

THE EFFECT OF U.S. ECONOMIC ASSISTANCE  
ON THE SUPPLY OF  
CRITICAL RAW MATERIALS

DECEMBER 1983

Prepared for the  
Bureau for Program and Policy Coordination  
U.S. Agency for International Development  
Washington, D.C. 20523

under  
AID Contract No. OTR-0000-00-00-3199-00

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The views and interpretations expressed in this report  
are those of the author and should not be attributed  
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# THE EFFECT OF U.S. ECONOMIC ASSISTANCE ON THE SUPPLY OF CRITICAL RAW MATERIALS

## EXECUTIVE SUMMARY

### Introduction

The United States is dependent on certain critical imported materials for its defense, industrial, and economic security needs. Many of these materials are imported from countries that have been characterized as too politically unstable and unreliable to assure continued access to the strategic minerals in the future. Foreign assistance may play an important role in helping the United States and the U.S. private sector to secure access to and develop new sources of strategic and critical raw materials, thereby reducing the vulnerability of the United States to possible supply disruptions that may occur.

### Supply Vulnerability and Materials Policy

There are many factors involved in the determination of development assistance policies that accomplish the dual goals of enabling the United States to gain access to foreign supplies of critical raw materials and developing the minerals sectors and economies of developing countries. These factors include U.S. minerals supply vulnerability, U.S. materials policy, the relationship between materials and U.S. foreign policy, and the U.S.S.R.'s use of economic assistance to gain access to supplies of critical raw materials.

Many of the imported minerals essential for defense, industrial, and economic security needs have been classified by the U.S. Government as "strategic and critical." Strategic and critical minerals are those materials that (1) would be needed to supply the military, industrial, and essential civilian needs of the United States during an emergency and (2) are not found or produced in the United States in sufficient quantities to meet such needs. "Strategic" generally refers to the relative vulnerability of materials, while "critical" refers to the materials' essentiality.

The issue of criticality raises questions about import dependence and supply vulnerability. Import dependence is based on the fact that the United States must import certain minerals because it either does not possess adequate supplies or reserves of these minerals or the domestic exploration and development costs are prohibitively expensive in times of minerals surpluses. Supply vulnerability poses more serious concerns than import dependence for U.S. critical minerals needs, U.S. industry, and government decisionmakers. Vulnerability to mineral supply disruptions is a function of many factors, including the number of alternative sources for the minerals, the availability of substitutes, the availability of domestic reserves, and the economic cost of a disruption.

Although the market system for minerals has generated a steady and reliable flow of supplies at reasonable prices in the past, there are many political and economic circumstances under which the supply vulnerability of the United States could increase or become more serious. Therefore, the U.S. Government has recognized that it has a role in materials supply and demand situations, especially when some overriding national concern arises, such as national security or the health of the economy.

The Legislative and Executive Branches have responded to the various materials crises in our history with a variety of government programs, laws, and special study or advisory committees. Most recently, Congress passed the National Materials and Minerals Policy, Research and Development Act in 1980. This act declared that it is the policy of the United States to "promote an adequate and stable supply of materials necessary to maintain national security, economic well-being and industrial production with appropriate attention to a long-term balance between resource production, energy use, a healthy environment, natural resources conservation, and social needs." This act also required the President to submit to the Congress a report that would describe how he intended to implement the provisions of the act. The National Materials and Minerals Program Plan and Report to Congress, submitted in April 1982, stated that it is the policy of the Reagan Administration to "decrease America's minerals vulnerability by taking positive actions that will promote our national security, help ensure a healthy and vigorous economy, create American jobs, and protect America's natural resources and environment." President Reagan, in letter transmitting the program plan to Congress, said that this policy is responsive to America's needs for measures to diminish minerals vulnerability by allowing private enterprise to preserve and expand the U.S. minerals and materials economy. The program plan describes Administration actions or proposals in several areas including land availability, minerals data collection and analysis, research and development, regulatory reform, stockpile policy, and the role of the Cabinet Council on Environment and Natural Resources.

Another concern of the United States in its minerals policy is the role of the U.S.S.R. The U.S.S.R. has been able to increase its political allies in developing countries and increase its sources of mineral supplies through the use of a variety of political and economic assistance mechanisms. These mechanisms have enabled the U.S.S.R. to fill the vacuum in developing countries created by the withdrawal of Western mining consortia and MNCs in the 1970s and gain access to the minerals sectors and markets in developing countries. The U.S.S.R.'s use of foreign assistance is directed at the broad political and economic purposes of gaining political influence around the world and increasing integration of the COMECON countries' economies with those of the Soviet Union and developing countries. These mechanisms include the granting of economic, technical, and scientific aid for mineral development to developing countries; purchase of raw materials from countries threatened with boycott by Western nations; and the manipulation of minerals prices in world markets that affects the economies of developing nations.

## Materials and U.S. Foreign Policy

It is important for the United States to have a role in certain foreign minerals development activities because of the importance of certain strategic and critical materials to national security, and the effect that a supply disruption would have on that security position. The Reagan Administration has stated that the U.S. foreign assistance program, as an essential instrument of foreign policy, should be utilized to reflect the U.S.'s national interest in free access to key raw materials and to meet U.S. economic, national security, and political goals with respect to strategic and critical minerals. Therefore, the foreign assistance program encourages foreign minerals exploration and development by U.S. companies as a means of assuring the United States access to supplies of critical minerals.

The United States has available many policy options to reduce its dependence on critical imported materials and mitigate the effects of any disruptions that might occur from such dependence. Two of these options, directly related to U.S. foreign policy concerns and foreign assistance, are diversifying sources of supply and utilizing foreign policy initiatives.

Diversification would provide alternative suppliers and supplies of critical imported materials during a period of disruption and lower the probability of a successful cartel's manipulating markets. Foreign assistance can help support diversification by creating a climate in developing countries in which the private sector would be willing to invest in mineral development.

The international character of mineral flows makes minerals vulnerability a foreign policy issue. The international setting is more complex now than ever before, with continuously evolving relationships between materials suppliers and users, the rise of new competitors for the use of critical raw materials, and the increased global presence of the U.S.S.R. Foreign policy initiatives could be implemented through trade agreements or other steps to assure the security of minerals supplies.

