits and costs. Some of these are "private" in the sense that a company undertaking mineral development incurs costs—such as those of construction, labor, and raw materials—and receives benefits in the form of revenues. Other benefits and costs, however, are more broadly "social" in character: regional economic development spurred by the mineral development, environmental degradation, and social problems such as alcoholism and crime that sometimes accompany frontier development. An important concern is that the distribution of these benefits and costs is not fair, equitable, or just. More specifically, much of the benefit of mineral development often goes to mining companies and national governments in the form of tax revenues, while the associated social costs are borne by local communities and indigenous peoples.

A (very) general proposal for making the distribution of benefits and costs more equitable involves process—namely that by involving all stakeholders in decision making the likelihood increases that outcomes will be fair. In the mineral sector, it has become generally accepted that local communities and regions within countries should be involved in assessing the overall feasibility of mineral-investment projects. In effect, the definition of feasibility now is more encompassing than was true a decade or two ago. "Feasibility" used to suggest technical and commercial worthiness of a project; now the concept embodies two additional aspects of worthiness, environmental and socio-cultural.

Epps (1997) provides several examples of nontraditional arrangements in response to concerns of local communities and indigenous peoples. To minimize the effects of mineral development on communities near the Porgera and Misima mines in Papua New Guinea, a system of fly-in/fly-out has been adopted, eliminating the need for extensive development of permanent townsites. Mining in Irian Jaya, Indonesia, supports development of local businesses. In the Philippines, a mineral-exploration agreement formally protects the land rights of indigenous peoples.

6. Final Thoughts

What is to be sustained? There is no simple answer to this question. At a broad level, it is easy to say that we should work toward sustaining or enhancing (simultaneously) the natural environment, economic well being, and social justice. It also is relatively easy to define sustainability in each of these three areas separately. It is quite another matter, however, to understand and act in recognition of the tradeoffs inevitable in pursuing objectives in all three areas at once.

Part of the solution is more attention to the process of organizing human beings to work toward sustainable development. Chapters 3, 4 and 5 of this volume focus on issues of process. Part of the solution also requires better methods for measuring sustainability and the tradeoffs inherent in pursuing multiple objectives. Chapters 6 and 7 focus on issues of methodology.

The result of more attention to process and better measures of sustainability will be, one hopes, better public policies and more appropriate incentives on the basis of which households, businesses, and governments make decisions. Otherwise, sustainable development is doomed to remain more of a slogan than a useful guide to decision making and public policy.

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Chapter 3

The Stakeholders: Interests and Objectives

Olle Östensson[1]

1. Introduction

The purpose of this chapter is to review the characteristics, roles, interests and objectives of the stakeholders in mining projects. The chapter is intended to provide a background to subsequent chapters by James Otto and by Janet Epps and Adrian Brett which deal with implementation and with how agreements between stakeholders are reached. The chapter is organized as follows: First, the concept of stakeholder is discussed and the different types of stakeholders that are relevant to mining projects are identified. Following that, the interests and objectives of the different groups of stakeholders are reviewed in sections 3 to 8. Each section concludes with a small text box. The boxes are intended to summarize the discussion of the objectives of each stakeholder. They show the main sustainability objectives of the stakeholder along with other important objectives. The inclusion of these other objectives, which may be contradictory or complementary to the sustainability objectives, is intended to illustrate the complexities of the goal structure. The geographical scope of the stakeholder's actions and its role are also included. Finally, in section 9, the extent to which the interests of stakeholders converge or diverge is analyzed, and an attempt is made to identify the areas where agreement between stakeholders is necessary in order for a project to be viable.

2. Who are the Stakeholders in Mining Projects?

The stakeholder concept is vaguer and less precise than alternative concepts used in law and in economics, in law to identify those that can legitimately expect to have their claims recognized by a court, and in economics to denote economic actors or those which a company has to take into account when making decisions (owners, customers, suppliers, employees). The stakeholder's interest in a project does not have to be of a direct economic nature and it is not necessarily derived from law. The term is usually used to mean somebody, or a group of somebodies, who has an interest, be it economic, legal, political or ethical, in the outcome of a project or a process, and who therefore “holds a stake” in it. Environmental non-governmental organizations (NGOs), for instance, seldom have a definable economic interest and are nevertheless generally considered to be stakeholders by other interests, including by governments and by industry.

For the purposes of this chapter, the "core" stakeholders are taken to include those who are materially affected by individual mining projects and whose objectives with

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[1]The views presented in this chapter are those of the author and do not necessarily represent the views of the secretariat of the United Nations Conference on Trade and Development (UNCTAD).

respect to sustainable development relate mainly to those projects. This group consists of mining companies, local communities (which include landowners as well as potential or actual employees of the company), and government authorities at different levels. A second group of stakeholders consists of those whose objectives are generally of a broader political, ideological or cultural nature, for instance, NGOs and intergovernmental organizations (IGOs). The influence of these latter groups is often exercised through one or more of the "core" stakeholders. This is not to say that the objectives of the first group relate solely to individual projects or that the stakeholders in the second group may not have interests in the realization of sustainability objectives within such projects. The conceptual development of the "ideology" of sustainability can not be detached from its concrete application and all the stakeholders participate in differing degrees at both levels. They do so, however, from different perspectives. The views and the participation of the core stakeholders in the policy discussion about sustainable development are mainly based on their experiences of concrete cases, which are used as a basis for formulating policy proposals. The other stakeholders proceed from principles and strive to see them fulfilled in individual cases through the application of law and/or public opinion pressure.

3. Mining Companies

The objectives of mining companies are predominantly economic. They are principally interested in maximizing the return on their shareholders' capital, thereby ensuring the company's long-term survival. Their corporate goal hierarchy differs somewhat from other companies, however. This is so because the location of their production facilities is dictated by where mineral reserves have been discovered and because a decision to invest can only be taken after considerable capital outlay has been made over an extended period in the form of exploration and feasibility studies. The restrictions on location choices and the front loading of investment costs tend to make mining companies very conscious of and sensitive to risk and to influence their objectives with regard to sustainable development.[2] Compared to an earlier situation where, in the almost complete absence of regulations, decisions on sustainability issues such as environmental protection measures and relations with local communities could be taken by the company alone, mining companies today are faced with higher levels of risk and uncertainty. Companies handle risk in either of two ways: by protecting themselves against risks that they can not influence or control (for instance, by using project finance for investments, buying insurance and carrying out hedging operations on terminal markets) or by trying to control the circumstances that give rise to the risks. In the case of environmental impacts and relations with local communities, companies are attempting to control the level of risk directly rather than protecting themselves against it. At the policy

[2] A survey in 1992 of the criteria for exploration and investment decisions showed that mining companies consistently gave high rankings to criteria related to the minimisation of risk (Otto 1992b, pp. 337-338).

level, they do so by attempting to influence the content of legislation.[3] At the individual project level they seek to identify solutions that satisfy the objectives of other stakeholders while minimizing the negative impact on the chances of attaining their own profit related objectives, thus integrating sustainability objectives into their goal structure.

As a result of the integration of sustainability objectives, the attitude of the mining industry to environmental management, biodiversity, public participation and other elements of sustainable development has changed considerably over the last couple of decades. Whereas earlier mining companies saw themselves as being concerned with maximizing the profit from the exploitation of a given deposits under constraints defined by law, it is now common for them to - at least publicly - quote sustainable development objectives among their corporate goals. Thus, there has been a change in the way mining companies present and describe themselves and their environmental performance to the rest of the world. This change is clear from the stated goals of the companies contained in their environmental policies and similar documents.[4] Companies have found it expedient or indeed necessary to adopt attitudes which at first glance may appear to be in conflict with their economic interests and detrimental to the profit maximization objective, but which are necessary if the companies are to continue doing business in the long term. Several factors provide incentives to adopt such attitudes, including pressure from actors with considerable influence over the company and the conditions under which it operates.

Shareholders are among the actors that may exercise pressure on the company. Some of the shareholders are likely to be people who are reluctant to derive an income from what they consider to be unethical practices. Thus, shareholders may divest their shares if they do not agree with the company's actions in areas such as environmental management or human rights.[5] While shareholders' campaigns and divestment have been relatively rare in the case of the effects of mining companies' activities on sustainable development, examples do exist.[6]

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[3] While individual mining companies play a role in influencing the content of legislation, industry associations carry out the main part of this activity on behalf of their member companies. As Otto describes in chapter 4, there exist several associations of mining and metals and minerals companies, both at the national level in most countries and at the international level. The national associations or chambers of mines are usually consulted about proposed legislation affecting the mining industry and they may also commission studies and disseminate information on their own initiative. Similarly, the international associations devote a large part of their resources to the dissemination of positive information about the activities of the industry with regard to environmental management, relations with local communities etc.

[4] One of the most radical formulations is found in the environmental policy of the Noranda Group, according to which the Group companies and operations "...commit to the principle of sustainable development, which means that our economic decisions will not take priority over considerations of health, safety and the natural environment" (see chapter 4).

[5] The effectiveness of divestment movements was clearly demonstrated in the case of sanctions against the apartheid regime in South Africa, where several companies preferred to anticipate sanctions rather than wait for formal decisions to be taken by governments.

[6] Following riots at the operations of Freeport McMoRan Copper & Gold Inc. at Grasberg in Irian Jaya, Indonesia, and widely published criticism of the company's policies both with regard to environmental management and relations with local communities, the Seattle Mennonite Church, which held 3,000 shares

Second, lenders, including international financial institutions, may be the originators of significant pressure. Most international financial institutions, including the World Bank and the regional development banks, have established their own sustainable development related criteria and conditionalities for lending. While sometimes the conditionality is expressed in the form of an explicit condition, in other cases it is implicit in the way project approval procedures are designed, with environmental guidelines, impact assessments and monitoring becoming an aspect of all development assistance (Wälde 1992, p.341). The trend extends to national development assistance agencies, most of which play a relatively limited role in the financing of mining projects, however[7]. While commercial lenders have been slower to introduce conditionalities of this kind, liability concerns[8] have provided a strong incentive for them to institute screening procedures that are very similar in nature (Wälde 1992, p.342).

A third potential pressure group is constituted by the consumers of the company's products. While so far we know of no instances of consumer boycotts of mining companies (probably mainly because individual consumers seldom buy products such as copper concentrate or unwrought aluminum), it is not inconceivable that other products marketed by the "offending" company or exported from its home country could become the target of consumer boycotts.[9] Moreover, end users of mineral products may have their own requirements or environmental policies according to which they have to be able to certify that the components of their products have been produced under environmentally friendly conditions.

Even in the absence of more or less explicit pressure from groups outside the company, there are several good reasons why a company should include sustainable development related objectives as part of its internal code of conduct in the interest of long term corporate survival. Among these are potential financial liability, minimization of long-term costs and preservation of a good corporate image.

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of Freeport stock, introduced a shareholder resolution for the 29 April 1997 annual shareholder meeting, calling for review of the environmental and social impacts of Freeport's presence in Indonesia. (Cogan 1997, p.12).

[7] See, for instance, the manual of environmental appraisal of the Overseas Development Administration of the United Kingdom, which states: "Environmental standards set by developing countries are regarded as a **minimum** requirement for ODA projects. Where there is no local legislation covering standards, the ODA and the developing country government should decide on the most appropriate standards to apply, including whether UK/EC standards should apply...all ODA projects should take account of international, legal instruments (protocols, conventions, codes of conduct etc.) aimed at safeguarding the environment, and to which the UK is party." (Overseas Development Administration, 1992, section 1, points 5 and 6).

[8] In the United States, in particular, the Superfund legislation provides a very strong incentive for financial institutions to try to ensure that operations to which they have extended finance are designed and operated in an environmentally acceptable manner, since they can be held liable for rehabilitation costs (Tilton 1994).

[9] A related issue, which does not, however, affect mining companies as a function of their individual environmental performance, is the efforts by NGOs and some governments to limit or ban the use of certain metals such as lead and cadmium which are deemed to pose unacceptable health hazards.

It is generally perceived that the exposure of companies to litigation and the extent of their liability have increased. More and more, mining companies are being held accountable for how they treat their surroundings and lawsuits could arise because of environmental damage (Thompson 1994, p.32). The exposure of companies appears to have been extended in two ways. First, it has proved possible for those wronged to initiate legal action not only in their own country (which is usually the country of operations of the company) but also in the company's home country. Second, when ruling on matters of liability for environmental damage, courts may take into account not only the laws of the present jurisdiction but also a growing body of international law, the scope of application of which appears to have increased significantly (see Otto's discussion of this phenomenon in chapter 4). Since it is difficult to make a successful complaint against a large powerful company in many countries and since, even if the complaint is successful, many jurisdictions set limits on the magnitude of material and punitive damages, the option to sue a company in its home country may be very attractive.[10] Accordingly, every mining company has to take the risk of litigation seriously today, particularly if it is an international company, perceived to have "deep pockets" and liable to being sued in its home country as well as in its country of operation, depending on which venue suits the plaintiffs best. This is so, moreover, since it may find itself without political risk insurance coverage if it is perceived to have acted irresponsibly.[11] Consequently, mining companies pay a great deal of attention to liability issues and are careful to avoid exposing themselves to litigation. Good environmental management and good relations with local communities are cost-effective ways of avoiding litigation.

With respect to long-term cost minimization, large international companies, in particular, may note that environmental regulations are unlikely to become any less stringent. While presumably there is a limit to how strict the regulations can become, that limit still seems to be far away. For that reason, it is in the interest of the company, planning for the future, to take measures that are well beyond those required by the regulations in force, in order to avoid costly changes down the road. This is so, in particular, since it is usually considerably cheaper to reduce environmental impacts at the planning stage than by "add-ons" at a later stage (Warhurst 1992).

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[10] The process leading up to the settlement of the lawsuit over the Bhopal catastrophe by the Indian Supreme Court in 1989 proved to be a turning point. In this case the settlement was eventually determined in a court of the country where the accident occurred (Nelson and Prince 1995, pp. 25-26). However, during the course of the case, the possibility of trying the case in the home country of the company was raised for possibly the first time in a case of this importance. Other cases have contributed to gradually weakening the arguments in favour of companies (Nelson and Prince 1995, pp. 26-29). In 1995, the Victorian Supreme Court in Australia ruled that negligence claims by landowners in Papua New Guinea against BHP in connexion with the Ok Tedi project could be tried in an Australian court, thus confirming that, at least in one important jurisdiction, legal action could be taken against a mining company in its own home country (Brett 1996, pp. 10-12).

[11] This was illustrated by the withdrawal of insurance coverage by the Overseas Private Investment Corporation from the operations of Freeport McMoRan Copper & Gold Inc. in Indonesia in late 1995. The coverage was restored in March 1996 (Cogan 1997, p. 12).

Finally, a company's reputation as a responsible "corporate citizen" which deals correctly with environmental impacts has become an important asset to may mining companies, particularly those who have operations in several countries. Access to deposits in a particular country - for instance, in the context of privatization of state owned assets or the opening up of areas previously barred to private or foreign investors - may partly depend on the company's track record and reputation for responsible environmental management and local community relations. In such cases, a bad reputation may seriously damage the company's chances of being selected. News about management errors travel quickly, particularly since many NGOs see as part of their mission to disseminate information of this kind, and it may prove difficult and time consuming to restore a damaged reputation.[12] While the cost to companies of neglecting environmental management can be high, the cost of environmental protection measures themselves is usually relatively low. The World Bank (1992, p.128) reports estimates of pollution control costs for the United States for the primary metals industry. In 1989, pollution abatement equipment accounted for 7 per cent of total investment in new plant and equipment in the primary metals sector. In the same year, the annual cost of pollution abatement as a share of the total value of output was 1.3 per cent. These cost estimates indicate that the direct environmental costs borne by the industry are likely to be minimal in the overall cost of projects. While higher figures have been quoted, they usually refer to projections rather than to actual costs incurred.[13] Moreover, there is no evidence that the costs of environmental protection account for a very high portion of production costs. If that were the case, we would expect to see some clearly identifiable effects, such as higher metals prices, reduced profits for mining companies, and unwillingness to explore for new deposits or invest in the development of new mines. The absence of such effects - except for some cases such as the closure of secondary lead smelters in the United States, which has been attributed to strengthened legislation on air pollution[14] - seems to indicate that the industry has adapted quite well to raised expectations with regard to environmental performance. There is also evidence that the incorporation of environmentally friendly technology into project development and implementation can result in increased economic efficiency of firms' operations, thus reducing or even eliminating the net cost to firms (Warhurst 1992).

In addition to the various factors just described, and which may be assumed to influence companies to reduce risks by integrating sustainable development type objectives into their goal structure, other factors may contribute to this integration. These factors do not influence the economic situation of the company but rather the behavior of

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[12] The Mineral Policy Center, a mining NGO based in the United States, issues report cards on mining companies, usually well researched and with the grades substantiated.

[13] Mining Journal (1991) quotes an estimate according to which environmental legislation was expected to add around 20 per cent to the costs of operations.

[14] In the latter half of the 1980s, 29 secondary lead smelters closed down in the United States (Mining Journal 1991).

its employees and the type of technical and economic solutions that they are likely to prefer.

First, employees of mining companies at all levels, up to and including managing directors, are human beings like the rest of us and do not function in a social vacuum. In a situation where environmental responsibility has become a social norm, at least among developed country professionals, decision makers in the mining industry are likely to lean towards the more environmentally friendly solution, other things being equal (and possibly sometimes when they are not).[15]

Second, environmental management has become an important part of the curriculum in all schools for mining engineers, and it is generally accepted that the solutions to engineering problems should take into account environmental factors. Thus, ability to manage environmental impacts is one of the parameters that define the professional competence of a large portion of the people influencing technical solutions in the industry and environmental consciousness has become part of the professional culture of mining company employees. This factor provides a powerful bias in favor of environmentally friendly solutions.

A third and final factor is the phenomenon of standardization of processes and equipment. While miners like to say that every mine is unique, they tend to buy their equipment from the same sources and use the same processes, often because it is easier to use a solution "off the shelf" than to develop something new. Since equipment makers respond to the needs of their customers, and since a large portion of their best customers require environment friendly equipment for all the reasons already given, it may be simpler to supply the same equipment even to those who do not specifically ask for it rather than to design environmentally "unfriendly" equipment. As a consequence, even the performance of companies with very limited environmental consciousness is likely to improve over time.

It is indisputable that mining companies' attitudes towards sustainable development and its elements, such as environmental management, have changed and become more positive. Companies generally subscribe to the objectives and standards formulated by international industry associations such as the ICME. It is also clear, however, that significant differences exist between companies, with regard both to their objectives and the effectiveness with which these objectives can be pursued. In addition to regulatory differences between the countries of operation, such differences may be due to a variety of factors, including size, geographical scope of operations and ownership.

First, there are of course differences that are due simply to differences in the companies' access to technology and technical know-how. A large, transnational company is more likely to see advantages in building and maintaining competence in specialized fields of environmental management or relations with indigenous peoples than a smaller company with operations only in one country. While the expertise can certainly be bought, judicious buying of expertise requires a certain amount of experience

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[15] John Tilton of the Colorado School of Mines found a good term for this phenomenon during a seminar at UNCTAD in 1993: "the teenage daughter effect". This effect refers to the emotion experienced by a mining company executive when his teenage daughter leans over the breakfast table and says "Daddy, is it true that your company is destroying the environment?"

- that is, it is easier to buy if you know what to ask for. Moreover, international companies acquire experience in dealing with a variety of situations and in applying their procedures and routines in a flexible manner. Finally, large companies are probably also better informed about the direction and content of changes in legislation and in a better position to anticipate strengthening of environmental regulations.

For large companies active in several countries, the outcome of a strict environmental permitting process also carries less potential danger than for a smaller, geographically undiversified company. If the result of the process is negative, the large company can drop the project and move elsewhere, losing only the investment sunk in the project in question. This investment may of course be sizeable but is unlikely to threaten the company's survival. Furthermore, the relinquishment of an opportunity does not inevitably lead to reduced market share and loss of competitiveness, since, unlike the situation in other industries, the opportunity is not automatically picked up by a competitor. The smaller company, on the other hand, may have all its assets tied up in one project and could face bankruptcy if it does not go ahead. Accordingly, it may be more easily tempted to try to achieve savings on environmental measures.

A smaller company with operations confined to a few locations is also less likely than a large transnational corporation to face the kind of pressures from outside sources described above. It may therefore be correspondingly less sensitive to environmental concerns (particularly since any transgressions on its part are likely to be less newsworthy and less interesting to international public opinion than ones committed by larger corporations). It would be a mistake, however, for the smaller company to believe that its activities are unobserved. Ease of access to information will quickly place information about any mistakes in the public domain.

Finally, there appears to be a difference between private and publicly owned companies when it comes to environmental management, with the performance of publicly owned companies being inferior. One of the main reasons for this is that state mineral enterprises often emerged from the nationalization of privately owned firms, where production technology was already embodied in large capital investment. Resources for subsequent investment have been scarce and so the state owned facilities tend to be less efficient than they could be both from the point of view of environmental and productive efficiency (Brown and Daniel 1991, p.46). Moreover, a state owned company may have more leverage over the regulating agency, which makes it difficult to impose and enforce environmental regulation. Thus, "separation of ownership and regulatory power is certainly an important precondition for getting better compliance,

Box 3.1 Objectives of mining companies

Sustainability objectives	Other objectives	Scope	Role
Comply with regulations	Profit maximization	Project	Operator
Preserve reputation	Long term survival	National/international	Participate in debate
Good environmental management	Social acceptability	Mainly project	Operator
Good relations with local communities	Social acceptability	Mainly project	Operator

since the state cannot be expected to enforce effectively against its own agencies." (Wälde 1992, p.345).

4. Governments: National and Provincial in Developed and Developing Economies

The role of national governments is crucial to sustainable development. They have the responsibility of translating into practical policy the lofty principles to which they have subscribed at the United Nations Conference Environment and Development (UNCED, or the Earth Summit) and at other conferences where declarations and resolutions on sustainable development have been adopted. This task involves the drafting of appropriate national legislation and implementing regulations, creating and maintaining institutions responsible for implementation, and continuous arbitration, refereeing and resolution of problems arising from the application of the policies. They are expected to find the optimal equilibrium and trade-offs between protecting the natural environment and promoting material economic growth, between local and national interests and between welfare for the present population and future generations.

The task of balancing the objectives of sustainable development and those relating to material economic growth is particularly difficult for the governments of developing countries. There, the need for rapid improvement in living standards is felt most acutely, while at the same time the pressure on natural and environmental resources such as arable land, drinking water and clean air may be higher than in developed countries. Pring (1998) observes that, already at the 1972 United Nations Conference on the Human Environment in Stockholm, "developing countries (the "South") served notice that the environment standards of developed countries (the "North") could not be imposed so as to defeat the South's economic betterment" and that the Stockholm Declaration moved toward compromise by validating both environment and development simultaneously.

The formulation of sustainable development goals is influenced by the fact that this industry has the potential to yield very large economic benefits to the government of a developing country. Few other economic activities can attain a high volume of production as quickly as mining, and rarely are the rents easier to appropriate than in mining. These rents can be channeled into investment in physical or human capital, thus broadening and raising the economic growth potential of the country, or they can be used by the government to build political support. Accordingly, developing country governments would be expected to be very sensitive to the economic benefits of mining and to accord them relatively higher weight than would governments in developed countries. Given the need to reduce acute poverty, they might also be expected to place a high value on near term benefits of mining as opposed to preserving natural resources for future generations. Few developed countries show a significant degree of economic dependence on mining,[16] and even in those countries where mining accounts for a relatively high proportion of exports, such as Australia or Canada, mining is no longer

[16] In the mid-90s, minerals and metals accounted for more than 20 per cent of merchandise exports in 27 developing countries and in only one developed country, Australia (UNCTAD 1995 and 1997).

automatically assigned precedence over other land uses and environmentally or socially important land is no longer made available for mining.

There is little support, however, for the contention that developing country governments are attempting to attract mining investments through a deliberate policy of applying more lenient environmental standards than developed countries. Assuming that such a strategy were politically feasible, which in itself is a strong assumption since stringent environmental standards appear to be as strongly supported by the public opinion in developing countries as in developed ones, few international investors would be attracted by what they would probably see as a transitory policy, likely to change later. In any case, they would be unlikely to be willing to profit from "loose" environmental regulations if this were to put their hard-earned reputations as environmentally conscious corporations at risk.

Thus, developing country governments are likely to see environmental protection and other elements of sustainable development as important objectives and accord them a high priority. They face great difficulties, however, in realizing these objectives. The enforcement of regulations concerning existing operations in developing countries faces considerable problems and may be less effective than in developed ones, particularly where those operations are owned by domestic enterprises and maybe, most of all, when they are owned by the state. The influence of other objectives accounts for a large part of the observed weaknesses in monitoring and enforcement of environmental regulations in many developing countries (UNCTAD 1994, p.40). Reluctance to increase the regulatory burden on existing companies too rapidly, possibly causing their survival to be threatened may play a role. Other reasons are also important, however. First, developing country governments often find it difficult to formulate practical standards and guidelines that are suitable for local conditions. There is a general tendency to copy Western standards that are often inappropriate (UNCTAD 1994, p.39). Second, lack of skilled staff and equipment also plays a role. It has been noted that:

> *In many cases, officers with decision making authority will have a general degree in biology or forestry or fisheries and will not understand the mining industry. The departments most familiar with mining, such as the Department of Mines, may not be the environmental approving authority because others in the government will view these officers as biased. Thus, decisions are often made by those who know very little about the practical realities of mining*. (Otto 1992a, p.2)

Third, and possibly most important, the objectives and interests that are brought to bear on the development of a mining project may differ between developed and developing countries in one important respect: the distribution of power between different levels of government and between the government and local communities.

Ideally, the role of the national government is to devise and build the policy and legal framework for sustainable development, including environmental standards, guidelines for assessments, procedural rules, and to ensure that the resources, most importantly, the technical expertise, necessary for implementation of policy are available. The role of lower level government authorities would be to channel the concerns of local

communities and to be responsible for implementation measures at the provincial and local level. It is often assumed that different levels of government work together towards a common objective, with the lower level government usually acting in an advisory capacity and the national government having ultimate decision making power, except for those cases where the decisions have been explicitly delegated or when lower level governments have been given the right of veto. The lower level government is assumed to be representative of local communities and to be able to articulate their concerns effectively, comprehensively and honestly.

In practice, few developing countries have institutions that allow lower levels of government to exercise a significant amount of influence on the permitting and planning process. Often, provisions for consultations with lower levels of government and public participation have been made in the legislation (UNCTAD 1994, p.49), but the consultations often do not produce concrete and relevant results since the lower level authorities usually have very limited technical competence. Moreover, the political weight of provincial and local government is likely to be small if they lack political legitimacy, as is the case if they are not directly elected, or if corruption is prevalent at these levels, which is not uncommon. The result may be a delinking of formal political/administrative authority and political legitimacy. As Wälde remarks:

> *Third world states are usually weak, but centralized. Formal mechanisms for involving local powers often do not exist. Since the elaborate procedures of public hearings and citizens' or environmental groups' litigation do not exist, local communities are either overpowered, underinformed or they take to violent action to assert themselves.* (Wälde 1992, p.338).

The problems faced by lower levels of government when trying to articulate the interests of their constituents and facilitate the process of adjustment to changes brought on by a mining project are further exacerbated by the fact that they very seldom receive a significant share of government revenue from the project. In most countries, the distribution of costs and benefits from mining operations is skewed, with costs being imposed locally while the major share of benefits accrues at the national level. Only in a small number of countries does the legislation provide for sharing corporate tax or royalty revenue with local government or local communities. The tax revenue that provincial and local governments collect tends to consist of items such as property taxes or, in some few cases, payroll taxes. The income from these taxes is often much smaller than the expenditure on social infrastructure that the local government needs to undertake (but which it may not be able to afford). This places the local government in a very difficult position: it is expected to deal with the impacts of projects while lacking the financial means as well as the political authority. As a result, local and international NGOs may assume the task of representing local communities and may be more effective, at least temporarily.

Against this background, it is not surprising that implementation of ambitious legislation intended to deal with environmental and social impacts of mining falls short of the target in many countries and that the factors that are most visible to the national

government, that is, the economic benefits, appear to be accorded greater weight. Due to the skewed distribution of benefits and costs, the national government will often tend to take a "pro-development" position, while the positions of provincial and local governments, although as a rule positive to development, since they are normally anxious to see economic growth take place, will often be moderated by other concerns. The potential tension between national and provincial/local level government might often have more to do with distribution of revenues than with differences in the evaluation of environmental and social impacts - there are numerous examples of the potentially serious consequences of disagreement over the distribution of benefits - but environmental concerns may serve as a useful proxy for the distribution issues and allow lower level governments to mobilize support that would otherwise not be accessible to them.

While the distribution of interests is in principle the same in developed countries, the political dynamics are often different and may give rise to outcomes that differ significantly from those in developing countries. Usually, local political institutions are stronger and they may be able to influence project design in crucial ways that increase the acceptability of projects to local communities. Moreover, national governments in developed countries are considerably less dependent on mining sector income and may therefore be more receptive to conservationist arguments. Generalizations are treacherous, however, and may be deceiving as shown by events in Australia and Canada, which would appear to support diametrically different conclusions about the positions that are likely to be taken by governments at the national and provincial level.[17]

5. Local Communities

Box 3.2 Objectives of governments

Sustainability objectives	Other objectives	Scope	Role
Preserve natural resources for future generations	Economic growth	National	Legislative
Ensure good environmental management	Preserve competitiveness	National/local	Legislative/regulatory
Balanced regional development	Equitable rent distribution	National/local	Legislative/planning
Protect traditional lifestyles	Social cohesiveness	Local	Planning/influencing
Protect interests of local communities	National sovereignty	National/local	Legislative/planning

and expropriate all company and individual claims in an area where a company proposed to develop the Windy Craggy deposit (Day and Affum 1995). The decision was controversial and gave rise to considerable criticism. The provincial government eventually paid compensation to the mining company concerned. In Australia, the Government of Tasmania announced a package of legislation affecting the mining industry, also in 1993. The package, which was warmly welcomed by the mining industry, included measures such as the revocation of part of a conservation area, an amendment to legislation that limited the depth of national parks to 50 metres below the surface so as to allow non-intrusive exploration and potential exploitation of underground reserves, and the creation of Strategic Prospective Zones in areas with high mineral potential with legislative protection to guarantee access for miners (Engineering and Mining Journal 1993).

Relations between mining companies and national governments on the one hand and local communities on the other have become the subject of increasing attention in recent years, partly as a result of several well-publicized incidents where the relations deteriorated to such a point that armed violence occurred[18]. These incidents are extreme examples of a trend of increasing assertiveness on the part of local communities, a trend that incorporates both traditional concerns such as employment and the natural environment but also new issues such as the management of social change.

It is not possible here to go into detail about the reasons underlying the increased assertiveness. Two factors appear, however, to be important. The first is the general trend towards increased openness, public participation and empowerment of local communities which may be said to characterize current world social development and which has encouraged the emergence of grass roots movements in almost all countries. The second factor is improved information and communications. This has made it easy for previously isolated communities to attract attention to their grievances, mobilize supporters and focus criticism on governments and companies. It has also resulted in local communities being considerably better informed about their legal rights and about standard environmental practices than they were earlier. Consequently, local communities are articulating their interests more clearly than before and are demanding that companies and governments take them into account.

It is sometimes assumed that the interests of local communities are adequately represented by local governments. In practice, this often turns out not to be the case. Even where the interests are clear and unambiguous and where they are understood by elected representatives, the local community that is concerned by a particular project may not correspond to the political subdivision, thus introducing one distorting factor. For instance, in many developed countries, the lowest unit for political decision making has become larger, due to the need for municipalities to take on increasingly complicated and technical tasks. Accordingly, these tasks are now carried out by larger municipalities created by the merger of several smaller ones, or by specially created political/administrative units. Moreover, the interests of local communities are seldom clear and homogeneous. Communities consist of different groups which may have distinctly different interests and may stand to gain or lose economically from a mining project depending on their occupation, employment status and whether they are landowners or not. It may be a hopeless task for the local government to reflect adequately all the resulting nuances in local community objectives or to arbitrate between them. The local government may also be a more or less efficient representative of local community interests depending on its technical competence, the degree of authority that has been delegated to it by central government and the conditions under which it has been elected. While it may be more likely that local government is technically competent and representative in developed countries than in developing ones, this does not mean that the need for local communities to resort to extra-parliamentary means to make their views

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[18] The most well-known of these incidents took place at Bougainville in Papua New Guinea, where the conflict resulted in the closing down of the mine which remains closed to this day, and at the Grasberg mine in the Irian Jaya province of Indonesia, where riots resulted in the deaths of several local inhabitants in 1995 (see also footnote 6).

known, such as the formation of dedicated pressure group NGOs, is non-existent in the former. On the contrary, due mainly to the difficulties faced by elected bodies in addressing multi-faceted, detailed issues, the use of consultative mechanisms outside the formal political system, such as town meetings, to solicit the views of local communities has been both earlier and more frequent in developed countries.

Nevertheless, when relations with local communities are discussed in the context of mining projects, it is usually with reference to local communities in developing countries - or when the local community in question is one of indigenous peoples. There are two reasons for this. First, in developed countries other stakeholders can usually feel assured that local communities will make their concerns known in terms and through channels that are clear to them, either through the formal political process or in some other way. This is not necessarily the case with communities in developing countries or with indigenous peoples, who may lack avenues for political expression or, when the avenues exist, may use modes of expression different from those used by other stakeholders. Thus, language difficulties, in both the literal and the figurative sense of the expression, form an obstacle to effective communication. Second, in developing countries and with indigenous peoples, mining projects are seen as an element of an economic development process and there is an expectation that they will result in a modernization of the local community. Thus, local communities in developing countries expect - and usually welcome - a transformation of their society. This places more complex demands on other stakeholders, including, in particular, the mining company. The ambitions of communities in developed countries are often limited to retaining the community as it is - only slightly more affluent.

Local communities can not be assumed to be inherently for or against mining development. Their attitude to a specific project will depend on local circumstances and factors, including the level of income, degree of unemployment, land use and land ownership institutions, perceptions, political and cultural values. Thus, a community with high income levels and little unemployment would not be expected to place a high value on the employment creation effects of a mining project, and might take a negative view of the expected influx of job seekers. In general, however, mining projects tend to be located in relatively sparsely populated, rural areas, simply because such areas constitute the main part of the land surface of the earth (it being assumed that mineral deposits are distributed in a roughly random manner across the earth's landmass). Such areas usually do not have a surplus of employment opportunities, and new employment is likely to be appreciated as is the prospect of an improved level of commercial and community services made possible as a result of a larger population base. On the other hand, people realize that development of a mine will inevitably change the character of the region and of the local community itself. They may ask themselves if the new type of society that will emerge as a result of the mining project corresponds to their ideals and if they will feel at home in it.

Generally speaking, most local communities are likely to have a relatively positive attitude towards new mining projects, although this attitude will be tempered by an ambition to extract the maximum possible in the way of positive commitments from companies and governments and by concerns about the environmental impacts.

It deserves to be emphasized that local communities are not homogeneous, but contain tensions, conflicts and opposing interests. It is all too easy to assume that public

opinion is monolithic and that interests converge. In practice, they often do not. Some people will lose and some will win and the opinion of what to do will rarely be unanimous. Moreover, while conflicts may be limited to certain areas before the project starts, development, with its attendant arrival of newcomers, will give rise to new problems and conflicts and may erode the cohesiveness of the local community further. The interests of local communities will therefore evolve, since the communities themselves are changing. New community members will contribute their views, which will carry just as much weight as those of the old ones - it is not possible in practice to make a distinction between "old" and "new" community members and there is nothing to say that one set of views is more representative than another in principle. While community members may want to preserve community "identity", the identity to be preserved is subject to constant change.

In conclusion, it is considerably more difficult to outline a clear description of the interests of local communities than it is to do so for companies or for government. The reason for this is of course that communities vary so much within and between countries and over time and that the internal social dynamics of a community are considerably more complex than those of a company.

Box 3.3 Objectives of local communities

Sustainability objectives	Other objectives	Scope	Role
Minimal environmental impact	Employment opportunities	Local	Influence decisions
Preserve lifestyles	Increased incomes	Local	Influence decisions
Balanced and diversified economy	Preserve traditional occupations	Local	Influence decisions

6. Indigenous Peoples

Indigenous peoples can be seen as a subset of local communities. They constitute be the whole local community or they may be a part of it. It is recognized, however, that as stakeholders they have some interests that tend to be common to them as a group and that are distinct from those of local communities in general. For this reason, indigenous peoples deserve to have a section of their own in this chapter.

It is often somewhat difficult to determine which groups of people should be considered as indigenous peoples. While the definition may not be absolutely decisive for the type of problems and interests that will be discussed in this section, it is nevertheless useful to clarify what we mean by indigenous peoples in this context. The following definition has been offered by the UNESCO Commission on Human Rights in 1982 (quoted in Cordes 1997).