## Mineral Resources Development as a Development Assistance Mechanism

The economy of a developing country may be dependent upon the optimal use of available mineral resources. Mineral resources have value only in the marketplace; they have no development value if they are left in the ground. Therefore, mineral resources development can be considered an effective development assistance mechanism. Mineral resources development has direct and indirect impacts on a country's economic growth and development through general economic benefits, increased employment, training and education benefits, the growth of ancillary services and an infrastructure, and the evolution of an indigenous private sector. (However, the minerals sector of many resource-rich countries is relatively weak due to external and internal economic and political problems. Mineral resources development, when used as a development assistance mechanism, can be utilized to correct or mitigate the effects of many of these problems.)

Mineral resources are a principal economic asset in most developing countries and are often the major source of an LDC's economic growth. Mining can serve as the nucleus for economic development (as the scope and size of minerals projects are independent of the size of local markets and the local economy) and broaden the development options facing the developing country's government and indigenous private sector. It can also promote backward and forward linkages between the mining project and the rest of the developing country's economy in order to maximize value added within the country, to the extent that it is economically sound. Mining also affects the host country's economic status as well, enabling the host country to receive government revenue through taxes and royalties and to earn or save foreign exchange.

Mining also offers to the host country certain employment benefits. In addition to creating jobs at the mining operation, indirect employment is created in infrastructure development, projects that would not be developed if not for the mining project, and in remote or depressed areas.

The impact of mineral resources development is most pronounced in its effect on national infrastructure development. The role of infrastructure development is more central in mining than in other industries because the mining activity is often conducted in relatively isolated areas.

Foreign minerals exploration and development by U.S. companies also facilitates host country development. This is especially true in many southern African countries that are dependent on their minerals sector for their overall economic growth. This offers the United States and the developing country a relationship of shared benefits: we supply foreign assistance to countries with the critical raw materials that the U.S. needs.

#### Use of Foreign Assistance to Increase the Supply of Critical Raw Materials

In his April 1982 materials and minerals program plan, President Reagan assigned to the International Development Cooperation Agency (IDCA) an important role in the process of securing access to supplies of strategic and critical minerals. The three components of IDCA are the U.S. Government agencies responsible for the U.S. foreign assistance program. These three agencies, the Agency for International Development (AID), the Overseas Private Investment Corporation (OPIC), and the Trade and Development Program (TDP), encourage U.S. firms to become active participants with host countries and indigenous private enterprises in the development of critical materials, as well as encourage developing countries to undertake or maintain natural resources development projects. These three agencies, therefore, can aid the U.S. mining industry in the identification and development of new sources of supply (and thereby diversification of sources of supply) and the maintenance of supplies from existing sources. This will contribute to the reduction of the United States' vulnerability to supply disruptions.

The broad objectives of the U.S. bilateral assistance program are to promote stability in friendly countries by assisting them to overcome their financial difficulties, and to help developing countries create the conditions for self-sustaining growth of a kind that permits the poor to participate in and benefit from the growth process. AID, the government's primary bilateral assistance agency, promotes U.S. interests in the developing world through the promotion of long-term equitable growth in the developing countries.

AID can affect mineral supplies through economic assistance (Development Assistance and Economic Support Fund), minerals assessments, training programs, bartering, and its private sector initiatives program. AID has not historically considered mineral resource development as a significant AID activity, but has sponsored some minerals activities because of their importance to a country's economic development. AID has financed mineral assessments and analyses and supplied loans to developing countries for minerals training and institutional development over the past several years.

Congress authorized the President to barter economic assistance or defense articles or service in exchange for strategic raw materials in the Foreign Assistance Act of 1974; however, neither the President nor AID has ever used this authority. This section of the FAA offers the potential for AID to help supply part of the United States critical materials needs because many of the countries now receiving assistance under PL-480 or other assistance programs possess supplies of critical raw materials, while helping those countries to improve their balance-of-payments problems and debt service load.

OPIC offers to the mining industry programs involving political risk insurance and project financing. OPIC's minerals initiative is regarded as one of the primary bilateral tools for encouraging investor interest in developing country mining projects. The protection afforded by OPIC's insurance programs is designed to encourage American companies engaged in strategic minerals exploration and production to enter international markets by reducing some of the perceived political risks associated with such projects. As a complement to its insurance programs, OPIC's finance program offers loan guaranties which provide medium-term and long-term funding support for mining ventures generally involving substantial equity and management participation by U.S. business. OPIC participation often is in the form of project financing, which is based on the economic, technical, marketing, and financial soundness of the project itself.

TDP offers trade enhancement and financing to the mining industry, primarily in the form of technical assistance and feasibility studies. TDP's legislation mandated a role for the agency with respect to mineral resources by authorizing the U.S. to facilitate "open and fair access to natural resources of interest to the United States." TDP is currently involved in many mineral projects that are designed to produce short-term benefits through the sales of technical services and equipment and long-term benefits by reducing U.S. supply vulnerability (by identifying and developing new sources of strategic and critical minerals).

## Recommendations

Several important conclusions serve as the basis for the recommendations for this report. First, many developing countries have the supplies of strategic and critical minerals most needed by the United States. Second, mineral resources development can serve as an effective development assistance mechanism and as a means of developing new or maintaining current supplies of strategic and critical minerals for the United States and other Western nations. Therefore, it is a relationship of shared benefits: foreign assistance and foreign policy should be utilized to meet U.S. economic, national security, and political goals with respect to strategic and critical minerals, while meeting the development needs of selected developing countries.

IDCA's component agencies endeavor to assure and promote reliable access for U.S. minerals investment in developing countries in order to maintain existing or develop new supplies of critical raw materials. These programs rely heavily on projects and a policy dialogue that encourage economic growth and development in developing countries and utilize the private sector to the fullest extent; however, IDCA and its components have limited financial and manpower resources with which to operate its programs. Therefore, IDCA's components should continue to direct many of their resources towards those countries that need assistance that have the critical materials most needed by the United States.

There are many actions that may be taken by IDCA, AID, OPIC, and TDP in order to assure the United States an adequate supply of critical raw materials while at the same time helping developing countries to achieve their economic growth and development goals. These recommendations are detailed below.

-IDCA should develop an intra-agency policy position that includes a statement of policy and program goals on critical raw materials. Two of the goals of the U.S. foreign assistance program should be to (1) secure current sources of supply of critical raw materials through the promotion of long-term equitable growth in developing countries and (2) provide opportunities to diversify current and identify new foreign sources of minerals to lessen U.S. vulnerability by encouraging countries to develop market economies that are open to foreign minerals investment. Another element of this policy position should be that continued U.S. economic assistance to a particular country is to be conditional on the continuity of U.S. access to critical raw materials in that country. Finally, this policy position should emphasize that the United States believes that the best method for assuring the development of the minerals sector in developing countries is to encourage the participation of U.S. and indigenous private sectors.

-IDCA should initiate greater cooperation on minerals issues with the Cabinet Council on Environment and Natural Resources and the Departments of State and Interior in order to be a participant in the critical materials policy dialogue and decisionmaking process.

-AID's primary role in the minerals sector should be to help to ensure the existence of an appropriate host country environment that allows for extensive access of foreign firms to investment opportunities in developing host country mineral resources, and tries to ensure that the benefits of such investment are broad-based.

-AID should encourage the promotion of economic development and political stability in developing countries in order to improve the chances for success of the mining sector. The mining sector cannot develop adequately if the economy as a whole is extremely weak, as mining is extremely capital intensive, requiring large investments.

-AID should seek to ensure the optimal use of available mineral resources to assure economic development and the growth of indigenous enterprises in developing countries. In this vein, AID should encourage host countries to direct mining revenues into continuing productive investments in other sectors, such as agriculture, industry, and infrastructure. (This is one method that may also be used to mitigate the effects of economic dislocation in developing countries due to minerals development.) Careful evaluation needs to be given to the type of assistance provided to indigenous minerals processing sectors. U.S. assistance should not be provided if it can be shown that such assistance would negatively affect or have an unfair competitive advantage over the U.S. minerals processing industry.

-AID should work with the private sector and the host country to work out a series of development and investment guidelines that deal with the major issues involved in minerals resources development, including the level of U.S. private sector ownership, investment, or operation in mineral resource development projects and infrastructure development responsibility. While it appears that AID regional bureaus are not staffed to handle negotiations between the U.S. private sector and the host country government, AID's Private Enterprise Bureau may want to coordinate such activities with the commercial attaches in U.S. embassies.

-AID should place increased emphasis on training and educational programs for mining and minerals-related activities.

-AID should support mining-related infrastructure development in selected country and regional development strategies. In this vein, there may be a role for AID to play in the planning phase of minerals-oriented infrastructure to ensure that, whenever possible, the infrastructure projects serve other sectors of the economy (in addition to the minerals sector).

-AID should develop a plan to implement the barter provisions of Section 663 of the Foreign Assistance Act of 1961, as amended. AID should work with the U.S. Department of Agriculture and the Federal Emergency Management Agency in the development of this plan, as these are the agencies most experienced with the bartering of commodities for strategic materials and with the Strategic and Critical Materials Stockpile's goals.

-OPIC should continue to increase its insurance limits and be more flexible in providing insurance services to better meet the needs of and be more responsive to U.S. mining industry. The Congressional restrictions on OPIC financing for mining programs should be raised to better enable OPIC to meet the needs of the mining industry. Unlike the other components of IDCA, OPIC's level of involvement in minerals projects is dependent on the general state of the economy, the world market for minerals, and the health of the U.S. mining industry. However, it may be possible that the insurance and financing that OPIC offers may still be at levels too low to attract mining investors when the mining industry recovers from its economic slump. It should be noted, however, that the imprudent allocation of financial resources to the minerals sector might come at the expense of other U.S. Government objectives embodied in OPIC's enabling legislation, such as OPIC's mandate to operate on a self-sustaining basis and with due regard to principles of prudent risk management.

-TDP's minerals program should be subjected to greater Administration and Congressional oversight because of its potential contribution to U.S. economic, national security, industrial, and defense interests. Most TDP-sponsored projects are currently in the planning stage or have just begun. It is, therefore, too early to know whether these projects will produce the short-term (sales of technical services and equipment) or long-term (reducing U.S. supply vulnerability by identifying and developing new sources of strategic and critical minerals) benefits that have been promised.

## 1.0 INTRODUCTION

The United States is dependent on certain critical imported materials for its defense, industrial, and economic security needs. Many of these materials are imported from countries that have been characterized as too politically unstable and unreliable to assure continued access to the strategic minerals in the future. Foreign assistance may play an important role in helping the United States and the U.S. private sector to secure access to and develop new sources of strategic and critical raw materials, thereby reducing the vulnerability of the United States to possible supply disruptions that may occur.

This report assesses the application of the policies and programs of the agencies of the International Development Cooperation Agency (IDCA) to the problems associated with continued U.S. access to supplies of critical raw materials, and proposes a set of recommendations for IDCA and its component agencies to consider when applying their policy goals and programs to mineral resources development and access to supply problems. IDCA is composed of the Agency for International Development (AID), the Overseas Private Investment Corporation (OPIC), and the Trade and Development Program (TDP).

This report also examines certain economic factors that affect the supply of critical raw materials; U.S. materials policy; materials and U.S. foreign policy; U.S.S.R. foreign policy concerns with respect to strategic materials; mineral resources development as a development assistance mechanism; development-related problems in the minerals sector in selected African countries; and AID, OPIC, and TDP's legislative mandate, policy instruments, and practical experience with critical raw materials.

## 2.0 POLICY CONSIDERATIONS INVOLVED IN INCREASING THE SUPPLY OF CRITICAL RAW MATERIALS

There are many factors involved in the determination of development assistance policies that accomplish the dual goals of enabling the United States to gain access to foreign supplies of critical raw materials and developing the minerals sectors and economies of developing countries. This section examines several of those factors including U.S. minerals supply vulnerability, U.S. materials policy, and materials and U.S. foreign policy.