> *Indigenous Populations are composed of the existing descendants of the peoples who inhabited the present territory of a country wholly or*

> *partially at the time when persons of a different culture or ethnic origin arrived there from other parts of the world, overcame them and, by conquest, settlement or other means, reduced them to a non-dominant or colonial situation; who today live more in conformity with their particular social, economic and cultural customs and traditions than the institutions of the country of which they now form a part, under a state structure that incorporates mainly the national, social and cultural characteristics of other segments of the population that are predominant.*

This definition identifies indigenous peoples as original inhabitants of modern nation states who are attempting to preserve their cultural and social worldviews while they are citizens of nations that profess significantly different values and practices. While the definition leaves open the question of content of the cultural and social values, observers of indigenous peoples' cultures - and the representatives of indigenous peoples themselves - maintain that the cultures have several common characteristics. One of these is the way that land is viewed and valued. The relationship between indigenous peoples and their land is complex, but typically well structured and based on an intricate network of kinship relationships with ownership typically vested in the kin group or community. The "ownership" concept is, however, different from that used in modern Western societies. Access to and use of the land is virtually guaranteed to all tribal members and nobody has the right to permanently alienate land from the group. Land allocation is both well regulated and flexible. The land itself often holds important symbolic and emotional meaning as the repository for ancestral remains, clan origin points etc. (Bodley 1990, p.77). The following quotation by a group of students from Bougainville in Papua New Guinea illustrates the cultural and emotional importance of land in the cultures of many indigenous peoples:

> *Land is our life. Land is our physical life - food and sustenance. Land is our social life; it is marriage; it is status; it is security; it is politics; in fact, it is our only world. When you take our land, you cut away the very heart of our existence. We have little or no experience of social survival detached from the land. For us to be completely land-less is a nightmare which no dollar in the pocket or dollar in the bank will allay; we are a threatened people.* (Connell 1991, p.60)

As regards other social values, stability is usually prized more than change. Social organizations tend to be egalitarian, and to emphasize reciprocity, harmony and equilibrium. Laws and rules reflect customary thought and behavior and are adapted to changing community needs. Conflict is approached with a view to mediation and compromise rather than as a search for rights, equity or just distribution. Interests of the community take precedence over the interests of the individual (Cordes 1997).

Many concepts and ideas of the modern westernized culture do not have any close equivalents in the cultures of indigenous peoples and consequently can not be integrated into their worldview. The rights of individuals, including the right to own and use property, and the codification of these rights in law, which form a central concept in

westernized culture, are significantly less important in traditional indigenous cultures. Consequently, the interests, wishes and reasoning of mining companies and government authorities may appear meaningless or mysterious to them. This means that traditional societies are often badly prepared for the changes that occur when a mining project is initiated. In addition to the consequences that are common to all communities and not welcomed by them, such as environmental degradation, increased income differences and unequal distribution of compensation payments, indigenous societies are also abruptly affected by changes in lifestyles that other communities have already gone through. These include (MacDonald and Sithole 1992, pp.4-5):

- disruption of the family units due to men moving to mines for employment, leaving behind their wives who often become wholly responsible for the agricultural duties of the family;

- shift to a monetary economy with attendant inequalities;

- increase in money-making initiatives as individuals begin small businesses catering to the mining community and increasing the exposure of the community to economic changes, for instance, when the mine closes down; and

- land use changes which may lead to the loss of livelihoods.

Over time, indigenous peoples assimilate the values of the dominant cultures. While many indigenous peoples make determined and successful efforts to preserve their cultures, elements of the dominant culture will inevitably be picked up. The integration of two disparate cultures is, however, not something that is done easily and the result may lack some of the strengths of either culture. Depending on the extent to which other values have been integrated into the traditional culture indigenous peoples may have a more or less positive attitude to mine development and the associated modernization.

Box 3.4 Objectives of indigenous peoples

Sustainability objectives	Other objectives	Scope	Role
Preserve culture and lifestyles	Modernization	Local	Influence
Protect land and land uses	Modernization	Local	Influence
Minimal environmental impact	Employment and income	Local	Influence
Preserve biodiversity	Employment and income	Local	Influence

7. Non-Governmental Organizations (NGOs)

Strictly speaking, NGOs are all those organizations which do not form part of the government structure and which do not have commercial objectives (while commercial organizations could in principle be included since they are not part of government, in practice they almost never are). They include a multitude of organizations with very diverse objectives and scope, from the local to the global. In the context of mining and sustainable development, however, it is mainly two groups of NGOs that are of relevance: local NGOs which claim to represent parts or the entirety of local communities, including indigenous peoples, and NGOs with exclusively conservationist objectives and which may be local or more broadly geographically based.

The importance and influence of NGOs have increased enormously over the past couple of decades. They exist everywhere, although their importance is of course strongly linked to historical, political and cultural factors.[19] Factors behind the growth of NGOs and their influence include the improved ease and speed of communications (particularly the Internet) and the perceived effectiveness of "single issue" groups as opposed to traditional political parties. In some cases, absence of other avenues of political expression and repression of political parties may have contributed to the emergence of NGOs as the only available vehicle for political action.

NGOs have gradually become accepted by the "establishment", and it is now for instance a matter of routine for NGOs to participate actively, although still formally as observers, in deliberations at United Nations conferences and other intergovernmental meetings. It is unusual today for anybody to question the legitimacy or representativeness of NGOs in these circumstances and it is accepted that their involvement is a *fait accompli* that can not be changed.

NGOs that are purely local in scope may be assumed to reflect at least a part of local opinion. The ones which are active in the discussions and debate surrounding a mining project usually have a negative attitude to it, since they are often established as a reaction to a proposed mining project or in response to specific events such as changes in mining procedures or accidents. The situation may be slightly different in situations where the local government can not be seen as representative of local public opinion, for instance because it is appointed rather than elected or because its constituency is not congruent with the area affected by the mining project. In such cases, NGOs may have to replace local government for the purposes of discussion of the project and they are then likely to represent a more complex set of objectives, incorporating, in particular, employment and income growth.

Purely environmental NGOs can be locally based, but often they are national or, as some of the best known, global. The large specialized environmental NGOS subscribe to different paradigms and have different views on where the optimal balance between developmental and environmental concerns should be struck. In particular, they differ on the subject of the extent to which it is acceptable to replace natural resources with other

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[19] For instance, according to Clark (1997), there are over 16,000 NGOs in the Philippines and less than 400 in Vietnam. A majority of the NGOs in the Philippines operates at the grassroots level, while less than 20 per cent do so in Vietnam. As a result of these discrepancies the NGOs of the Philippines play a key role in community building, assuring indigenous rights and in dealing with mining companies with respect to mineral developments. Conversely, in Vietnam they have little or no voice in these activities.

physical or human capital, with some arguing that the total quantity of natural resource capital should be kept intact and passed on to future generations and others being prepared to condone some depletion of natural resource capital in the interest of development.[20] Consequently, their views of mining also differ significantly although none of them can be said to have a positive or even neutral attitude towards mining. The most important reason why environmental NGOs tend to have a negative attitude to mining is of course that they are advocacy groups with the objective of protecting the environment. No advocacy group is very effective if it attempts to anticipate the outcome by promoting balanced views or deals. It is the task of formal political authority to balance interests against each other. The advocacy group is inherently partial.

NGOs affect the conditions for mining mainly through their lobbying and public information activities which exercise a strong influence on public opinion and therefore also on the continuing work on establishing a framework for sustainable development. A few national and international environmental NGOs have specialized themselves in mining. These "mining/environmental" NGOs are without exception negative to mining, at least by large mining companies, and in the context of individual projects they usually side with those who are attempting to stop mining projects, mainly by supporting and assisting local NGOs. Notwithstanding their consistently negative attitude, which sometimes may appear to be independent of the merits of the project in question, their broader range of knowledge and greater expertise may assist local NGOs to improve the quality of their arguments. In this manner, the quality of the debate may improve, as may the prospects of attaining a solution satisfactory to all stakeholders.

NGOs are not insensitive to developmental concerns, however. Many NGOs are strong supporters of the development aspirations of developing countries and, although most of them argue that the contradiction between sustainability and economic development is more apparent than real, they are prepared to examine the practical problems of combining material development and sustainability. Moreover, NGOs tend to have strong egalitarian - sometimes populist - views and respect for cultural diversity,

Box 3.5 Objectives of non-governmental organizations (NGOs)

Sustainability objectives	Other objectives	Scope	Role
Minimal disturbance of ecosystems	Equitable income and wealth distribution	International/national/local	Influence
Maintain natural resources intact	Elimination of poverty	International/national/local	Influence
Respect for cultural diversity	Modernization	International/national/local	Influence

[20] See Colby (1990) for a good systemization of the different paradigms of environmental management in development, particularly with respect to the balance between resource conservation and development.

which leads them to support the interests of local communities and indigenous populations.

8. Intergovernmental Organizations (IGOs)

The experience of the past couple of decades shows that IGOs contribute to the evolution of thinking about sustainable development and its application in three important ways:

- international standards, norms and guidelines are formulated under IGO auspices;

- IGOs assist developing country governments in preparing and implementing legislation and administrative practices intended to promote sustainable development; and

- IGOs contribute to the advancement and dissemination of scientific and technical knowledge as well as of statistics, basic economic data and innovations in the area of environmental and socio-economic management.

All of these activities contribute to shaping public debate about sustainable development issues and influencing the actions of not only governments but also of other stakeholders.

To assert that IGOs have objectives or interests different from or beyond those subscribed to by their member governments is a risky proposition. Nevertheless, IGOs may at times act in ways that suggest that the whole is greater than the sum of the parts and that policy recommendations can be more far-reaching than the least common denominator or even the average of government opinions.

Of the three ways in which IGOs were said above to contribute to thinking about sustainable development, the first way may provide the best example of this. When formulating international standards, norms and guidelines, the fact that the subject is addressed in an intergovernmental context may in itself have a mobilizing effect on public opinion and government policies. It is difficult to believe that sustainable development policies around the world would have been the same if events such as the United Nations Conference on the Human Environment in Stockholm in 1972 and the Rio Conference on Environment and Development in 1992 had not taken place. Thus, the recommendations and agreed conclusions of these conferences and others on related subjects have often been considerably more ambitious than policies in participating countries

There are several reasons why intergovernmental debate has advanced the cause of sustainable development. First, many sustainable development issues such as climate change, global resource conservation and biodiversity are inherently global and their resolution requires actions that are beyond the means of individual governments. Second, the striving for consensus can exert significant pressure on individual governments. As negotiations go on, delegations try to stretch the limits of their instructions in order not to

be seen as the ones that are holding up progress. Finally, since the agreed texts are usually generally worded and non-binding, governments reason that they can participate in a consensus without having made commitments that may be difficult to implement nationally. However, even vaguely worded texts tend to affect national policies, mainly through their impact on public opinion. Moreover, a pattern of review conferences and other follow-up activities stimulates governments to activity and influences the dynamics of the domestic political process. As noted by Otto in chapter 4, the main impact of efforts by IGOs has been to shape the agendas of national lawmakers and company officers with regard to issues and policies. Thus, concepts that are developed as usually unenforceable international "soft" law are adopted into enforceable "hard" national law or into internal company policy and practice.[21]

A second way in which sustainable development objectives are transmitted into national practice is through technical assistance activities by IGOs. Technical assistance is an important function of many IGOs as seen from the description provided by Otto in chapter 4. The technical assistance is often closely related to the norm setting activities of IGOs and aims to help in the application of the standards and guidelines evolved under the auspices of the IGOs concerned. Consequently, a large part of the technical assistance is aimed at various forms of capacity building, for instance through modernization of legislation and training of government officials.

In the context of individual mining projects, the most common role of IGOs is to provide part of the necessary capital. As already mentioned, the project approval procedures of IGOs include guidelines concerning environmental and socio-economic impacts that are likely to be at least as stringent as those contained in national legislation. Consequently, the involvement of an IGO in project financing would be expected to lead to a strengthening of requirements.

IGOs also transmit knowledge and information about sustainable development practices, thereby facilitating their incorporation into national regulations and procedures for environmental and social impact assessments. By virtue of their universal membership, IGOs have easy access to information from the entire world and can utilize existing networks to disseminate it effectively. These advantages are equally valid for scientific information, basic data and information about analytical and management methods.

It may appear from the foregoing that IGOs are exclusively concerned with the sustainability aspects of development. As was illustrated by the quotation in section 4 above about the Stockholm Conference, however, IGOs have found themselves at the intersection point between material development interests and sustainability objectives ever since the beginning of the international environmental debate. Their activities reflect the constant balancing of these two objectives in accordance with the directives issued by their member governments. The outcome of this balancing act and the success with which the objectives are successfully integrated into a holistic philosophy of development varies over time and from one organization to another, depending mainly on its mandate.

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[21] See Pring et al. (1998) for a comprehensive and detailed inventory of hard and soft international law as applied to mining.

Different observers are also likely to assess their success in one or the other dimension differently.

Box 3.6 Objectives of intergovernmental organizations (IGOs)

Sustainability objectives	Other objectives	Scope	Role
Preserve natural resources for future generations	Economic development	Global	Legislation/assistance/information
Promote high standards of environmental management	Respect for national sovereignty	Global	Legislation/assistance/information
Respect for cultural diversity	Modernization	Global	Legislation/assistance/information

9. Converging and Diverging Interests

As seen from the preceding discussion, the last several years have seen a philosophical convergence among stakeholders in the sense that all of them at least pay lip service to sustainable development objectives. However, this does not prevent disagreement over implementation in individual cases and such disagreement will usually follow typical lines, where the variation in attitude for a particular stakeholder can be expressed along a continuum. Accordingly, it would be theoretically possible to work out the various possible combinations of positions and identify the trade-offs that would be possible. In practice, this is made difficult by the fact that not only are the values that that would be traded expressed in different units, but also by the absence of mechanisms that would allow trade-offs to be made.

The fact that optimal solutions are not attainable does not, however, absolve the stakeholders from the responsibility of working out arrangements that are, if not ideal, at least acceptable to all involved. This task is made easier by the fact that the rents of most mining projects that have a realistic chance of being implemented today will be sufficient to compensate those that have to bear the burden of external costs. Projects with lower rents would probably be screened out either by the investing company on the grounds of insufficient profitability in the face of risk, or by government authorities during the permitting process. The distribution of the rents is a matter for negotiation, where traditionally the mining company and the national government have been the only parties to the negotiation. What is new in today's situation is that a third stakeholder, the local community, insists on a seat at the negotiating table. The other stakeholders discussed in this chapter, while interested in the outcome, will usually not be able to influence it directly, but may support one of the negotiating stakeholders. NGOs provide support to local communities, financing institutions advise their creditor companies and IGOs influence the process indirectly by extending assistance to governments with the

development of regulatory frameworks. Whereas the negotiation between national government and investing company is relatively simple and one-dimensional, concerning mainly the magnitude and distribution of the stream of payments from company to government, the three-way negotiation which will have to be carried out in today's and tomorrow's projects is more complicated. Some of the concessions desired by the local community may not be possible to convert into monetary terms and the presence of tensions and contradictory objectives within the local community may exclude certain solutions. At the same time, precisely these factors may also increase the range of possible solutions, including some that may not be zero-sum solutions. The challenge of the negotiation process is to identify these solutions and convert them into practical reality.

Table 3.1 represents a rather crude attempt to illustrate the interests of the various stakeholders with regard to a hypothetical mining project in a systematic fashion. The number of Xs show how important a particular issue is to the stakeholder. The table is of course a generalization and the interests of an individual company, for instance, may differ considerably from the "average" company represented in the table. NGOs have been divided into two groups, local and national/international, since the interests of these two types of NGOs are likely to differ. Intergovernmental organizations have been left out, since they are normally not involved as stakeholders at the level of individual projects. The table does not show whether interests converge or diverge. This means that the existence of three Xs for a particular issue for two stakeholders may imply that this issue is a "deal breaker" or that it offers an opportunity for two groups of stakeholders to form an alliance. The various issues will be discussed in turn with a view to identify the ones where interests of stakeholders on issues that are important to them converge or diverge.

The economic return of the project is of importance mainly to the company and to the national government and, on this issue, their interests are clearly similar. They are both interested in the financial viability of the project, which ensures a good return to shareholders as well as a satisfactory level of tax revenue for the government. While there may be differences of opinion regarding the distribution of the revenue, there has to be something to distribute in the first place. For the other stakeholders, this aspect is of limited importance, although the local government is likely to take more of an interest if it shares in tax revenue. Local communities, indigenous population groups and NGOs will usually not see the economic return as an important objective, but they may use differences in magnitude between profits and expenditure on environmental and social expenses as an argument to support certain types of actions. Thus, their objectives are related to the use of economic rents rather than to the size of the rents.

Table 3.1 Issues and stakeholders

Issues □	Stakeholders						
	Company□	National government□	Local/provincial government□	Local community□	Indigenous peoples□	Local NGOs□	National/ international NGOs
Economic return of project	XXX□	XXX□	X□	X□	□	□	□
Direct employment	XX	X	XXX	XXX	XX	XX	
Indirect employment	X	X	XXX	XXX	XX	XX	
Land ownership and land use	X□	X□	XX□	XXX□	XXX□	XX□	X□
Social and cultural impacts	X□	X□	XX□	XXX□	XXX□	XX□	XX□
Environmental compliance	XXX	XXX	XXX	XX	X	XX	XX
Environmental impacts	X□	X□	XX□	XXX□	XXX□	XXX□	XXX□
Impacts on biodiversity	X□	XX□	X□	XX□	XXX□	XX□	XXX□

The employment effects of the project, both direct and indirect, are very important to the local/provincial government and to the local community. They are also somewhat important to the company, to indigenous peoples and to local NGOs (depending on the extent to which they represent the entire local community or only segments of it). Again, this is an issue where interests converge and where major conflicts are unlikely to occur during most of the project's life. The company will usually be anxious to recruit as many of its employees as possible locally and the local population will welcome the new, usually relatively well paying, job opportunities. There may of course be differences of opinion about the emphasis that should be given to local recruitment, the amount of training that the company should provide and whether certain functions should be carried out within the company or be outsourced. It is normally possible, however, to settle these differences relatively easily. It is important to note, however, that the generation of indirect employment is a less important objective to companies and one with which they have historically not concerned themselves greatly. Local communities and lower levels of government, on the other hand, attach great importance to the additional employment opportunities that may arise and will usually attempt to influence the company to invest in the local economy, for instance, by giving preference to local businesses as suppliers. Where local skill levels are low, these secondary job opportunities become even more important. The potential for controversy over this point increases as the project nears its end, which is when objectives concerning employment often diverge. The local community and the local/provincial government will normally want to delay the time of closure in order to protect both direct and indirect employment. The company will try to minimize its costs and will be unwilling to accept any continuing responsibility for employment. Nevertheless, if sufficient attention is given to the creation of a sustainable local economy, including the identification of replacement economic activities at an early stage, conflicts may be avoided.

Land ownership and land use may not be a priority issue to the company (except insofar as rules concerning land ownership affects the security of tenure) or to the national government. To the local stakeholders, including indigenous peoples, on the other hand, this issue may be extremely important and their interests are likely to diverge from those of the mining company. Owners of land may be influential in the local community and the customs and rules concerning land ownership may occupy a central role in the local culture. Moreover, as was noted in section 6 of this chapter, the land itself often holds important symbolic and emotional meaning to indigenous peoples. Accordingly, there is considerable potential for conflict between the company and local communities over issues concerning land and land use. On this issue, the local stakeholders may also get some support from national and international NGOs. The divergence of interests does not, however, necessarily have to result in conflict. While this issue may be a deal breaker since mining is difficult to combine with other land uses, interests can often be reconciled through compensation payments and, perhaps most importantly, through attention to local land use planning, well managed rehabilitation programs, and early planning of post-mining land uses.

Social and cultural impacts are, again, very important to local interests and less so to the company and the national government. The preservation of lifestyles, community traditions and a positive social environment is obviously of more concern to those that

live in the community concerned than to the company - which may not regard itself as part of the community - or to the national government, which is concerned about the welfare of the whole country's population. This is an important area of potential conflict, where the influence and interests of national and international NGOs also have to be taken into account. It is also an area where much work needs to be done on improving regulations and ensuring that they provide an appropriate framework for settlement of differences. Indeed, it is only recently that many governments have begun to require the preparation of a social impact assessment as part of the permitting process. The diverging interests are likely to manifest themselves during the early stages of the project, often already during the exploration phase, and if they are to be reconciled, action has to be taken at this stage.

Environmental factors have been divided into two issues in the table: formal compliance with environmental regulations and actual environmental impacts. The division of the environmental aspects into two issues is intended to allow a distinction between two kinds of objectives and attitudes to environmental impacts, the difference between which underlies much of the environmental controversy surrounding mining projects. The company and the national government are most concerned with compliance, that is, whether the company has carried out a satisfactory environmental impact assessment and is observing its commitments with respect to emissions and other impacts. The government can not demand any action from the company that goes beyond the requirements of the regulations. For the company, while it may voluntarily undertake obligations concerning environmental protection that are more ambitious than those legally required, the effects of not being in compliance are usually more serious than those of not meeting its internal standards. Consequently, the formal compliance objective is given a larger weight. The local stakeholders and NGOs consider the actual impacts that they experience to be more important than formal observance of standards, the content and meaning of which may in any case not be very clear to them. If regulations, despite the best intentions of the national government, do not correspond to the real concerns of local communities, conflict may well result. Thus, the emergence of diverging opinions and conflict on environmental issues may often reflect that environmental regulations are not appropriate to the local situation rather than lack of commitment to good environmental management on the part of the company and the national government. Accordingly, the occurrence of conflicts over environmental issues may be avoided by ensuring that regulations are appropriate and can be enforced and by paying attention to local conditions during the scoping stage of the environmental impact assessment.

The final issue, impacts on biodiversity, has been included since it is distinct from the other environmental issues. Biodiversity is often not an important priority for the core stakeholders, except as an indicator of environmental impact. For national and international NGOs, however, the preservation of biodiversity is among the principal sustainability objectives. Consequently, with respect to this issue, interests of the local stakeholders, with the important exception of local NGOs and indigenous peoples, may converge and they may find themselves in conflict with interests that they perceive to be promoted by “outsiders”, such as national and international NGOs and, possibly, the national government. The issue of biodiversity will normally be important at the planning

stage. This makes it difficult to achieve a reconciliation of interests because the consequences of mine development may not be clear to all stakeholders at this stage. Moreover, it is an issue that may not be at all familiar to local communities and lower levels of government.

As is seen from this brief review, on most of the issues where interests diverge, the company and the national government tend to end up on the same side, while local government, the local community, indigenous peoples and NGOs end up on the other. While this line-up of interests is not inevitable, it illustrates the basic problem of ensuring a balanced distribution of benefits and costs of mining. It is also important to note that the distribution of interests and the urgency of issues in many cases change over time. This fact underlines the need for the national government and the company, who have the means to plan ahead, to do so in order to ensure that issues are addressed as the earliest opportunity.

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Chapter 4

Institutional Frameworks: Process and Implementation[1]

James M. Otto

1. Introduction

The objective of this chapter is to identify principle institutional frameworks that can or could affect the formation and implementation of mineral sector sustainable development policies. The primary focus is to describe the regulatory mechanisms and processes available to achieve sustainable development objectives. In addition, regulatory requirement impacts on private sector minerals investment decision-making is briefly explored in both a present and future context.

The chapter is divided into five principle sections. The first introductory section distinguishes the respective regulatory roles of governments and the private sector and briefly discusses the agenda-setting role of inter-governmental organizations (IGOs). The second section provides a summation of the importance that IGOs play in initiating sustainable development policy development processes, lists examples of "international law" that may impact mining, and discusses the IGO role in assisting governments to draft sustainable development laws and regulations. The third section is devoted to an explanation of the multi-tiered options that governments can use to develop and implement sustainable development policy through regulatory means. The fourth section concentrates on self-regulatory mechanisms available to the private sector. A concluding section draws together the first four sections and relates government regulatory requirements to private sector investment decision-making.

In most nations minerals belong to the state or to the people communally and mineral resource usage is administered by government agencies assigned assorted duties and powers. These duties and powers originate in the regulatory framework. The design of this framework is often an evolutionary process that finds its roots in the national constitution or common law but is mainly shaped through the adoption and modification of policy through the passage and amendment of statutes, regulations, orders and other regulatory instruments. In some nations, negotiated or model mining agreements form a part of the regulatory or contractual framework. The implementation of government policies is further shaped through the administrative practices of the agencies responsible for the implementation of the law. In the 1990s, mineral policy makers in many nations, whether they are lawmakers or administrators, have begun to consider the concept of sustainable development as it applies to the mineral resources sector.

The challenges that government policymakers face when addressing the topic of mining and sustainable development are significant. Mineral deposits are depleting assets exploited by socially and environmentally disruptive operations, and their exploitation is fertile ground for a broad spectrum of government policies concerned with sustainability

[1] This chapter is based, in part, on an earlier paper by James Otto (1998).

issues.[2] Policy challenges are posed at every part of the mining cycle—exploration, development, mining, rehabilitation, post-mining. Pressure is brought to bear on policy makers by their electorates, non-governmental organizations, fellow policy-makers, government agencies and the mining industry. At present, even defining the scope of what is meant by the term "sustainability" in respect to mining is a challenge. Policy making is done at many levels within government—from direction offered by the executive branch, to the decisions of politicians expressed through legislative process, to interpretation of the law and enforcement by government agency officers and courts.

Although mineral resources are often state-owned, the actual discovery and development of these resources is usually undertaken by the private sector. In determining whether to invest in a specific exploration venture or mining project a private firm will carefully assess the regulatory framework that defines its rights and obligations. In a few nations, this framework with regard to at least some sustainability issues is partly defined, but in most nations, policy concepts remain embryonic. Many major mining companies have taken internal initiatives to address sustainability issues both within the context of national operations and as part of global operations. Industry groups such as chambers of mines also have a role to play. Self-regulation on a both a company and industry group basis is an important part of sustainable mineral development.

While regulation is primarily a function of either governments (direct regulation) or the private sector (self-regulation), intergovernmental bodies such as the United Nations and World bank also contribute to the process of developing sustainable development concepts as applied to the mineral sector. The role of intergovernmental organizations, governments and companies to form and implement sustainable development policies is described in the following section.

2. The Role of IGOs and International Law

2.1 Shaping the agenda

Intergovernmental organizations (IGOs) have played a central role in the origination and refinement of the concept of sustainable development. As Ostensson has described in Chapter 3, they have in effect brought the concept to the center stage and provided the impetus to governments to consider how the concept applies to their country and how resulting policies can be implemented. In some instances, international law resulting from IGO activities in the form of various treaties and protocols have, or may in the future have, an impact on the mining industry. For instance, the Basel Convention has impacted the trade in metal scrap, which is a key element in sustainable development from the perspective of recycling.[3] The main impact of efforts by IGOs has not been to develop effective sustainable development regulatory systems, but rather to shape the agendas of national law-makers and company officers with regard to issues and policies. Thus, concepts that are developed as usually unenforceable international "soft" law, are adopted into enforceable "hard" national law or into internal company policy and

[2] For a comprehensive review of the impacts that a mine or mineral processing facility may have on the natural and human environment see Mining Journal Research Services (1991).
[3] For an analysis of the impact of the Basel Convention on minerals trade see Guevara and Hart (1996).

practice. The range of IGO originated "international law" affecting mining has been extensively dealt with by others[4] and will not be dealt with in detail here. However, it is illustrative to consider the broad range of matters taken up by IGO and related institutions. A listing of the principle treaties and protocols identified by Pring, Otto and Naito (1998) as having the potential to impact mineral sector sustainable development policy is given in Table 1.[5] It is ironic that even as the role of IGOs increased in the 1990s in regard to sustainable development policy stage setting, their role in actual national regulatory development assistance has decreased.

2.2 IGO role in national mineral sector regulatory development

During the early 1990s, governments could rely on the support of a number of specialized intergovernmental organizations to aid them in designing and drafting mineral sector regulatory frameworks. This has changed dramatically over the past decade as key organizations have been disbanded or experienced severe budget cuts. The two principle United Nations implementing agencies that historically provided mining legislative advisory services were the UN Centre for Transnational Corporations (UNCTC) and the UN Department of Technical Cooperation for Development (UNDTCD). UNDTCD was dissolved in the early 1990s, and UNCTC has been absorbed into the Conference on Trade and Development (UNCTAD) where its work on matters relating to mining have markedly declined. Other UN agencies that could play a role in legislative advisory support, such as the Commission on Sustainable Development (UNCSD), Environment Program (UNEP), UNCTAD, Industrial Development Organization (UNIDO), Educational, Scientific and Cultural Organization (UNESCO), International Labour Organization (ILO), Revolving Fund for Natural Resources Exploration (UNRFNRE), regional economic and social commissions (UNESCAP, UNECLA, UNECE, UNECA) lack either the mandate (the mining sector is usually accorded a very low priority), budget or legal staff to effectively fill the void left by the dissolution of UNDTCD and refocusing of UNCTC. After 1995, IGO support with regard to mineral regulatory matters has been largely restricted to efforts by the World Bank and, to a lesser extent, the Commonwealth Secretariat and East-West Center.

The World Bank and its sister organizations (IDA, IMF, MIGA) have played an increasingly large role in regulatory development assistance during the 1990s. Through its country assistance projects it has provided advisory services to assist a number of countries in drafting laws affecting the mineral sector.[6] In addition, on a project and country lending basis it, like other development banks and private lenders, has been able to pressure governments to implement a broad range of "green conditionalities" as part of its lending practice.[7]

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[4] An extensive treatment is provided by Pring, Otto and Naito (1998).

[5] For additional analysis also see Brett (1996).

[6] For example, the World Bank provided funding and assistance to the government of Zambia to privatize its copper industry, reform its mineral sector regulatory agencies, and draft a new mining law. In the 1990s the Bank had active mining law assistance programs in Africa, central Asia, Eastern Europe and South America.

[7] Most development banks have developed detailed guidelines that specify environmental and social requirements that are a pre-condition for grants or loans from the bank. For example, "in accordance with its mandate [European Bank for Reconstruction and Development] to promote sustainable development,

Table 1. A sampling of "international laws" and their potential applicability to the stages of mining

Item	Land Access	Production	Product
World Heritage Treaty	X	X	
Ramsar Convention	X	X	
Regional Nature Treaties	X	X	
Biodiversity Treaty	X	X	
Law of the Sea Treaty	X	X	
Antarctic Treaty Regime	X	X	
EIA Conventions	X	X	
Regional Seas Treaties		X	
Water Quality Treaties		X	
Convention on Long-Range Transboundary Air Pollution (LRTAP)		X	
LRTAP Heavy Metals Protocol		X	X
Air Quality Treaties		X	
Stratospheric Ozone/Montreal Protocol		?	
Climate Change Convention		X	
General Agreement on Tariffs and Trade (GATT)			X
Regional Free-Trade Treaties			X
Basel Hazardous Waste Convention		X	X
Regional Hazwaste Treaties		X	X
Multilateral Development Bank Guidelines	X	X	
Development Assistance Agency Guidelines	X	X	
Stockholm/Rio Principles	X	X	X
Agenda 21	X	X	X
Regional IGO Programmes	X	X	
ISO 14,000 Standards	X	X	X
Indigenous Peoples/Local Communities Legal Developments	X	X	

Source: derived from a larger table developed by Pring, Otto and Naito (1999).

The Commonwealth Secretariat maintains an economic and legal advisory group that provides assistance to governments that are part of the Commonwealth of Nations. To date, these services primarily have been to backstop governments in mining agreement negotiations. Most agreements in the 1990s contain some provisions related to sustainable development concepts.

The East-West Center provides advisory services similar to those offered by the Commonwealth Secretariat, but with a greater emphasis on capacity building and educational programs, to nations in the Asian-Pacific region. Budget cutbacks during the 1990s have limited the scope of its activities but it remains a valued asset to the region.

On a regional basis, the European Union has collectively begun to consider the adoption of various regulatory measures designed to provide a more uniform mineral sector regulatory system for its member nations. A framework document was issued in 1992[8] that identified the potential issues that are recommended for EU common regulation or for countries within the EU to individually consider in order to achieve greater harmonization.

While work by the World Bank, Commonwealth Secretariat, East-West Center, European Commission and similar organizations to aid governments in the development of mineral sector regulatory schemes has had an appreciable effect in a few countries, the vast majority of governments rely on their own expertise to evolve their regulatory systems.

3. Role of National Regulatory Systems to Achieve Sustainability Objectives

In order to regulate sustainable mineral development a government should ideally:

- first set its policy objectives,
- decide how these objectives will be met,
- decide whether the public or private sector will have the primary role in meeting each objective,
- determine what regulatory framework is required and then implement that framework, and
- decide which agencies of government will have regulatory oversight.

In some instances these activities take place according to a preset schedule and in a logical sequence, but more often, they occur in an *ad hoc*, piecemeal way. Thus, it is not uncommon for governments to begin drafting laws or amendments to laws before the basic policy underlying the draft legislation is decided.

In some nations, a published national mineral policy provides a summary of government positions on key elements of mineral sector development including policies regarding sustainable development. The creation of a formal national mineral policy serves three important functions: first, it provides guidance to the private sector on key government positions; secondly, it provides guidance to law drafters and administrative agencies; and thirdly, the process by which it is arrived at provides a consensus building

[8] The European Union has issued a number of directives and guidelines relating to mining over the past decade, some of which address issues relating to sustainable development. For an overview see European Union (1992).

opportunity, allowing important issues to be identified, discussed and agreed upon (Otto, 1997).

A number of nations that have published national mineral policies have formally addressed sustainable development. For example, Canada and India make sustainable development a central theme in their mineral sector policies. An extract from the Canadian policy (Canadian Government, 1996) may be indicative of the types of issues that governments may increasingly address in the future:

> *The Government has adopted the Brundtland Commission's definition of sustainable development. The* [Canadian] *Policy applies this definition by identifying the key elements of sustainable development in the context of minerals and metals. In light of the foregoing, the Policy has six major objectives:*
>
> - *integrating the concept of sustainable development in federal decision-making affecting the minerals and metals industry;*
> - *ensuring the international competitiveness of Canada's minerals and metals industry in the context of an open and liberal global trade and investment framework;*
> - *advancing the concept of sustainable development of minerals and metals at the international level through partnerships with other countries, stakeholders, and multilateral institutions and organizations;*
> - *establishing Canada as a global leader in promoting the safe use of minerals and metals, and their related products;*
> - *promoting Aboriginal involvement in minerals- and metals-related activities; and*
> - *providing a framework for the development and application of science and technology to enhance the industry's competitiveness and environmental stewardship.*

India's national mineral policy (Indian Department of Mines, 1992) states that sustainable development is one of the nation's 7 primary mineral sector objectives.

> *The basic objectives of the mineral policy in respect of minerals shall be as follows … to develop mineral resources taking into account the national and strategic considerations and to insure their adequate supply and best use keeping in view the present needs and future requirements …*

The process by which official government policy is determined varies widely. In some nations, the President or a Minister simply decides and declares what the policy is. In other countries, a very involved consultative approach is used to arrive at a consensual understanding. In some nations policy-making is left strictly to government while in other nations a variety of means are used to obtain industry and community input. Nations have used a wide variety of means to obtain industry and community input to assist in shaping their policies including: joint industry-government taskforces (Canada),

public hearings (U.S.A.), advisory technical committees (Malaysia), government industry roundtables (Vietnam, China), green paper/white paper parliamentary procedures (South Africa), and so forth.[9] The processes that governments use to engage stakeholders in policy-making is developed further by Epps and Brett in Chapter 5.

Regardless of how policy is determined, the tools available to governments to implement policy are similar: statutes, agreements, regulations, guidelines, orders and action or inaction by administrative agencies. Mining laws and agreements are the primary approaches used to regulate mines. In some cases, one or the other of these two approaches is used exclusively, but it is not uncommon to see a combination of both approaches being used. Regardless of the approach, both laws and agreements are an important means governments can use to express policy and act as the primary tools to implement that policy. Both approaches can extend to include policy dealing with sustainable development issues.

3.1 Regulation by laws, regulations and government guidelines

Many individual laws affect mining and can and do act to reflect various government policy on issues relating to mining sustainability[10]. Key laws typically include the environmental law, water law, land law, labor law, trade law, tax law, etc. To the author's knowing, no country had, as of 1998, passed a specific law dealing solely with sustainable development.[11] While many laws affect mining operations, core amongst these is the mining law (or mining "code" in most civil law jurisdictions).

The mining law can act as a legal expression of sustainability policy and the means for its enforcement through a number of mechanisms including the statute itself, regulations, terms and conditions prescribed under the statute, and through enforcement tools such as orders and decrees. Each of these mechanisms will be described in turn.

Mining law systems vary widely but there is enough commonality to provide a descriptive framework that is useful to understand the principle ways in which the law can be used as a tool to implement sustainability policies. Mining statutes typically cover exploration and mine production activities, and more rarely downstream smelting and refining. In some statutes, principles of sustainable development are explicitly described, while in others, the subject is approached indirectly. Section 2 of the Philippine mining statute[12] is indicative of the new focus balancing mineral development and sustainable development issues found in some recently enacted mining statutes:

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[9] Miller (1997) provides the rationale and several possible approaches to the concept of partnering to arrive at suitable policies and regulatory systems.

[10] For a review of the evolution of mining laws over the past several decades see Otto (1996). For a view of government mineral policy changes in the 1980s also see Waelde (1992).

[11] Clark (1997, p.43) argues that "no country has an adequate legal regime for dealing with social-cultural issues as they relate to mineral resource development projects." Most persons would consider social-cultural impacts a sub-set of sustainable development issues. Clark goes on to propose that a regulatory system to address these impacts must consist of three levels: clear government policies; laws and implementing rules and regulations; and government capacity to monitor and enforce project-specific matters.

[12] Republic Act No. 7942 Philippine Mining Act of 1995.

> *All mineral resources in public and private lands within the territory and exclusive economic zone of the Republic of the Philippines are owned by the State. It shall be the responsibility of the State to promote their rational exploration, development, utilization, and conservation through the combined efforts of government and the private sector in order to enhance national growth in a way that effectively safeguards the environment and protects the rights of affected communities.*

In countries with a legal system based primarily on "common law" traditions (mainly ex-colonies of Britain and most Asian nations), authorization to explore and the requirements under which mineral exploration may proceed are usually granted under the mining statute by the government in a license. Authorization to produce minerals is addressed through a subsequently granted mining lease. In "civil law" or "roman law" jurisdictions (Germany, France, most-French speaking nations and much of Latin America) the distinction between exploration and production is less pronounced with both exploration and production activities often referred to jointly as "mining." Authorization and the rights and obligations pertinent to "mining" are granted in many of the civil/Roman law jurisdictions in the form of a concession license granted by the government under the mining statute.

The provisions of the mining statute apply equally to all holders of each type of license, lease or concession. For example, all mining lease-holders may be required to submit an environmental and social impact assessment before commencing mining and to post a bond to cover eventual reclamation costs[13]. Generally, provisions in a statute may not be varied or contradicted by administrative means. Exceptions to this general rule occur in some civil/Roman law jurisdictions where administrative means can be used to deviate from statutory law if such deviation serves a "public purpose" and does not go against public order.[14]

In most countries, the mining statute provides a central framework that is embellished by regulations and rules. While the mining statute is formulated and brought into force by law-makers, and any subject changes require a repeal of or amendment to that statute by politicians, regulation and rulemaking is often done by a specific government officer or agency empowered by the statute. For example, Article 81 of the Botswana mining statute[15] states "The Minister may make regulations for any matter required to be made by regulations under this Act for the better carrying into effect of this Act …". Regulation and rule making authority under most mining statutes is very broad and can be used as a major regulatory tool to achieve sustainable development objectives. For example, while a provision in the law may require the submission of a social impact study, the law may be silent on the required study content; regulations may provide that detail. Section 170(o) of the Papua New Guinea mining statute is typical of a general regulatory power granted to an officer to prescribe a detailed regulation:

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[13] Examples of regulatory approaches to guarantee reclamation have been documented and analyzed by Intarapravich and Clark (1994).

[14] For an in-depth analysis of how civil law allows administrative means, including negotiated agreements, to take precedence over statutory law see explanations of the principles of *autonomie de la volonte* and *contract administratif* in Barberis (1996).

[15] Mines and Minerals Cap.66:01.

> *The Head of State … may make regulations … for prescribing … provisions for the protection of land upon which mining operations are conducted and the rehabilitation of land disturbed by the mining operations; and … any other matter to effect the proper administration of this Act.*

Most mining statutes provide for legal enforcement of regulations and rules (typically both fines and penal provisions are proscribed in the statute). Matters that are directly enforceable by government agencies or courts regardless of whether they originate in the statute or in related regulations or rules are often referred to as "hard law."

A further level of regulation is provided by government issued guidelines.[16] Guidelines are not usually enforceable by law but are intended as "soft" law by providing additional detail and guidance on specific matters or procedures. For example, Ghana has issued guidelines on the preparation of environmental impact statements, environmental action plans, and environmental guidelines for mining.[17] Guidelines are often quite specific and it is common to see separate guidelines for each phase of the mineral development cycle, from classification of resources and reserves (see Box 4.1), through to exploration,[18] extraction and closure.[19] Compliance with guidelines is often indirectly enforced through the ability of the administrative agency to withhold approval or issuance of required permits and the like.

The reflection of sustainability policy under a statute, regulation or guideline is pertinent to all holders of a like type of license/lease/concession without accounting for specific characteristics of the project or activity being undertaken pursuant to that authorization. Project specific requirements often take the form of conditions or orders.

When a standard license/lease/concession document is issued, it will grant the holder the same rights and subject the holder to the same obligations as other holders of that type of license/lease/concession. However, in addition, the license/lease/concession document may be issued with attached conditions that are project specific. For example, the granting agency may recognize that the deposit contains both high and low grade ore and consequentially require the mine operator to conform to a minimum specified cut-off grade requirement. Such conditions may not contradict obligations or rights under the statute. The conditions are usually "attached" to the license/lease/concession at the time the authorizing document is issued thus affording the applicant a chance to decline the license/lease/concession. The ability of the granting agency to define obligations unique

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[16] Guidelines are often drafted by a government through a process of adapting general guidelines developed by IGOs, academics and other nations to its own needs. For example, general guidelines developed by Turnbull (1994) for environmental impact assessment have had an impact on the development of guidelines in some Southern Africa Development Community Nations whose environmental officers have participated in his training programs.

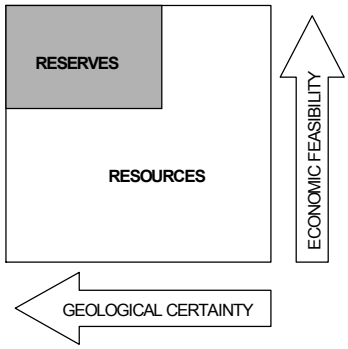
[17] Examples include "Guidelines for Environmental Action Plan for Mining and Processing" and "General Guidelines for Exploration, Mining, Mineral Processing and Mine De-Commissioning in Ghana" issued by the Director for Monitoring and Evaluation, Ghana Minerals Commission; "Guidelines for Environmental Impact Assessment for New Mines in Ghana," published by Programme Officer, Ghana Environmental Protection Council.

[18] For example, the US state of Arizona has issued environmental guidelines for mineral exploration (Arizona 1992).

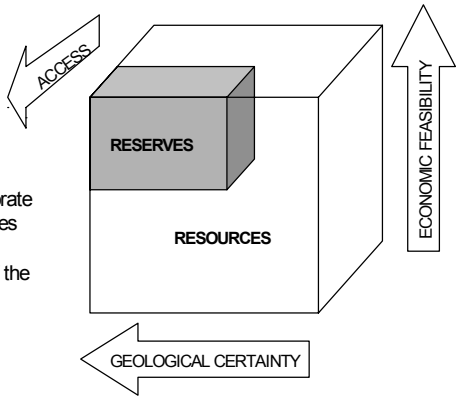
[19] For a sampling of national regulatory approaches to each phase of the mineral sequence see the numerous articles appearing in United Nations (1997).

Box 4.1 Evolution of mineral reserve and resource classification schemes

The traditional reserve/resource classification system (McKelvey box) is based on two dimensions: geological certainty and economic feasibility.



An added dimension can incorporate sustainable development attributes (access) to more accurately distinguish the reserve portion of the resource base.



Both governments and companies have an interest in assessing the extent of their mineral resources and reserves. Prior to the application of the concept of sustainable development to minerals, resource and reserve classification schemes concentrated on two primary attributes: degree of geological certainty, and feasibility of economic recovery (or in centrally planned economies, technological recovery), i.e., the so-called McKelvey box at top. Commencing in the mid-1990s, discussion emerged about the need to introduce a new classification system for mineral resources and reserves that takes into account sustainable development. Cook and Sheath (1997) among others have proposed that a third attribute "accessibility" be added. Access to minerals may be controlled for socio-political reasons through the regulatory system, either through government guidelines or by statute. The worldwide introduction of such a system is being debated within numerous national geological surveys, NGOs and IGOs.

to the circumstances of individual projects is a powerful means by which to implement many project specific facets of sustainable development policy. Failure to meet an attached condition is usually subject to some means of enforcement, including license/lease/concession cancellation.

Means to enforce provisions of the statute, regulations and attached conditions on a license holder, or other relevant person, include fines and penal penalties. Another important and more manipulative enforcement tool is the administrative "order." Many

mining statutes empower a government officer to issue an "order" on the holder of a license/lease/concession in order to either stop an action or to take an action. The order must be tied to a specific provision in the mining statute, regulations, or conditions to the license/lease/concession. For example, Section 12 of the Malaysian mining law[20] states:

> *The holder of a ... mining lease shall comply with the approved operational mining scheme ... and carry out development work and mining in accordance ... with such ... scheme. Upon failure by the holder of a ... ining lease to comply with the approved operational mining scheme, the Director shall inquire into the matter and may order the holder ... to (a) undertake all necessary measures to ensure compliance with the approved operational mining scheme; or (b) suspend development work or mining until the necessary measures are taken to comply with the approved operational mining scheme.*

Often a mining statute will empower a government officer to issue orders in the event of a "public nuisance," "threat to the public health," or to "protect worker safety." Broad order making power can play an important role in administratively implementing a wide range of sustainability objectives.

3.2 Regulation by negotiated and model agreements

In many developing countries and in most countries that are transitioning from a centrally planned to a market-oriented economy, mining investment is regulated through a "model" or negotiated mining agreement. In some instances this agreement acts to merely supplement other laws by providing additional detail, but, in many cases, the agreement supercedes the provisions of at least some laws. In most jurisdictions, in order for a term in an agreement to supercede a provision in a statute or regulation, the agreement must itself be passed as a statute by the appropriate law-making body.[21]

The ability of an agreement that is adopted as a statute to supercede other laws is a powerful way to implement sustainable development policies in mining. Many sustainable development issues are complex and are intertwined with many existing laws. An agreement can therefore be used to cut through the "Gordian knot" of multiple law regulation or to conversely create multi-subject matter "regulatory" requirements. For example, in some jurisdictions matters concerning the environment may need to be reported by a miner to a wide variety of government agencies, using a wide variety of different legislated reporting forms and requirements. A provision in a mining agreement could negate the need to report separately to these agencies and instead impose the requirement on the miner to submit a single comprehensive report according to a negotiated format.

Most jurisdictions approach mining agreements on a mine-by-mine basis allowing for each agreement to be tailored to meet, among other government aspirations, sustainable development objectives suitable and achievable for that project. However, in

[20] Act 525, Mineral Development Act.

[21] In some civil/Roman law jurisdictions terms in an agreement can, in some cases, supercede a statutory provision without the agreement being passed as a law.

order to achieve greater administrative efficiency, other jurisdictions utilize model agreements that apply generally to a class of mines within a given generation.[22] In the later case, project specific details may not be incorporated in the agreement but may still be indirectly present through the provision of agreement mandated future work-plans, EIAs, social impact assessments, closure plans, etc. that require subsequent government approval.

In a small but growing number of jurisdictions, there is a legal or administrative requirement that a miner negotiate some issues with local communities/ indigenous groups/ landowners/ landusers.[23] [24] [25] These groups often will benefit the most from a mining project but will also bear the greatest burden in terms of many sustainable development impacts. For instance, the mine may provide employment for locals, but when the mine closes the locally hired employees will lose their jobs. The requirement for the mine to enter into some form of agreement with those most affected by the mine is again a powerful tool to achieve some types of sustainable development objectives.[26] Section 155 of the Papua New Guinea mining law[27], for example, states:

> *The holder of a* [mining] *tenement shall not enter onto or occupy any land, the subject of the tenement, for the purpose of mining , until … he has made an agreement with the landholders as to the amount, times and mode of compensation and the agreement has been registered ….*

Examples of how communities have been involved in mineral project planning are provided by Epps and Brett in Chapter 5.

The ability of government/miner negotiated agreements to supplement other laws or to supercede specific provisions in laws provides a very useful and powerful means to implement sustainable development objectives of both the government and the company. In addition, agreements entered into with local groups can be particularly effective in providing for those persons that may be most vulnerable to negative impacts caused by a mine.

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[22] In Indonesia a model agreement is used to regulate most large-scale exploration and mining projects. When the agreement is deemed to have become out of date a new generation of model agreement is created and applied to new entrants. Indonesia has used seven versions of its model Contract of Work since the early 1970s and will undoubtedly introduce new versions in the future. Many Asian nations have created a generation of model exploration/mining contracts that will, over time, evolve with regard to new entrants.

[23] For example, Papua New Guinea and the Philippines both have such requirements in their respective mining laws. Such approaches are not restricted to developing countries. Depending on the location of the mineral deposit, a miner in Australia or Canada may also be required to enter into an agreement with legally defined landowners/land-users/indigenous peoples.

[24] For an overview of issues concerning indigenous peoples and transnational investment on their lands see Commission on Human Rights (1992).

[25] The World Bank convened a conference on mining and communities in 1998 where governments and companies came together to discuss the key issues, case studies, and potential regulatory approaches. The proceedings are to be published in 1999 (World Bank, forthcoming).

[26] A study prepared by a Canadian intergovernmental working group (Canadian Government, undated) identifies the types of issues that have been incorporated in the numerous indigenous peoples/ mining company agreements signed in Canada. A study by McGill and Crough (1987) provides insight into agreements entered into between indigenous peoples and mining companies in North America and Australia.

[27] No. 20 1992, Mining Act.

The emphasis in this chapter thus far has been to examine the regulatory options that governments can use to achieve sustainable development objectives. The next section examines self-regulating mechanisms that the mining industry uses, or can use, to implement sustainable development objectives.

4. Role of Private Sector Efforts to Achieve Sustainability Objectives

The mining industry has created for itself a negative image in the minds of most people. As Cordes and Eggert have already indicated in earlier chapters of this volume, mines cause impacts on the environment and on local communities, and historically mining companies have not dealt with closure, economic dislocation, and long-term environmental degradation in a sensitive manner. Times have changed and there is a growing perception by mining companies that an essential part of their business is to deal with a broad range of sustainable development issues in a manner that is acceptable to the public at large, to local communities, to lenders, and to their shareholders. Increasingly, mining companies have both implemented self-governing internal measures and become active in industry-wide moves to achieve a higher level of "self-regulation."[28] [29]

4.1 Efforts by companies

Many multinational mining companies have taken the initiative to implement internal policies regarding mining and sustainable development. It is increasingly common to find such companies charging a senior company officer, often at the Vice President level, with the responsibility of developing and implementing the company's internal sustainable development policy. In forming and implementing such policy mining companies must grapple with a host of issues including:

- defining what sustainable development means to them;
- what sustainable development objectives to set;
- how to go about achieving those objectives;
- how to measure whether progress is being made in achieving objectives; and
- how to pay for the effort while maintaining adequate profit levels.

While most large companies have begun such efforts, even the most ambitious companies have been struggling with implementing their sustainable development programs. The following statement by Dr. Frank Frantisak, Noranda's Senior Vice-President for Environment, is indicative of what is happening within mining companies:

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[28] Mikesell (1997) argues that sustainable development must be promoted mainly at the micro-economic level by activities such as pollution abatement, restoring depleted soil and forests, and conserving and finding renewable substitutes for exhaustible resources. Many micro-economic mining decisions, as contrasted to macro-economic mineral sector decisions, are decided by individual firms who are in a position to implement the activities that will lead to the attainment of sustainable development objectives.

[29] The United Nations journal Industry and Environment has published a special edition (UNEP 1998) that describes a wide variety of voluntary private sector initiatives that relate to sustainable development.

Last year, a major commitment was made to our … strategy for the future based on four principal elements: Business Integration, Sustainable Development, Choice Supplier to Our Customers, and Research and Technology. We also set out to better define sustainable development by designing a set of indicators with which to measure our performance year over year. We have had mixed results on both counts.

The identification of sustainable development indicators has been happening slowly. In 1997, we set out to design a set of measurement criteria that would allow us to track our progress toward sustainable development and quantify this progress annually for our stakeholders and the public. While we identified a number of relevant indicators, we have yet to establish a satisfactory measurement system. In 1998, we intend to seek advice from others – both inside and outside our industry – on how to track our progress in this crucial area. We hope to have clear criteria by early 1999. Part of the discovery process is understanding our limitations. When trying to define sustainable development, it is difficult to claim that the mining part of our business is sustainable. We cannot replace the ore in the ground. On the other hand, it is possible for the metals part of our business to be considered sustainable, because metals are recyclable.

For a mining company, therefore, sustainability has to mean something different, if it is to mean anything at all. It means that mining companies have a special obligation to take environmental responsibility seriously. It means maintaining sustainable ecosystems at our operations by continuously reducing the air pollution we emit and the metals and other effluents we discharge. It means working harder on implementing product stewardship through a growing commitment to metals recycling. It means ensuring that when we enter a community our environmental homework is done. It means operating responsibly, and when we leave, helping the community prepare for new opportunities, and returning the land to a productive state.[30]

The company has also adopted, and published, an Environmental Policy that includes provision for sustainable development.

Noranda Group companies and operations:

- Strive to be exemplary leaders in environmental management by *minimizing their impact on employees, the public, customers, and the natural environment.*
- *Commit to the principle of sustainable development, which means that our economic decisions will not take priority over considerations of health, safety and the environment.*

[30] http://www.noranda.com

- *Design, operate and evaluate their facilities to ensure that effective control systems are in place to minimize risks to health, safety and the environment.*
- *Implement site-specific environmental, health, hygiene, safety and emergency response policies and programs.*
- *Develop product stewardship programs to protect employees, the public, customers, and the environment by providing risk management information on the safe use, transport, and disposal of their products.*
- *Conduct regular environmental, health, hygiene, safety and emergency response audits and implement action plans resulting from those audits.*
- *Communicate openly and on a timely basis with employees, the public, governments, and other stakeholders on activities involving health, safety and the environment.*[31]

Noranda is not alone in its efforts to self-regulate itself with regard to sustainable development issues. A visit to almost any multinational mining company internet web-site or annual report will yield a statement about the company's commitment to sustainable development. Many firms have backed up their "commitment" with detailed action plans while others acknowledge the concept without truly integrating it into project implementation; additional examples of corporate sustainable development are provided in Chapter 5. At present, smaller mining companies tend to place less emphasis on the formal adoption of sustainable development concepts and objectives.

4.2 Efforts by international industry groups

There are a number of international mining industry groups. Some of these are organized by profession (the Institute of Mining and Metallurgy for mining engineers, the Section of Energy and Resources Law of the International Bar Association for mining lawyers), some by commodity (International Lead Zinc Study Group, Association of Tin Producing Countries), some by research agenda (International Geological Correlation Programme), and others by regional affiliation (ASEAN Mining Association). Almost all such groups have actively debated issues related to minerals and sustainable development. The most visible of these groups in the 1990s, as identified by Ostensson in Chapter 3, has been the International Council on Metals and the Environment (ICME).

The ICME was founded in 1991 by a group of multinational mining companies to "promote the development and implementation of sound environmental and health practices in the production, use, recycling and disposal of non-ferrous and precious metals." The ICME "emphasizes the importance of sound science and technical and economic analyses underlying policies in support of environmentally sustainable economic development." Activities of the ICME range from the support of international conferences[32] to the publication of books on matters related to a broad spectrum of mining environmental and development issues. Importantly, it provides a forum for the

[31] http://www.noranda.com/environpolicy.html

[32] Such as the International Conference on Development, Environment and Mining (Washington DC, June 1-3, 1994) cosponsored by ICME, World Bank, UNEP and UNCTAD.

largest of the multinational mining companies to discuss the key issues regarding mining sustainable development. Being the principal international industry organization reflecting the current thinking of many multinational mining companies, it is useful to consider its charter (Box 4.2).[33]

The ICME charter includes many elements that realte to the fundamental building blocks of sustainable development described by Eggert in Chapter 2 of this volume. For instance, the charter addresses the sustainable development of the physical resource base, the economy and the environment. The Charter does not attempt to describe how companies should implement its stated principles, but does provide a framework that individual companies can use when considering the principles to be followed when implementing a minerals project.

With regard to the interaction of mineral development and social systems (also see Eggert, Chapter 2), the ICME has adopted a Statement of Community Principles (Box 4.3).

Like its Charter, the ICME Statement of Community Principles does not attempt to describe how individual companies should implement their community-oriented efforts, that is matter for each company to determine based on its unique circumstances. Epps and Brett offer insight into this process in Chapter 5.

A common criticism of industry led coalitions such as the ICME is that, in most cases, either industry positions such as are stated in the above Charter are not binding on their members, or if they are, there is no mechanism for monitoring whether a member is in compliance. This criticism has merit, but is not realistic to expect that any type of industry led coalition, regardless of the type of industry, can effectively act to police itself. However, such coalitions can nevertheless play an important role in shaping the thinking of companies with regard to sustainable development issues. By providing a forum for discussion, information is disseminated, approaches successfully used by one company become known to others, consensus or debate results in substantial peer pressure to conform, and dedicated research on key issues is funded. In addition, the publication of industry group "charters" and statements provide guidance to lawmakers, enforcement officers and courts with regard to what defines phraseology such as "international best practice" that is often incorporated into mining statutes, regulations and agreements.

4.3 Efforts by chambers of mines

Countries with a substantial number of mines usually have a mining industry organization that provides a forum for discussion and development of nation-wide industry positions on current issues. Historically, such organizations tended to take a defensive posture with regard to regulatory or populous moves which were perceived as a threat to the industry or to its profits. This is still true to some extent, but many of these organizations now approach environmental and sustainable development issues in a proactive, rather than reactive way. As the thinking of individual companies shifted to regard environmental protection and some aspects of sustainable development as "the normal course of business," positions of many chambers of mines have recently embraced and even promoted key sustainable development principles.

[33] http://206.191.21.210/icme/

Box 4.2 ICME Charter

Introduction

The International Council on Metals and the Environment (ICME) brings together major non-ferrous and precious metal mining and primary metal companies on a worldwide basis. Its purpose is to promote sound environmental and related health policies and practices to ensure the safe production, use, recycling, and disposal of metals.

To this end, ICME develops and continuously reviews criteria for responsible policies and practices in relation to the environment and health. ICME emphasizes the importance of sound science and technical and economic analyses to support its position and to improve environmental and health standards internationally.

Preamble

Everywhere in the world, the progress and prosperity of individuals, communities and societies depend on the economic production and availability of a broad range of metals. In coming years, population growth and expectations of improvement in the quality of life, notably in developing countries, will necessitate additional assured supplies of metals. ICME members have the capacity not only to meet these increasing requirements, but also to add to human progress and scientific knowledge. They recognize that this will require environmentally acceptable economic development.

ICME members are determined to achieve and demonstrate progress in environmental performance consistent with the improving standards people everywhere expect in today's world. Neither their operations nor their products should present unacceptable risks to employees, customers, the general public or the environment. Members of ICME accept the importance of responsibly managing their operations and products. They will adopt appropriate measures and implement enhanced risk management strategies, in current and future activities, to foster environmentally sustainable economic development.

On behalf of its members, ICME will participate in international debate and contribute to international understanding, thus helping to determine the way in which the world moves into the next century, and will be guided by the principles set out below.

Product Stewardship Principles

- *Develop or promote metal products, systems and technologies that minimize the risk of accidental or harmful discharges into the environment.*
- *Advance the understanding of the properties of metals and their effects on human health and the environment.*
- *Inform employees, customers and other relevant parties concerning metal-related health or environmental hazards and recommend improved risk management measures.*
- *Conduct or support research and promote the application of new technologies to further the safe use of metals.*
- *Encourage product design and uses that promote the recyclability and the recycling of metal products.*
- *Work with government agencies, downstream users and other in the development of sound, scientifically-based legislation, regulations and product standards that protect and benefit employees, the community and the environment.*

Box 4.2 ICME Charter *(continued)*

Environmental Stewardship Principles

- *Meet all applicable environmental laws and regulations and, in jurisdictions where these are absent or inadequate, apply cost-effective management practices to advance environmental protection and to minimize environmental risks.*
- *Make environmental management a high corporate priority and the integration of environmental policies, programs and practices an essential element of management.*
- *Provide adequate resources, staff and requisite training so that employees at all levels are able to fulfill their environmental responsibilities.*
- *Review and take account of the environmental effects of each activity, whether exploration, mining or processing, and plan and conduct the design, development, operation, and closure of any facility in a manner that optimizes the economic use of resources while reducing adverse environmental effects.*
- *Employ risk management strategies in design, operation and decommissioning, including the handling and disposal of waste.*
- *Conduct regular environmental reviews or assessments and act on the results.*
- *Develop, maintain and test emergency procedures in conjunction with the provider of emergency services, relevant authorities and local communities.*
- *Work with governments and other relevant parties in developing scientifically sound, economic and equitable environmental standards and procedures, based on reliable and predictable criteria.*
- *Acknowledge that certain areas may have particular ecological or cultural values alongside development potential and, in such instances, to consider these values along with the economic, social and other benefits resulting from development.*
- *Support research to expand scientific knowledge and develop improved technologies to protect the environment, promote the international transfer of technologies that mitigate adverse environmental effects, and use technologies and practices which take due account of local cultures and customs and economic and environmental needs.*

In support of the above Environmental Charter and in communicating ICME policies and principles and in promoting better understanding, ICME will seek to:

- *provide a free flow of information on international environmental and developmental issues affecting the industry;*
- *listen and respond to the public about metals and the environment;*
- *develop and implement programs that communicate the benefits of a balanced consideration of environmental, economic and social factors;*
- *present products, processes or services as being environmentally sound only when supported by well-founded contemporary data; and*
- *ensure information provided is candid, accurate and based on sound, technical, economic and scientific data.*

Box 4.3 ICME Statement of Community Principles

Preamble

In response to the world's growing need for metals, the mining industry seeks high quality ore bodies in all parts of the globe. The discovery of deposits and their subsequent development provides the mining industry with an opportunity to foster sustainable improvements in health, education and prosperity. The following principles offer guidance to ICME members as to how they relate to their local communities during the exploration, development, operation and closure of mining and related activities.

Core Principles

1. *Respect the cultures, customs and values of individuals and groups whose livelihoods may be affected by exploration, mining and processing.*
2. *Recognize local communities as stakeholders and engage with them in an effective process of consultation and communication.*
3. *Contribute to and participate in the social, economic and institutional development of the communities where operations are located and mitigate adverse effects in these communities to the greatest practical extent.*
4. *Respect the authority of national and regional governments and integrate activities with their development objectives.*

The Mining Association of Canada is a good example (additional examples are provided by Brett and Epps in Chapter 5). Mining companies belonging to the Association agree to abide by the Association's Environmental Policy (which contains many elements related to sustainable development) and indicate this agreement by signing a formal document with the Association. The Policy was developed by the environmental managers of major mining companies in Canada and has been endorsed by their chief executives. The Policy applies to all operations of the Association's member companies in Canada and in the rest of the world. The 1995 Charter is reproduced in Box 4.4. The Mining Association of Canada began an effort in the mid-1990s to draft a set of principles directly addressing sustainable development, but a consensus on those principles has yet to materialize by the end of 1998.

Efforts by chambers of mines to self-regulate their members face the same limitations and strengths as efforts by international industry organizations (see section 4.2 above). The inability of such groups to effectively police their membership should not be construed as a fatal flaw with regard sustainable development issues. While these groups may falter on "enforcement" they lead the way in shaping the manner in which the industry regards and approaches sustainable development. In many nations, particularly in developing nations, politicians are hesitant or slow to implement laws embodying sustainable development principles. In some instances this may be traced to views that

Box 4.4 The Mining Association of Canada Environmental Policy

Member companies of The Mining Association of Canada are committed to sustainable development which embodies protection of human health, the natural environment and a prosperous economy. In all jurisdictions, in addition to complying with legislative requirements, member companies will diligently apply technically proven and economically feasible measures to advance protection of the environment throughout exploration, mining, processing, manufacturing and closure.

The member companies of The Mining Association of Canada will:

Corporate Priority--recognize environmental management as an important corporate priority and establish policies, programs and practices for conducting business in an environmentally sound manner.

Integrated Management--Integrate environmental policies, programs and practices into all activities of the organization.

Environmental Management--Monitor the performance of environmental programs and management systems to ensure compliance with company and legislative requirements and this policy.

Continual Improvement--Establish an ongoing program of review and improvement of environmental performance, taking into account technical and economic developments, scientific understanding and environmental effects of operations.

Efficiency--Develop, design and operate facilities based upon the efficient use of energy, resources and materials.

Risk Management--Identify, assess and manage environmental risks.

Incident Management--Develop, maintain and test emergency preparedness plans to ensure protection of the environment, workers and the public.

Research--Support research to advance understanding of industry's impact on the environment and to reduce harmful effects through improved practices and technologies.

Technology Transfer--Contribute to the dissemination of environmentally sound technology and management methods

Public Policy--Work with government and the public to develop effective, efficient, and equitable measures to protect the environment based on sound science.

Contractors and Suppliers--Require contractors to comply with corporate environmental requirements and work co-operatively with suppliers to identify opportunities to improve environmental performance.

Communications--Encourage dialogue on environmental issues with employees and the public and be responsive to concerns.

Employees--Ensure that all employees understand and are able to fulfil their environmental responsibilities.

Closure--Reclaim sites in accordance with site-specific criteria in a planned and timely manner.

sustainable development is only for the rich economies, the poor must concentrate on development. Most multinational mining companies today build their mines using best available technologies and methods; technologies and methods that often go beyond what is required by local environmental laws. Increasingly, the same pattern is emerging with regard to a broad range of sustainability issues. For instance, it is more prevalent today for mining companies to involve local community leaders in mine development and long-term planning than previously, even though there may be no legal requirement to do so.

The potential for industry group action with regard to artisanal and small-scale mining activities is less clear. Although small scale mining organizations do exist (for example, in Malaysia and Zimbabwe) and the challenges faced by them are often directly related to sustainable development, few have the capacity or perhaps the incentive to address sustainable development issues.[34]

5. Private Sector Decision Making and Sustainable Development

In the process of deciding where to explore and whether or not to develop a deposit private sector companies will take into account a wide variety of factors. One of these is the regulatory system and the legal requirements under that system. In a survey of multinational mining companies conducted by this author (Otto, 1992), companies were asked to specify which of 60 possible investment factors they considered as important in their country investment decision-making. Of the top ranked 10 factors, all but one dealt with regulatory matters.[35] Most nations have yet to fully define and embrace sustainable development policies into their regulatory systems and thus with regard to investment decision making, sustainable development government regulation is not a major consideration at this point in time. However, this is likely to change. As an outgrowth of debate at an international level and from pressures exerted by local electorates and non-governmental organizations, there is active debate in many countries regarding a wide spectrum of sustainable development issues. A decade ago, only a handful of developing countries had significant environmental laws on their books; today it is rare to find a country that does not. Sustainable development legislation, probably in the form of amendments to existing laws will, like environmental laws, emerge in many nations in the coming century. As regulatory requirements develop, they will undoubtedly become another factor influencing corporate investment decisions.[36]

While companies may not be faced with major legal sustainable development requirements in most nations at the present time, sustainability issues are beginning to impact their decision-making processes and the ways in which they operate. While profitability concerns remain the dominant factor in investment decisions, increasingly companies look at how sustainability objectives can be incorporated into their corporate thinking and decision-making. Many companies are now adopting self-regulating internal policies that are implemented in the absence of government regulation.[37]

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[34] For a discussion of small scale mining and its relationship to development see Solomon (1997).

[35] For a ranking of the top factors identified in the survey see Otto (1996).

[36] The existence of legal requirements is not in itself necessarily a negative factor affecting invest decision-making. Many companies prefer the certainty of a known law to the uncertainty of possible future laws. For a description of this preference see Ostensson (1998).

[37] For example, British Petroleum, Shell and Noranda had by late-1998 each adopted internal emission reduction targets in line with the Kyoto protocol even though not required to do so by national law.

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Chapter 5

Engaging Stakeholders

Janet Epps and Adrian Brett

1. Introduction

This chapter addresses a key aspect of the social dimension of sustainable development as it relates to mining. It is concerned with the engagement of stakeholders and their emerging role in the decision-making processes of mining companies.

'Stakeholder' refers, in the widest sense of the term, to those groups and individuals who either affect, or are affected by, the activities of an organization. It goes far beyond the narrower, traditional groups of stakeholders comprising shareholders, employees and customers. This broader group includes government decision makers, local, national and global community groups, landowners, neighbors, public interest groups, suppliers, contractors, consumers, insurers, financial lending institutions, industry associations, environment interest groups, media, and education institutions.

The concept of the stakeholder is rapidly gaining attention as more interest is being paid to corporate responsibility and governance. This area now includes the range of social, environmental and economic impacts that organizations have upon society at large, and more particularly for mining companies, on local communities. Thus corporations are now needing to be able to effectively engage a much wider, often ill-defined and almost limitless audience when addressing stakeholder concerns. In particular, they need a new set of skills and methodologies to effectively engage these new groups of stakeholders.

2. Balancing the Interests of Stakeholders: Cultural, Economic and Environmental

2.1 Background

As the millennium turns, the social and ethical dimensions of business are increasingly being forced on the agenda of major corporations as the social risks associated with doing business steadily escalate. This is particularly true for those corporations which operate outside their 'home' countries where cultures will often be very different to their own. Operations are now increasingly being established in developing countries in the vicinity of local communities who have little infrastructure development, poor health and education levels, and have had little exposure to western society and the sophisticated corporate world. The first principle of the Rio Declaration on Environment and Development (Earth Summit 1992) proclaims that "Human beings are at the centre of concerns for sustainable development...[and] are entitled to a healthy and productive life in harmony with nature." This principle supports the earlier words of the 1948 United Nations Universal Declaration of Human Rights, and the 1966 International Covenant on Economic, Social and Cultural Rights: "Everyone, as a

member of society... is entitled to realization of the economic, social and cultural rights indispensable for his dignity ... [and] a standard of living adequate for the health and well-being of humanity and his family."

Also important in the emerging international field of human rights is the United Nations Draft Universal Declaration of the Rights of Indigenous Peoples (United Nations 1992). A number of the draft principles may provide for greater rights for indigenous peoples. The operative paragraph when discussing the rights of indigenous people in negotiating certain aspects of mineral project developments is paragraph 20, which states:

"Indigenous peoples have the right to require that States and domestic and transnational corporations consult with them and obtain their free and informed consent prior to the commencement of any large-scale projects, particularly natural resource development projects or exploitation of mineral and other subsoil resources, in order to enhance the projects' benefits and to mitigate any adverse economic, social, environmental and cultural effects. Just and fair compensation shall be provided for any such activity or adverse consequence undertaken."

Further, a declaration issued by the Indigenous delegates to the Mining and Indigenous Peoples Consultation (held in London, May 1996) confirmed their support for the adoption of the aforementioned UN Draft Declaration on the Rights of Indigenous Peoples. They also declared, "....(5) To demand that Indigenous Peoples be consulted with, and full and comprehensive information be provided in a timely manner, when mining activities are being considered for sites located on Indigenous Peoples' lands....[and] That the free and informed consent of Indigenous Peoples be obtained before any mining development can occur on Indigenous Peoples' lands."

On a broader front, prior to the 1992 Earth Summit in Rio de Janeiro, the Berlin Guidelines (1991) were formulated at a round table conference of representatives from the mining industry, governments and non-government organizations entitled "Mining and the Environment". One particular element of the *environmental guidelines for action* dealt with stakeholder participation and the recognition of socio-cultural conditions and human health, as follows: "Governments, mining companies and the minerals industries should as a minimum: .... Ensure the participation and dialogue with the affected community and other directly interested parties on the environmental aspects of all phases of mining activities; .... and recognize the linkages between ecology, socio-cultural conditions and human health and safety, both within the workplace and the natural environment."

It is from these various sources of international agreement, and the report titled "Our Common Future", prepared by the World Commission on Environment and Development (1987), which have defined the area many now consider to be the corner stone of sustainable development: the social dimension.

As mentioned by Cordes in Chapter 1, sustainable development ultimately challenges us to restructure our relationships between the human, cultural, political and economic arenas, with acceptance of a broader social concept incorporated into the business of doing business. In short, it demands the expectation that markets serve humane and social as well as economic goals.

Cordes also highlighted the connection between the modern concept of sustainable development and the ancient Western core belief of hope in a better future - of belief in human progress. Over time, however, progress has become increasingly

defined by the capability to conquer and harvest a bountiful planet for economic purposes and material gain, to the benefit of a few and disbenefit of the environment and the majority of the world's population. The economic and political have become sought after 'ends' rather than the means to a better end for society at large, resulting in the question Cordes ultimately asks "whether the spiritual, moral, and intellectual grounding on which our progress was built is slipping away from us, despite our material success?"

There is evidence that the route towards sustainable development has been a natural evolution of concerns in society in response to the exclusive focus of development on economic considerations, most recently as a continuum from consumer health in the 1960s, to environment protection in the 1970s-80s and finally the social responsibility displayed by companies (i.e. producers) in the 1990s. The dramatic changes in government environmental policies applied to mineral development decisions since 1970, and particularly since the Earth Summit in 1992, reflect both the increasing scope and power of public attitudes to polluting and land degrading industries such as mining and mineral processing. Environmental issues are now being integrated with broad community concerns and recast in the context of sustainable development.

This chapter discusses how sustainable development, and particularly the social dimension is incorporated into mining development.

2.2 Socially sustainable development

Within the broad community, the traditional economic values and valuations of individual mineral projects, must increasingly share the stage with a much more subjective public expression of what society values. This includes expression of values based upon moral and community concerns, rather then based on considerations of material consumption alone, with a growing awareness that sustainable development must encompass the aspirations and rights of affected local communities: the involuntary stakeholders. This group includes the landowners, neighbors, indigenous and other vulnerable groups, local and regional communities and their representative local governments.

It is these particular stakeholders who are increasingly showing concern for the impacts which mining causes in the vicinity of their communities, both the social disruption and the physical degradation which mining generally creates. They are also realizing that they too have a right to a healthy and productive life, just like that enjoyed by mining company personnel and corporate shareholders.

Failure to acknowledge and engage these involuntary stakeholders has and is increasingly placing existing and potential mining developments at substantial risk (social risk), through either the outright prevention of mine development, prolonged permitting processes, substantial environmental damage liabilities (Ok Tedi Mining, PNG), complete suspension of mining (Bougainville Copper, PNG), and civil disturbances and resulting disruption to mining (Freeport McMoRan, Irian Jaya).

Sustainable development will not be ultimately achieved unless it embodies the belief and value systems of the intended beneficiaries. It is not the business of the private sector to decide what values people should have, but rather to help people to make reasoned decisions about the things that matter to them. To do this, Stakeholders must be engaged by the Company. According to Richard Barrett of the World Bank (1996a),

"there are five values that lead to a unity of understanding: respect for all life, equality of all souls, importance of the common good, responsibility for the whole, and unconditional caring. When we fully express these values as individuals and in our organizations, our lives and the public endorsement of our organizations will change." He adds "the radical changes occurring in our society herald a historic convergence between the practical aspects of human life and its moral and spiritual dimensions. How we treat each other and how we treat the Earth must be motivated by a new sense of cooperative stewardship, rooted in our deepest ethical, moral and spiritual traditions, as well as in our common interests and responsibilities..... Actions that do not flow from our deepest spiritual, ethical and moral values cannot succeed in building the kind of secure, sustainable and hopeful future to which Rio pointed and to which we all aspire" (World Bank 1996a).