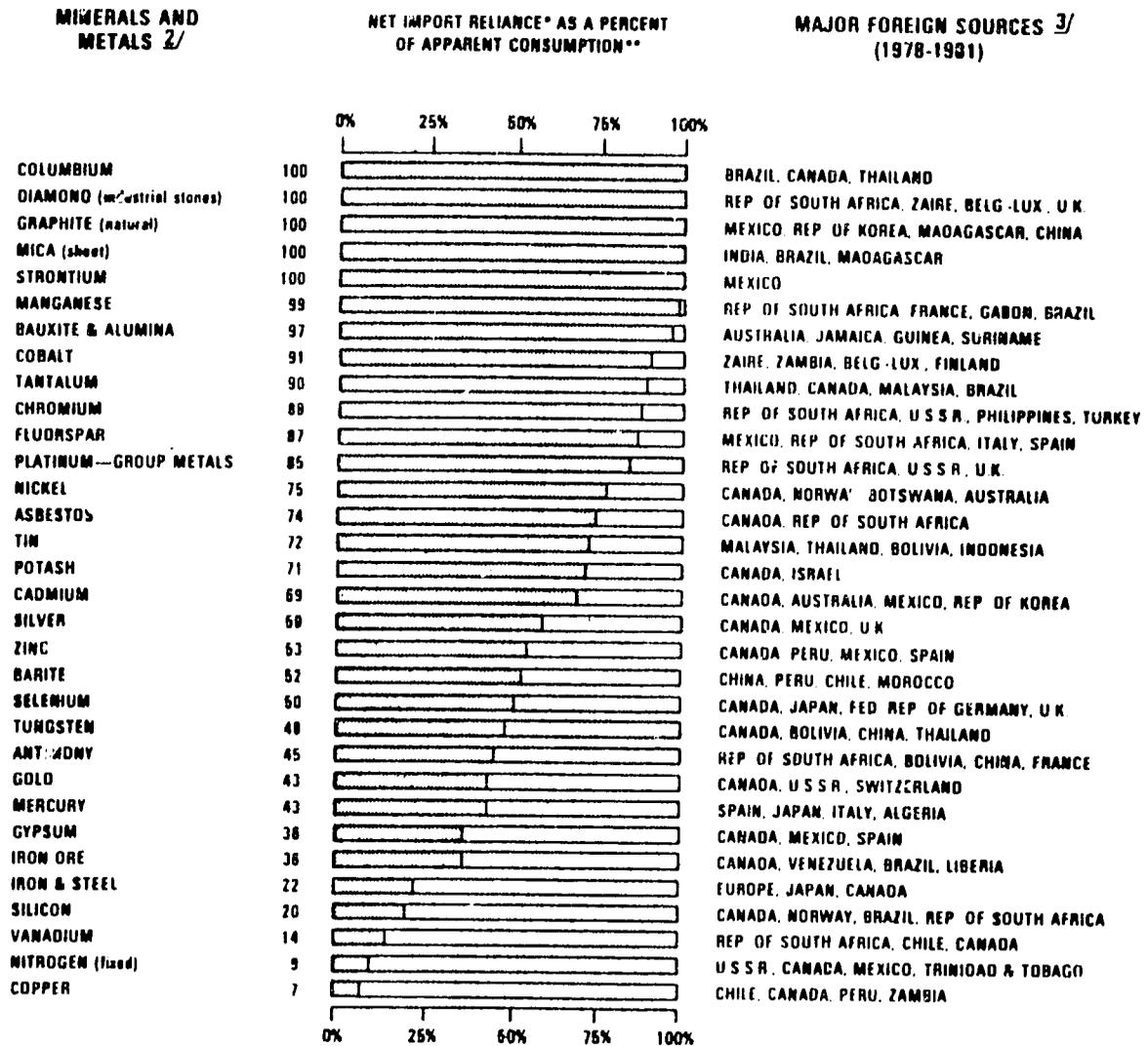
### 2.1 Critical Minerals and Supply Vulnerability

Mineral imports to the United States began to increase in the 1920s; by the 1970s, domestic minerals production was consistently below consumption. Today, the United States is dependent on certain critical imported materials for its defense, industrial, and national security needs. These minerals are also essential for achieving and maintaining economic health and stability. The problem facing the United States is that although many of these materials are imported from countries that are political allies of the United States and are economically and politically stable (such as Canada), many of the U.S.'s suppliers for the most strategic and critical minerals are too politically unstable and unreliable to assure the United States continued access to these minerals in the future (such as Zaire and Zambia). The U.S. net import reliance on selected minerals and metals as a percent of consumption in 1982, as well as the major foreign sources of these minerals and metals, is detailed in Table 1 on page 3.

As noted above, many of these imported minerals have been classified by the U.S. Government as "strategic and critical." Strategic and critical minerals are defined (according to the Strategic and Critical Materials Stock

TABLE 1

**U.S. NET IMPORT RELIANCE OF SELECTED MINERALS AND METALS AS A PERCENT OF CONSUMPTION IN 1982 <sup>1/</sup>**



\*NET IMPORT RELIANCE = IMPORTS - EXPORTS  
 +ADJUSTMENTS FOR GOVT AND INDUSTRY STOCK CHANGES.

\*\*APPARENT CONSUMPTION = U.S. PRIMARY  
 +SECONDARY PRODUCTION + NET IMPORT RELIANCE

<sup>1/</sup>JANUARY 28 1983

<sup>2/</sup>SUBSTANTIAL QUANTITIES OF TITANIUM ORES, RHEINIUM, BERYLLIUM AND ZIRCONIUM IMPORTED DATA WITHHELD TO AVOID DISCLOSING COMPANY PROPRIETARY DATA.

<sup>3/</sup>SOURCES SHOWN ARE POINTS OF SHIPMENT TO THE U.S. AND ARE NOT NECESSARILY THE INITIAL SOURCES OF THE MATERIAL.

Piling Revision Act of 1979) as those materials that (1) would be needed to supply the military, industrial, and essential civilian needs of the United States during an emergency and (2) are not found or produced in the United States in sufficient quantities to meet such needs. "Strategic" generally refers to the relative vulnerability of materials, while "critical" refers to the materials' essentiality. The factors that indicate the criticality of materials are: adequacy of production capacity and supporting domestic reserves; substitution and recycling possibilities; and degree of import dependence and wartime vulnerability.

The four minerals most often cited as critical are cobalt, chromium, manganese, and platinum-group metals. Although these minerals are used in small quantities, these applications are relatively high in unit value. In addition, there are no feasible substitutes for cobalt in certain military applications and in high-temperature, high-stress alloys; chromium in stainless steel; manganese in steel production; and platinum in petrochemical processes. These minerals are also imported from relatively insecure sources (southern Africa and Communist bloc countries) subject to supply disruptions (which increases U.S. vulnerability).

The issue of criticality raises questions about import dependence and supply vulnerability. Import dependence is based on the fact that the United States must import certain minerals because it either does not possess adequate supplies or reserves of these minerals or the domestic exploration and development costs are prohibitively expensive in times of minerals surpluses. When U.S. mining companies have a choice between producing or importing certain minerals, market price is usually the determining factor.