For a mine developer, this new set of considerations requires the need to make moral choices, to choose technology with a human face, and develop economics and ethics that cooperate with nature rather than exploit it. The United Nations Development Programme (UNDP) expresses it this way: "A new development paradigm is needed that puts people at the center of development, regards economic growth as a means and not an end, protects the life opportunities of future generations as well as the present generations, and respects the natural systems on which life depends."

In short, sustainability means changing people's behavior. It begins with each of us, with our personal values, behaviors and actions. It is a bottom-up process. It advances when it engages the hearts and minds of the local community, progressing the economic, social, environmental, ethical and spiritual well-being of each individual. It is about improving the quality of life, rather than just the standard of living. To achieve this, development has to become fully participatory and people-centered, driven by ethical values that embrace caring and nurturing at their core; integrating reason, logic and intuition in development decision-making. These are not the values of the modern financial world, which derives its values from a materialistic and scientific base, creating a tension between the demands of the private sector and the needs of the public.

To achieve social sustainability, therefore, we need to design our businesses by building people up (both our internal and external stakeholders) instead of making them helpless, vulnerable and sometimes abandoned. This involves core values of our communities, providing real alternatives that make sense within their context of values, and always involving the people themselves in decisions that affect their lives and their children's futures. It is important to find ways to give everyone in the community a voice, regardless of their degree of political or economic power.

Empowering the community as stakeholders and potential partners in this new type of development, becomes a significant issue for sustainability. Appropriate channels include involving them in decision making processes, promoting increased legal tenure to land[1], access to credit, education and other relevant training and assistance, particularly to vulnerable groups such as women. While developing societies increasingly seek to define themselves in terms that reflect the present and the future, without being overwhelmed by the dominant western culture, they still value and wish to stay connected to their heritage.

Empowerment of and assistance to communities is most effective when provided

[1] For example, WMC initiative at Tampakan (Philippines) and Placer Dome at Las Cristinas (Venezuela).

within a government framework that takes responsibility for implementing transparency, accountability, pluralism, participation and the rule of law. Governments can also assist in ensuring that the actions of the public, private and community sectors are enhanced by a common base of shared moral values and a shared perspective of the future, treating people with respect and strengthening the bonds that unite them.

3. Moving from Adversarial Processes to Mutual Accommodation

3.1 A history of changing powerbases

The international mining industry can be thought of as having passed through three distinct phases this century. In the pre-1950 period, the large international companies were based in the capital cities of the colonial powers, they emerged to exploit the mineral reserves within the dominions of their empires with little regard for the local inhabitants and simply imposed their own view of mineral rights and land ownership. There was neither mutual accommodation with local or traditional landowners nor an adversarial relationship, as the local communities had no power to exercise against their all-powerful 'conquerors'.

This period came to a rapid close following the Second World War when a wave of nationalization of mining operations commenced and continued until the mid 1980s. Nationalization often occurred where independence was granted to former colonies and the new national governments moved to replace foreign ownership from their mining and other income-generating sectors, initiating the now key risk principle of mining investment, that of sovereign risk. So commenced the period in some socialist countries of benevolent ownership of the mining industry by the state and the direct funding of social infrastructure from mining revenues. This practice, usually at the expense of reinvesting in the mine's further development, has ultimately helped bankrupt both government mining operations and indeed some of these countries, forcing them to turn to the private sector once again to rejuvenate their mining sectors.

The confrontationist environmental movement which commenced in the 1960s and 1970s significantly altered the public's view of how mining projects should be evaluated and how governments' policies should be designed. In the 1980s and 1990s, the approach became focussed on the perception that: 'economic development is to propose and environmental regulation to oppose' and that economic prosperity and environment protection is supposed to result from resolution of this conflict. This conflict, initially driven by a strong public environmental consciousness, has now translated into the seeking of sustainable development, forcing an examination of the social dimension and a more efficient decision-making mechanism that looks for cooperative win-win outcomes arising out of a development.

Further, growing controversy is now developing over who should decide when or whether mining projects should be permitted to proceed, and under what conditions. For example, if 10 per cent of the local community strenuously disagrees with the proposal, including affected landowners, should this override 90 per cent of the community who will support, or at least accept the development? This is, of course, a source of great frustration to mining companies acutely aware of just how hard and expensive it is to locate an economic ore deposit on a planet that has a very finite supply of these

geological anomalies.

The public perception of the mining industry and its environmental, socio-economic and socio-cultural impacts are, therefore, now of primary importance to both regulators and mining companies alike, with regard to the development of government policy and regulations, and corporate strategies, respectively.[2] Traditionally, governments' policies and regulations are reactive and lag behind contemporary attitudes as government attempts to balance community (public) concerns and the national interest with industry's concerns.

Local communities, as involuntary stakeholders, now no longer accept alienation from the project decision making process but expect to participate as informed stakeholders in the process and even in some cases, as partners in the project. Experience has shown that failure by mining companies to recognize this new paradigm can place their company and their investments at serious risk. Thus mining companies must now find proactive ways and arguments that convince their shareholders, that the traditional economic bottom line must be extended to encompass the environmental and socio-cultural bottom lines - generating the so called 'triple bottom line' for shareholder endorsement.

In 1996, Rio Tinto's David Humphreys (1996), chief economist designate, noted that: "The bigger challenge now is not a technical one. Rather it lies in the development of interactive and lasting relationships with the communities, regions and countries in which the industry operates". He also mentioned how the fundamentals of long-term success for mining companies "will be their ability to align the interests of local communities with their own in areas where they wish to operate and to develop mines within those communities on the basis of mature and respectful partnerships".

The local community is now, therefore, a key and influential stakeholder in mine development.

3.2 A new decision-making framework

3.2.1 Consultation and partnerships

The identification of sustainable development by companies as a new strategic business driver has created an impetus for change within mining companies. While there is now an awareness within at least the larger, multi-national companies of the importance of social as well as environmental issues, there is a very real shortage of relevant skills and experience within the industry. While most mining companies now have extensive experience with managing environmental risks associated with their projects, they are still relatively inexperienced in implementing social impact assessments, assessing social risk and strategically managing social and community development issues.

Meanwhile, corporate strategists are needing to rapidly and simultaneously devise new mechanisms which can accommodate the various stakeholder aspirations (including, importantly their shareholders), endeavor to generate positive public perceptions, and

[2] This reality is not restricted to the mining industry, it also applies to the forestry, fishing, irrigation and other natural resource industries.

introduce a new corporate culture with a new skill set, into their existing engineering-orientated organizations.

The concept of sustainable development has led to an evolution of public participation processes in mineral project decision making. Today this process amounts to one of trying to balance community concerns and raised expectations amongst external stakeholders with corporate aspirations. The activity of 'community consultation' within the planning methodology of environmental impact assessment (EIA) is a now widely accepted process designed to establish this balance.

Progressive companies seeing the need to confront the reality of the sustainability agenda, are increasingly focussing on the effective involvement of relevant stakeholders as partners in the company decision making process. This may include the lending institutions, the NGOs, representatives of the public at large, as well as those who live and work in and around mine operation areas. Humphreys (1996) pointed out that only those with a good track record globally will be able to raise the finance, gain the permits and command the public trust that future success in the mining industry will require.

In this contemporary era, the effective management of this new suite of business relationships provides a substantial challenge to both the company and all key stakeholders, requiring a whole new private-public decision-making framework. The industry has only very recently started to come to terms with the full implications of sustainability, led by the multi-national companies. Some have started to grapple with the issues at both individual operations sites and at the corporate office levels, however there is as yet little commonalty in the approaches taken by different mining companies.

3.2.2 Industry stakeholder consensus agreements

Two examples from Canada and Australia illustrate recent constructive attempts to improve stakeholder consultation and change the poor public perception mining has acquired in recent times, to one of a good corporate citizen. The focus in these two examples has been on environmental issues and the need to engage all stakeholders in decision making processes and a more comprehensive decision-making framework.

The Canadian Whitehorse Mining Initiative was an industry-led initiative focussed on building partnerships with industry stakeholders. It comprised a two-year national consultation process (1992-1994) the objective of which, was to work cooperatively with stakeholders, including trade unions and environmental activists to develop a new strategic vision for the mining industry. The industry appreciated that not only did it need to be understood by the stakeholder groups but it also needed to understand other groups' attitudes and values. The knowledge gained was then to guide industry behavior and tactics. The initiative was proposed by the mining industry and supported by the Canadian federal, provincial and territorial ministers of mines.

Direct participants in the consultation process numbered around 150, being drawn from six major groups: mining industry executives; federal government officials from several ministries; government officials from several provinces and territories, representing mainly mines and environment ministries; trade unions representing mining workers; non-government environmental organizations and Aboriginal peoples. At the end of the consultation or negotiation phase, several consensus documents were produced. These contained the principles, goals, objectives and recommendations which

had been agreed to by the participants. It then became the task of each stakeholder group to try to implement the agreed principles and to work together to attain the agreed goals.[3]

Australia, also heavily dependent upon its mining industry for its economic growth, embarked upon a similar process in 1990. In Australia's case, the federal government initiated a summit of all industry groups, unions and conservation organizations in order to establish a process whereby Australia could embrace and apply the principles of Ecologically Sustainable Development (ESD). Following a public comment phase, nine Working Groups (mining being one of these groups) were established to consider the implementation of ESD principles in the main industry sectors that use or have significant impacts on natural resources. Public consultation was a vital part of the ESD process and comprised: public newsletters, consultation with relevant community and industry groups; State and Territory forums; a survey of public attitudes; and a wide circulation of the draft reports of the Working Groups. A particular theme of the mining report was the need to integrate environmental and social factors into economic development decision making. On the issue of partnerships, it concluded that the changes of attitude and commitment to integrated decision making that are required for ESD will rely heavily on effective consultation with the community and community interest groups, and made a number of recommendations for establishing an institutional framework for ongoing consultation and ways in which this could be achieved.[4]

4. Who Should be at the Negotiation Table?

[3] For a fuller description and analysis of the Canadian Whitehorse initiative see paper presented by C.George Miller (1996) "The Whitehorse Mining Initiative: a case study in Partnerships" at the United Nations Conference on Trade and Development (UNTACD) sponsored workshop on "Management of commodity resources in the context of sustainable development: Managing social impacts of mining" held at Bandung, Indonesia, 14-15 October 1996. This paper provides an analysis of the Canadian situation leading up to the initiative. In summary, the investment climate at that time was marked by an atmosphere of uncertainty and the threat of unpredictable and arbitrary decisions. This situation arose in part because industry had little credibility or support among the Canadian population, most of which lives in cities remote from mining activities. The paper also provides an insight into how the various stakeholder groups went about implementing the accord.

[4] Commonwealth of Australia (1991). Ecologically Sustainable Development Working Groups, Final Report- Mining, November 1991. The Working Group on Mining accepted six main objectives as being central to the achievement of ecologically sustainable development, which are: i) to improve material and non-material well-being; ii) to take a long-term approach to industry's interaction with the environment and recognise the goal of intergenerational equity, by providing an appropriate community return on the community's mineral resources; iii) to deal cautiously with risk and uncertainty, particularly where there is a lack of information about environmental impacts; iv) to maintain biological diversity and protect ecological integrity in a context of increasing pressure from mining sector growth; v) to provide for intragenerational equity, by directing attention to the social, equity and justice aspects of ESD, including the implications of industry operations and development for employment, occupational health and safety, and the health and well-being of the surrounding community (the position of Aboriginal people is particularly important in this regard); and, vi) to recognise the global dimension. In particular, the mining industry must maintain its international competitiveness and export orientation in order to make a full contribution to the future well-being of all Australians, while being part of a global industry that contributes no more than its share of the greenhouse gases that can be safely absorbed by the physical environment.

4.1 Stakeholder identification

While the private sector is undoubtedly the 'engine of growth', the market's ruthless efficiency must be balanced with the needs and concerns of national and local government, non-governmental organizations, community-based organizations, and international organizations so that 'the whole is more than the sum of the parts.' In order to make this work, according to the World Bank's Vice-President for Environmentally Sustainable Development, Ismail Serageldin, "We need to have faith in one another, in our motivations, and in our willingness to learn not just to get the prices right, but to get the roles right - the roles of national governments, the private sector [and the 'community']" (World Bank 1996a).

Thus mining companies today are needing to consider an almost limitless audience when addressing stakeholder concerns, including government decision makers, local, national and global community groups, public interest groups, suppliers, contractors, consumers, insurers, and financial lending institutions, industry associations, environment interest groups, media, and education institutions (see Figure 5.1). Of these, 'voluntary stakeholders' may include shareholders, employees, service providers, customers, resource providers, national governments, regional authorities, and NGOs.

Alternatively, the people whose lives are unwittingly affected by mining activity may be termed 'involuntary stakeholders'. This group includes affected landowners, neighbors, indigenous peoples, minority/vulnerable groups and local and regional communities. The terms 'indigenous peoples', 'indigenous ethnic minorities', 'tribal groups', and 'scheduled tribes' describe social groups with a social and cultural identity distinct from the dominant society that makes them vulnerable to being disadvantaged in the development process. The term 'indigenous peoples' is used to refer collectively to these groups.

The roles, concerns and expectations of each of these groups in the negotiating process are outlined in this section.

4.1.1 The corporate position

Corporate responses to social issues and Stakeholder engagement processes

Mining companies are in business to make profits. Their principal legal and ethical obligation is to earn an acceptable, risk-adjusted rate of return for their various investors. To be able to accomplish this goal, they must obtain the necessary access to mineral resources on terms that are consistent with the discipline imposed by product and financial markets.

However, to succeed over time, mining companies must maintain a welcome status for their existing and potential investments. It is this requirement, that of minimizing social risk and its potential to adversely affect mining investments, which increasingly requires companies to learn how to co-exist with their neighbors in an environmentally and socially sustainable manner. It is this requirement that also now places a business imperative on environmental and social responsibility as a component of the cost of doing business. Additionally there is a concurrent increase in shareholder's

Figure 5.1 goes here

and other investor's expectations of business being run in an ethical and publicly supportable manner.

In order to, at the very least, co-exist peacefully with neighbors and, at best, contribute productively and sustainable to mine affected communities, it will be necessary for mine developers to establish amicable relations with all relevant stakeholders from an early stage (i.e. exploration), maintain the dialogue over the life of the operation and, most importantly, effectively manage the communities' expectations of both the positive and negative aspects of the mine development throughout the life of the development (see Section 6.2.1).

Some of the larger mining companies are now openly dealing with the issues of sustainability at the project, operations and corporate levels. Some individual companies appear to understand the issues quite well and are implementing initiatives to deal with the various elements of sustainability, including: public sustainability reporting; annual environmental reports which also address social concerns; defining and implementing sustainability indicators; implementing community relations policies; establishing community advisory committees and independently auditing against the array of the company's environmental and social policies.

The adoption of an environmental policy is now almost standard practice for major mining organizations, whereas only some of these companies have an explicit social/community policy. Examples of some initiatives concerning these policies include: community relations (BHP, North, Rio Tinto), indigenous people (Rio Tinto, WMC), and sustainable development /sustainability (Placer Dome). Corporate social or community relations policies[5] are critical to successfully integrating community concerns into company decision making and represent the most significant indication of a corporation's commitment to environmental and social responsibility. Of course *demonstrated* implementation of these policies is the real test of commitment. In the absence of strong environmental and social policies, supported by senior management commitment, the allocation of necessary resources to a concerted corporate commitment is likely to be minimal.

The implementation of individual indigenous peoples policies by mining companies is unique in comparison to other industry sectors. These set out to establish mechanisms for effective, sustained communication with indigenous groups, recognize their desires to fulfill responsibilities within their traditional culture, identify and deal with indigenous interests and increase the awareness of indigenous issues within the companies.

Community programs, be they with indigenous or any other type of community, if they are to be effective, must be done in a participatory way if they are to foster independence and not create long term dependency of the community on the company. This means ensuring that programs are of direct relevance to the intended beneficiaries, that forums are created to facilitate discussion with communities, that the capacity to negotiate and plan is nurtured, and thereby improve the prospects for success of the social

[5] A distinction should be made here between community relations and public relations, the latter of which has traditionally comprised a one way information stream from a company's head office designed to address the public at its broadest level, about company initiatives and programs.

programs and developments devised. Ideally, local community programs guided by corporate policies, will be aligned with government's regional development plans.

As negotiated frameworks are still very individual to each company, a number of different approaches to engaging stakeholders (providing a forum for negotiation) and some outcomes of these approaches are outlined in the following examples.

Examples of company initiatives

Placer Dome

The implementation of a Sustainability Policy by Placer Dome (see Box 5.1) stating its social responsibility perspective, offers an insight to the direction some mining companies may take in future, including the engagement of stakeholders in decision making processes. Placer sees 'sustainability' as meaning that they must add economic, social and environmental value to society through their activities, while 'sustainable development' describes society's goal and is therefore the broader framework in which the company operates. Expected benefits Placer hopes to achieve from implementing sustainability include:

- Increased shareholder value - improvements to share price and returns through reduced risk, cost of capital, greater operational efficiencies and continued license to operate.
- Enhancing the Company brand - by positioning the company as a preferred partner and developer of major mining projects.
- Increased employee motivation and productivity - by aligning corporate and personal values.
- Increased employee and stakeholder support - through improving our relationships with government, interest groups and communities.

Rio Tinto

One of Rio Tinto's stated fundamentals for long term success is the ability to align the interests of local communities with their own in areas where they wish to operate and to develop mines within those communities on the basis of mature and respectful partnerships. To achieve this, Rio Tinto believes that companies will need to establish active partnerships with local and national governments, relevant non-government organizations (NGOs) and other affected parties representing communities' environmental and cultural interests. (See Figure 5.1)

An example of such a partnership is that established with the local communities living in the vicinity of Rio Tinto's Renco mine near Rupike, Zimbabwe (RTZ 1994). The local people, when asked how Rio Tinto Zimbabwe might help them, focussed on the supply of water as being of critical importance to their daily lives. In response, the company created an irrigation scheme from the Tugwane Dam, the mine's water supply source, which now also provides irrigation water to 200 families who earn a regular income on their half hectare irrigated plots. As a consequence of this small irrigation development the scheme became the focal point for much wider development, with the

Box 5.1 Placer Dome's Sustainability Policy

Placer Dome is committed to being a responsible member of the global community and to implementing a policy of mining and sustainability. We will lead the mining industry to higher standards of performance and earn public support for our business around the world. We believe that sustainability expresses the core values of our employees. Sustainability requires profitable mines. It is an essential component in acquiring reserves, developing projects and managing risks. For Placer Dome, sustainability means the exploration, design, construction, operation and closure of mines in a manner that respects and responds to the social, environmental and economic needs of present generations and anticipates those of future generations in the communities and countries where we work. We are committed to demonstrating that through this policy we can contribute to long-term improvements in quality of life while acting as stewards for the environment.

To achieve sustainability, Placer Dome will:

Corporate Commitment:	Establish an effective management system based on ethical conduct and a commitment to continuously improve performance; integrate sustainability as an essential element in the duties of all employees; and encourage the adoption of our sustainability principles by joint venture partners.
Public Responsibility:	Communicate with stakeholders and work towards consensus based on honest discussion and a mutual understanding of concerns and needs.
Social Progress:	Contribute to the quality of life of employees, local communities and host countries, while respecting their cultures, needs and priorities.
Environmental Stewardship:	Protect human health, reduce our impact on the ecosystem and return sites to a state compatible with a healthy environment.
Economic Benefits:	Integrate our activities with the economic development objectives of local communities and host countries in which we operate.

Our direction is clear. The task before us is challenging. It is urgent. We are committed to establishing performance measurements and credible verification of our contribution to sustainability. The implementation of our Sustainability Policy will require creativity and judgement of our employees at every project in all regions. Our progress will come from our efforts and from our partnerships with communities, governments, joint venturers, non-governmental organisations and international institutions. We invite all those who share our vision of mining and sustainability to work with us in creating our common future.

Placer Dome's Core Values

- People – developing skills and rewarding achievement;
- Community – living the principles of environmental and social responsibility;
- Culture – creating an action orientated, entrepreneurial outlook; and
- Principles – acting with integrity, fairness and respect.

construction of four electric grinding mills, new stores, a butchery, hardware and farm supplies store, many new homesteads and numerous other developments.

This scheme at Rupike illustrates how the essential ingredients for local development, in this case a reliable source of irrigation water, can lead to a self-sustaining and self-generating project which has clear economic and improved living standard benefits to local communities. The irrigation scheme was formally handed over to the Zimbabwe government in 1994.

Western Mining Corporation (WMC)

The approach being taken by Western Mining Corporation (WMC) involves the identification of core values based on its statement of purpose (business principles), code of conduct (statement of ethics), safety and health policy, environment policy, and indigenous peoples policy. The latter policy commits the company to developing

relationships of mutual understanding and respect with the indigenous peoples of the areas in which it operates.

The WMC indigenous peoples policy commits to establish effective, sustained communication with indigenous groups, recognizes their desires to fulfill responsibilities within their traditional culture, identify and deal with indigenous interests, and increase awareness of indigenous issues within the company.

As an illustration of WMC indigenous peoples policy in action, WMC's Tampakan project in the Philippines (on Mindanao) offers an insight to the policy implementation, and in particular an engagement process involving indigenous communities (WMC 1991). Very early in the project, WMC began community consultation and development work with people living, or having an interest, in the project area. These people have been the recipients of much of WMC's community development work, while potentially affected people living outside the area have also been involved in community consultation. Consultation has involved two main cultural groups - Bla-an indigenous cultural communities and Christian migrant settlers. These peoples, and other interest groups such as the elected local government units and non-government groups, are considered by WMC as a part of the community in which it operates.

WMC have a particularly broad view of what constitutes the community at Tampakan. While still at an early stage of project definition they have included a wide range of parties located outside the potential minerals development area, including landholders and occupiers adjacent to the minerals development area, local government units, non-government organizations representing community interests, businesses or livelihoods which potentially may be affected, and WMC shareholders.

4.1.2 Government

Government role in facilitating an enabling environment

The government at each of the national, provincial and local levels, has an important role to play as a key stakeholder in mineral development. Apart from the important role of granting permits, licenses and other approvals, it also has a pivotal role in community consultation processes. These processes help to define the boundaries of corporate environmental and social responsibility and ensure that these translate into proper legal agreement, performance of which is properly and credibly monitored.

Of relevance to the government role is a developing concept of sustainable development that focuses on leaving future generations at least as many opportunities as previous generations. This opportunity, as promoted by The World Bank, and others can be measured in terms of capital: man-made, natural, human and social. Sustainability is then defined as the combined total of these types of capital that we leave to future generations[6].

[6] The World Bank calculated wealth for 192 countries in 1995 and discovered that man-made capital represented less than 20% of total wealth, leading the Bank's researchers to conclude that most wealth is in the form of social and human capital.

The most encompassing view of social capital[7] includes the social and political environment that enables norms to develop and shapes social structure. According to the World Bank's Gloria J. Davis (World Bank 1996b) "Social capital involves attitudes and norms as well as formal and informal institutions - both traditional and modern - at local, community, regional, national, and global levels." This includes the more formalized institutional relationships and structures, such as government, the political regime, the rule of law, the court system, and civil and political liberties.

Government, then, has a primary role in creating the enabling environment in which a society's social capital base can be expanded through the implementation of socially and environmentally responsible development. An enabling environment for

Box 5.2 WMC's Community consultation and social impact assessment programs at Tampakan, Philippines.

Community consultation at the Tampakan project site is an ongoing process. The consultation program's objectives are to:

- Learn about the needs, concerns and aspirations of the community and to ensure community participation in formulating development programs to improve their living standards.
- Ensure that those affected by WMC's activities fully understand the consequences of the Company's presence in the area. This is considered an integral part of WMC's commitment to transparency about its exploration activities and potential development.

The opening of a WMC Information Center in the town of Tampakan has facilitated communication with the communities. This center hosts visits to the base camp, drill sites and rehabilitation projects by individuals, organizations and school groups seeking a better understanding of the Company's exploration activities.

The Social Impact Assessment (SIA) process, which WMC must conduct prior to any development commenced as soon as detailed geological exploration commenced in 1995. This social impact assessment process is ongoing and includes a detailed baseline study of potentially affected communities. This SIA work has involved:

- A cultural research program to identify communities and interests potentially affected by WMC activities, and to understand their history, lifestyles and traditions, and their contemporary needs and aspirations;
- Collecting and analyzing existing municipal and provincial statistical data;
- Establishing a database of socio-economic indicators against which existing and future data can be compared; and
- Undertaking detailed regional socio-economic baseline studies in the three municipalities affected by the minerals development area.

These data are to be used in assessing socio-economic impacts and in identifying areas and programs to optimize benefits and opportunities to the local and regional people arising from WMC's presence in the Tampakan area.

Source: WMC (1991) WMC in the Philippines. Information paper No. 1, October 1997.

[7] There are differing views on the concept of social capital, but a key feature of the concept "is that it facilitates coordination and cooperation for the mutual benefit of the members of the association." The current enthusiasm in the literature with developing sustainable development indicators, is mostly concerned with the development of social capital indicators which are designed to track changes in social capital over time. Mining companies for example are currently engaged in developing indicators of the local "horizontal" associations and thus take the microperspective (eg. number and type of local associations, extent of membership, gender membership).

improving the society's social, human, man-made and environmental capital base is predicated on general good governance, enforcement of property rights, an independent judicial system, a competent transparent bureaucracy, and mechanisms to promote dialogue and resolve conflict among economic agents (World Bank 1996b, p.90).

The role of government in its stakeholder/negotiator role is very relevant to the concept of building 'social capital', being the party who primarily defines how individuals and societies interact, organize themselves, and share the responsibilities and rewards. The World Bank recognizes that this form of capital is a critical variable in explaining the success of development in certain countries and the lack of progress in others (World Bank 1997). Understanding social capital and helping to craft it, is therefore an important development objective and there is growing evidence that changing levels can have an impact on development outcomes such as growth, equity and poverty alleviation.

Besides the generation of social capital being in the national interest and also a driving force for economic development, any inappropriate development can destroy social capital, setting off a vicious circle of social and economic decline. Thus there is clearly a role for government in promoting 'desirable' development that contributes positively to the country's social capital. This role is crucial to the part played by government as a stakeholder and participant in mine development negotiations.

In summary, McPhail and Davy (World Bank 1998a) state the key responsibilities for government in the stakeholder engagement process are:

- To be both facilitator and instigator of environmentally and socially sustainable development;
- To be a strategic decision maker in the interest of nation, province, and municipality; and
- To be responsible to the whole electorate.

4.1.3 Community

The Community's rights and concerns

Local communities are generally the stakeholder group most limited in terms of their resources, power and economic or political influence. Why should such an insignificant group play such a significant part in the process of sustainable development? The importance and moral or ethical power of this group lies in a number of issues, such as: resources accessibility, land rights and ownership, local indigenous knowledge, human rights and cultural diversity. These areas are increasingly translating into significant economic and social risk considerations.

The crucial consideration for community groups (including landholders) is the negotiation of compensation and benefits derived from the development (see Figure 5.2 and Box 5.3). The government is a key stakeholder together with the company, in these negotiations, to which affected landowners and community groups will be seeking to maximize economic and other benefits, and probably also to control their distribution within the community. It is becoming increasingly important for the company to ensure that leading negotiators are properly informed and empowered to be able to conduct these

negotiations in a fair and equitable fashion. (see Section 5.4)

Existing local associations and organizations can play a valuable part in the development of mineral projects. Their involvement has the potential to improve beneficiary targeting, reduce project costs through partnership programs, and enhance the sustainability of projects by increasing 'ownership' and appropriateness. This does, however, require care in the selection of organizations so that they are truly inclusive of the intended beneficiaries and have objectives in line with the project. It will probably also involve the company's support in empowering the organizations to be able to effectively carry out their roles.

Ideally the participatory process of involving the local community will be supported by government, national and international organizations as appropriate. Participants might include representatives of local groups and NGOs, women's groups, resource users, producers/traders, academics, together with the company's representatives. Most traditional cultures do, however, prefer collectiveness rather than individuality, and conformity to originality and change.

Whereas in some instances a new development is seen as beneficial, usually from the economic viewpoint, in other communities concerns are more complex and may not necessarily focus on traditional western economic values. For example, concerns may be centered upon changes being forced on small traditional communities that have had little exposure to modern modes of living. This is an increasingly common situation as a substantial proportion of today's mining projects are located in remote areas which are very often inhabited by traditional indigenous communities. The stakeholder group referred to collectively as "indigenous peoples" are commonly among the poorest segments of a population, and often engage in economic activities that range from shifting agriculture in or
near forested areas to wage labor or small-scale market orientated activities. As a group they are particularly vulnerable to the negative impacts from development, and so proponents of development must ensure that their development process fosters full respect for their dignity, human rights and cultural uniqueness.

The increasing importance being placed on indigenous peoples' participation is in many cases being driven by the realization by governments and developers alike that the recognition of their distinct social and cultural identities deserves respect and protection. Specifically developers must ensure that indigenous peoples do not suffer adverse effects during the development process and they must receive culturally compatible social and economic benefits.[8] As these groups commonly live in small, simple communities that have had little exposure to the global society, there is a real need to establish mechanisms that can help to predict potential social impacts and provide appropriate participatory processes.

In summary, for these local groups, environmental concerns are now seen to have been extended to include not only effects on ecosystems, but also on the physical and mental health of individuals. The focus has now shifted to a more comprehensive view of human well-being and the rights of local inhabitants to determine the quality of their

[8] For specific details on procedures for addressing social and cultural aspects, consultation and participation processes, so as to safeguard the interests of indigenous peoples, see The World Bank's Operational (Directive) Manual, in particular Operational Directive (OD) No. 4.20.

Insert Figure 5.2

lives, and those of their children and their children's children.

If power is not shared with the local communities or does not benefit them, they may become frustrated, hostile and violent, becoming angry and rebel, as was the case at Bougainville, PNG and more recently at Freeport, Irian Jaya.

McPhail and Davy (World Bank 1998a) suggest the key responsibilities for the community groups in the stakeholder engagement process are:

- to recognize the legitimate role of government to make strategic development decisions in the interest of the nation, region, municipality etc;
- to recognize that all citizens have legitimate roles in decision making through electoral, consultation and other legal processes; and
- to recognize that those communities subject to adverse impacts of development should receive benefit preferentially (landowners, local community).

4.1.4 NGOs

As discussed in Chapter 3, NGO's have made a major impact on modern approaches to development, in both developed and developing countries. International, national and local NGO groups generally work cooperatively to leverage their capabilities and maximize desired outcomes. They have emphasized the importance of people-centered development, quality of life measures, and the need for developers to make contributions to the communities they affect in terms of education, health care, meaningful employment, protection of human rights, equality and individual empowerment. Through their advocacy they forge links between individuals and the wider society, appreciating that human-centered development can be carried out only with the full involvement of members of civil society and a dynamic partnership between governments, Egos and the private sector.

It is important to appreciate that it is the participatory process in project planning which most often contributes to social capital building, by inducing the formation and activity of local interest groups: often the most important stakeholder groups for a mining company to be dealing with. Egos can fill a valuable role in empowering these individuals and small, local groups (and through them the broad communities) and mobilizing them into a constructive, focussed force for implementing sustainable development. In practice, both non-government organizations and local government are frequently in the ideal position to provide support to these groups and all can benefit if the local government, local groups, NGOs and company can all contribute productively to well negotiated local collaborative programs.

According to McPhail and Davy (World Bank 1998a) key responsibilities for NGOs in the stakeholder engagement process are:

- To foster support for sustainable development at the national, regional and importantly, the local level. NGO advocacy provides for a balance to the views of the proponents of development;
- NGOs have a responsibility to accurately reflect the desires of the communities they support and/or represent;

- NGOs should recognize the limits of corporations' abilities to exert social and political influence and lack of authority to do so;
- NGOs have an important role to play in monitoring the scale of predicted impacts;
- NGOs should develop accountability structures to the local communities they represent; and
- NGOs should develop long-term supportive relationships between all stakeholders to help advance environmentally and socially sustainable development.

4.1.5 IGOs (International Governmental Organizations)

As discussed in Chapter 3, IGOs such as the United Nation's specialized agencies and The World Bank play a major role in international technical assistance areas.[9] This often includes stakeholder engagement activities such as: the holding of the 1991 round-table conference by a consortium of United Nations agencies, whose outcome was the production of the Berlin Guidelines (see section 2.1); and the 1994 International Conference on Development, Environment and Mining convened in Washington D.C. by the World Bank, UNEP, UNCTAD, and ICME. A more recent example is the Steering Committee established by the World Bank to guide its studies into the integration of social concerns into private sector decision making in the mining, oil and gas sectors (see World Bank 1998a).

4.1.6 Industry associations

As a stakeholder group, Industry Associations have become focal points of stakeholder dialogue between member mining companies, community groups and government: devising codes of practice, charters and other initiatives to further their objectives of winning stakeholder support for industry development.

As a consequence of pollution control laws, due diligence legal requirements and shareholder demands, most mining companies today, in particular the majors, have formulated standards of best environmental practices to guide their, often worldwide, mining operations.

However, to further strengthen their positions, many companies seek alliances with local, national or international entities that promote and require good environmental performance. For example, some have implemented or are in the process of attaining International Standard ISO 14001 environmental management framework standards for decision-making systems, performance evaluation, auditing and risk assessment.

The International Council on Metals and the Environment (ICME) provides a common framework of principles for its members to foster environmentally sustainable development. The ICME environmental stewardship principle relevant to the issue of socially sustainable mineral development acknowledges that "certain areas may have particular ecological or cultural value alongside development potential and, in such

[9] For examples of World Bank participation and partnership approaches see ref: World Bank (1996). *The World Bank Participation Sourcebook*. Washington D.C.: The World Bank.

instances, to consider these values along with the social and other benefits resulting from development". It is argued that the ICME Charter provides much discretion and interpretation and provides for no monitoring or sanctions, which is unsurprising considering that the ICME Group is in effect an industry interest and advocacy group. Cordes (1997) notes that others have argued that even if enforced, industry standards such as ICME's may not necessarily be socially accepted standards.

An alternative response is that demonstrated by the Australian Minerals Council's *Code for Environmental Management*. Over 40 Australian mining companies have become signatories to the code since its launch in 1996, which commits their companies to applying the code to both their local and international operations. Among its provisions are obligations to facilitate community partnerships, to have operations reviewed by externally approved auditors, and to publish annual reports on corporate environmental performance and code implementation. Although this is still a voluntary approach, by being a more local (i.e. Australian) code it is expected to stimulate peer pressure and competitive standards as well as the setting of performance indicators across the industry.

4.2 Trust building

"Participation is a process through which stakeholders influence and share control over development initiatives and the decisions and resources which affect them" (World Bank 1996c).

Unsurprisingly, a key element of concern to many, in the stakeholder engagement process, is the issue of power: both corporate vulnerability due to perceived loss of power by the mining company, and power imbalances between the various stakeholder groups (of concern to community groups).

According to Marris (1996) change or imbalance of power creates the conditions out of which anxiety grows. He documents how the less each party undertakes to meet each others expectations, the less trustworthy the patterns of interaction, and consequently the more uncertainty created. The stress of increased uncertainty (which has frequently affected involuntary stakeholders of mine developments) may then be reflected in broken marriages, illness, alcoholism, child abuse and a pervasive undermining of self-respect. The more one's sense of security is undermined, the greater the alienation and the more competitive the defense to development.

The issues of community uncertainty, power imbalances and effective management of expectations are clearly issues of considerable importance and concern to mining companies, keen to establish themselves as good neighbors.

Alternatively, and much more productively from all stakeholders' perspectives, the more people cooperate with each other in dealing with uncertainty, sharing information and committing themselves to reciprocal plans of action, the less uncertainty everyone has to face. Such strategies depend on trust. The maintenance of that trust over a period of time represents the true value of the relationship.

Equalization of power, then, involves not only a redistribution of assets (as in benefit distribution from mine generated wealth), but greater reciprocity in relationships and generation of collaborative strategies e.g. for community projects, within a framework of mutual commitments. Cooperative strategies in business are, however, difficult to implement as the more powerful must firstly concede some of their

prerogatives and make themselves initially more vulnerable. The outcome from having had the courage to concede power was, to one happy participant, the experience that "through participation, we lost 'control' of the project and in so doing gained ownership and sustainability, precious things in our business" (World Bank 1996c).

Once, a collaborative strategy or plan is agreed to, joint decisions can be translated into a framework of shared ideals and meanings; problems can be identified and solutions proposed. Plans bring predictability into the situation, thereby reducing uncertainty. The very act of conceptual organization within a defined relationship structure, can be powerfully reassuring, containing the threat of disorder, uncertainty and insecurity.

Collaboration against uncertainty must be grounded in the very fundamental, universal qualities of our common humanity. Contemporary business ethics struggle with moral issues in terms of articulating common understandings, partly because the essential nurturing element of human relationships has been long segregated from the public arena and made the exclusive realm of women. This has created a Western work culture that is competitive, and unresponsive to nurturing behavior, peculiarly genderising the moral basis of life. No other culture has made this separation into two mutually exclusive arenas or exempted economic relationships from moral responsibility, in the way the West has done.

4.3 Communicating with stakeholders

4.3.1 Interactive fora

Empowerment of stakeholders (particularly through a participatory education and awareness-raising process), is perhaps the most important function in enhancing a community's capability to work collaboratively and productively for its own purposes in partnership with the mining company. It is from a multi-directional and active dialogue that all stakeholders, including the company's specialist teams, are "educated" and appropriately empowered in terms of skills required for the implementation of sustainable development.