Supply vulnerability poses more serious concerns than import dependence for U.S. critical minerals needs, U.S. industry, and government decision-makers. Vulnerability to mineral supply disruptions is a function of many factors, including the number of alternative sources for the minerals, the availability of substitutes, the availability of domestic reserves, and the economic cost of a disruption. There are many circumstances under which the supply vulnerability of the United States could increase or become more serious. These circumstances include:

- political and economic instability in supplier countries that could lead to work stoppages, higher taxes on foreign firms, problems with repatriating profits, questions over the ownership of production facilities and techniques and technology transfer, and the possible overthrow of existing governments;

- increased control of the production and export of minerals by host governments, state-owned or -sanctioned companies or monopolies, or minerals producers cartels (similar in design to OPEC), which may lead to politically motivated disruptions;

- non-market objectives sought by producing countries under which the local managers put in charge of mining activities because of nationalization seek certain economic and social benefits for the host country, often at the expense or in lieu of traditional, profit-motivated behavior (which can result, for example, in the maintenance of high production levels during periods of depressed minerals demand);

- interruptions of minerals supplies as an intended or side effect of civil or military disturbances, terrorism, sabotage (as in Zaire in 1977 and 1978) and transportation and shipping disruptions;

- disturbances in the production of non-critical minerals (such as copper) that, in turn, would disturb the production of by-product minerals (such as cobalt);

- changes in the type of materials available from developing countries as these countries build indigenous facilities for the processing of raw materials, which will decrease the quantity of raw materials available on world markets while increasing the prices for both raw and processed materials;

- reductions in minerals exploration activity by U.S. mining companies in developing countries as a result of the policies (such as nationalization and expropriation) that were pursued by these countries in the 1970s;
- limitations on mineral production capacity expansion because of weak demand conditions during periods of reduced economic activity in the United States and other industrialized countries (such as exists today);
- competition for minerals from European Community countries, Japan, and the newly industrialized and middle-income countries, which will increase as the economies of these countries grow and will rely on the same suppliers as the United States relies upon);
- shortages of minerals supplies that cannot keep pace with occasional surges in demand to meet defense mobilization requirements;
- "Resource War" and foreign assistance policies of the U.S.S.R. (which are discussed in detail in Section 3.2);
- uncoordinated attempts to stabilize minerals markets by producers and consumers, which may lead to the adoption of conflicting, unnecessarily expensive, and protectionist measures by governments to assure supplies while disrupting free markets. (Dept. of the Interior 1979, Szuprowicz 1981, Dept. of the Interior 1983)

There are five major points raised against any of these circumstances causing long-term supply disruptions. The primary argument is the importance of the indigenous minerals sector to the economies of the producing nations and the value of the U.S. market to those countries. Secondly, many developing nations have realized that their previous goal of self-sufficiency was unreasonable and their previous policies of nationalization and expropriation were generally inefficient and unproductive. The third reason given is that total minerals supplies will increase as improved mining technology and rising minerals prices make previously uneconomical sources of materials more financially attractive. Fourth, advances in minerals substitution and ceramics technologies will cause the demand for many minerals to decrease (although, as noted earlier, adequate substitutes have yet to be developed for many critical minerals applications). Finally, the likelihood

of a successful minerals producers cartels is given little chance of success based on the general lack of long-term effectiveness of existing commodity cartels and the fact that world cobalt producers were unable to form a cartel in the wake of the cobalt supply disruptions in Zaire in 1977 and 1978.

## 2.2 U.S. Materials Policy

The U.S. Government has always recognized that it had a role in materials supply and demand situations, especially when some overriding national concern arises, such as national security or the health of the economy. Views on this role have changed as changes have occurred in population, technology, and the state of industrial and military preparedness.

The Legislative and Executive Branches have responded to the various materials crises in our history with a variety of government programs, laws, and special study or advisory committees. Among the agencies that operate programs that affect materials supply and demand are the U.S. Bureau of Mines and the U.S. Geological Survey in the Department of the Interior, the Office of Strategic Resources in the Department of Commerce, the Department of Defense, and the Federal Emergency Management Agency (FEMA). FEMA manages the National Stockpile of Strategic and Critical Materials, which was established following the materials shortages that the U.S. experienced in World War II and is considered by many to be the U.S. Government's primary tool for avoiding or mitigating the effects of materials shortages.

Many of the laws passed by Congress during the past forty-five years have impacted on materials policy, through such mechanisms as mining depletion allowances and environmental protection rules. Nine of these laws have dealt with materials policy and materials supply problems directly. These laws and

the years they were enacted are: the Strategic Materials Act (1939); Strategic and Critical Materials Stock Piling Act (1940); Reconstruction Finance Corporation Act (1940); Defense Production Act of 1950 (1950); Resource Recovery Act of 1970; Mining and Minerals Policy Act of 1970 (1970); Strategic and Critical Materials Stock Pile Revision Act of 1979 (1979); National Materials and Minerals Policy, Research and Development Act of 1980 (1980), and the Deep Seabed Hard Mineral Resources Act (1980).

Five study commissions or advisory committees to examine materials supply and shortage situations have been created by the President and the Congress. These institutions (and the date of their final reports) are the President's Materials Policy Commission (1952), the Cabinet Committee on Minerals Policy (1954), the National Commission on Materials Policy (1973), the National Commission on Supplies and Shortages (1976), and the National Nonfuel Minerals Policy Review (1979). The major themes that ran through all of these commission or committee reports were: the United States (and, in fact, no nation) could be completely self-sufficient in raw materials; non-communist nations were interdependent; and materials policy involves complex inter-relationships between materials, energy, and the environment. The four latter commissions, however, only echoed the views of the 1952 Paley Commission when it declared "the overall objective of a national materials policy for the United States should be to insure an adequate and dependable flow of materials at the lowest cost consistent with National Security and with the welfare of friendly nations."

As noted above, Congress passed the National Materials and Minerals Policy, Research and Development Act in 1980. This act declared that it is

the policy of the United States to "promote an adequate and stable supply of materials necessary to maintain national security, economic well-being and industrial production with appropriate attention to a long-term balance between resource production, energy use, a healthy environment, natural resources conservation, and social needs." This act also required the President to submit to the Congress a program plan that would describe how he intended to implement the provisions of the act. President Reagan submitted a National Materials and Minerals Program Plan and Report to the Congress in April 1982.

The program plan stated that it is the policy of the Reagan Administration to "decrease America's minerals vulnerability by taking positive actions that will promote our national security, help ensure a healthy and vigorous economy, create American jobs, and protect America's natural resources and environment." President Reagan, in his letter transmitting the program plan to Congress, said that this policy is responsive to America's needs for measures to diminish minerals vulnerability by allowing private enterprise to preserve and expand the U.S. minerals and materials economy. The program plan describes Administration actions or proposals in several areas including land availability, minerals data collection and analysis, research and development, regulatory reform, stockpile policy, and the role of the Cabinet Council on Environment and Natural Resources. (Reagan 1982)

### 2.3 Materials and U.S. Foreign Policy Concerns

It is important for the United States to have a role in certain foreign minerals development activities because of the importance of certain strategic and critical materials to national security, and the effect that a supply

disruption would have on that security position. The United States has available many policy options to reduce its dependence on critical imported materials and mitigate the effects of any disruptions that might occur from such dependence. These options include increasing the national defense stockpile, building economic stockpiles, subsidizing domestic production, encouraging exploration and production on public lands, intensifying minerals research and development, diversifying sources of supply, and utilizing foreign policy initiatives. The last two options, both long-term in nature, are directly related to U.S. foreign policy concerns and foreign assistance.

Currently, the United States receives its critical imported materials from very few sources (and often the same sources as other industrialized nations). Diversification would provide alternative suppliers and supplies during a period of disruption and lower the probability of a successful cartel's manipulating markets. It should be noted that while U.S. government policy has traditionally encouraged U.S. private sector investment in the resource industries of developing nations, that policy does not differentiate between diversification and other expansions of supplies. Foreign assistance can help support diversification by creating a climate in developing countries in which the private sector would be willing to invest in mineral development. (CBO 1983)

The international character of mineral flows makes minerals vulnerability a foreign policy issue. While foreign policy requires the setting of priorities among the many competing national interests that arise in dealing with foreign governments, materials policy and supply vulnerability issues have often been slighted in favor of other demands. However, the international

setting is more complex now than ever before, with continuously evolving relationships between materials suppliers and users, the rise of new competitors for the use of critical raw materials, and the increased global presence of the U.S.S.R. Foreign policy initiatives could be implemented through trade agreements or other steps to assure the security of minerals supplies. (CBO 1983)

Secretary of State George P. Shultz has stated that the U.S. foreign assistance program, as an essential instrument of foreign policy, should be utilized to reflect the U.S.'s national interest in free access to key raw materials. This interest is reflected in two ways: (1) critical minerals are a major component of international trade and (2) the promotion of continued availability of needed foreign minerals at reasonable prices with the involvement of the private sector.

Foreign minerals exploration and development by U.S. companies facilitates host country development and benefits the United States by assuring U.S. mining companies access to supplies of critical minerals. This linkage between U.S. bilateral assistance and supplies of strategic and critical minerals was made clear by Secretary Shultz in the April 4, 1983 Report to the Congress on the U.S. International Security and Development Cooperation Plan. He spoke of the developing world as being fundamental to U.S. security interests, the need for the United States to help these nations maintain economic and political stability, and the fact that "strategically, some of the least secure developing nations are sources of critical raw materials." (Dept. of State 1983) It should be noted, however, that the State Department believes that access to supplies of critical raw materials is only one factor

in our foreign relations, and should not be used with undue leverage in U.S. relations with supplier nations.

In the past, the Congress has been very critical of the State Department's consideration of access to supply problems as an element of foreign policy. The House of Representatives Subcommittee on Mines and Mining, in a 1980 report, took the State Department to task by saying:

"The foreign policy of the U.S. Government has failed to evidence a basic responsibility for the adequacy or cost of mineral imports. U.S. foreign policy has disregarded both its legitimate mineral interests abroad and the security of mineral access--even in the sub-area of economic policy." (House of Representatives 1980b)

The Subcommittee recommended that the State Department, while integrating U.S. economic interests in foreign policy, develop an economic strategy relative to foreign nations that gives higher priority to mineral resource aspects and utilize foreign relations as a means to manage and limit resource vulnerability. The Subcommittee also recommended that foreign policy should have as its goal reliable access for U.S. mineral investments for national economic security, and that foreign aid as an aspect of foreign policy should be directed toward this goal. (House of Representatives 1980b)

The major thrust of the latter recommendations has been adopted by the Reagan Administration, as demonstrated by Secretary Shultz's speech which referred to the integration of mineral supply problems into foreign policy and the Reagan Administration's belief that foreign assistance and foreign policy should be utilized to meet U.S. economic, national security, and political goals with respect to strategic and critical minerals. (AID, OPIC, and TDP's policies and programs are discussed in detail in Section 4.0.)

### 3.0 MINERAL RESOURCES DEVELOPMENT AS A DEVELOPMENT ASSISTANCE MECHANISM

The economy of a developing country may be dependent upon the optimal use of available mineral resources. Mineral resources have value only in the marketplace; they have no development value if they are left in the ground. Therefore, mineral resources development can be considered an effective development assistance mechanism. This section examines the developmental benefits associated with mineral resources development (including general economic, employment and training, and infrastructure development), the U.S.S.R.'s use of foreign assistance to gain access to supplies of critical materials, and development-related problems in the minerals sector in three African countries.

#### 3.1 Developing Country Benefits

##### 3.1.1 General Economic Benefits

Mineral resources are a principal economic asset in most developing countries and are often the major source of an LDC's economic growth. In fact, mining is far more significant as a basis for development planning in these countries (in which there are few other bases for industrialization) than in industrialized nations. (United Nations 1970, Gluschke et al 1980)

Mining projects have a greater impact on the economy of LDCs (especially in relation to Gross Domestic Product and export earnings) than in developed nations. This impact will vary, of course, depending on the economic situation of the country, the market structure and demand for the particular mineral, and the state of the mining process. (Gluschke et al 1980, Zorn 1980)

Mining can serve as the nucleus for economic development (as the scope and size of minerals projects are independent of the size of local markets and the

local economy) and broaden the development options facing the developing country's government and indigenous private sector. Mining can also stimulate regional development, often in remote areas.

Mining can also promote backward and forward linkages between the mining project and the rest of the developing country's economy (through requirements for local purchasing, local minerals processing, and other indirect linkages) in order to maximize value added within the country, to the extent that it is economically sound. The development of an indigenous minerals processing sector is the linkage discussed most often, as this is most viable because of the country's comparative advantage, economies of scale, and external economies. This may entail movement from ore-mining to smelting, refining, and fabricating. It may spur the evolution of indigenous private sector enterprises that could provide other services to the mining project such as financing and marketing, as well as the development of vertical markets. (Bosson and Varon 1977, Nankani 1979, Zorn 1980)

Mining also affects the host country's economic status as well. It enables the host country to receive government revenue through taxes and royalties and to earn or save foreign exchange.