As external stakeholder resources are often quite limited, the use of more formalized dialogue processes such as stakeholder forums conducted at the local level, are gaining prominence. By this process, the participating stakeholders not only communicate their concerns and aspirations to the company, but also learn about the company: its values, its policy, its commitments to sustainability, and specific corporate initiatives and plans. It is, in short, a two way learning process. Of course this assumes that the company *has* a social policy, promotes its values and has a commitment to sustainability.

Experience shows that acknowledging the legitimacy of all stakeholder perspectives is critical, particularly if social sustainability is to be achieved and particularly at the local level. The use of interactive stakeholder forums is an ideal process for enabling this outcome.

4.3.2 Prior to mine development (social impact assessment)

The goal of stakeholder engagement and communication is sometimes conducted under a social impact assessment (SIA) program. The objective of such a program is to provide individuals, community groups, local authorities, government and the proponent with the fullest possible understanding of the social ramifications of a proposed development. Feedback from this process enables identification of probable consequences, the social costs and benefits to be evaluated by the company, and decisions to be modified, in order to produce the best possible outcome from the mining development.

Aims of the SIA process as proposed by Allan (1997) in the implementation of SIA are: [10]

- form an early and continuing flow of information between all parties;
- ensure that information is collected and available;
- simplify channels of communication;
- minimize duplication by keeping participants in touch;
- alert the proponent and others to the implications of the development, facilitating strategies to maximize benefits and minimize costs;
- clarify objectives of all groups in the community;
- encourage public participation and involvement by using existing community groups, or helping them form where they don't currently exist.

4.3.3 Integrated social assessment with environmental assessment

In a survey by McPhail and Davy (World Bank 1998a) the majority of respondents cited the underlying reasons for adopting a policy in support of integrating social and environmental assessments were mainly due to positive experiences with projects in which social and environmental concerns were integrated. In particular, these benefits were associated with the outcomes of stakeholder consultation.

Over half the corporate respondents in the survey cited negative experiences with projects, in which integration had not taken place, as an important policy driver. Shareholder expectations, pressure from other stakeholders, and staff commitment were also cited as reasons for adopting a policy on integration. The advantages of such integration provided by the respondents to this survey included the following:

- Helps to secure agreement to proceed with projects;
- Improves the cost-effectiveness of projects (for example, by accelerating the permitting process);
- Facilitates the resolution of interdisciplinary issues before development concepts are finalized, through public involvement;
- Improves project designs and provides a better basis for sustainable

[10] For additional information on SIA process, see guidelines in: *Working with communities: A Guide for Proponents*. Social Impact Unit, Western Australian Government, Perth 1990.

development;
- Engenders community interest, involvement, acceptance, ownership; and enhances social stability;
- Facilitates the incorporation of local and traditional knowledge, which improves the design of projects and mitigation plans;
- Provides for the resolution of interdisciplinary concerns;
- Reduces the impact on natural resources on which communities may be dependent, or which may be important to conserve - on biodiversity, cultural, or religious grounds; and
- Enhances the training and employment opportunities to help develop local capacity to undertake integrated social and environmental assessments.

4.3.4 Social auditing

Social auditing is rapidly becoming a powerful mechanism for developing a systematic stakeholder dialogue for existing operations - as has already occurred for environmental auditing and EIA. The merits of the social auditing approach, in terms of engaging stakeholders, is that it seeks to institutionalize stakeholder processes. Any dialogue is no longer an ad hoc event in which the parameters are defined by the company, but part of a more formal relationship in which terms for engagement are defined over time by both the company and stakeholders. Implementation of this process can involve the comprehensive 'mapping' and profiling of all stakeholders as a fundamental component of the process, then adopting a process of tracking how each stakeholder relationship is progressing.

5. Education: Communication, Negotiation Skills and Stakeholder Capabilities

5.1 New competencies for all stakeholders

As already mentioned, raising the level of empowerment (and hence social capital) within a community has a lot to do with education and participatory decision-making, and is also linked with levels of company and government disclosure.

Improved education levels, in terms of mining company activity, are a key point in terms of increasing the capability of stakeholders to better articulate their needs and demands and thereby increase their contribution to the participatory decision-making process. In effect this means that stakeholders become better potential partners capable of engaging in the community development activities facilitated by mining companies.

This type of education is a two way process, and while stakeholders need to learn a great deal about the company in their midst, the development proponent also needs to acquire knowledge regarding the stakeholders, their culture, their values and the environment in which they reside (e.g. through the SIA process). This sometimes necessitates fostering an understanding between the company's technical, environmental and social specialists of the legitimacy and importance of each corporate contribution, as much as between the company itself and its external stakeholder groups.

An increased level of education and awareness is a highly desired community

output of the development process[11]. Education is, of course, a worthy pursuit for its own sake, however a better-educated population is generally considered to be an important outcome of successful development, as an effective contributor to continuous improvement within the society (World Bank 1997).

For example, local associations can play a role in environmental management monitoring, especially where natural resources (water, forests, heritage features) are concerned, drawing on long-term local knowledge (World Bank 1997). Invariably, the need to raise the level of appropriate education within the local stakeholder community, is of paramount importance if successful development is to be achieved. Hence, we need to see education for all stakeholders as "a continuous learning process that helps achieve self-empowerment, sustainability, equal participation in community affairs, and capacity building, not only in the short term or the medium term but also in the long term." (World Bank 1996b). This education process then needs to facilitate development that is people centered and accommodating of the community's cultural values, with institution building and human empowerment central to the development process and underpinning economic well-being.

5.2 Company

Davis (1995) as managing director and CEO of CRA (now Rio Tinto) stated that one of the great paradoxes of our time, is that as resource companies become bigger, more technically dependent and more capital intensive, it is even more essential to have the support and understanding of people such as employees, shareholders, neighbors and the general public. He suggested that the leaders of future successful global companies will be those who can identify and manage the deployment of the new competencies required. Four areas he identified where new competencies are called for are: working in developing countries; working with Aborigines; working with the environmental lobby; and working with the company's people.

The training and experience which is required of company personnel to undertake consultation and other engaging approaches with stakeholders are typically limited in most organizations and developing the capacity to undertake these roles within organizations must be a priority. Often those employees who have been involved in the consultative processes of EIA will be familiar with some of these methodologies, which are similar between the two fields.

Significantly, Davis pointed out that although in setting up Bougainville Copper, CRA displayed good research skills, good cross-cultural understanding and requisite diplomacy, once the operation commenced, these came to be regarded as specialist functions only and came second in importance to core competencies like ore extraction, treatment and marketing. He suggested that because CRA had not mainstreamed the competencies that were displayed during project development, the company failed to recognize just how quickly social attitudes and expectations were changing, which

[11] Sustained economic growth requires high levels of education, however it is not a case of education alone as some highly developed economies arguably have declining levels of social capital (as measured, for example, through rising crime rates, declining family and kinship cohesion) as well as falling trust in both government and the political process.

ultimately lead to civil unrest and eventual closure of the mine.

According to Susan Lazar (World Bank 1996b) of the Washington Psychoanalytical Institute, who elaborates on these necessary competencies, "When the situation is less than optimal [e.g. engaging indigenous communities averse to mine development], the responsibility for ensuring a sustainable outcome must be assumed by the giver [the mining company]. It is up to the giver to assess the characteristics of a situation, to adapt to them sensitively and creatively, and to make available the ingredients deemed useful for that situation. The choice is then left to the receiver, who will take the initiative to select what he or she wants to make use of according to his or her own predilection, style or aesthetic sense. In the absence of feelings of intrusion, dominance, or prejudice the receiver feels empowered and free. He or she trusts the giver enough to ask for additional guidance. A state of reliance and mutual cooperation may then exist between the [two parties]. The one that commands should always act in such a way as to enhance the identities of both the giver and the receiver."

Mineral development proponents need to better understand the nature of existing cultures and forms of social capital in the countries and local areas in which they operate or propose to operate. This should be an integral part of the project planning process, and the necessary skills will need to be available to the proponent. The assessment of the target area's social context/capital could be combined with social impact assessment studies, which would identify existing institutions, social relationships and networks that contribute to growth, and also those which impede it. An assessment of this type would prevent projects from weakening existing, community cohesion (positive social capital structures) and would highlight ways to strengthen it, enhancing the basis for optimizing development benefits in the area and minimizing actions that may lead to community fragmentation.

The key objective for the company in initiating interaction with stakeholder groups, is to find out what information the stakeholders need from the company, what information the stakeholders want to convey to the company, and what roles the individual stakeholders wish to play in the development activity. On an ongoing basis, the most common way of monitoring stakeholder concerns and expectations has been through the use of surveys, targeted studies and/or monitoring social welfare indicators (e.g. crime statistics, health, disputes, complaints).

Apart from corporate competencies in engaging stakeholders, competencies will also be required for implementing strategies for social programs under a corporate Community Affairs Policy that will need to be individually negotiated with each individual community. Stakeholders may indicate interest in contributing to community policy development, community program development and implementation, monitoring and auditing of programs and asset transfer programs at the time of closure. Stakeholder involvement and partnership can, on this basis, overcome traditional concerns regarding corporate credibility, openness and accountability through the simple expedient of ongoing dialogue. Non-local stakeholder groups can alternatively benefit from regular public environmental and community program reporting, particularly where independent verification processes are adopted.

Common features of corporate community programs may include greater investment in the community, empowerment of that community to assist their participation as equal partners in appropriate areas of development, increased

involvement with local and national governments on issues such as planning, provision of ongoing information about the activities of the company, managing local expectations of corporate contribution and distribution, and developing strong relationships with stakeholders based on mutual benefit.

5.3 NGOs

Education and empowerment of NGOs, and consequently their effectiveness, has been a phenomenon of the 1990s, with well funded international bodies having provided considerable training, information and other support to their national brethren, many of whom operate in developing countries. Where possible and appropriate, these empowered national groups have then similarly supported more locally based NGOs.

According to Nafis F Sadik of the United Nations Population Fund, "as their implementation role becomes more tangible, NGOs should acquire the skills and resources that will enable them to move from advocacy to action. They should also learn to accept the new responsibilities that come with success, including the need to respond positively to significant changes" (World Bank 1996b).

Opportunities can usually be created for NGOs and local communities to actively participate as partners in local business development and provision of services. NGOs can also be potentially involved in environmental and social monitoring and evaluation, including input into the development (or endorsement of) clearly specified indicators to track changes in for example income, living standards, and environmental quality, which are then linked to action plans for corrective measures where deemed necessary.

5.4 Communities

Recognition of the need for individual development is essential during rapid socio-economic change and is usually necessary for a deeper understanding of the processes and implications of development. An enhanced appreciation of self awareness relevant to others, is an essential element in empowering people to take charge of their destinies and to become equal and efficient partners in development. For example, people may see the world as a threatening, frightening place in which they are being victimized, or they may see it as a place of opportunity. An education process can assist these people to take the more positive perspective, empowering them to be all they can be: creating their own identity and institutions and empowering the weak and vulnerable to be the producers of their own well-being rather than to be the recipients of hand-outs.

Empowerment of the individual in some cultures may not necessarily lead to the outcomes experienced in the West. Individualism can have different outcomes in different cultures and may indeed lead to alienation and loss of cultural framework. "Individuals can exist only within the social order, and the social order can exist only to the extent that it respects the individual's right to act as an individual." Hence, coming to terms with individual empowerment may require a major adjustment for the individual before it can be a productive competency" (World Bank 1996b, p.3). This may be particularly the case for women.

According to Lazar (World Bank 1996b, p.30), "For children of both genders women are central to the development of self image, self-esteem, and a sense of the

possibilities in one's future. If women are second class citizens in their own cultures, what impact does this have on the messages concerning dignity and self-sufficiency that they convey to their male and female children?.... There are powerful forces at work to keep the established unequal power relationships between men and women in place... People react to the way they are treated: a woman who has to limit her ambitions, who is assigned second-class citizenship, and who is not allowed to chart her own course as an adult will harbor anger and mistrust towards men and towards her own culture, even if she seems to be accepting, passive and compliant externally..... Sexism... erodes the self-esteem and empowerment of most of the world's women, wastes most of their potential to contribute to the world's cultures, and breeds resentment and conflict between the sexes. Sexism weakens the vitality and cohesiveness of society and diminishes its capacity for further growth and development."

Serageldin (World Bank 1996b, p.3) sums this dynamic up when he comments that "the possibility of having bonds and shared values that hold a society together so that the whole is more than the sum of its parts or, conversely, of having a negative dynamic that leads to the disintegration of that society, both can arise from the perception and interaction of the self and the others in that society."

Education, therefore, needs to be oriented to the most effective manner in which all people can learn how to improve their capabilities to share equal rights and responsibilities while feeling safe and accountable as a result of the transparency of the process.

6. Ideals and Reality: Implementation of Stakeholder Programs

6.1 Establishing partnership structures

Partnership is a means to an end. Partnerships provide a mechanism for resolving community or collective dilemmas by minimizing free riding, facilitating consensus building, and helping to increase social capital, in the forms of knowledge, policy (i.e. rules of the game), global consensus and social infrastructure.

According to Picciotto (World Bank 1998b), five prerequisites of successful partnerships are: i) the objectives must be fully shared by the partners, this usually calls for joint elaboration of the goals of the partnership; ii) the partners must secure full consensus for the objectives of the partnership at senior levels; iii) the partners must demonstrate intellectual conviction through concrete upfront actions; iv) the partners must engage in broad based participation in support of partnership goals; and v) capacity development must be built into the partnership to ensure that the weaker members are able to participate fully and made able to exercise influence.

Partnerships are, a lynch-pin of sustainable development. Economic growth and development (driven by the private sector), are facilitated by government provision of an enabling environment, together with public consensus and social development driven by the civil sector (or the increase in social capital, in the form of partnerships, networks, institutions and community consensus). There is increasing evidence that this harmonious coexistence and collaboration between the private, civil and public sectors are characteristic of modern prosperous societies, enhancing the nurturing of appropriate customs and behaviors that engender social trust.

Increasingly, mining companies are actively pursuing partnership approaches for delivery of social and economic outcomes in support of sustainable development. The advantages of developing these partnerships includes the pooling of resources, the building of respect and understanding between potential adversaries, and transfer of knowledge. For example, local communities and NGOs can help to shape social impact mitigation or community development projects, and monitor corporate compliance with previously agreed objectives and commitments. Some of the larger multi-national companies believe that the responsibilities for community involvement cannot simply be outsourced and that direct partnerships with communities are essential if mining companies are to maintain the community endorsement to operate.

When negotiating with companies developing mining projects, governments should ensure that some project revenues do in fact accrue to key stakeholders in an equitable and transparent manner. For example, a proportion of government revenue from royalties, taxes, or equity might be directed towards local development activities to ensure that those most impacted by the development are adequately compensated and enjoy some of the benefits (Figure 5.2). Where revenue sharing arrangements are put in place, it is important that transparent tracking mechanisms are developed to ensure that the benefits go directly to the intended beneficiaries. Often this will be difficult to achieve, particularly where there are local groups who have traditionally been in conflict. An increasingly used mechanism is the performance contract between stakeholders, which agrees on objectives, programs, and institutional responsibilities and accountabilities of each party. The performance contract should also identify indicators to measure the progress and success of agreed programs (based on outcomes), and responsibilities for monitoring and reporting.

A legal mechanism being used to distribute benefits to stakeholders is the ‘trust’. An example of one such trust is that developed by the Ok Tedi copper-gold mine in Papua New Guinea. Under the PNG Mining Act, Ok Tedi Mining Limited pays compensation for damage to traditional gardens and economic trees downstream of the mine. In 1990 it also established the Lower Ok Tedi/Fly River Development Trust, funded exclusively by the company, to bring community infrastructure and small business to villages along the river system impacted by the mine’s operations. This trust was not regarded by the government or the company as an alternative to payment of compensation. However, following significant landowner dissatisfaction, the Mining (Ok Tedi Restated Eight Supplemental Agreement) Act 1995 now provides for K110 million to be paid as general compensation over the
remaining life of the mine for these same villages. In addition, as a separate package, the most severely affected Lower Ok Tedi landowners will be receiving a special K40 million compensation, infrastructure and business development program for the remainder of the mine’s life.

Another example of a partnership is the foundation. Numerous companies, both large and small are setting up foundations to facilitate the transfer of various social and economic benefits to impacted communities. An Australian example is the ‘CRA-RTZ (now Rio Tinto) Aboriginal Foundation’. Other Rio Tinto foundations include the ‘Rossing Foundation’ associated with the Rossing uranium mine in Namibia and the ‘Rio Tinto Foundation Indonesia’. In the latter example the foundation’s aim is to work in partnership with local communities, governments and other aid organizations to assist in

improving the well being of Indonesian people with particular emphasis on those living in the vicinity of Rio Tinto's mining operations. In particular, "the foundation was formed as part of Rio Tinto's efforts to be a good neighbor and to improve in a sustainable manner, the social and economic well-being of the people in areas where Rio Tinto operates" (Kunanayagam 1998).

One distinct advantage of the 'foundation' mechanism is that, if properly constituted with equal representation by all partners to the relationship, it can remove any perceived imbalance in a relationship. If properly structured with appropriate financial arrangements, the beneficiaries (often indigenous people or traditional owners) will not feel disempowered or lose the right to voice their disagreement over mine practices.

Health improvement is a common feature of trusts and foundations, with communities seeking a rapid improvement in their lifestyles, while education, infrastructure, and business development are usually longer term. One such health partnership is that between Placer Pacific's Misima Gold Mine, the local community on Misima Island (PNG), the Government health agency, and the World Health Organization's Collaborating Centre at the School of Public Health and Tropical Medicine at James Cook University (Australia). In the context of this partnership, a new treatment regime has been successfully trialed on Misima Island which has resulted in a 90% decrease in villagers infected by the tropical disease, Filariasis. This project has now been expanded to all 13,000 inhabitants of Misima Island and will be further extended to the 39,000 inhabitants of the Samurai Murua District within the Milne Bay Province of Papua New Guinea (Placer Pacific 1997).

The Lihir Gold Mine development on Lihir Island, Papua New Guinea, is a recently developed operation whose corporate management has sought to pay a high degree of attention to the effective integration of social issues into the decision-making process and in particular dealing with the issue of financial equity arrangement with the Lihirian community. A brief summary of the key community features integrated into the project are outlined in Box 5.3 below.

6.2.1 Sustainability strategies

Companies are, of course, central to the participatory process of developing a stakeholder-based sustainability strategy for their mine developments, and at the same time being accountable to governments and shareholders. McPhail and Davy (World Bank 1998a) have identified the following critical success factors for mine developers interested in integrating social concerns into their decision making:

- *Adopt a policy on sustainability and critical social issues*: the most basic indication of a corporation's commitment to social responsibility. It forms the basis for an implementation, monitoring and verification system.
- *Acknowledge the legitimacy of stakeholders, their values, and perspectives*: this requires that they first be identified. The most obvious stakeholders are governments, both local and central, landowners, neighbors and local community groups.
- *Identify the social risks and opportunities for engagement*: the opportunities arising from socially responsible corporate behavior are often cited as:

improving the prospects of access to further exploration concessions with the country; reducing the likelihood of conflicts with the local communities; reducing the risk of permitting delays; and improving employee commitment to managing the project in a socially responsible manner.

- *Assess the social and environmental impacts in an integrated fashion*: the proper analysis of both social and environmental impacts of the various project options can form the basis for avoiding, offsetting, or mitigating those impacts to acceptable levels
- *Recognize the importance of public involvement (NGOs, specific interest groups)*: public involvement (consultation, participation, partnerships) should be recognized as essential to both the design and implementation of socially and environmentally sustainable projects.\ *Identify and delineate responsibilities for providing social services*: Mining projects, particularly those in developing countries, very often need to provide certain social services (health, education, power, water etc) to mine employees and their immediate families. Often companies will provide these services in excess of what is provided by government as a service to the local community.*Aim for social equity*: in revenue distribution, property compensation and other societal compensations e.g. housing, health and education services, local business development etc.
- *Develop local partnerships to support sustainable development*: i.e. with local businesses, NGOs, local government and other local groups who have a local capacity to provide or develop social support programs and monitor social issues. This enables greater resources to be utilized, it builds respect and understanding between the groups, and provides a facility for transfer of local knowledge, skills and experiences between the partners.

6.2 Strategies, corporate systems, performance indicators and public reporting

- *Provide stakeholder representation in public and corporate forums for the life-of-mine*: any public consultation and stakeholder involvement should not end with the project's planning approval. Paternalistic attitudes are being replaced by co-operative, collaborative alliances and partnerships.

- *Provide mechanisms for conflict resolution*: where disputes are unresolvable at the local stakeholder level, perhaps local or central government agencies or an independent party could play a key role.

- *Evaluate and report on the effectiveness of the above (accountability and verification)*: if the sustainability of developments is to lead to gains in social and human capital, outcomes to this effect must be able to be credibly (independently) monitored, verified and publicly reported upon.

Figure 5.3 illustrates in overview, the integration of these critical success factors into an Integrated Social and Environmental Management Model for Mining Projects.

Box 5.3 Integrated Benefits Package to Lihirian People, New Ireland Province, Papua New Guinea by Lihir Gold Ltd (an RTZ subsidiary).

This integrated benefits package provides compensation for the following:

- *Disturbances*: Payments for disturbances, damages, use of land and its resources.
- *Development*: Provision of development support and project assistance.
- *Security*: Establishment of sustainable trust funds to allow for community and human development to be on-going after mining ceases.
- *Rehabilitation*: Rehabilitation significance to be acknowledged and provision made for cooperative development of rehabilitation plans.
- *Royalties:* The proposed royalty rate of 2% of gold production will be split 50-50 between the province of New Ireland and Lihir.
- *Equity:* The PNG Government and the 7,1000 Lihirians own 8.55% each in the US$725 million project, with the Lihian equity to be administered by a trust. Other PNG investors haven taken up 6.5%. Following the public offering, Southern Gold (owned 75% by RTZ and 25% by Vengold) holds 22.8% of Lihir. Niugini Mining holds 17.1%, the Australian public 13.9%, Australian institutions 10.8% and international institutions 11.8%.

Lihir Gold's Community Relations Program covers the following issues:

- *Land*: investigation to determine customary ownership; assessment and payment of compensation for damage to property.
- *Negotiation*: negotiate leases, compensation and relocation agreements.
- *Communications*: liaison with churches, all levels of government and community bodies; village patrols; community notice boards; media - company newsletter and informational and educational booklets, local radio broadcasts.
- *Relocation*: supervise and monitor the relocation of residents from the project area.
- *Youth and sport:* assistance (logistics, fund raising, donations) to youth and sporting groups; development of recreational and sporting facilities; introducing new sports and organising coaching clincs.
- *Welfare service*: transporting sick people to health centres; social casework and counselling.
- *Social monitoring*: monitoring of the social impact, in particular, the generation of social problems in the community.
- *General community assistance*: fund raising; logistic and financial support for social projects.
- *Training, employment and termination*: advice on selection (Lihirians are given preference in training and employment); advice on local custom; induction and orientation courses for non-Lihirian workers.

Lihirian Business Development

It is recognised that Lihirians wish to receive business spin-offs from the project and, to date, almost 80 Lihirian companies (earth moving, construction, retailing, transport and security) have been established. Loans of over K700,000 were made available to set these up and to assist various other small local businesses.

Source: Mining Journal (1996) Mining Environmental Management. Lihir: Socio-economic impact. pp.4-8, March 1996.

Figure 5.3 goes here

6.2.1 Management Systems

Sustainability strategies, based on corporate social policies, require a mechanism to implement the strategy as well as monitor, audit and account for each component. A good example of a relevant community management system is that of Australia's North Limited.

North is a diversified natural resource company with interests in mining, forestry and manufacturing, including 100% ownership of Energy Resources of Australia, which operates the Ranger uranium mine in Australia's Northern Territory.

The North community relations policy, instigated in 1998, has taken a systems approach in its implementation. The community relations management system is designed to direct employees to implement activities that lead towards broad change in the area of corporate community relations (see Box 5.4). This management system approach is similar, and integrated with, their existing Occupation Health, Safety and Environment management
system.

Of particular interest is North's approach to ongoing assessment and verification, where the objective is to set annual community relations goals and review, assess and verify the performance of North's community relations activities on a site-by-site basis. The company states that results from annual assessments by North will be independently verified and publicly reported.

Box 5.4 North Community Relations Policy: system elements

Policy

1. Policy
2. Roles, responsibilities and resources
3. Actively involving employees

Planning and Preparation

4. Identification of interest groups, issues and impacts
5. Prioritising outcomes and making a plan
6. Initiating and reviewing consultation
7. Responding to interest group issues
8. Training for change

Checking and Reviewing

9. Keeping records
10. Review, assessment and verification

Source: North (1998). Words into Practice - Implementing the North Community Relations Policy.

6.2.2 Performance indicators and public reporting

In order to be able to objectively measure, monitor and manage sustainability parameters, use of performance indicators is increasingly being seen as a proper way of addressing this management area. These indicators can be used at the international, national and private sector levels as a tool for reporting, measuring performance, and

reporting on the progress towards sustainable development. The key determinant of a good indicator is the link between the measurement of some social or environmental condition to various policy options. (See Chapter 7, Section 3 – Measuring Project Sustainability)

Regular public reporting of the results of this monitoring, and collective corporate reporting across all of a company's operations, is rapidly becoming an integral part of a major mining company's continual improvement/best practice program. This type of public reporting is seen as a key contributor to achieving the sustainability objective of openness and ongoing communication with stakeholders.

6.3 Planning for closure: is there a sustainable future for the community?

Most national environment protection acts and regulations require all new, proposed or existing mining operations to develop Environmental Impact Statements. In some countries, for example Republic of Zambia[12], a component of the EIS is the development of a comprehensive decommissioning and closure plan, which besides addressing the normal mine infrastructure decommissioning and environment protection issues, also requires that the socio-economic impacts of mine closure be addressed.

The prospect of mine closure often poses a daunting challenge for mining communities. The term 'community' in this situation is used in its broader sense, and includes the company's workforce, their family dependents, local mine dependent and non-dependent businesses, local government and other service providers. In many cases, particularly those communities with a long history of mining (in both developed and developing economies) the mining enterprises have tended to encourage a dependent relationship between the mine and its workforce. Very often this was a necessity to attract a local workforce into a remote part of the country where few services and infrastructure were available.

In this context, the companies have tended to become service providers on a large scale, providing food, housing, medical facilities, and various recreation and municipal services. This has particularly been the case and still often is in some developing countries, where mining companies have been seen as agents for the government, often out of necessity. Fly-in, Fly-out developments are, of course, now being widely established to minimize these issues.

When planning for mine closure, the major implication for dependent communities is the need to untangle the complex and often deeply entrenched web of interrelationships and interdependencies which might exist. Sometimes, due to market forces, mines may need to be closed quite quickly and the question of transfer of services and infrastructure will need to be addressed also. The main issue for such mine closures is, what institution or institutions will take over the services role and who has the resources to maintain the infrastructure utilities (water supply, power, sewerage, transport) which the community needs to have retained?

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[12] Republic of Zambia (1997) *Mines and Minerals (Environmental) Regulations* 1997. Numerous Environmental Impact Statements undertaken under this Regulation by Zambia Consolidated Copper Mines Limited (ZCCM) as part of the Zambian privatisation program have included the development of substantial Rehabilitation and Decommissioning Plans with a significant proportion of the plan dedicated to addressing the social issues of mine closure.

Resolution of these, generally major, considerations for a community highlight the need to have a social as well as physical closure plan in place long before the event occurs. The closure plan should represent the final stage of the collaborative community program developed jointly between the company and the stakeholders.

Managing the social impacts of closure

Closure of any mine's operations will have deep and lasting implications for local communities, many of which may defy mitigation. However, with proactive closure planning, some of the socio-economic impacts can be mitigated. Management measures for handling these impacts fall into three planning frameworks:

- Policy and strategic planning at the corporate level, involving government and other stakeholders at the national, regional and municipal levels, preferably undertaken at the project planning stage. Stakeholder benefits agreements should ideally include provisions for mine decommissioning and closure, for example, the transfer of assets, land and services to relevant institutions;

- Medium term in-house closure planning. Preparation for closure undertaken by the mining company over a period of about ten years, including the commencement of mine rehabilitation and closure plans.

- Short term closure planning, involving all stakeholders in a process involving local representative development and planning forums. This activity should commence about five years before closure.

In summary, the socio-economic interdependence between mine and town is often close and complex. Mine closure can occur unexpectedly, even from the corporate perspective, if a mine operation or company faces economic collapse. To protect against a closure scenario that has the potential to severely damage, or even destroy, a fragile economy and the community's social fabric, it is important that any company's social/community relations/indigenous peoples policies fully accommodate the social and economic impacts which can result from mine closure. This includes accepting full corporate responsibility for ensuring that proper mitigating measures will be implemented by appropriate and properly supported entities irrespective of the timing or reasons for mine closure.

It is imperative that these policies ensure that the community is an active partner in all activities that are important to a community's post-closure wellbeing during the operational phase of development. With good planning and an empowered community, closure should not be feared, but anticipated by all as the final stage of community programs that have been planned from the start to culminate in the mine closure stage: i.e. the 'stakeholder disengagement phase'.

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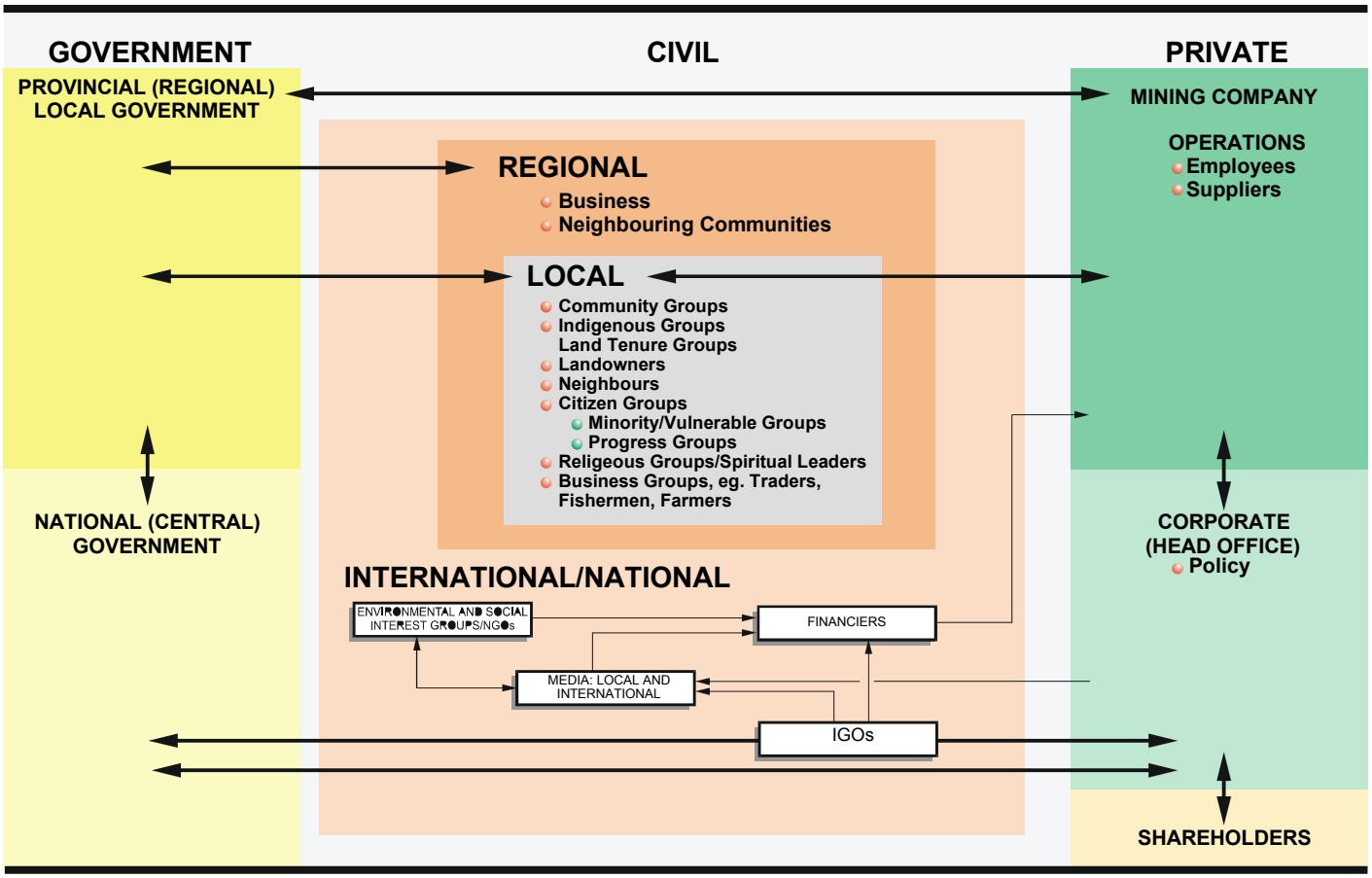
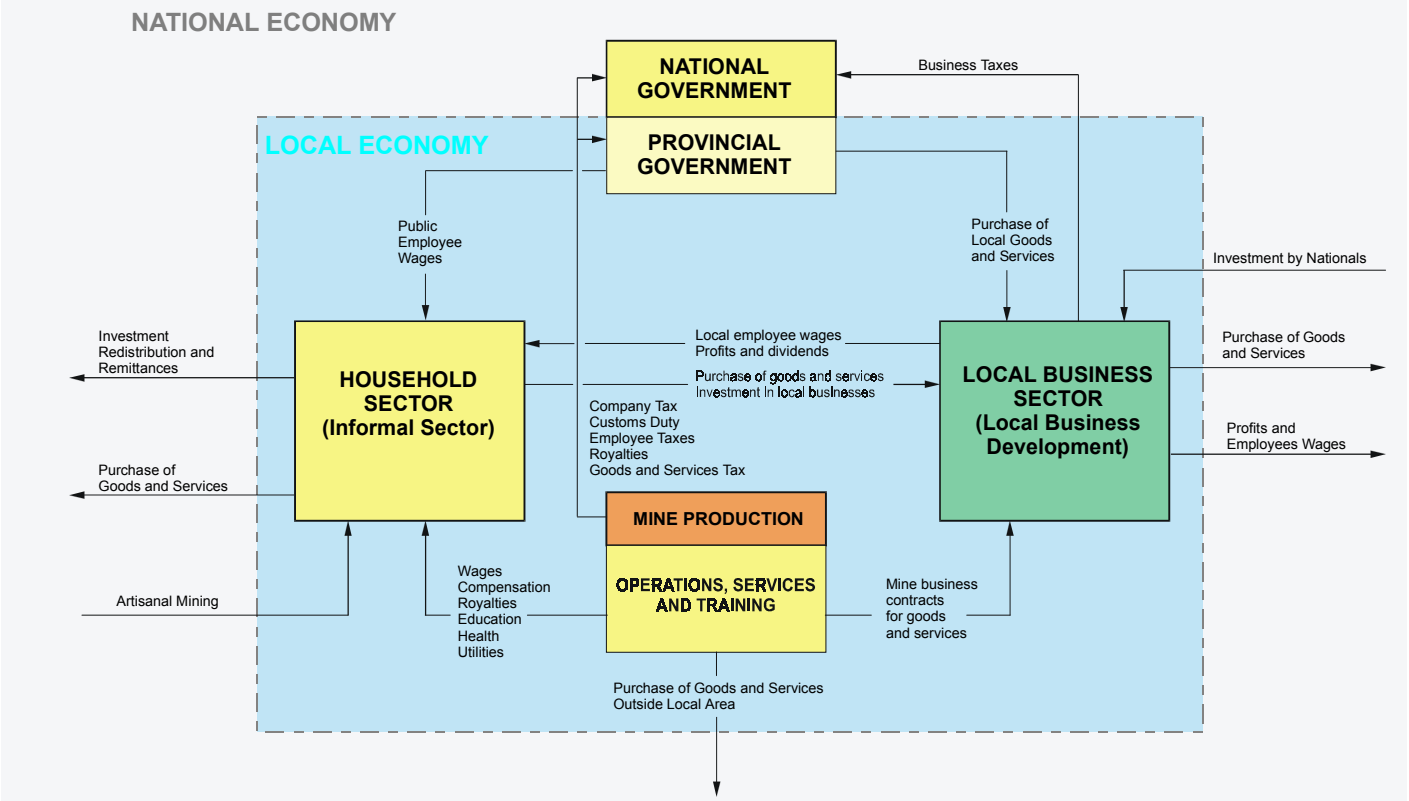


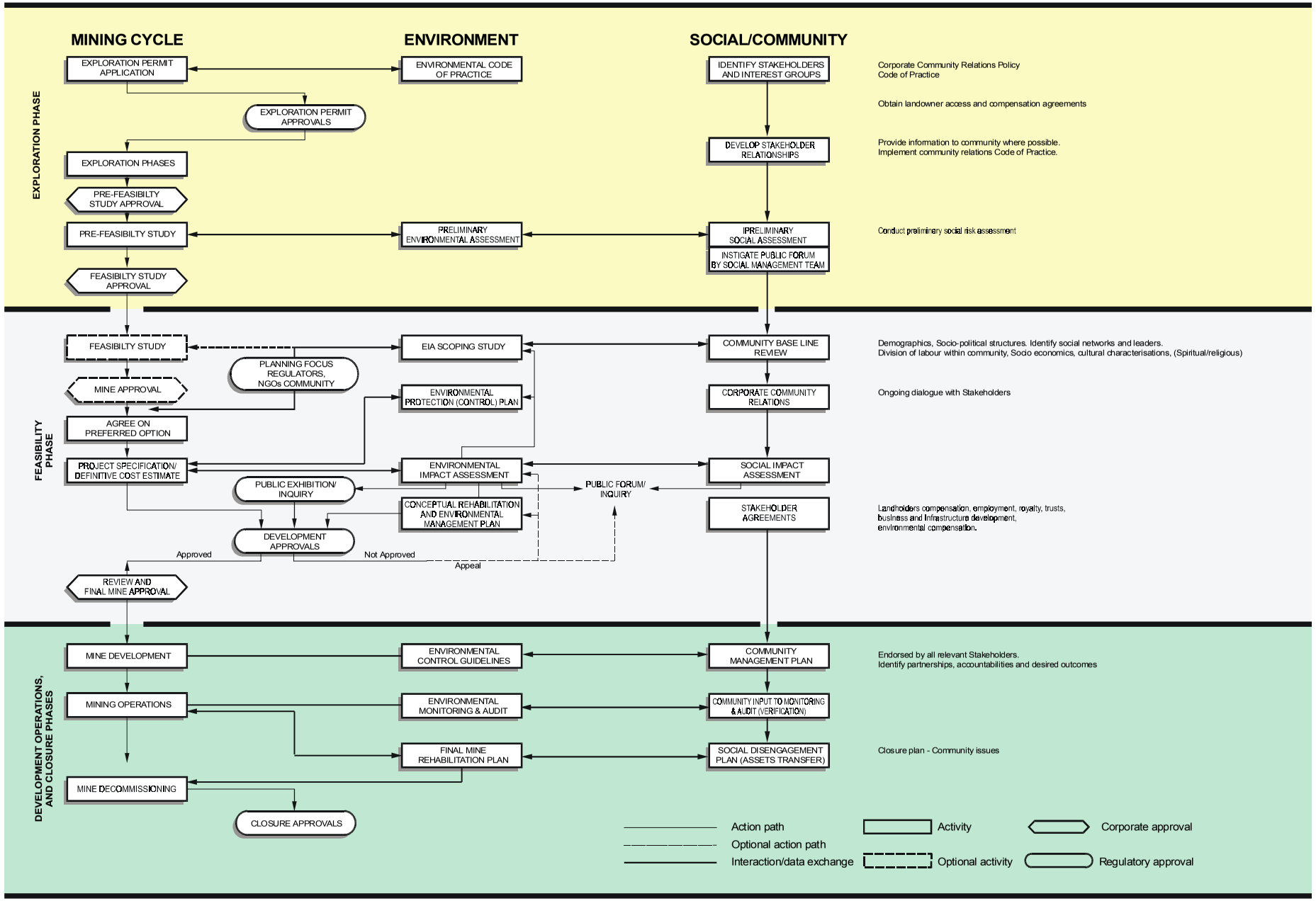
STAKEHOLDER ENGAGEMENT MODEL

FIGURE 1



STAKEHOLDER BENEFITS MODEL

FIGURE 2



INTEGRATED SOCIAL AND ENVIRONMENTAL MANAGEMENT MODEL
FOR MINING PROJECTS

FIGURE 3

Chapter 6

National Assessment Methodologies and Measures

Wade E. Martin

1. Introduction

Over the last decade the discussion of sustainability[1] has evolved from a "catch phrase" into an integral component of policy-making within governments. According to the categorization scheme presented by Brenton (1996, p.10-11), sustainability has moved from a *Level 1* issue where it's a "good idea but we won't take any action" to a *Level 3* issue that involves "implementing actions to meet the goals" of sustainability. Therefore, once the discussion has moved to such a position in policy-making it is necessary to consider the difficult issues of measurement and methodologies. Such issues are particularly problematic in the non-renewable resource area of minerals.

As governments and industry have taken the issue of sustainability to a "new" level it has become increasingly obvious that there needs to be an increased sense of agreement as to what sustainability is and how do we know when it has been achieved. Many authors have proposed definitions (see Cordes, this volume), others have proposed frameworks or goals for considering the issues (Meppen and Gill 1998) and still others have presented the criteria for evaluating sustainability (Natural Resources Canada 1995). Much of this activity is designed to provide the necessary input into the development of a set of indicators that will be appropriate for governments to use when evaluating the effectiveness of their actions toward sustainability or sustainable development.

The next section will provide a selected review of the existing discussions concerning the framework or goals for the consideration of sustainability. This will be followed by a discussion of the methodologies available for evaluating sustainability. This discussion will evaluate methods from a variety of disciplines. Section four will present a variety of measures used to evaluate sustainability. These measures will come from a number of sources. Next, the methods and measures will then be discussed in the context of mineral development and the implications for the use of non-renewable resources. A concluding section will then provide some final thoughts on the measurement issue.

2. Criteria for Considering Sustainability

An important stage in the transition of sustainability from a *Level 1* issue to a *Level 3* issue is the discussion designed to clarify the concept of sustainability. The most widely recognized starting point for a normative discussion of sustainability is the World

[1] This chapter will use the term sustainability to reflect the concept of sustainable development in an intergenerational context similar to the Bruntland Commission report in WCED (1987). For more complete definitions of the concepts see Jamieson (1998), Meppem and Gill (1998), and the chapters by Cordes and Eggert in this volume.

Commission on Environment and Development (1987, p.8) report that defined sustainable development as development that "meets the needs of the present without compromising the ability of future generations to meet their own needs". In the intervening years it has become increasingly obvious that this definition was operationally difficult to implement.

A number of authors have since attempted to improve or expand upon the concept in order to clarify the concept and improve the probability of developing meaningful policies for achieving sustainability. For example, Costanza (1994, p.392) states that "sustainability entails maintenance of (1) a sustainable scale of the economy relative to its ecological life support system, (2) a fair distribution of resources and opportunities between present and future generations, as well as between agents in the current generation, and (3) an efficient allocation of resources that adequately accounts for natural capital". Although this definition provides significantly more detail, it is still somewhat lacking due to the need to define "fair" in a meaningful sense.

Perhaps a more relevant definition for our purposes is proposed by Herman Daly who recommended "1) for renewable resources (fish, trees, etc.) the rate of harvest should not exceed the rate of regeneration; 2) the rate at which we allow economic activity to generate wastes that must be passed into the environment should not exceed the environments ability to absorb them; and 3) the depletion of non-renewable resources (oil, coal, etc.) should be offset by investment in and development of renewable substitutes for them" (quoted in Prugh 1995, p.47). Although this set of considerations provides guidelines for the use of renewable and non-renewable resources it does not address the possibility of substitution between natural and man-made capital as discussed by Eggert (this volume).

One of the more provocative attempts to rework the definition of sustainability and provide guidelines for achieving sustainability is provided by Meppem and Gill (1998). They (p.134) propose a new methodology for considering sustainability (to be discussed in the next section) that focuses on the "path" toward sustainability versus a "target" of sustainability. Therefore, to accommodate their proposed methodology, they state that:

> *sustainability describes a state that is in transition continually: 1) The objective of sustainability is not to win or lose and the intention is not to arrive at a particular point. 2) Planning for sustainability requires explicit accounting of perspective (world view or mindset) and must be involving of broadly representative stakeholder participation (through dialogue). 3) Success is determined retrospectively, so the emphasis in planning should be on process and collectively considered, context-related progress rather than on achieving remote targets. A key measure of progress is the maintenance of a creative learning framework for planning. 4) Institutional arrangements should be free to evolve in line with community learning. And 5) the new role for policy makers is to facilitate learning and seek leverage points with which to direct progress towards integrated economic, ecological and socio-cultural approaches for all human activity.*

A number of other groups and organizations have attempted to contribute new and expanded definitions and goals to the sustainability debate. Two notable organizations are the President's Council on Sustainable Development and the International Institute for Sustainable Development (IISD). The President's Council has developed a set of ten goals for the USA. IISD organized a conference that resulted in the development of the so-called Bellagio Principles for Assessment[2] (Hardi and Zdan 1997). The Bellaigo Principles are quite detailed and relatively broad based and will be discussed here. The Bellagio Principles are designed to serve as guidelines for the assessment process. The ten principles identified by the conference participants are presented in Box 6.1.

Box 6.1 The Bellagio Principles

1. GUIDING VISION AND GOALS
   Assessment of progress toward sustainable development should:
   - Be guided by a clear vision of sustainable development and goals that define that vision.
2. HOLISTIC PERSPECTIVE
   Assessment of progress toward sustainable development should:
   - Include review of the whole system as well as its parts.
   - Consider the well-being of social, ecological, and economic sub-systems, their state as well as the direction and rate of change of that state, of their component parts, and the interaction between parts.
   - Consider both positive and negative consequences of human activity, in a way that reflects the costs and benefits for human and ecological systems, in monetary and non-monetary terms.
3. ESSENTIAL ELEMENTS
   Assessment of progress toward sustainable development should:
   - Consider equity and disparity within the current population and between present and future generations, dealing with such concerns as resource use, over-consumption and poverty, human rights, and access to services, as appropriate.
   - Consider the ecological conditions on which life depends.
   - Consider economic development and other, non-market activities that contribute to human/social well-being.
4. ADEQUATE SCOPE
   Assessment of progress toward sustainable development should:
   - Adopt a time horizon long enough to capture both human and ecosystem time scales thus responding to needs of future generations as well as those current to short term decision-making.
   - Define the space of study large enough to include not only local but also long distance impacts on people and ecosystems.
   - Build on historic and current conditions to anticipate future conditions- where we want to and could go.
5. PRACTICAL FOCUS
   Assessment of progress toward sustainable development should be based on:
   - An explicit set of categories or an organizing framework that links vision and goals to indicators and assessment criteria.
   - A limited number of key issues for analysis.
   - A limited number of indicators or indicator combinations to provide a clearer signal of progress.
   - Standardizing measurement wherever possible to permit comparison.
   - Comparing indicator values to targets, reference values, ranges, thresholds, or direction of trends, as appropriate.
6. OPENNESS
   Assessment of progress toward sustainable development should:
   - Make the methods and data that are used accessible to all.
   - Make explicit all judgments, assumptions, and uncertainties in data and interpretations.
7. EFFECTIVE COMMUNICATION
   Assessment of progress toward sustainable development should:
   - Be designed to address the needs of the audience and set of users.
   - Draw from indicators and other tools that are stimulating and serve to engage decision-makers.
   - Aim, from the outset, for simplicity in structure and use of clear and plain language.

[2] The Bellagio Principles were developed at a conference in Bellagio, Italy that was held in November 1996. The conference involved measurement practitioners and researchers from five continents and was funded by the Rockefeller Foundation.

Box 6.1 The Bellagio Principles (continued)

8. BROAD PARTICIPATION
   Assessment of progress toward sustainable development should:
   - Obtain broad representation of key grass-roots, professional, technical and social groups, including
     youth, women, and indigenous people-to ensure recognition of diverse and changing values.
   - Ensure the participation of decision-makers to secure a firm link to adopted policies and resulting action.

9. ONGOING ASSESSMENT
   Assessment of progress toward sustainable development should:
   - Develop a capacity for repeated measurement to determine trends.
   - Be iterative, adaptive, and responsive to change and uncertainty because systems are complex and change frequently.
   - Adjust goals, frameworks, and indicators as new insights are gained.
   - Promote development of collective learning and feedback to decision-making.
10. INSTITUTIONAL CAPACITY
    Continuity of assessing progress toward sustainable development should be assured by:
    - Clearly assigning responsibility and providing ongoing support in the decision-making process.
    - Providing institutional capacity for data collection, maintenance, and documentation.
    - Supporting development of local assessment capacity.

Source: Hardi and Zdan (1997, p.2-4).

As the detail provided in the box demonstrates, the Bellagio Principles are clearly the most comprehensive guidelines provided in this review. This detail, however, needs to be considered in the context of the underlying assumptions regarding the methodologies behind most of these guiding principles. The next section will discuss the various methodological approaches that are available and commonly used in the sustainability debate. The relationship between these methods and the guidelines and definitions provided above will then be discussed.

The U.S. President's Council of Sustainable Development was formed in June 1993 by executive order. The Council's role is advisory to the president. The mission of the council is:

- Forge consensus on policy by bringing together diverse interests to identify and develop innovative economic, environmental and social policies and strategies;
- Demonstrate implementation of policy that fosters sustainable development by working with diverse interests to identify and demonstrate implementation of sustainable development;
- Get the word out about sustainable development; and
- Evaluate and report on progress by recommending national, community, and enterprise level frameworks for tracking sustainable development.

The council has developed a set of interdependent goals that address the belief that sustainable development needs to consider economic prosperity, environmental protection and social equity. The ten goals of the council are presented in Box 6.2.

Box 6.2 The goals of the U.S. President's council on sustainable development

Goal 1: Health and the Environment – Ensure that every person enjoys the benefits of clean air, clean water, and a healthy environment at home, at work, and at play.

Goal 2: Economic Prosperity – Sustain a healthy U.S. economy that grows sufficiently to create meaningful jobs, reduce poverty, and provide the opportunity for a high quality of life for all in an increasingly competitive world.

Goal 3: Equity – Ensure that all Americans are afforded justice and have the opportunity to achieve economic, environmental, and social well-being.

Goal 4: Conservation of Nature – Use, conserve, protect, and restore natural resources –land, air, water, and biodiversity—in ways that help ensure long-term social, economic, and environmental benefits for ourselves and future generations.

Goal 5: Stewardship – Create a widely held ethic of stewardship that strongly encourages individuals, institutions, and corporations to take full responsibility for the economic, environmental and social consequences of their actions.

Goal 6: Sustainable Communities – Encourage people to work together to create healthy communities where natural and historic resources are preserved, jobs are available, sprawl is contained, neighborhoods are secure, education is lifelong, transportation and health care are accessible, and all citizens have opportunities to improve the quality of their lives.

Goal 7: Civic Engagement – Create full opportunity for citizens, businesses, and communities to participate in and influence the natural resource, environmental, and economic decisions that affect them.

Goal 8: Population – Move toward stabilization of U.S. population.

Goal 9: International Responsibility – Take a leadership role in the development and implementation of global sustainable development policies, standards of conduct, and trade and foreign policies that further the achievement of sustainability.

Goal 10: Education – Ensure that all Americans have equal access to education and lifelong learning opportunities that will prepare them for meaningful work, a high quality of life, and an understanding of the concepts involved in sustainable development.

Source: http://www.whitehouse.gove/PCSD/Overview/

3. Methodologies for Assessment

One of the most difficult issues facing the sustainable development objective of a nation is the need to coordinate activity among a number of policy-makers, decision-makers and researchers, each coming at the issue from a different perspective or type of training. The variety of paradigms that are used in the analysis makes communication an extremely difficult task. Almost all participants in the sustainable development debate agree that the solutions need to be framed in a multidisciplinary context to have any use that makes sense. Such an approach, however, may prove to be problematic. How an individual that is trained as a cultural sociologist or anthropologist communicates with someone trained in economics or the physical sciences may lead to confusion and/or

conflicting objectives associated with a sustainability plan. For example, how and when to deplete a non-renewable resource may lead to very different answers from a social analysis verses an economic net present-value analysis.

The focus of this chapter is on the economic models that can be used to analyze the effects of incorporating sustainability into the national planning process. These models will be presented realizing the constraints on their use to evaluate the effectiveness of the sustainability path of a national economy. Most of the economic models were developed to evaluate the achievement of economic goals such as the optimization of production of goods and services. The focus on market goods was desirable since there was a readily available measure, price, for incorporation into the model. Goods that are not traded in markets (i.e. clean water) are not as readily incorporated into economic models.[3] This still does not resolve the problem of how to incorporate values from cultural changes or use of the environment as a sink for certain types of waste (i.e. the value of trees in absorbing carbon dioxide). However, given the shortcomings of the economic models they still provide an important source of information for the sustainability debate.

The most common methodological approach used by economists and policy-makers for the analysis of policy changes is benefit-cost analysis. Such an approach is based in welfare economics and provides for an optimal allocation of resources under certain fairly restrictive assumptions (Mishan 1978). The basic idea that underlies benefit-cost analysis is really quite simple—the benefits of a particular action should be at least as great as the cost of taking that action. Three major concerns with the use of the benefit-cost approach are: 1) how to determine the correct prices for the benefits and costs, 2) the model results are insensitive to the allocation of the benefits and costs (i.e. it doesn't matter who wins or who loses!) and 3) the question of intergenerational equity, which is at the heart of the sustainability debate and is particularly problematic with non-renewable resources.

The problem of getting the correct prices has been addressed by Solow (1992). According to Solow, it is essential that the market reflect the correct prices, or the correct scarcity value of the resource or good, so that the allocation of the scarce resources is efficient. Basically, what Solow is saying is that we have to "get the prices right" if we expect to meet any definition of sustainability. Bromley (1998), however, does point out that getting the prices right is only a necessary condition for sustainability, not a sufficient condition.

The allocation of benefits and costs is a somewhat more problematic issue. For the majority of policy issues who wins and who loses is an important consideration. The United States is attempting to deal with such issues through analyses of environmental justice, however, this is only a very recent endeavor. One aspect of environmental justice focuses on the relationship between environmental remediation and the socio-economic characteristics of the exposed populations. Such an approach provides an important first step in equity considerations; however, by no means does it address all the issues associated with the allocation of benefits and costs.

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[3] Developing methods to determine prices for such non-market goods is an active area of research in environmental economics. The contingent valuation method has been used in numerous court cases to value environmental damage and to assign liability.

Intergenerational concerns are highlighted in almost every definition of sustainability and in all philosophical discussions (Cordes, this volume; d'Arge 1993). Benefit-cost analysis is based upon evaluating all impacts in a common monetary value at one point in time. To do this it is necessary to consider the time value of money. When this is done, future generations are essentially given a value of zero and, therefore, no "dollar votes" in the allocation of resources. It has been proposed that intergenerational issues use a zero discount rate, which would create allocation problems within a generation.

Another method that economists have used to consider sustainability is computable general equilibrium (CGE) modeling (Martin and Skinner 1998). CGE modeling is designed to evaluate the effect that a policy change would have on the various sectors of the economy, including the production, household, government and international sectors. Depending on the level of aggregation, it is possible to determine the allocation of impacts for various socio-demographic strata in society. CGE models can be static or dynamic in structure. The insights provided in each type of model can provide a foundation for evaluating particular aspects of sustainability goals. For example, Martin and Skinner (1998) used a CGE model to evaluate alternative tax policies for "getting the prices right" to determine the impact on resource allocation given various tax structures.

The attractive feature of general equilibrium modeling is that it considers cross-market effects. Alternatively, partial equilibrium modeling will only evaluate the impacts of a particular policy on a specific sector or segment of the economy. Therefore, relying on partial equilibrium models for an analysis of the impacts of sustainability policies will provide an incomplete picture.

Another approach that can be used to analyze the impacts of various sustainability policies is decision analysis. Decision analysis provides a methodology for balancing conflicting objectives such as environmental protection and economic development. The multi-criteria decision making techniques of decision analysis provide an important tool for decision-makers in both the private and public sector of the economy when addressing the conflicting objectives embedded in the sustainability debate. For example, the primary objective of the south to achieve economic development yet also a concern with environmental protection versus the north that has an objective of environmental protection but don't affect economic development. Attempting to model such a complex set of objectives requires an understanding that various nations have multiple objectives, some of which may be conflicting.

Finally, another approach that is receiving considerable attention is the systems approach. Bellany (1997) discusses an approach that attempts to link the physical systems with the human systems in order to integrate environmental issues into world politics. The link between the physical systems and the human systems is often ignored at the policy level. For example, when addressing the precautionary principle does the policy maker consider the impacts to the physical system only as these impacts potentially affect the human systems or does the policy maker also consider the integrity of the physical system independent of the human system.

4. Measures and Indicators at the National Level

One of the main issues that needs to be addressed in the sustainability debate is a clear definition of what is to be sustained. The focus of the discussion to date has been mainly focused on how to adjust or redefine the National Income Product Accounts (NIPA) to measure "quality of life" instead of just "standard of living".[4] Historically, NIPA values have been used by many to reflect quality of life instead of the more limiting standard of living. Such incorrect usage has spurred the perceived need to expand the measures, such as gross domestic product, to reflect quality of life by including resource depletion and/or environmental degradation.

Once agreement is reached on what is to be sustained, it is then important to determine the indicators that will be used to evaluate whether or not these measures or targets are in fact being met. The types of indicators that have been used in the past may no longer be appropriate to evaluate the success or failure of meeting sustainability goals. Indicators such as GDP, unemployment rate, etc. do not provide the level of detail necessary to evaluate sustainability unless the methods for calculating these values are modified.

Modification of the traditional economic measures to include factors that can be used to evaluate sustainability goals is not a trivial task. An important aspect of extending the traditional measures is to determine the "new" characteristics that the indicators need to meet. There are at least three characteristics that need to be considered in developing the new set of indicators. First, the indicators need to be *comparable*. This characteristic is critical if society is to be able to determine the impact of a declining stock of a particular resource compared to an increase in the economic reserves of another stock. Comparison in physical units may not make sense in many cases, whereas, cyclical fluctuations in prices may provide mixed signals regarding the true scarcity of particular resources.

The second characteristic that is important is that the indicator is *computable*. It is important that the data necessary to accurately compute the desired indicator is available. Identifying an indicator that would be important in evaluating a change in the environment, such as methane releases from solid waste disposal, but is impossible to measure accurately would be of no practical use.

Finally, a critical characteristic of indicators of sustainability is that they be *forward-looking* or provide foresight for problems that are coming in the future. The temporal nature of meeting sustainability goals is very different than the traditional use of existing economic measures. Generally, the existing measures of economic activity have been used to compare economic activity between two points in time or two points in space.[5] For example, this year's GDP is greater than last year's GDP or per capita GDP in the U.S. is greater than per capita GDP in Brazil. The temporal aspects of the measures meet very different goals.

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[4] A report by the National Research Council (1994) addresses many of the issues associated with modifying the NIPA accounts to include "green" values.

[5] The traditional economic measures do have a forward-looking component in that attempts are made to predict the value of certain measures such as GDP in the future. However, the objective of the measure is very different that the forward-looking characteristic of a sustainability indicator.

An example of the development of new indicators that meet the objectives of sustainable development is provided by a joint effort between the Canadian government, International Institute for Sustainable Development and the International Development Research Centre (IISD & IDRC 1998). This effort focused on mining and sustainable development in the Americas. The approach used to determine the appropriate measures is based upon a hierarchical objectives structure. This structure is based upon first identifying strategic objectives, then fundamental objectives that are associated with each strategic objective, then indicators (or means objectives), and finally, measures (or attributes) for each of the indicators. The objective's hierarchy presented in Box 6.3 provides only the strategic and fundamental level objectives. This level of detail provides the foundation for developing the indicators that will then measure the level of achieving such objectives or goals. Details on the associated indicators will be presented in the next section.

Box 6.3 Objectives for mining and sustainability

Strategic Objective I: IMPROVED LIVING CONDITIONS
- A. Local Economic Development
- B. Improved Conditions for the Integration of Women
- C. Development of Local Capacities

Strategic Objective II: SUSTAINABLE TECHNOLOGICAL AND ECONOMIC DEVELOPMENT
- A. Cleaner Mining
- B. Economic Diversification
- C. Better Management of Market Cycles

Strategic Objective III: TRANSPARENT REGULATIONS AND POLICIES
- A. Generally Accepted and Effective Legal Structures
- B. Control and Monitoring by Civil Society

Strategic Objective IV: SOCIAL CONSENSUS
- A. Greater Breadth of Vision and Capacity in Business Decision Making
- B. Sustainable Development Generally Accepted as a Social Goal

Strategic Objective V: DEMOCRATIC PARTICIPATION BY STAKEHOLDERS
- A. Effective and Active Networks
- B. Participation and Consensus

Another effort at developing indicators for sustainable development has been the work of the United Nations. The indicators that have been proposed are organized into four categories: social, economic, environmental and institutional. The working list of indicators has been developed based upon the efforts outlined in Agenda 21 (United Nations 1992). Box 6.4 presents the indicators that have been proposed by the UN. The structure of the information is in a modified hierarchical form. First, the general category is presented with sub-measures provided below the higher level category. This is followed by three levels of indicators: 1) driving force indicators (DF); 2) state indicators (SI); and 3) response indicators (RI). Driving force indicators refer to "human activities, processes and patterns that impact on sustainable development." State indicators indicate " the state of sustainable development" and response indicators identify "policy options and other responses to changes in the state of sustainable development". Each of the indicators presented in this list can be evaluated based upon the three criteria for

indicators presented above; comparable, computable, and forward-looking. Not all of the indicators listed meet each of the criteria but as a group they provide an overall picture that meets these criteria.

Box 6.4 UN indicators of sustainable development

Social

Combating Poverty
- DF: Unemployment Rate
- SI: Head count index of poverty
  - Poverty gap index
  - Squared poverty gap index
  - Gini index of income inequality
  - Ratio of average female wage to male wage

Demographic Dynamics and Sustainability
- DF: Population growth rate
  - Net migration rate
  - Total fertility rate
- SI: Population density

Promoting Education, Public Awareness and Training
- DF: Rate of change of school-age population
  - Primary school enrolment ratio (gross and net)
  - Secondary school enrolment ratio (gross and net)
  - Adult literacy rate
- SI: Children reaching grade 5 of primary education
  - School life expectancy
  - Difference between male and female school enrolment ratios
  - Women per hundred men in the labor force
- RI: GDP spent on education

Protecting and Promoting Human Health
- SI: Basic sanitation: percent of population with adequate excreta disposal facilities
  - Access to safe drinking water
  - Life expectancy at birth
  - Adequate birth weight
  - Infant mortality rate
  - Maternal mortality rate
  - Nutritional status of children
- RI: Immunization against infectious childhood diseases
  - Contraceptive prevalence
  - Proportion of potentially hazardous chemicals monitored in food
  - National health expenditure devoted to local health care
  - Total national health expenditure related to GNP

Promoting Sustainable Human Settlement Development
- DF: Rate of growth of urban population
  - Per capita consumption of fossil fuel by motor vehicle transport
  - Human and economic loss due to natural disasters
- SI: Percent of population in urban areas
  - Area and population of urban formal and informal settlements
  - Floor area per person
  - House price to income ratio
- RI: Infrastructure expenditure per capita

Economic

International Cooperation to Accelerate Sustainable Development in Countries and Related Domestic Policies
- DF: GDP per capita
  - Net investment share in GDP
  - Sum of exports and imports as a percent of GDP

Box 6.4 UN Indicators of sustainable development (continued)

SI: Environmentally adjusted net domestic product
Share of manufactured goods in total merchandise exports
Changing Consumption Patterns
DF: Annual energy consumption
Share of natural-resource intensive industries in manufacturing value-added
SI: Proven mineral reserves
Proven fossil fuel energy reserves
Lifetime of proven energy reserves
Intensity of material use
Share of manufacturing value-added in GDP
Share of consumption of renewable energy resources
Financial Resources and Mechanisms
DF: Net resources transfer/GNP
Total ODA (development assistance) given or received as a percent of GNP
SI: Debt/GNP
Debt service/export
RI: Environmental protection expenditures as a percent of GDP
Amount of new or additional funding for sustainable development
Transfer of Environmentally Sound Technology, Cooperation and Capacity-building
DF: Capital goods imports
Foreign direct investments
SI: Share of environmentally sound capital goods imports
RI: Technical cooperation grants

Environmental

Protection of the Quality and Supply of Freshwater Resources
DF: Annual withdrawals of ground and surface water
Domestic consumption of water per capita
SI: Groundwater reserves
Concentration of fecal coliform in freshwater
Biochemical oxygen demand in water bodies
RI: Waste-water treatment coverage
Density of hydrological networks
Protection of the Oceans, all kinds of seas and coastal areas
DF: Population growth in coastal areas
Discharges of oil into coastal waters
Releases of nitrogen and phosphorus to coastal waters
SI: Maximum sustained yield for fisheries
Algae index
Integrated Approach to the Planning and Management of Land Resources
DF: Land use change
SI: Changes in land condition
RI: Decentralized local-level natural resource management
Managing the Fragile Ecosystems: Combating Desertification and Drought
DF: Population living below poverty line in dryland areas
SI: National monthly rainfall index
Satellite derived vegetation index
Land affected by desertification
Managing Fragile Ecosystems: Sustainable Mountain Development
DF: Population change in mountain areas
SI: Sustainable use of natural resources in mountain areas
Welfare of mountain populations
Promoting Sustainable Agriculture and Rural Development
DF: Use of agricultural pesticides
Use of fertilizers
Irrigation percent of arable land
Energy use in agriculture
SI: Arable land per capita
Area affected by salinization and waterlogging

Box 6.4 UN indicators of sustainable development (continued)

RI: Agricultural education
Combating Deforestation
DF: Wood harvesting intensity
SI: Forest area change
RI: Managed forest area ratio
Protected forest area as a percent of total forest area
Conservation of Biological Diversity
SI: Threatened species as a percent of total native species
RI: Protected area as a percent of total area
Environmentally Sound Management of Biotechnology
RI: R&D expenditure for biotechnology
Existence of national biosafety regulations or guidelines
Protection of the Atmosphere
DF: Emissions of greenhouse gasses
Emissions of sulphur oxides
Emissions of nitrogen oxides
Consumption of ozone depleting substances
SI: Ambient concentrations of pollutants in urban areas
RI: Expenditure on air pollution abatement
Environmentally Sound Management of Solid Wastes and Sewage-related Issues
DF: Generation of industrial and municipal solid waste
Household waste disposed per capita
RI: Expenditure on waste management
Waste recycling and reuse
Municipal waste disposal
Environmentally Sound Management of Toxic Chemicals
SI: Chemically induced acute poisonings
RI: Number of chemicals banned or severely restricted
Environmentally Sound Management of Hazardous Wastes
DF: Generation of hazardous wastes
Imports and exports of hazardous wastes
SI: Area of land contaminated by hazardous wastes
RI: Expenditure on hazardous waste treatment
Safe and Environmentally Sound Management of Radioactive Wastes
DF: Generation of radioactive wastes

Institutional

Integrating Environment and Development in Decision-making
RI: Sustainable development strategies
Programme of integrated environmental and economic accounting
Mandated environmental impact assessment
National councils for sustainable development
Science for Sustainable Development
SI: Potential scientists and engineers per million population
RI: Scientists and engineers engaged in R&D per million population
Expenditure on R&D as a percent of GDP
National Mechanisms and International Cooperation for Capacity-building in Developing Countries
International Institutional Arrangements
International Legal Instruments and Mechanisms
RI: Ratification of global agreements
Implementation of ratified global agreements
Information for Decision-making
SI: Main telephone lines per 100 inhabitants
Access to information
RI: Programmes for national environmental statistics
Strengthening the Role of Major Groups
RI: Representation of major groups in national councils for sustainable development
Representatives of ethnic minorities and indigenous people in national councils for sustainable dev.
Contribution of NGOs to sustainable development

5. Mining Sector Issues

This section focuses on the integration of the mining sector (or other natural resource and environmental issues) into the national accounts and indicators that have been proposed. Two approaches can be used to accomplish such an integration. First, a system of satellite accounts can be developed as proposed by the United Nations (1993). Second, a country can integrate the natural resource issues into a national strategic plan or set of accounts. The first strategy has been pursued by the United States and the second by Costa Rica. Each of these cases will be discussed in the following subsections.

5.1 Satellite accounts of the United States

Beginning in the early 1990's the Bureau of Economic Analysis (BEA) began a program to include changes to the system of National Income and Product Accounts (NIPA) that have been used for the previous 50 years. The idea was to develop a set of accounts that "…supplements, rather than replaces, the existing accounts" (U.S. Department of Commerce 1994). Most economists have long recognized that the NIPA approach omitted a number of factors that make the system of accounts understate the level of economic activity such as household production. More recently, however, economists have realized that the accounts also omitted the impact that changes in natural resource stocks and the environment would have on the accounts. The desire to attempt to remedy this situation was motivated by the Brundtland Commission (World Commission on Environment and Development) report in 1987 on sustainable development.

The starting point for the BEA work was the realization that the "economy and the natural environment interact at many points" (U.S. Department of Commerce 1994, p. 33). This led to a number of questions that needed to be addressed if the satellite accounts were to provide relevant information for policy makers and the public. The basic set of issues addressed were (U.S. Department of Commerce 1994, p. 33):

- The Nation's wealth includes natural resources, such as oil and gas reserves and timber, which are used in production. At what rate are these resources being used?
- The income of producers in the mineral industries includes a return to the drilling rigs, mining equipment, and other structures and equipment engaged in them and a return to the mineral. What share is attributable to the mineral?
- Economic activity adds to the proven stock of natural resources by exploration and technological innovation. How much of the use of natural resources in production has been offset by these additions?
- Households, governments, and business all make expenditures to maintain or restore the environment. What share of their spending is for the environment?
- The economy disposes of wastes into the air and water, and the resulting degradation of the environment imposes costs, such as lower timber yields and fish harvests and higher cleaning costs. What are these costs? Which sectors bear them?

These six questions demonstrate the need to provide measures that can be used to keep track in some sense of the changes to the natural resource base and the environment. The BEA decided on a strategy to address these issues in three phases. First, phase I addresses the overall framework and prototype estimates, focusing on non-renewable resources such as minerals. Next, phase II will extend the work to renewable resources with phase III considering environmental assets. At this time significant work has been done on phase I.

The motivation for starting with nonrenewable assets was the natural link between the treatment of *depreciation* of man-made capital and the *depletion* of natural capital. Three issues that demonstrate the asymmetry of the two measures in the traditional NIPA framework were identified. These three issues are:

1. depreciation is subtracted from profits to determine true, or sustainable, profits, but depletion is not;
2. depreciation is subtracted from GDP to estimate NDP, but depletion is not; and
3. additions to the stock of plant and equipment are added to GDP as capital formation, but additions to mineral reserves are not.

For example, the traditional approach will take Gross Domestic Product less depreciation of plant and equipment to arrive at Net Domestic Product. According to economic theory the depletion of the natural assets should also be deducted from GDP in order to arrive at a more accurate measure of NDP. This, however, raises the question as to what should be the starting point for the reserve estimate in the national accounts. Should we begin with proved developed reserves, proved reserves in general, probable, possible, or undiscovered? The U.S. has chosen to use proved reserves in their satellite accounts.

Deciding on proved reserves answers one question but raises a number of others. From an accounting perspective, one needs to address the issue of how to treat additions to reserves, and should reserves be treated as fixed natural capital or inventory. Valuing the resource is also a heroic task. The BEA identified five methods for valuing the natural resource stock. The five methods are: current rent estimates (two versions); net present discounted value; replacement costs; and transaction price. Each of these methods is presented in Box 6.5.

Box 6.5 Alternative methods of valuing mineral resources

Current Rent Method I (based on average return to capital):

$GR = TR - COE$
$RR = GR - \gamma NS + DEP$
$\gamma R = RR/QE$
$VR = \gamma r(QRES)$
$DEPL = \gamma r(QE)$
$VA = \gamma r(QADD)$
$REVAL = VA(t) - VA(t-1) + DEPL - VA$

Box 6.5 Alternative methods of valuing mineral resources (continued)

Current Rent Method II (based on value of capital stock):

γ GR = GR/QE
V = γ GR(QRES)
VR = V – NS
γr = VR/QRES

Net Present Discounted Value:

$$\Phi = \sum_{j=1}^{T} \frac{1/T}{(1+i)^{j-.5}}$$

$\delta r = \Phi[(V\text{-}NS)/(QRES)]$

***Replacement Cost**:*

bf = [(QE/QRES)/((QE/QRES) + r)]
δ r = bf[(TR – COE)/Q] – ($ADD/Q)

Transaction Price:

δ GR = (TV/TQ)
δ r = δ GR – (NS/QRES)

Definitions:

Aggregate value measures:
TR = total revenue
COE = other extraction expenses, including employee compensation, materials consumed, and overhead cost allocated to current production.
GR = gross rent
RR = resource rent
NS = net stock of capital valued at current replacement cost
TV = value of purchased reserves during the year
V = value of the proved reserves (resource and fixed capital values)
VR = value of the resource stock
VA = value of the annual additions
DEP = depreciation
DEPL = value of the annual depletions
REVAL = the effect of price changes on the value of the stock
$ADD = the annual exploration and development expenditures for drilling oil and gas wells in fields of proven reserves (including overhead costs allocated to development)
Φ = Net discounted present value factor

Quantity measures:
QE = quantity of the resource extracted during the year
QRES = stock of reserves
QADD = quantity of resources added to reserves during the year (new discoveries, extensions of existing sites, revisions to estimated reserves
TQ = quantity of proved reserves purchased during the year

Per unit measures:
δGR = gross rent per unit (GR/Q)
δ r = resource rent per unit

Rates and other items:
r = real rate of interest, or discount rate
N = life span of a resource, R/Q
j = current year
T = life of asset
a = reserve decline rate, Q/R
bf = barrel factor

Source: Survey of Current Business, April 1994, p. 55.

The satellite accounts for mineral assets were calculated for the years 1958- 1991. Four of the five methods were used, excluding the transaction price approach, to value fuels (petroleum, natural gas, coal, and uranium), metals (iron ore, copper, lead, zinc, gold, silver, and molybdenum) and other minerals (phosphate rock, sulfur, boron, diatomite, gypsum and potash). Somewhat surprisingly, a number of conclusions emerge from the calculations, regardless of the method used. These are (U.S. Department of Commerce 1994, p.57-58):

- The value of additions has tended to exceed depletions; since 1958, the value of stocks of proved mineral reserves in the aggregate has grown in current dollars, while showing little change in constant (1987) dollars.
- Changes in the stocks of these productive assets over time have largely reflected changes in their resource rents. Increases in resource rents have been accompanied by greater investment in exploration and enhanced recovery technology, and decreases in rents for some resources have been accompanied by reduced exploration activity and the closing of marginal fields and mines.
- Proved mineral reserves constitute a significant share of the economy's stock of productive resources. Addition of the value of the stock of these mineral resources to the value of structures, equipment, and inventories for 1991 would raise the total by $471 - $916 billion, or 3 – 7 percent, depending on the valuation method used.
- The stocks of proved mineral resources are worth much more than the stocks of invested structures and equipment associated with the resources. In 1991, the value of the stock of subsoil assets was 2 to 4 times as large as the value of the associated stock of invested structures and equipment and inventories.
- Valuing the effect of depletion and additions, as well as including the value of resource stocks, provides a significantly different picture of returns. Compared with rates of return calculated using income and capital stock as measured in the existing accounts, the IEESA (BEA)-based average rates of return on capital in the mining industry for 1958-91 are lower – 4-5 percent rather than the 23 percent reported in NIPA. Rates of return for all private capital slip from 16 percent using measures in the existing accounts to 14-15 percent using IEESA measures for the mining industries.
- Although the trends that emerge from the alternative methods are similar, the range of estimates is large. The highest estimates of stocks, depletion, and additions were obtained from the current rent estimates based on capital stock values, and the lowest were from the current rent estimates based on average rates of return to capital.