Developing countries often have their own objectives relating to mineral resources development in addition to the benefits described above and in Sections 3.1.2 and 3.1.3. These countries may seek some form of ownership or control of the mining project; transfer of technology, employment and training of nationals, and diminution of the country's dependence on foreign expertise; transition of the country from a mineral-dependent economy to a highly diverse economy; and political-legal objectives, such as asserting sovereignty over

natural resources and the supremacy of their own laws for settling disputes between the government and MNCs. (Nankani 1979, Zorn 1980) Many of these countries have also demonstrated that they are willing to sacrifice some national economic growth and restrict foreign investment in minerals projects in order to assert greater control over their economic development.

It should also be noted that the governments in mineral-dependent economies have tended, in the past, to overstress the importance of the mining sector and underemphasize the other major sectors of the economy, especially agriculture, labor-intensive manufacturing, and small-scale enterprise development. Misjudgements on investments have also led to wasteful expenditures of capital and other resources.

### 3.1.2 Employment and Training Benefits

Although mining is more capital intensive than manufacturing and other industries and its contribution to national income and export earnings is greater than to job creation, it does offer to the host country certain employment benefits.

In addition to creating jobs at the mining operation (especially during the early stages of development), indirect employment is also created. This indirect employment may be reflected in infrastructure development (which is discussed below), projects that would not be developed if not for the mining project, and in remote or depressed areas.

Mining companies that operate in LDCs generally have two objectives for their training programs: to develop the skills in nationals necessary for efficient mining and mining-related activities and to accommodate the manpower policies of the host government (which usually has as its goal the maximizing

of employment of its citizenry). Many of the professional and technical skills taught to nationals in these education and training programs can be transferred to other industries (such as manufacturing or construction) that require similar skills; help to increase the general availability of skilled labor; and may also provide basic education to and increase the literacy of the population at large. (Bosson and Varon 1977, Gluschke et al 1980)

### 3.1.3 Infrastructure Development Benefits

Although mineral resource development meets the U.S.'s development objectives and provides the recipient country with the development benefits described above, the impact of mineral resources development is most pronounced in its effect on national infrastructure development. The role of infrastructure development is more central in mining than in other industries because the mining activity is often conducted in relatively isolated areas.

The development of mining areas, therefore, requires heavy investment in infrastructure facilities. The large infrastructure investments will be directed towards water and electric power supply systems, transportation facilities (railroads, highways, port facilities, and loading and unloading facilities), communication systems, and social and municipal facilities (housing, hospitals or other medical centers, and schools). Much of the infrastructure can be designed for use for non-mining applications such as a transportation system that can move agricultural goods from the farm to the market as easily as raw materials are moved from the mine site to a port, processing facility, or a market. (United Nations 1970, Bosson and Varon 1977)

Historically, the foreign mining companies that operated in developing countries bore the cost of building the infrastructure. Developing countries,

however, have assumed a larger share of infrastructure building during the past few years in order to maintain control over certain infrastructure activities (such as public utilities). (Bosson and Varon 1977)

### 3.2 U.S.S.R.'s Use of Foreign Assistance to Gain Access to Supplies of Critical Raw Materials

The U.S.S.R. has been able to increase its political allies in developing countries and increase its sources of mineral supplies through the use of a variety of political and economic assistance mechanisms. These mechanisms have enabled the U.S.S.R. to fill the vacuum in developing countries created by the withdrawal of Western mining consortia and MNCs in the 1970s and gain access to the minerals sectors and markets in developing countries. (Meyer 1980, Grichar et al 1981)

The general explanation for the U.S.S.R.'s use of economic assistance to gain access to supplies of critical minerals in selected African countries is the "Resource War" concept. This concept means that U.S. dependence on imported minerals is considered by the U.S.S.R. to be a "weak link" in the United States' strategic position and that the U.S.S.R. will exploit this weak link by limiting U.S. access to the critical minerals. (Hull 1982)

However, the U.S.S.R.'s use of foreign assistance is actually directed at the broader political and economic purposes of gaining political influence around the world and increasing integration of the COMECON countries' economies with those of the Soviet Union and developing countries. The U.S.S.R. is able to take this approach to critical minerals and foreign assistance because neither it nor the Soviet bloc countries are yet dependent on minerals imports from developing countries. Therefore, the U.S.S.R. can

try to influence events in these developing countries without becoming directly involved or taking any commercial risks.

This use of foreign assistance is primarily reflected in three ways. First, the U.S.S.R. grants economic, scientific, and technical aid for mineral development to over 90 African, Asian, and Latin American countries. U.S.S.R. aid agreements usually feature large-scale Soviet technical aid for exploration and development of new mines, with the eventual payment in the form of recovered minerals. The U.S.S.R. claims to have approximately 2,000 engineers and technicians working in tropical Africa. In Africa, this aid is reflected in exploration projects in Algeria and Malagasy: bauxite and alumina development in Egypt, Guinea, and Guinea-Bissau; phosphate development in Morocco; gold development in the Congo, Ethiopia, Ghana, and Mali; coal development in Mozambique and Nigeria; copper development in Angola; and minerals development in Algeria.

The second mechanism used by the U.S.S.R. is economic aid in the form of purchases of raw materials from non-aligned countries when Western nations threaten to impose a boycott on these countries. The U.S.S.R. purchases the products of these boycotted or soon to be boycotted countries although it may already possess sufficient supplies of the raw materials, in an effort to supplement or replace the assistance of Western nations. (Meyer 1980, Grichar et al 1981, Miller 1983b)

Finally, the U.S.S.R. manipulates the prices of its own mineral products in order to create havoc on world minerals markets, which negatively affects the mining sector in developing countries. In this manner, the U.S.S.R. will gain a firm foothold in the target market, and then raise its prices to as

high a level as possible. This technique was clearly demonstrated by the U.S.S.R.'s successful attempt to enter the U.S. chromite market in the 1960s by undercutting the price of Turkish chromite. Prices climbed again once the U.S.S.R. was secure in the U.S. market. (Grichar et al 1981)