It is important to remember that the conclusions and calculations are based upon a high level of aggregation. The results for a specific metal or fuel source may vary significantly.[6]

[6] For more detail regarding the satellite accounts see the Survey of Current Business, issue April 1994.

5.2 Costa Rica's national development strategy

An alternative approach to developing the necessary information for decision making in order to achieve sustainability is to revise the complete system. Costa Rica has pursued this option. Following the Earth Summit (or Rio Conference) in 1992 the Costa Rican government developed a National Development Strategy for 1994-1998. This strategy incorporates the philosophy of sustainability into the planning process. This process has required the government and the population of Costa Rica to undergo a complete paradigm shift. The strategy is based upon two fundamental principles. These two principles are: 1) equitable improvements in the quality of life of the population, and 2) that such quality of life improvements be permanent and integral in economic, social, environmental and institutional terms.

Achieving these high level goals requires the government to specify the lower level objectives that need to be met. The Costa Rican government identified four sub-objectives that are targeted toward the social, economic, environmental and institutional goals. These four sub-objectives are:

- Social sustainability will be enhanced by strengthening social policy at the core of government actions.
- Economic sustainability will promote a competitive productive structure based on the efficiency and productivity of physical, natural and human resources.
- Environmental sustainability will be based on building an alliance with nature which balances the demands of social and economic development on natural resources and the environment.
- Institutional sustainability will promote mechanisms for responsible participation of civil society actors in decision-making processes.

The dramatic change in the decision-making process requires not only the government to change but also the general population. The implementation of the national plan is being coordinated by the Ministry of National Planning and Economic Policy. Even though the conference in Rio provided an important motivating factor for the government to change its approach toward planning, previous Costa Rican governments had also attempted to move along the sustainability path. For example, in the late 1980s the Ministry of Natural Resources, Energy and Mines promoted an approach based upon *Conservation Strategy for Sustainable Development*. The main components of the current strategy are presented in Box 6.6.

The set of strategies outlined in Box 6.6 provide a significant departure from the more traditional approach to achieving sustainable development, particularly the economic policy dimension. As Solow (1992) points out, an important first step toward sustainability is to "get the prices right". The Forest Law that provides payments to land-owners that maintain the natural forest demonstrates a significant commitment to sustainability. Also, the use of carbon taxes to correct for the negative externalities associated with the burning of fossil fuels is a significant step toward getting the prices right.

Box 6.6 National development strategy

Environmental Policy: The Ministries of National Planning and Environment elaborated a National Environmental Policy Plan. This plan is consistent with Agenda 21, Chapter 8 about the integration of environment and development in decision making. It defines as priorities the protection, conservation and sustainable management of natural resources; air pollution in the Metropolitan Area of San Jose; water pollution; solid waste management; and the use and management of pesticides.

Poverty Alleviation: A national poverty alleviation plan was elaborated, which focuses on five areas; I) infancy and youth; ii) women; iii) job creation; iv) solidarity with the disabled; and v) community development.

Women Issues: The plan for equality of opportunities between men and women is intended to improve participation of women in policy formulation and decision making processes related to the sustainable use of natural resources and protection of the environment.

Education: Strategies for the transformation of the Costa Rican education system to attain standards of international quality, and ensure the sustainability of human resources and economic, social and environmental sustainability are being developed and implemented. This initiative has been supported by law.

Public Health: The government initiated the implementation of a public health program called Basic Teams for Integral Attention of Health. It is intended to improve coverage, accessibility, quality and efficiency in the provision of public health services, with emphasis on preventative care.

Economic Policy: The economic dimension of sustainability is partially addressed through initiatives to eliminate subsidies unfriendly to the environment; and improving economic equity and distribution such as implementing laws to prosecute tax evasion, and creating a state funded pension system. Also, new legal and economic instruments are being developed to support environmental policy. The recently-approved Forest Law introduces the concept of "environmental services" meaning services provided by forests and forest plantations which impact directly on protection and improvement of the environment. This law also creates the Forest Protection Certificate which remunerates owners of natural forests for the environmental services these provide. This is quite significant in terms of both environmental and economic policy: Costa Rican legislation explicitly recognizes that forests provide many goods and services in addition to wood and agricultural land, and that these goods and services must be assessed appropriately even though there may not be a market for many of them. Carbon taxes will be used to promote reforestation activities that contribute to fixing gases that cause greenhouse effects.

Source: Hardi and Zdan 1998, p. 28-31.

Another important change in the approach outlined in Box 6.6 is the role of the public. The National Development Plan for 1994-1998 explicitly identifies that the intended audience for the plan is government institutions and non-government stakeholders and the general population. For the planning process to succeed, it is important that all levels of society agree with the objectives. However, such a structure requires a significant feedback mechanism to be integrated into the planning process. The role of assessment is critical to the evaluation of whether or not the goals are being met.

There are many factors that can stand in the way of achieving the goals stated in the plan. One important factor that can be problematic is the change in government. With the election of a new president and new cabinet the commitment to sustainability may not remain. The coming election will provide an important measure of how the change in paradigm has permeated the general population. Another important roadblock could be financial constraints. In order to implement laws such as the Forest Law requires the financial foundation necessary to allocate the resources to such uses. The commitment to the environment becomes less and less as the economy becomes worse and worse.

5.3 Summary

The two case studies presented above provide a stark contrast for the two approaches that can be pursued. The U.S. approach of developing a set of satellite accounts provides a relatively conservative approach to incorporating some additional information into the planning process. On the other hand, Costa Rica has pursued a dramatic change in philosophy in attempting to achieve sustainability. Both approaches have their strengths and weaknesses. Two important considerations regarding the appropriate approach may deal with the size of the economy and the population of the country. A large economy and very populace country may be less likely to adopt such a dramatic paradigm shift.

6. Final Thoughts

Since the publication of the Brundtland Commission report in 1987 there has been considerable activity by the international community. Specifically, the United Nations, the World Bank, the OECD, and others have allocated considerable resources to develop a workable approach to sustainable development. Today, sustainable development remains a somewhat amorphous concept with each group or nation developing their own twist to the basic definition. Also, the various groups or nations that are attempting to move to a *Level 3* response to sustainability have chosen a variety of means to achieve that end. The two case studies in section 5 highlight two such approaches.

Another important feature of the efforts to date is the link to economic models. Each effort needs to determine the appropriate methodology that provides a sound theoretical foundation for the goals of the project. Whether the effort requires that the appropriate model would be a benefit-cost approach or a computable general equilibrium model, the decision needs to be made explicitly. The systems approach used by Costa Rica required a dramatic change in the way they "do business". The partial equilibrium effort by the U.S. required a much less significant institutional change.

Perhaps the most significant effort at measuring the progress toward sustainable development has been achieved by the United Nations (see Box 6.4). The effect that this effort has had is obvious when evaluating the structure adopted by Costa Rica in the National Planning Strategy. The four major sections of the UN effort are social, economic, environmental and institutional, the same as Costa Rica. Also, the UN guidance on satellite accounts provided the foundation for the U.S. effort.

The important question that remains is "Do we need a one-size fits all" approach to sustainability. Obviously, the approach pursued by the U.S. is radically different than the approach taken by Costa Rica. However, this does not mean that one way is right and the other is wrong. When considering the non-renewable resources sector, the one thing that is evident is that in order to more accurately reflect the wealth of a nation we need to include some measure of depletion, revisions to reserve estimates and quality changes.

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Chapter 7

Project Assessment Methodologies and Measures: The Contribution of Mining Projects to Sustainable Development

Graham A. Davis

1. Introduction

Of the many problems with the concept of sustainability and sustainable development, none is more limiting than the absence of an operational measure by which to implement it. Project-level sustainability, which is simply sustainability at the microeconomic level, seems an obvious point of departure when moving towards the implementation of sustainable development on an aggregate basis. As Jamieson (1998, p. 189) notes, "At a global level there is too little by way of shared beliefs and values to provide enough content to ideas of sustainability to make them effective…. The language of sustainability is more likely to be useful in small communities facing specific problems." One such problem is whether a mining project is consistent with sustainable development. The answers, if they are to be found, will be found here. Mining projects are relatively simple, with few actors and issues involved, the data are manageable, and implementation pilot studies can be undertaken without disrupting entire economies. Mining is also the ultimately unsustainable practice, with the unsustainability affecting near-term generations as well as distant generations. If the concept of sustainable development can be developed and applied to mining projects, it should be possible to do this for all types of projects.

This chapter proposes a method of mine project appraisal that is consistent with the concepts of sustainability and sustainable development. It begins by reviewing the existing difficulties with project analysis, and then proceeds to define and interpret sustainability and sustainable development. A method of project appraisal is then created to reflect these concepts at the project level. An example of the implementation of the proposed methodology in presented, followed by a discussion of the measurement and implementation issues involved.

1.1 The philosophy of project analysis

Project analysis, regardless of methodology used, always seeks to determine whether the undertaking of a production activity is in the social interest, and if so, whether the project entails the best use of society's productive resources. Typically, social benefits created by via optimal project management are weighed against the project's social costs. The project should be undertaken if the net benefit is positive and greater than the net benefit that could be created by these resources in other uses (their opportunity cost). That is, undertaking a project should make optimal use of scarce resources in the sense of creating the greatest in increase social welfare possible.

Methodological controversies arise as soon as this analysis is implemented. First, what are the social benefits, and how do we quantify them? What are the costs? Since many of the elements of the benefits and costs will be in different units, how to we aggregate and compare them? And, since the flow of benefits and costs is intertemporal, some comparison of benefits and costs over time is necessary (Box 7.1). This requires discounting, which within popular opinion ranges from a controversial to preposterous act. Furthermore, many projects are undertaken by private firms, who weigh up private benefits and costs. In the presence of externalities, the decision by the firm to undertake or not undertake the project may not correspond with the socially optimal decision.

Of late, and adding to the complexity of project valuation, is the concern over project sustainability. Under most understandings of sustainability, projects that consume resources now and benefit the current generation at the expense of future generations do not contribute to sustainable development. Sustainability means that not only must projects create social benefits that exceed costs, but this creation of wealth must be sustained into the future.

Box 7.1 The nature of social cost-benefit analysis

In determining whether a project benefits society, economists include both private and social costs. For example, if a project consumes fresh water from a stream at no cost to the company, private project analysis would treat this as a zero-cost input. Economic or social project analysis, on the other hand, charges the project with the "opportunity cost" of this water, which is the lost benefits that the fresh water was providing to society. Lost benefits might include a habitat for fish, drinking water for downstream communities, and irrigation.

Economists must also compare social costs and benefits that do not necessarily occur simultaneously. For example, most projects incur the majority of their costs during construction, while the project benefits extend for the life of the project, or even longer. To determine whether the social benefits of the project are greater than the costs, economists discount these cost and benefit flows to the present, such that they can be compared. At issue is the discount rate to use, and even whether this method of comparing inter-temporal costs and benefits is valid.

Before going further, it is useful to understand the nature of projects, and of the creation of project value. A project brings together a number of scarce resources to produce an output good. It is a transformation process, which is often irreversible. The project is a valuable entity if it "adds value," in the sense that the value of the output good is greater than the opportunity cost of the inputs used in creating that value. In mining, capital (machinery), labor, energy, and environmental services are drawn away from other productive activities and applied to the recovery of underground reserves in order to produce a metal output that has some value to society. If the value of the metal recovered outweighs the costs of the inputs, the project is said to have positive economic and social value, or rents.

Only in rare instances does such a combination of inputs applied to a mineral reserve create social value. The reserve must be of sufficiently high grade (lowering the unit costs of extraction), the metal must have sufficient value to society (as indicated by its unit price), and the opportunity cost of labor, capital, and environmental services low (as exhibited low wage rates, interest rates, and pollution effects). For example, should a

rich mineral deposit lie beneath a ski hill, that mineral should be extracted only if the social benefits from doing so exceed the benefits derived from leaving the mountain intact as a ski hill. In another example, Power (1996) argues that mineral extraction denudes natural landscapes, the latter creating more wealth for a community than any mining activity can. That is, Power suggests that the opportunity cost of mining, in terms of lost landscapes, outweighs any benefits.

The standard project appraisal tool, both in social and private project analysis, has for decades been discounted cash flow (DCF) analysis, or net present value (NPV) analysis. Here, per period costs and benefits are monetized and discounted to the present using a risk-adjusted discount rate. If the revenues exceed the costs, in present value terms, the project is valuable, and undertaken of no other use of the scarce inputs generates a greater NPV. Implicit in the analysis is design of the project so as to maximize the difference between the discounted costs and benefits, which usually means extracting the material as quickly as possible.[1]

Recent advances in project analysis have taken particular interest in the uncertainty of future metal prices and their impact on the optimal management and valuation of mineral projects, resulting in the "option pricing" of mining projects (Davis 1996). Nevertheless, the method is still a form of discounted cash flow analysis, which compares benefits against costs. For now we will abstract from uncertainty, not because it has little influence on project analysis, but because its consideration complicates matters enormously.

1.2 The controversies in project analysis

Methodological controversies arise as soon as any form of project analysis is implemented. First is debate over relevant benefits and costs, and the failure of private firms to take into account social values. What are the social benefits? How widely a net should we cast when assessing these benefits? If a project benefits a foreign region or nation, should these benefits be included? What are the costs? And again, if a project inflicts costs on outside regions or nations, should these be considered? Since the benefits and costs will be in different units, how to we compare them? And, since the flow of benefits and costs is intertemporal, some comparison of benefits and costs over time is necessary. If we use discounting, this raises the question of the rate at which to discount the intertemporal flow of benefits; a social rate or a private rate (Harberger 1996). Is discounting even ethical, or is it merely a convenient method of ignoring costs that will burden the future (Box 7.2)?

Furthermore, many projects are undertaken by private firms, who weigh up only private benefits and costs. As such, only the private costs and benefits accruing to the firm are assayed.[2] In the presence of externalities, the decision by the firm to undertake or not undertake the project may not correspond with the socially optimal decision.

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[1] This is because the value of the resource in situ appreciates at less than the discount rate, causing the present value of extraction to diminish as time progresses.

[2] See Cordes (1998b) for a critique of Rio Tinto's position on social costs.

Projects that have net negative value to society may have net positive value to the firm. A case in point is the New World Mine in the United States, which appeared profitable to the mine owners, but which had negative social value in the eyes of the public due to the potential environmental damage to a nearby wilderness area. The Federal government offered the mine owners some $60 million dollars to walk away from the project; evidently, the net cost to society had this mine gone ahead would have been greater than $60 million, and the net (private) benefits to the firm less than $60 million. Another result of firms only taking private benefits and costs into account is that even when private *and* social project values are positive, the optimal rate of extraction given private benefits and costs may be higher than the that under social benefits and costs (Howe 1987). That is, the mine operators do not extract the maximum amount of social wealth from the reserve. Economists typically shrug this problem of as one of incomplete markets, and suggest taxes and subsidies to induce the firm to extract the ore the socially optimal manor. However, given the absence of such fiscal incentives, the suboptimality remains a concern.

Box 7.2 The problem with discounting

Discounting future benefits and costs is equivalent to multiplying these values by a weighting factor between 0 and 1. The higher the discount rate and the further into the future the benefits and costs occur, the lower the factor.

The concerns with discounting can be made evident by a simple example. Suppose a project creates benefits today that are worth $100 dollars. The costs of the project, however, occur only in 50 years' time, when they will be $200. In the absence of discounting, the project creates no social benefit, as the costs outweigh the benefits. If we use discounting to compare the benefits and costs, we would multiply the current benefits by 1.0 and the future costs by a factor less than 1.0, say 0.4. In this case, the discounted costs ($80) are lower than the current benefits ($100), and the project should go ahead. Some see this as unfair to the generation that incurs the costs.

A second controversy is the extent of social benefits of a project. Competitive demand price, corrected for any market distortions, is without doubt the best estimate of the benefit of the production of each marginal unit (Harberger 1996). However, many would include incidental benefits of production, such as credits for regional growth-inducements via multiplier effects. If these are not included in the price of the good, and we have no reason to believe that they would be, these additional benefits must be added to any revenue stream generated by the project. The controversy comes in valuing these unpriced benefits.

Perhaps even more controversy extends over the calculation of project costs. Once again the competitive supply price, or marginal cost, measures the social opportunity cost of each marginal unit of input (Harberger 1996). However, many factor inputs operate in markets distorted by taxes and subsidies, and some factor inputs, such as environmental services, are not priced in the market at all.

Scores of documents exist as to the correct way to incorporate these cost/benefit issues into project analysis (e.g., Davies 1996; Kirkpatrick and Weiss 1996; Munasinghe 1993). But, even so, practitioners are mostly forced to work with the data at hand, producing extremely crude estimates of project value. The above controversies, while not necessarily resolvable, help us think through the problem clearly, and help us to improve

on estimates and measures that are still extremely crude and approximate (Harberger 1996).

A final issue is the optimal timing of resource extraction. If the goal is to extract the resource when it has the maximum present value to society, it should be produced immediately if its value is rising at less than the interest rate, and produced later if its value is rising at greater than the interest rate.[3] Most mineral reserves are growing in value at less than the interest rate, and should by these rules be developed as soon as they are found. Yet this conflicts with any concept of deep ecology, or of preserving resources for future generations. This raises the issue of sustainability and mining.

1.3 The sustainability of mining projects, and the impacts of mining on sustainability

Mining projects are of finite life, averaging somewhere around 12 years from the initiation of extraction to the production of the last unit of ore. As such, the flow of direct benefits derived from the project is unsustained. Some of the costs, on the other hand, can extend beyond the life of the mine. For example, should a mining project require the removal of a stand of sustainable forest to furnish lumber for underground roof supports, the opportunity costs of harvesting the forest (such as the value of the lost CO_2 absorption) extends beyond the life of the project. Other possible long-term mining costs include acid mine drainage and negative social and cultural impacts. Indirect benefits, such as induced growth effects from infrastructure investments, may also continue after the project is completed, but these are less obvious, and are normally thought to be swamped by the long-term environmental and social costs of mining (e.g., Power 1996). What makes these costs especially noticeable within the sustainability framework is not that they are costs, but that they are costs that extend *beyond* the period of direct project benefits, and are often incurred by those that reaped no direct benefits from the mining activities. Frequently cited is "the burden imposed on future generations who must cope with the cost of closed mines," which in Canada is thought to be in the billions of dollars (Ackerman 1998). This, it would seem, is directly in conflict with any notion of project sustainability.

Imposed burdens on future generations should not be enough to rule out mining as a desirable production activity. We must in fact ask whether future generations—who may inevitably incur the clean-up of mining wastes and *will* inevitably incur the social and cultural costs of mining—would wish that mining in the present had never taken place. Or, since we ourselves are currently incurring the costs of mining and other industrial activities that took place in the first half of the century, we must ask, "would *we* wish that mining in the past had never taken place?" In looking for the answers to these questions, one gets the distinct impression that mining is impoverishing not only future generations, but current generations as well (e.g. Auty 1993; Power 1996; Shafer 1994). But to borrow a phrase from Cordes (1998b), we must distinguish between what is, what

[3] The proceeds from mining can always be invested at the current interest rate, r. The decision is then between owning a reserve that appreciates in value at some rate γ, and a bank account that is increasing in value at rate r. Wealth is maximized by choosing the asset that gives the highest rate of return.

ought to be ,and what can be. Another way of looking at the question is to assess whether a mining project has the *potential*, at least, given any necessary intervention by the state, to maintain or improve the welfare of future generations. To begin this type of analysis, a new assessment of mineral projects within the rubric of sustainable development is needed.

Imposing some type of sustainability requirement on mining projects is likely to impact the method of project analysis, penalizing the project for long-term negative impacts to a greater extent than is currently done via NPV analysis. Little, if anything, has been done to date on such refinements, either at the practical or theoretical level. Many international development agencies, in assessing whether its projects are "sustainable," simply measure the project's rate of return after 5 years and label the project sustainable if the rate of return then is equal to or greater than the initial (expected) rate of return (Bamberger and Cheema 1990). This is hardly a fair test, as, if the initial estimate of project return is unbiased and normally distributed, 50% of all projects should fail the sustainability test at year 5. Indeed, of the projects reviewed by a World Bank study, about half do fail this sustainability test. McPhail and Davy (1998) assume that the integration of social and environmental concerns into project analysis *improves* project sustainability, but are at a loss when it comes to measuring whether projects are sustainable. de Janvry, Sadoulet, and Santos (1995) are to my knowledge the only economists to force a true sustainability constraint on project analysis. The development of a more appropriate sustainable project assessment tool for mining projects along the lines of de Janvry et al. will be the focus of the remainder of the chapter.

2. Defining Sustainability and Sustainable Development

If project analysis is to have built into it a sustainability requirement, then an understanding of sustainability is required. But, as Cordes notes in Chapter 1, sustainability is a term that "has been interpreted to mean almost anything or almost nothing of importance." Jamieson (1998, p. 184) describes sustainable development's delicate balance between "fruitful ambiguity and outright contradiction." My reading is that beneath all the rhetoric there is concern for the ecological health of the planet, and the worry that extended development of the world economy, under the guidance of Smith's invisible hand and Hayek's spontaneous order, will cause irreversible damage to the ecosystem. While social injustice, ethnic fractionalization, and cultural disintegration in developing countries are just as likely, in my opinion, to threaten the future of the planet as environmental catastrophe (witness the recent nuclear testing in Pakistan and India), this ecological version of sustainable development has been promoted for the most part by the elites of Western society, concerned with the maintenance of *their* social, cultural ,and natural environment.

If the future is the concern, and if markets will not adequately ensure continued ecological soundness, then the nature of our intertemporal contract with future generations is entirely normative (Bromley 1998). A default, although somewhat niggardly, position is that the current generation act to as to perpetuate or sustain our level of welfare. Sustainability is within this framework a condition under which the earth's

inhabitants "enjoy" the same levels of welfare from generation to generation, with the decisions of the present generation not having a negative impact on the ability of future generations to enjoy at least our level of prosperity. It requires a symmetric treatment of the present and the long-term, with explicit recognition of the life-preserving value of environmental assets (Heal 1997). Sustainable development, then, urges improvement in this sustainable level of welfare—or a vector of several desirable social objectives—only if the future of the planet is not compromised.

Sustainability implies the maintenance of a vector of several desirable social objectives, and sustainable development implies improving the level of this vector, but what is contained within this vector? I, as do most others, take the anthropocentric view that human well-being is the argument of the objective function, and that the goal of sustainability focuses on sustaining the good, rather than the bad (Jamieson 1998). Current modeling efforts consider the maintenance of one of three things: utility, consumption, or capital. The choice of metric is important, as the sustainability of capital can involve diminishing per capita consumption and utility; the sustainability of consumption can lead to unsustainable utility; and sustained utility, if utility comes from natural landscapes, can mean zero consumption (Heal 1997; Vercelli 1997).

In the sense of acting to maintain something at its current level so as not to imperil the welfare of future generations—this could be consumption, utility, capital stock, or some other desirable objective—sustainability is a concept that could only have been raised by a currently affluent society that is concerned about continued affluence, and for which not only consumption, but the mere existence of a perpetual stock of non-renewable natural resources, gives pleasure. For, the word sustainable implies stasis, aversion to change, perpetuation of the status quo. It in no way implies maximization of intertemporal welfare unless welfare is derived from knowing that nothing will change, which is unlikely to be the case.[4] For example, the earth's ecosystem in the days of early man, in an equilibrium and barring any catastrophic event, was, in the absence of any development or technological advance, sustainable. The level of utility/capital/consumption was not necessarily pleasant, nor something one would want to pass on to future generations. Sustainability concerns, then, arise only when society has something good going for it that it wants to preserve.

Nor, from a development perspective, is sustainability optimal (Weitzman 1990). But in any event sustainability worries are not derived from optimization concerns, but from ethical or moral concerns that we are consuming more than our income, which Hicks defined as "the maximum amount that could be spent without reducing real consumption in the future." Sustainability thus requires that we do not consume more than our income, maintaining our capital base (read natural capital) intact at the expense of economic efficiency and possible economic growth.

Sustainable development follows as more permissive than sustainability, allowing a type of constrained development involving a self-imposed constraint on the method by

[4] In this case, the maximum level of sustainable welfare can be shown to involve zero consumption in perpetuity, keeping the existing stock of non-renewable resources intact (Heal 1997). Power (1996) would seem to subscribe to this view, suggesting that change disrupts local society to such an extent that stasis is preferred to development.

which we develop our economies. If it is taken for the most part to mean "environmental sustainability of economic development" (Vercelli 1997), the constraint is most evidently the requirement that we stop substituting made capital for natural, social, and cultural capital in our pursuit of growth.

This constraint binds now only because we have reached significantly diminished marginal rates of substitution between made capital and these other types of capital. We have progressed from early man, and are no doubt better off for it, because we *have* drawn down our stock of natural capital and inflicted pressures on community and society. The sustainable development constraint arises in this construct and at this point in the earth's history not because of concerns that the stock of man-made capital will not maintain future generations, but that society, social justice, and the ecosystem supporting life will not, that made capital cannot continue to substitute for these essential inputs to human life, and that we are now comfortable enough to consider maintaining our current level of well-being in order to preserve it indefinitely. Sustainable development thus has as its current focus the stock of the long-run natural resource base, and more specifically the life-support resources of the planet that cannot be replaced by man's ingenuity. If we are in trouble, it is not because we do not have enough man-made goods, but because we have been consuming and not replacing the services from the natural environment, drawing down its stock to the possible detriment of the future of life on the planet. Future development must therefore be a constrained form of development, being careful not to imperil long-term enjoyment of what we already have.

Box 7.3 Substitution and sustainable development

Much of the theoretical work on sustainability focuses on the substitutability of made capital for natural capital in production. What will we do, for example, when we run out of oil? Will we have a man-made substitute to fuel our cars? Originally, the environment was seen as an input to production, and technological substitution was the focus of the early sustainability models. However, environmental goods have recently been recognized as commodities themselves, and of equal concern is the substitutability of made and natural capital in consumption. Humans need obvious environmental services (oxygen, drinking water, food) to survive, and enjoy other environmental services as luxuries (a hike through the forest). To some extent we can substitute artificial environmental services for real ones (we can manufacture oxygen from water, or go to Disney Land instead of hiking through the forest). The extent to which this is possible is called the marginal rate of substitution.

Economists believe that the rate of substitution between made and natural goods in consumption diminishes with fewer natural goods available. That is, as I am able to take fewer and fewer walks in the woods, I am less likely to forgo one in favor of a trip to Disneyland. There becomes a point beyond which substitution becomes impossible, and if I must forego my walk in the woods (perhaps because it has just been harvested to build a new Disney theme park), my quality of life deteriorates. For those who receive great utility out of environmental services, this point will come sooner rather than later. For this reason sustainable development is often associated with "environmentalism," since it is the environmentalists that are our canaries in the coal mine.

The sustained health of the earth and its inhabitants could, under a complete prohibition of further population growth and consumption growth, presumably be obtained via preservation of the extant ecosystem. The sustainable development

challenge is to continue to transform raw materials into products that benefit a developing society without imperiling the sustainability of the ecosystem. Implicit in this statement is either the notion that at least some further degree of continued substitutability exists between made capital and natural capital in consumption (if we allow the natural capital stock to be drawn down in the development process), or that capital investment increasingly be directed towards decreasing emissions from production (Cazzavillan and Musu 1997).

Matching all of this to project analysis, and mining projects in particular, a sustainable mining project is one that increases welfare permanently without imperiling the future of the planet (or mankind) in the sense that the life support services provided by natural capital are not diminished as a result of the project. If constant consumption is the goal, it is a project that produces in increase in the constant, indefinite flow of net consumption benefits enjoyed by society.

Given these rules of engagement, and since it is future generations that are potentially impoverished by a mining project, we should allow them to decide whether a mining project should be undertaken. Since future generations are not present, we will need a type of Rawlsian game, where we decide not knowing whether we are from the present or future generation. The outcome is the maximization of the welfare of the least-well-off generation, which we currently take to be future generations (for if not, we, as the impoverished, must increase consumption now!). To facilitate this decision-making process, we need a new way of evaluating mining projects, one that takes into account sustainability concerns.

2.1 Sustainable mining project evaluation

If there is to be implementation of sustainable development, the micro, mineral-project level is an ideal place to start. First, there will be a limited number of non-market benefits and costs relative to national or international sustainability concerns. Second, the impacts of the project will be to a great extent local in terms of both benefits and costs, and the community concerned with sustainability will be small and readily apparent. Third, mining projects can generate substantial profits, and yet are relatively short-lived, setting up an ideal paradox for sustainability. Fourth, the unsustainability of regional development based on mining is well noted, and those that enjoy the benefits of the mining rents are the same ones to be affected in the future by the long-run social,

Box 7.4 Operationalizing sustainable development

"It is now time that the idea of sustainable development be translated into operational measures of sustainability to guide decision-making. Unfortunately, existing definitions of sustainable development have not succeeded so far in suggesting a satisfactory operational criterion of sustainability. The main reason for this failure lies in the fact that they are based on assumptions about the preferences of future generations which are bound to be implausible, the more so the further they are projected into the distant future. What is worse, specific assumptions about the preferences of future generations encounter the ethical objection of being paternalistic… It is, therefore, necessary to define the concept of sustainable development on the basis of an operational and non-paternalistic criterion." (Vercelli 1997, p. 184)

cultural, and environmental costs. For example, in Namaqualand, South Africa, the rents from decades of mining have not been taxed and invested, and there is no perpetual income stream to offset the perpetual community dislocations and environmental pressures that will occur when mining comes to an end (Östensson 1997b).

As noted earlier, a main problem with existing project evaluation methods is that they cannot easily allow comparison of the finite rents from a project, accruing to the present generation, with perpetual costs, such as the irreversible destruction of environment or the perpetual stream of acid mine drainage (AMD). Implicit in all existing frameworks is discounted utilitarianism, which, at any positive discount rate, reduces future benefits and damages to trivial values. Moves towards project sustainability screening have yet to break out of present value analysis; sustainable project development at present simply means monetizing and incorporating environmental damages into cost-benefit analysis (e.g., Munasinghe 1993, Wilson 1997) or including a qualitative concept of sustainability into a multi-criteria analysis, in which project sustainability is a benefit but not a binding constraint (van Pelt 1993). The goal of this section is to derive a method of sustainable project evaluation that allows comparisons of short-term benefits and long-term costs within a common framework that has sustainability as a binding criteria.

For a project provide sustainable development, it should be able to enrich all generations in perpetuity beyond that which would occur in the absence of the project. Let us for a moment abstract from reality, and consider a project that incurs no costs, but only generates a certain stream of social benefits in the form of mining rents.[5] That benefit stream is, however, finite, and hence unsustained. It fails the primal sustainability test, that the benefits be perpetual. However, in a purely monetary sense, and given the presence of financial markets and a positive real rate of interest, there are an infinite number of ways a finite cash or benefits flow can be distributed intertemporally. One of these possibilities is the conversion of the finite benefits flow from a project into a constant perpetuity via investment of a portion of those flows in a trust fund (Mikesell 1992; Pearce, Markandya, and Barbier 1990). There is nothing special about a constant flow, except that, in real income terms, it implies that all generations are treated equally. The temporary project flows can thus be divided into two components, the annual amount that must be saved and invested in a trust, and the amount that can be consumed now and hereafter. The latter is the Hicksian income generated by the project, since that level of consumption can be sustained into perpetuity.

The attraction of this ideology, if somewhat arbitrary, is that it creates a sustained income flow, and this fits nicely into at least one facet of the sustainability debate. Thus, while it is largely semantics as to whether the benefits from a mining project are seen as finite or infinite, it behooves our analysis to convert it to the equivalent perpetual flow. The only necessity for the finite flows to be converted into a perpetual stream is that the requisite portion be set aside and invested in financial and real assets, and that the real return on these be positive.[6] It should be noted, however, that such a consumption

[5] Rents are economic profits, meaning residual profits after all claimants have been paid. They are what make the project NPV positive.

[6] An ideal investment is an inflation-indexed bond, which guarantees a specified real rate of return.

smoothing profile is not necessarily optimal from the sense of maximizing the sum of intertemporal utility (Weitzman 1990). But it is nevertheless feasible, and relatively easy to implement; a portion of the finite benefit flow from mining must be invested in the productive capital assets of society, converting it into a delayed sustainable flow of income available for consumption.[7]

The sustainability concern, of course, is not so much with finite benefit flows that abruptly end—although this *is* a concern in mining-dependent regions (Östensson 1997b)—but that these finite benefit flows are created and consumed by the present generation at the expense of future generations, who incur the ongoing cleanup costs. To complete the analysis, we must include costs. To begin simply, assume that the only cost of achieving the benefit flow is the using up a portion of natural capital, such as the destruction of a stand of sustainable forest which would have produced an infinite flow of environmental services in the form of CO_2 absorption. Now, since the "stock" of natural capital is diminished, and future welfare and consumption are potentially diminished (depending on preferences and the meter of sustainability), a second sustainability criterion is violated.

I would suggest that all would agree that future welfare is improved if the perpetual benefit flow created by the taxation/investment scheme is of more value to future generations than the perpetual burdens that the generation of this flow creates. There is no need to discount these perpetuities to the present; we need only compare one infinite flow (of benefits) against another (the costs associated with creating these benefits). With the benefit and damage streams each a perpetuity, the only remaining difficulty comes in comparing the benefits and damages inflicted by the flows, and not their timing. The gained flow is a financial flow that can be used for any purpose, typically consumption. The cost is the lost environmental services provided by the forest. Can one offset the other? Can money and its servicing of mankind's "commodity fetishism" make up for the lost quality of the environment? This is the heart of the substitutability issue in sustainable development mentioned above. As Mikesell (1992, p. 87) notes when discussing project sustainability, "How far can society go in satisfying the demand for wilderness amenities, clean air, and living space with man-made goods? Surely a point exists beyond which higher per capita real income in the form of produced goods and services cannot compensate for further degradation of the environment. What is the utility tradeoff in driving a Cadillac or Mercedes in a perpetual traffic jam surrounded by foul air against walking through a grove of ancient redwoods?"

This example encourages us to be doubtful that any amount of consumption credits can offset the lost environmental amenities created by the project. But this inclination is entirely case-specific, and hinges on Mikesell's condition that we are at a point *beyond which higher per capita real income in the form of produced goods and services cannot compensate for further degradation of the environment*. In other words, we are at a point where substitution possibilities between made and natural capital are

[7] An alternative approach is to break time into successive generations, where actions by the current generation are constrained only to leave enough resources at the end of the period for future generations (de Janvry et al. 1995). This model, not addressed here, is less restrictive, as it does not require a constant consumption flow within each generation, but only a constant flow between generations.

limited. And this may be true for the citizen in Mikesell's mind, who I would wager is a rather affluent Oregonean. But this is not necessarily representative of the world's populace. Consider an alternative scenario, where the citizen, an African tribesperson, is *not* at this point of diminished substitution possibilities in consumption. In their world there is an abundance of natural capital and limited made capital. Rephrasing the hypothetical with this in mind: "What is the utility tradeoff in driving home from a delightful restaurant meal in a Cadillac or Mercedes in a perpetual traffic jam surrounded by foul air, against walking through the African Savannah, hungry, with no dinner in sight?" The answer here is not so obvious. Nevertheless, in the above mining example, we have a clear comparison; a perpetual benefit flow of cash ($X/year), at the cost of a lost stream of environmental services, Y thousand tons of CO_2 absorption per year. The project allows for sustainable development if, in the opinion of future generations (and we will have to be Rawlsians here in making this decision), the cash flow outweighs the lost environmental services.

Box 7.5 An example of sustainable development.

Imagine a cold and desolate primitive area of the world, where the inhabitants are barely but sustainably eking out an existence. Population is constant because of high infant mortality, caused by malnutrition. The inhabitants survive by harvesting a renewable crop, replanting enough after each harvest such that the yield is constant, and enough to sustain their constant population. They also own a stock of mineral sands, which serves as a play-ground for their children.

The inhabitants are ultimately concerned about the welfare of future generations, and concerned that their actions not impoverish their childrens' children. One group, the Developers, suggests that they forego the limited amount of leisure that they currently enjoy and employ their labors to irreversibly mine the mineral sands in order to produce glass for greenhouses. These greenhouses, the Developers argue, would last forever, and would forever increase the sustainable yield from the harvest. In doing this, not only would future generations benefit, but so would the present generation (in payment for their decreased leisure time). The only cost is the lost play area for the children, which seems to them a luxury given the current infant mortality rate.

The mineral sands project would produce a perpetual stream of benefits in the form of an increased sustainable crop yield. However, in doing so, the mineral sand asset is used up (a perpetual cost in terms of a lost play area, for which there is no substitute). Noticing this, the Sustainers in the group complain that future generations' children will not have access to the mineral sands, and thus such actions by the current generation impoverish the future according to the sustainability criteria.

To win the Sustainers over, the Developers note that under the Sustainers' philosophy the mineral sands can never be mined (since mining will always impoverish some future generation). Since the mineral sands produce only luxury benefits in situ, the infant mortality in the clan will never change unless the sands are mined. So, the Developers argue, the issue really comes down to when the sands should be mined, not whether they should be mined. They note that the longer the delay, the longer the sustainable increase in welfare is put off. All agree, in the end, that the greenhouses should be built as quickly as possible, *in the interests of improving the sustainable welfare of this and future generations*. Future generations, obviously, would wish that the greenhouse be built, and would wish that the current generation use *their* leisure time to do so.

We can complicate the analysis further by including other costs, such as labor and capital. The costs of these inputs can be deducted from the finite flow of benefits, yielding a diminished flow of net benefits, or rents, which is then transformed into a diminished perpetual flow. There are also potential extended costs, such as future clean-up costs, disruptions to the functioning of society, and loss of community. Pezzey (1992, p. 355) notes that projects make societies more transient, dispersed, and mechanically complex. Communities erode, "and people need more consumption simply to participate in life." These costs, too, can be added to the lost CO_2 absorption as perpetual costs of the mining activity, creating a full-cost pricing approach to costing (Cordes 1998b).

The final complication is the cost associated with the depletion of a finite resource.[8] A project that irreversibly eliminates a non-renewable resource interferes with strong-form sustainability, since it removes from future use the resource itself. Given our sustainability criterion, the project should not be undertaken, as, in terms of pure physical assets, our actions remove this asset from use by future generations. The implication is that mining, or any processing of a non-renewable asset, is unsustainable.

The sustainability concern, I believe, with depleting a natural asset is that future generations will not be able to experience the fundamental pleasures that the asset allows given an absence of man-made substitutes; the quality of life of future generations will be diminished because of the current generations' actions. A reasonable way around these problems is to see the using up of the mineral resource as similar to the removal of the stand of trees, where an infinite sustainability charge should be placed against the project because of the lost services provided by the trees. The difference between the forest and the mineral resource, though, is that the in-situ mineral resource does not produce a perpetual flow of services. That is, the resource only has value if it is extracted, and has no existence value.[9] This means that there is no explicit "charge" to using up the resource, only lost income from not extracting the resource more profitably, perhaps, at a later date. For this reason, I view mineral depletion in economic terms, rather than in quantity terms. The cost of depletion is not the lost quantity of the mineral reserves, but the lost perpetual income that the reserve was generating (de Janvry et. al 1995).

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[8] The term depletion is used here within an economic context, equivalent to the financial depreciation of capital (Davis and Moore 1998). It has nothing to do with the arbitrary "depletion allowance" involved in the calculation of taxable mining income.

[9] An analogy can be drawn between a share that pays dividends and a share that does not. The share that pays dividends has value to its owner because of these dividends and because of its capital appreciation. The share that does not pay dividends only has value because of its capital appreciation. In cashing in the dividend-paying share, the owner gets the benefits of the sale, but loses the dividend stream. Cashing-in the non-dividend paying share incurs no lost dividend stream.

Box 7.6 Mineral depletion and green income accounting

Much has been done in the national accounting framework in coming up with an appropriate depletion charge for mining. The simplest result is that the charge for mining now is the present value of the lost revenues from not mining later: an opportunity cost. For example, when the value of a unit of depleting reserves rises at the rate of discount, and all reserves are homogeneous, the depletion value equals the rents from mining (Hartwick and Hageman 1993). These rents are the difference between revenues and costs, including payments to lenders and shareholders. However, an important difference between green national income accounting and sustainable project development is that income accounting is designed only to reflect depletion in the calculation of a Net National Product (NNP). It does not *compensate* future generations for depletion either by taxing projects and donating the proceeds to future generations, and nor does it require that the depletion charge be used to sustain the current level of natural capital, as is typically the understanding with depreciation charges on made capital.

In devising a formula for sustainable project assessment, we therefore need as a final step a tax on the current project to compensate future generations for lost capital gains (the depletion charge). Assume that, in the absence of a project, the mineral asset appreciates in real terms. The owners of the resource can then enjoy a sustainable income flow equal to the appreciation of the asset.[10] Extraction eliminates this benefit flow, and should be charged for this opportunity cost. If the resource is appreciating at the interest rate, it turns out that the depletion charge will be equal to the perpetual cash flows created by mining, and no sustainable development will take place should mining commence. If the value of the asset is not rising with time, there is no opportunity cost. This treatment of depletion also ties in nicely to the issue of optimal timing of extraction, where early extraction creates sustained benefits, net of depletion, whenever the asset is appreciating at less than the interest rate, and creates a sustained loss whenever the asset is appreciating at greater than the interest rate. Thus, mining should be delayed whenever appreciation is greater than the interest rate, and undertaken whenever it is less, a standard result (Weitzman 1990). The latter economic condition is believed to be the norm in minerals,
with markets indicating that the resource should be extracted immediately, and not saved for future generations (Radetzki 1992).

We now have a method that *potentially* converts all rents, depletion charges, and damages into perpetuities, such that the benefits and costs to future generations can be compared. The world, without any further development, is presumably generating some level of sustainable perpetual income (green NNP, say). Any mining project, if it is consistent with sustainable development, must be seen to add to this level of sustainable welfare, net of all negative effects. The project will produce a finite stream of cash (rents) that can be converted into a perpetual stream of cash flows via taxation—a form of sustainability bond—and investment of the revenues in financial and real assets. To this, add non-market benefits, such as decreased inequity, welfare benefits (converted into a perpetual stream somehow). The project can be defined as contributing to sustainable development (sustainably increasing the welfare of present and future generations) if that

[10] They could operationalize this by selling off a portion of the asset equal to the capital gains in each period, and consume the proceeds. The value of the asset will stay constant, and the benefit stream from sequential sales will be perpetual.

stream of funds can and will, in the opinion of future generations, more than offset the lost social, cultural and environmental amenities.

This conceptualization of project sustainability is exactly in keeping with intuitions by mining companies (Epps and Brett 1998). Placer Dome sees sustainability as meaning that a project must add economic, social, and environmental value to society through their activities. BHP commits to working with communities to ensure that they receive long-term benefits. North limited wishes to conduct its affairs in a way which benefits society as a whole. The method is similar to the traditional practice of converting all costs and benefits to a present cash value, so that the current generation can compare them, only now we convert all costs and benefits into perpetuities, leaving them in their natural units. The advantage of latter is that it does not require intertemporal comparisons of utility, explicit valuation of environmental and social damages, nor the discounting to the present of future generations' welfare. It also provides a clear indication of the project's contribution to sustainable development, which then serves as an input into the decision as to whether the project is undertaken or not.

The greatest difficulty will come in identifying the nature and magnitudes of the costs and benefits, and then comparing them, since they are in different units. First, of course, the project must demonstrate a positive NPV after depletion, such that a perpetual benefits stream can be created. Then, this stream must be enough to compensate those hurt by the mining operations. The type and magnitude of the compensation will depend on the type and value of damages and the degree of substitutability between compensations and the damages in the minds of those affected—the less the substitutibility the greater the monetary compensation or level of made capital required to compensate. If no substitutability is allowed, the rent stream could be used, in some cases, to replace or prevent damages. For example, if a lost environmental service is CO_2 absorption, something which is necessary for the sustained ecosystem and for which no substitutes exist, the rents, if sufficient, could be used to invest in technology that reduces CO_2 emissions, so that we get back to the previous absorption levels.

This idea of correcting for the damages incurred through mining is also a common thread in current approaches to sustainable project analysis. It also guides us as the appropriate form of use of the perpetual benefits stream; replacing the lost capital stock, preventing emissions from other sources such that the level of pollution remains constant; or consuming the perpetuity to replace the environmental pleasures lost due to the project.

If the project cannot generate perpetual stream that more than offsets the lost income due to depletion and the lost environmental (aesthetic, spiritual, religious, cultural, political, moral) values in the opinion of those impacted by the project, then it detracts from sustainability, and should not be undertaken. Note that projects that do more damage to difficult-to-replace values or have greater environmental impacts will be less likely to meet the sustainability criterion, a desirable outcome of this framework of analysis. On the other hand, projects that negatively impact impoverished communities are more likely to be found sustainable, as substantial substitution possibilities between made and natural capital remain.

We also need to ensure that these rents *are* saved and invested to generate the appropriate compensations for future generations. There are indications that some firms are either taking it upon themselves or are legally required to invest some of the proceeds

from mining in community development or environmental programs (McPhail and Davy 1998; Otto 1998). The former is a method of investing the proceeds to the benefit of future generations, while the latter is a method of replacing or mitigating lost environmental services. Especially notable are sector-wide insurance schemes, whereby rents are invested in a fund that is drawn down as environmental damage is incurred, as this is exactly the idea behind turning a finite flow into a perpetual resource. In Chapter 5 Epps and Brett report on a number of mining projects that have set up trust funds, in cooperation with the local community, aimed at smoothing the benefits over time and at compensating the community for certain damages. McPhail and Davy (1998) report on similar initiatives in both the mining and oil and gas sectors. To a certain extent, mining companies are coming to see the transfer of mining rents to trust funds or environmental remediation as a cost of doing business.

Even so, mining projects, while potentially contributing toward sustainable development under this framework, are in practice unlikely to be achieving sustainability. We do know that the oil economies are currently pursuing rent-saving at a national level, although not saving enough to generate a flat benefits profile (Askari 1990, Askari et al. 1997). In other economies the mining rents are for the most part consumed in the current period, with the perpetual costs of mining falling onto uncompensated future generations. For example, in Saudi Arabia and Nigeria, where some or all of the oil rents are taxed, the proceeds go to building infrastructure in urban areas, rather than in directly compensating those hurt by the extraction activities. No doubt future generations, who are unlikely to benefit from current infrastructure expenditures, would prefer that oil extraction be undertaken later (by them) rather than now (by us). Even in the few negotiated "sustainability" arrangements between mining projects and local communities to date, it is unlikely that the current generation of stakeholders is negotiating for and caring for those of the future, instead caring for itself. That is, I see this as a negotiation over the sharing of the pie, rather than a conscientious setting aside of benefits now to create a perpetual benefit flow; the negotiated programs are largely consumption-based, with the level of consumption far in excess of that which is sustainable.[11]

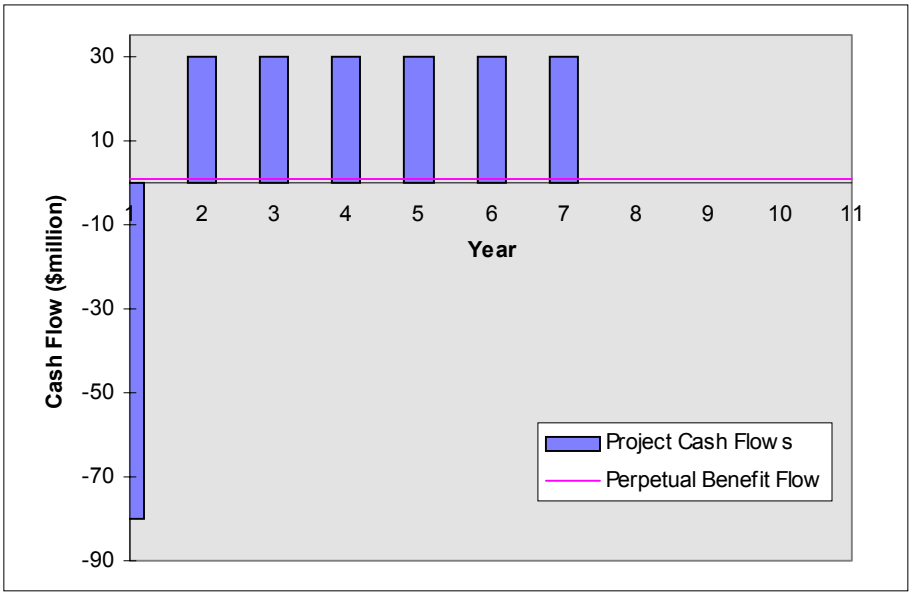
Assurance that the appropriate amount of investment is undertaken, if not done voluntarily by the mining companies or adequately negotiated and managed by the current stakeholders, is certainly feasible via community-legislated resource rent taxes and appropriate public rent management programs. These programs can see that the perpetual rent stream is collected and directed in perpetuity back to the stakeholders negatively affected by the project. Under this scenario, any sustainability or remediation investments by mining firms can be made tax deductible, such that firms have an incentive to willfully manage the sustainability of their projects.

[11] Later in the chapter I show an example of a small mining project that generates a total perpetual benefit stream of $87 per community member per year. This is the amount that can be sustainably consumed annually. Larger projects might generate at most $500 per person in sustainable consumption. Any consumption beyond these levels is unsustainable.

2.2 A mining example

Consider a reasonably realistic small but profitable gold mining project that will convert 8 million tons of ore into 1 million ounces of gold. The mine is situated in a town with 20,000 inhabitants. The life of the project, once installed, is 6 years, and the revenues, net of the usual operating costs and tax credits (but without counting environmental costs, social costs, or depletion charges), will equal $30 million per year in real terms. There are no dynamic benefits from the activity, such as a permanent increase in the skills of the local populace, nor any incidental advances in technology. The mine wastes will produce perpetual acid drainage of 2,500,000 m^3 per year, which will cost, in real terms, $500,000/yr. to treat. These costs are not born by the company. If not treated, the drainage will create damage in the form of lost sport fishing amenities, again whose costs are not the liability of the company. The initial capital investment is $80 million. A schematic of these cash flows is given in Figure 7.1.

Figure 7.1 Gold project cash flows



At a 2% real discount rate, these income flows are equivalent to an instantaneous payout of $168 million.[12] Given the capital cost of $80 million, the private NPV or rent of the project is a healthy $88 million; its internal rate of return (IRR) is a whopping 30%. A positive NPV is the first traditional hurdle that the project must clear. Then, a full environmental analysis of this project would try to find the present value of the costs of cleaning up the AMD, or equivalently of the lost fishing amenities, and charge these to the project. This environmental analysis might be done via an environmental impact assessment (EIA). The present value of the costs requires discounting a perpetuity, which makes the distant future costs virtually nil, while the present value of the costs of the lost

[12] I use the risk-free rate of interest because I have this far abstracted from uncertainty.

fishing opportunities involves lost intertemporal welfare, which requires the formulation of welfare functions. Thus, there are severe conceptual problems with linking the EIA to project desirability, and even so, there is no obvious link between environmental acceptability of the project and sustainable development.

The method of project evaluation proposed in this chapter avoids these problems, while indeed screening the project within a sustainability framework. First, setting aside the $88 million in rents and investing them at 2% would produce a real perpetual flow before depletion charges of $1.74 million/yr. available for compensation and/or consumption by those negatively impacted by the project. Note that this is in *excess* of all wages, payments to lenders, and other costs paid out during the project. Equivalently, the annual positive and negative cash flows can be converted into a constant positive stream, and this converted into the equivalent perpetuity. Weitzman (1990) shows that a finite cash flow stream of T years in length, growing at g percent per year in an economy where real interest rates are r%, and starting from a level of $\$c$/yr., can be converted into a perpetuity of $\$p$/yr., where

$$p = c\frac{r(1-e^{-(r-g)T})}{r-g}.$$

In this case, at an interest rate of 2%, the cash flows in Figure 1 are equivalent to an annual constant positive cash flow of $13.33 million in each of years 1 through 7 of the project (this produces the same NPV of $88 million). With $g = 0$, c = $13.33 million/yr., $T = 7$ years, and $r = .02$, once again p = $1.74 million/yr.

By either method, we have the project generating a net perpetuity of about $1.74 million per year. Now, to ensure that extraction now rather than later is welfare-enhancing—that is, that sustainable *development* occurs of the project is undertaken—we further charge the project with a depletion charge. Assume that the project would gain 1% per year in value if delayed due to technological increases that lower costs.[13] The lost capital gains due to early extraction, the depletion opportunity cost, invoke a perpetual annual charge of 1% of $88 million, or $0.88 million. The annual net income flow associated with sustainable development is then $1.74 million less the depletion charge of $0.88 million, netting a perpetual real benefit flow of $0.86 million.[14] This is shown in

[13] Even though a riskless asset, the project does not rise at the real risk-free rate due to a positive dividend yield created by the cash flows from operations (Davis 1998a). The inflation of the value of the in-ground asset provides an important indication of the future demand for the asset. Some raise the concern that mining copper now will mean that no copper will be available in the future. But these concerns should be evident in the difference in demand for copper now and in the future, and by this evident in the rate of appreciation of the in-ground assets. Evidently, with mineral reserves not growing at all in real terms over the past several decades, the near-term future is either not concerned that it will need copper, or that it can obtain it from mining garbage dumps or the streets of New York. The demand of distant generations, however, may not be reflected in the current rate of rise in price, as arbitrage across present and distant generations is unlikely to be reflected in current price trends.

[14] Note that if the value of reserves was rising at 2%, the depletion charge would exactly offset the rents, indicating the project contributes nothing to net sustainable welfare. This result is consistent with national income adjustments for mineral depletion, where, if the unit reserve value is rising at the rate of interest, the depletion charge equals the entire mining profit stream (Hartwick and Hageman 1993).

Figure 1. Incidentally, a positive annual net income flow indicates that current extraction, as opposed to extraction at a later date, is optimal. In this case, an asset that was earning a 1% return is being converted into an asset that is earning a 2% rate of return.[15]

To implement a scheme whereby current rents are taxed and converted into a perpetuity, the entire NPV of the project would have to be taxed and deposited into a sustainability bond that is invested in real or financial assets. In the above example a tax of $1.74 million in year 1 and $15.39 million per year during years 2 through 7 would be necessary to create the income perpetuity of $1.74 million/yr. It would also reduce the NPV of the project to zero. These tax revenues would then be invested, with perpetual payouts by the state to the stakeholders as follows, beginning in year 1:

- $0.88 million per year (the depletion charge) would be used to either rebuild the natural capital stock in the region (for those who wish to see the aggregate level of natural stock maintained) or compensate the current and future "owners" of the mineral reserve for the income (in the form of capital gains) that they are foregoing through current extraction;[16]

- up to $0.86 million/yr. (the perpetual benefit flow after depletion) would be used to correct any perpetual costs created by the project, or to compensate those directly and indirectly impacted by the perpetual costs of the project;

- the residual, if any, would be available to current and future local residents for sustainably increased consumption.[17]

The sum of these flows, at $87 per community member per year, are the most that can be sustainably consumed. $44 of this is the depletion charge, leaving $43 as the maximum amount available to compensate for or mitigate damages. If $43 is more than enough to cover damages, the remainder is the essence of what is meant by sustainable development via the mining project. There is more likely to be a residual windfall 1) the higher the NPV from the project, 2) the lower the perpetual environmental and social damages created by the mine, 3) the higher the degree of substitutability between consumption and the damages created by the project, and 4) the greater the difference between the real interest rate and the rate of appreciation of in-ground mineral assets. In this case, with the

[15] Even if our sole concern was future welfare, the project should not be delayed, as any delay will result in a real benefit flow that is less than $0.86 million in real terms.

[16] If the mining company is deemed to "own" the asset, then they should receive the depletion charge, as it is they that are foregoing the income from the asset. However, such ownership would have to have been purchased away from society at some point, and so society would, in effect, have a lump sum from the sale that can be converted into a perpetual stream. Thus, regardless of ownership, a depletion charge will flow, either directly or indirectly, to the local community.

[17] If welfare discrepancies within the current generation are of concern, the "poor" could be targeted to receive these early flows. Some of this residual could also be returned to the company, providing it with an incentive to mitigate the environmental and social disruptions of the project.

cost of containing the AMD being $0.5 million per year, the project is consistent with sustainable development; it allows perpetually increased consumption equivalent to $0.36 million per year while maintaining a sustainable natural resource base. The "sustainable" value of the project is $0.36 million/yr., or $18 per local citizen per year. Or, if AMD treatment were for some reason not technically possible, we would have to determine whether the $0.86 million/yr. is enough to create a fishing area equivalent to that which is spoiled (to keep the stock of natural capital intact), or enough to compensate via increased consumption those that have lost welfare (assuming that there is at least some potential for substitution between fishing areas and Cadillacs).[18] If it is, then again the project is in accordance with the criteria for sustainable development.

Another way of looking at this flow is that there is a $0.86 million/yr. benefit foregone—$43/yr. per local citizen—if the mining project is not undertaken, and instead the existing aesthetic qualities of the region are permanently preserved. In determining whether this mining project contributes to sustainable development, we would simply ask ourselves whether future generations would rather have the $43/yr. in compensation for the environmental, social, and cultural destruction associated with the mining project, or forego the $43/yr. and maintain the community in its present form. No monetization of damages is required, nor are blanket assumptions about the substitutability of environmental and made goods required. We need only use our intuition about the option that future generations would choose.

In spite of the attractiveness of this project on a traditional NPV and IRR basis, the sustainability analysis does not lead me believe that current and future residents of an American town would opt for mining to take place, confirming Power's (1996) intuition about the limited scale of net regional benefits from mining projects. However, Power's analysis is decidedly Western. Were this mining project in Mozambique, where per capita incomes are around $100/yr., I think there is no doubt that current and future residents would see this project as sustainable development, and would opt for the $43/yr.[19]

This provides a simple example of a sustainable mining project analysis. A convenient aspect of the approach is that if, *a priori*, the perpetual depletion and damage compensations required to be paid by the state necessitate a tax of greater than that calculated above, the project NPV becomes negative, and it will not be undertaken by private agents. The tax system, then, ensures that only projects that enrich future generations into perpetuity will be developed. This is a fundamental difference between sustainable project analysis and green national income accounting; the latter only provides a measure of whether growth is sustainable, while the former ensures it.[20] In addition, the project allows flexibility and local empowerment in the definition of project sustainability, incorporating the local level of current welfare and concern for

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[18] The loss in welfare is typically measured by the area under the demand curve for these amenities.

[19] This again reveals the extent to which the deep ecologists' position, and more generally calls for restricted development in the name of sustainability, is based on elitist Western values.

[20] Even El Serafy (1989), who was one of the first to recommend a depletion charge in national income accounting, refers to the act of reinvesting the depletion portion of the resource rents as a metaphor. Green national income accounting is only a tool to reveal the portion of rents that is true income; it is in no way intended to restrict consumption to the level of income, as is the intention here at the level of the project.

environmental amenities. For example, the above project would probably be sustainable in Mozambique, but not in America. Existing cost-benefit present value approaches simply define a project as sustainable or not, regardless of context.

Real projects will be more difficult to analyze, even within this simple sustainability framework. What will the social and cultural impacts of the project be? Are these irreversible (i.e. perpetual), or only temporary? Where project impacts are widespread, it may be difficult to assess who is damaged by the project, what the nature of those damages are, and what reasonable compensation might be (there is inevitably subjectivity in our assessment of future generations' desires). For example, the value of natural environments is likely to rise over time in real terms, contrary to my assumption of a perpetual constant damage stream (Power 1996; p.117-120). If we are to consider the long run, we must also consider the long-run preferences of mankind such that we are sure not to diminish their welfare through our actions. But this is like Aristotle, with his views of piracy as a noble occupation and manual work as a debasing activity, concerning himself with our preferences when making consumption choices (Vercelli 1997). Moreover, it be impossible to determine many of the more subtle impacts of the project, such as damages to the environment at the supra-project level, and to determine the amount of compensation necessary to offset these impacts. There may also be difficult-to-measure growth-inducing benefits from the project, such a skill development, which equates to augmentation of the human capital stock of the region. But, even with all of these difficulties, at least we now have a method that reveals what needs to be done, not necessarily that it can be done.

Uncertainty adds even more complexity to the task of assessing projects, as the rents and damages are not known prior to completion of the project. The next section discusses this in more detail.

2.3 Sustainable project evaluation under uncertainty

When project revenues and costs are uncertain, Net Present Value analysis is still the tool used to evaluate the project, only with expected values replacing certain values in the calculation, and a risk adjusted discount rate replacing the risk-free discount rate. Additional charges expensed against the project include the cost of finding and proving up the reserves (exploration charges). The result is an expected NPV, which is a best estimate of project value. There is no guarantee that the revenues and costs will turn out as planned, and hence no guarantee that the estimate is correct; all one could hope for is that on average the method provides unbiased estimates with a relatively narrow range of error.

One problem with NPV analysis is that it does not account for the value created by managerial responses to uncertainty throughout the operation of the project. For example, when prices are low the project may temporarily shut down, and when prices are high the project may increase its output. The result is a higher effective unit sales price, which increases the value of the project but which is not captured in the NPV technique. Another problem is that under uncertainty it becomes optimal to develop the project only when its NPV is considerably positive. This is because, under uncertainty, the project resembles an American call option on a dividend-paying asset, which are only

exercised when they are well-in-the-money. Thus, an additional project opportunity cost arises.[21]

This impacts sustainable project analysis in several ways. First, the initial project valuation should be conducted within the real options framework. This provides an estimate of the total rent, in present value terms, available for taxation. In the Example in Section 2.2, the present value of the rent stream was $88 million. Under uncertainty, that expected value may be lower or higher. Second, the opportunity cost of developing the project now rather than later increases. As such, the depletion charge will rise. This is because waiting has more value under uncertainty than under certainty. In principle, the depletion charge will now be the lost capital gains, as in the above example, *plus* a premium that is related to the profitability of the project. That premium is the difference between the option value of the project and the expected NPV, which is called the option premium. The option premium is greatest when the project is marginal, and decreases in a non-linear fashion as the project becomes more profitable. In mining projects, the premium goes to zero when the NPV is roughly equal to the initial investment (Davis 1998b). In the example is Section 2.2, the NPV was roughly equal to the investment cost, so the additional depletion charge would be minimal.

The result of these two issues is that under uncertainty marginal projects will tend to be less sustainable, since the depletion charge will rise, reducing the sustainable net income available to offset any perpetual damages. Thus, it is quite possible that a mining project that appears to contribute to sustainable development under certainty will not contribute to sustainable development under uncertainty, and should not be undertaken.

A third issue is one of portfolio effects. A region whose wealth derives from a single asset, such as a mineral resource, has income that is dependent either on the capital appreciation of the asset (if it is not being extracted) or the sustainable income from extraction of the asset. With mineral prices subject to considerable volatility, the level of sustainable income flows would fluctuate wildly if production is not hedged.[22] This is similar to a financial portfolio that is undiversified; the owner is subject to unsystematic risk for which they are not compensated. Portfolio diversification or hedging is recommended. Weitzman (1990) recommends that mineral economies extract their minerals more rapidly than they would in the absence of these diversification concerns, and invest the rents in a diversified portfolio of assets. Indeed, the mineral economies that are largely dependent on their minerals for income have great difficulties managing price booms and busts, while those that have diversified away from minerals, such as Canada, are less prone to these issues. Mineral economies generally derive between 5% and 50% of their income from mineral extraction. Communities deriving their income from mining projects are subject to an even higher exposure to mineral prices, and the very sustainability as a community is threatened by price uncertainty (the value of the resource may drop at any point). Incorporating this portfolio effect into sustainable

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[21] For a review of these concepts see Davis (1996), Dixit and Pindyck (1994), and Trigeorgis (1996). The classic paper that values a copper mine as an option on copper is Brennan and Schwartz (1985).

[22] This is a criticism of green national income accounting. An economy's sustainable level of income, which is the environmentally adjusted Net National Product, will fluctuate widely from year to year due to variations in the value of the natural capital stock, giving little indication at any one time of the sustainable level of income in the long-term.

project valuation is left to further research; I wish only to note here that diversification incentives will serve to lower the depletion charged to the project, reversing some or all of the delaying impact created by uncertainty.

Finally, under uncertainty, there is no guarantee that a project that appears to contribute to sustainable development *ex ante* will in fact turn out to do so. It may turn out that the lost amenity values are higher than expected, or that the realized mineral price is lower than expected. The analysis only gives us an unbiased predictor of sustainability on average, with some projects exceeding our expectations and others falling short. The key result is that mining projects that pass the sustainability criteria will on average contribute to sustainable development.

3. Measuring Project Sustainability

The model proposed above provides a framework for sustainable project analysis. The remaining limitation is in collecting the data necessary to perform the analysis. Project revenues and operating costs are standard fare. The difficulty is in identifying and estimating in advance the perpetual damages that will be created by the project.

Since sustainability evaluations must be undertaken prior to project development, we need to establish a data base relating mining activity to its positive and negative impacts on base-level ecological and cultural factors. A first step is to do a forensic analysis of existing mining projects, such that we develop a database of mining project impacts. Mining activities typically create soil destruction, sedimentation in rivers and lakes, toxic chemical discharges to the air and waterways, scars on the land, adverse effects on indigenous cultures, social disruption, and class, race, and income segregation. We must take stock of the social, cultural and environmental characteristics of the project footprint area, and all changes in these characteristics over time. These changes will be a combination of natural changes, such as natural atrophy of a stream or lake, and artificial changes due to the mining operation. By modeling the natural changes, we can deduce the impacts created by the mine. This data can then be used to estimate the impact that a planned project will have on its surrounding environment, such that the perpetual costs and benefits of mining activity can be estimated in advance for use within the above sustainability evaluation framework.

At the project level, little, if any, data exists. Clark and Cook Clark (1997c) and Cook Clark (1997) have proposed indicator methodologies for mining projects, although limited data has been collected to date. Some ad hoc efforts have started at the community level, since many communities have started to adopt sustainability as a planning goal (Pinter and Hardi 1995), and Australia and Papua New Guinea are assembling valuable data-bases at the community level (Epps and Brett 1998). This is obviously a valuable data base on which to draw, although with noise in each of these measures, a statistically significant time series is required before the data is of any use.

Indicators can be categorized in terms of the resource base, cultural objectives, economic objectives, and environmental objectives. I briefly discuss each of these in turn, more of a guide as to what must and can be done than as offering any solutions to the data problem. A further discussion can be found in Chapter 5.

3.1 Indicators of the resource base

The resource base includes all assets that will at some point in time provide a valuable flow of services to mankind. Even though a resource may not be currently valuable, it has a positive option value given uncertain future outcomes. Assets may also have value merely because of their existence. The goal of measuring the resource base is to be able to determine a base-line from which deviations due to mining can be assessed and charged to the project.

In neoclassical economics assets are broadly termed capital. Capital in turn is either natural, human, or made. Sustainability theory breaks these down into subclasses. For example, natural capital is either renewable or nonrenewable. And within renewable capital the population of each individual species or element is of concern. A major difference between economic science and sustainability science is that the former implicitly allows for substitution of various species in its concern only with an aggregate level of natural capital, whereas the level of each individual species is of importance in the latter. Given this, indicators of the resource base must be directed at measuring the quality and quantity of each type capital that is important to the community at the micro level, with much more detail than is typically of concern to economists.

A selection of indicators currently being collected by various community, regional, national, and international agencies are listed in Table 7.1.

3.2 Indicators of cultural capital

Cultural capital reflects the self-organizing capacity of community. It is a productive capital that provides human society with the means and adaptations to deal with and modify the natural environment (Berkes and Folke 1992). Cultural capital is reflected in goodwill, well-being, belonging, religion, a sense of community, and an absence of crime. There are arguably negative aspects of some cultures (racism, cannibalism, sexism), and thus each community must decide which of its cultural attributes it wishes to sustain.

A sense of community—repeated participation with the same local families, friends, colleagues and customers—is a frequently-mentioned component of cultural capital, giving amenity benefits such as altruism, friendship, love, honesty and a sense of belonging (Pezzey 1992). Mining projects encourage transience and dispersion, which erode community (Power 1996). The most important indicator here, in relationship to sustainable mining projects, would then seem to be community. Two indicators of community are vehicle miles traveled and gasoline consumption per capita. These reflect travel in individual units, more of which creates a declining sense of community (Maclaren 1996). Another is ethnic fractionalization, the probability that two parties who randomly meet will not relate to each other or be able to communicate (Easterly and Levine 1997). Other indicators might include the number of locked doors, the median age of those in the region born locally, the distance between family members, suicides, and adult and juvenile offences.

Cultural capital can also be indicated by cosmology, environmental philosophy and ethics, ecological knowledge, and the types of social and institutional institutions found in the community (Berkes and Folke 1992).

Table 7.1 Indicators of capital stock

Resource Category	Specific Asset	Indicator
Renewable Natural Capital	Arable soil	Soil salinity
		Biomass yield
		Soil erosion
		Moisture content
		Pesticide residues
		Organic matter
	Fresh water quality	Salinity
		Hilsenhoff biotic index
		Index of biotic integrity
		Shannon-Weaver diversity index
		Number of salmon returning to spawn
	Vegetation	Stock of trees (m^3)
		Stock of wet heathland (m^3)
		Stock of grass (m^3)
	Air quality	Solids loading
		Vehicle miles traveled
		Fuel consumption per capita
Nonrenewable Natural Capital	Minerals	Mineral reserves and resources
Human Capital	Productivity	Years of schooling
		Proportion of school-age population in school
		Type of employment (skilled/semi-skilled/unskilled)
		Literacy rate
		Birth weight
		Perinatal mortality
		Mental hospital admissions
		Truancy

3.3 Economic indicators

Even with a change of focus towards sustainable development, economic objectives will remain an important component of social welfare. Poverty levels, unemployment rates, pre-tax incomes, vacancy rates in buildings, wage rates, infrastructure expenditure per capita, and other economic variables will continue to be valued in the community. Imposing a sustainability constraint on projects will affect the levels of these indicators, although at present the thoughts on sustainability seem subordinate the maintenance of economic objectives to the maintenance of social, cultural, and environmental objectives.

There are extensive data bases on these indicators at the national level, mainly collected by the United Nations and the World Bank. Little data exists at the community level.

3.4 Environmental indicators

At the heart of the push for sustainability is the environment, and environmental monitoring is key. Moldan et al. (1997) lay out an extensive framework within which to measure environmental indicators. Examples of current and proposed indicators are given in Table 7.2. Once again, however, data at the community level is limited, and data related to the environmental impacts of mining projects even more scarce.

Table 7.2 Indicators of environmental health

Resource Category	Specific Asset	Indicator
System Integrity	ecosystem	energy inputs as a percentage of consumption
		population
		soil organic matter
		level of biodiversity
		soil moisture content
		percentage of intact ecosystem
		road density
		chemically induced acute poisonings
		area of land contaminated by hazardous wastes
		per capita emissions of CO_x, NO_x, SO_x
	fresh water quality	salinity
		Hilsenhoff biotic index
		index of biotic integrity
		Shannon-Weaver diversity index
		number of salmon returning to spawn
	air quality	solids loading
		vehicle miles traveled
		fuel consumption per capita

4. Implementation Issues

This chapter outlines a method whereby mining projects can be assessed for their potential contribution to sustainable development. Under most interpretations of sustainability, the potential to contribute is not enough; the project must actually raise sustainable welfare. I propose the taxation of a some or all of the mining project profits, after allowing for fair compensation to shareholders for all costs and risks. These taxes are then invested in a trust fund that serves first to perpetually compensate current and future generations for the negative impacts of the project, where compensation can include replacing lost capital stock or providing consumable income as a substitute for the irreversible and irreplaceable damages incurred, and then to enrich all generations in the spirit of sustainable development. The implementation of such a tax scheme will be highly unpopular; witness the current US Congressional debate over the addition of a

trivial royalty to mining revenues derived from Federal lands. Making matters worse, unilateral undertaking of the taxation scheme by any one region or state will reduce comparative advantage derived from resource endowments, reducing or eliminating domestic and foreign investment in exploration in the region. Such a tax scheme also moves in a direction opposite to that of recent changes in mining laws, which are imposing fewer taxes rather than more. It increases the role for the state in taxing mining and providing for mining communities, much as was its role prior to industrialization (Östensson, 1997a).

On the other hand, mining companies are beginning to view their projects within terms that are highly similar to this sustainability framework. Several mining firms have independently moved towards enacting sustainable project management, this being a negotiated outcome between mining companies and the communities in which these projects are located (Clark and Cook Clark 1997a, 1997b; Epps and Brett 1998; McPhail and Davy 1998; Miller 1997; Östensson 1997a). Negotiation and consultation has the advantage that the benefits and damages are mutually agreed upon, and the remedies satisfactory to all parties. The negotiated compensations, and in particular trusts and foundations, are potentially similar to the perpetuities that the tax revenues would create. Noranda, in fact, is monitoring its emissions to the environment, and states that it is committed to the principle of sustainable development while only demanding a 12% return on its investments. This means that it should not resent setting aside a portion of its excess profits to create a perpetual compensation flow for asset depletion and environmental damage, and should not develop projects where the excess profits are insufficient to enact fair compensation.

If this willingness to operate only sustainable projects is genuine, the limiting factor is data on the impacts of mining at the community and regional level. Indicators have been developed to measure many of the flows of interest, and social impact assessments are a frequent part of mining company environmental analyses (McPhail and Davy 1998). We now await establishment of a data-base containing the relevant data from which to estimate the perpetual costs of each project, and to investigate whether indeed the existing negotiations between mining companies and stakeholders outlined in Chapter 5 met the conditions of sustainability.

In the mean time, the rules for sustainable project development presented in this chapter allows us to see what sustainability can mean. There are obviously tradeoffs between the efficiency of spontaneous order, on the one hand, where all positive NPV projects are developed, and sustainability, on the other, where only projects that generate sufficient excess profits to offset depletion and environmental damage are developed. Enforcing a sustainability constraint will most likely reduce the rate of mining, force metal prices up, and decrease the current welfare of mining company shareholders. In this light, we may decide that sustainable development is not such a hot idea after all, Noranda may retract its commitment to sustainable development, and the rally against commodity fetishism will remain ineffectual. Then again, with metal prices at an all-time low and US share prices at an all-time high, America, at least, would seem to be in a position to sacrifice the efficiency impacts of sustainable mining in return for sustained environmental benefits.

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