### 3.3 Case Study: Development-related Problems in the Minerals Sector in Selected African Countries

Africa provides an example of the relationship between U.S. materials needs, U.S. foreign policy concerns, and development concerns. There is a significant potential for political instability in some of the countries in central and southern Africa which are important suppliers of raw and processed materials to the United States and its allies. The Reagan Administration's program in southern Africa is designed to support the economic development process in that region while ensuring continued Western access to key strategic minerals. For these reasons, those regions have been a focus of concern to U.S. policy for many years. (Dept. of State 1983)

The economy and minerals sectors of many African nations have declined during the past several years, after experiencing a period of steady growth and development in the 1960s and early 1970s. This decline has been caused by many factors including: the worldwide recession; the adoption of unfortunate economic and political policies that have discouraged foreign investment and subsidized inefficient indigenous industries; decreases in world minerals prices; and the burden of paying foreign debt obligations. As a result of this depressed economic situation, many resource-rich African countries face certain similar development-related problems including the absence of a strong indigenous minerals sector, skilled workers and education programs, and mining-related infrastructure.

U.S. assistance programs in Africa are designed to place emphasis on economic growth, education, and the growth of the U.S. and indigenous private sectors. The following sections discuss the status and development-related problems of the minerals sector in selected African countries (Zimbabwe, Zambia, and Zaire).

### 3.3.1 Zimbabwe

Zimbabwe is a major supplier of critical minerals to the United States, producing large quantities of chromium, as well as copper, nickel, gold, cobalt, and platinum. The diversity of Zimbabwe's minerals sector has made that country generally less vulnerable to world market price fluctuations than many of its minerals-producing neighbors. (Hull 1982)

Until the recent downturn in Zimbabwe's minerals sector, mineral production contributed approximately 6 to 8 percent of that country's Gross Domestic Product, accounted for 40 to 60 percent of export earnings, and employed 6 percent (approximately 65,000 people) of the country's total workforce. However, depressed export prices and spiralling costs in 1982 have resulted in a slowdown in mine expansion projects and a 5,000 person decrease in the number of mining industry employees. (Hull 1982, Morgan 1982, Miller 1983a)

The Government of Zimbabwe has enacted many laws important to Zimbabwean national economic development since it achieved independence in 1980, including investment, tax, and foreign exchange legislation. These laws have affected the mining industry as well. Zimbabwe encourages the development of mineral resources by private enterprise as part of its effort towards economic independence, and provides the administrative structure necessary for the registration and protection of mining rights.

It should be noted, however, that the Zimbabwean government has announced plans to nationalize certain industries in Zimbabwe. Although mining is not among these industries, the creation of a state minerals marketing agency does not auger well for free enterprise in Zimbabwe's mining sector. (Hull 1982, Morgan 1982, Miller 1983a)

The United States was the first country to provide economic assistance to Zimbabwe when it gained its independence. This assistance was in the form of balance-of-payments support, infrastructure construction, housing investment guarantees, and food aid. Later U.S. assistance was directed towards meeting Zimbabwe's short-term needs, such as improvements to the Zimbabwe rail system and training programs. (House of Representatives 1982)

Despite past U.S. economic assistance, recurring problems still face Zimbabwe's minerals sector including:

-Growth and development of the minerals sector. Zimbabwe has adopted a mineral processing policy that encourages the development of domestic mineral processing facilities for ferroalloy production. The Zimbabwean government hopes that this policy will increase the value of production and demand for indigenous labor, and reduce the demand for imports and the burden on Zimbabwe's transportation system. (Morgan 1982)

-Worker education and training. Since 1976, the outflow of skilled and professional workers has had serious effects on the productivity of the mining sector. The mining industry is in need of skilled indigenous scientists and technicians. Although the government has a mining education and training program, it seems that these programs are inadequate to meet the needs of the mining sector. (House of Representatives 1980a, Hull 1982, Morgan 1982)

-Construction of a railway infrastructure. The Zimbabwean minerals sector faces infrastructure problems with transportation bottlenecks, sabotage, and inadequate unloading facilities at railway unloading ports. Its rail system is critical for transporting critical commodity exports in land-locked Zimbabwe and making Zimbabwe less dependent on other countries to meet its transportation needs. (House of Representatives 1982, Morgan 1982)

### 3.3.2 Zaire

Zaire is one of the largest producers of critical minerals (copper and cobalt) in Africa, which it supplies to Western industrialized nations in exchange for consumer goods and the needs of its mining industry. Minerals production accounts for approximately 70 to 80 percent of Zaire's foreign exchange earnings and 35 percent of its Gross Domestic Product.

Like many other African countries, Zaire's economy was diversifying and growing strong until the early 1970's. Catapulted by dramatic increases in copper prices, the Zairian government undertook a drive to exert economic independence by enacting policies that encouraged the nationalization of foreign-owned companies; beginning the process of Zairianization, during which management of commerce and industry shifted from the foreign to the indigenous sector; and borrowing large loans from foreign commercial banks to finance an ambitious building program. (House of Representatives 1980a, Hull 1982)

However, the price of copper dropped and the impact of the drop was felt throughout the economy: national revenues dropped; Zaire devolved from being a crop exporter to a food importer; its infrastructure of roads, railways, water transport facilities, and communications deteriorated; and the country was unable to meet its debt obligations. The situation changed again in the late 1970s as the country realized that its economic program was unsuccessful: it began to de-nationalize and de-Zairianize its industries.

At that time, Zaire also had serious security problems. Katangan rebels disrupted the Shaba region of Zaire during 1977 and 1978. These disruptions affected the mining and transportation sectors and, as a result, cobalt was airlifted out of the country.

Zaire looks to its minerals sector as the centerpiece of its economic recovery plan. Investment in mining and import-substitution industries have accounted for 90 percent of total capital expenditures, accompanied by a renewed interest in repairing the physical infrastructure. (Nankani 1979)

The four major problems facing Zaire's minerals sector are the stability of Zaire's economy, the weakness of a minerals processing sector, training of mining workers and managers (a situation necessitated by the exodus of skilled expatriate mining engineers and technicians during the Katangan invasions and the mismanagement of the minerals sector during the period of nationalization and Zairianization), and the construction of new and maintenance of existing infrastructure. (Transportation systems, for example, were virtually ignored during the 1970s).

### 3.3.2 Zambia

Zambia provides copper and cobalt to the United States. The minerals sector of Zambia is the most important sector of that country's economy, contributing approximately 35 percent of Gross Domestic Product, 45 percent of revenues, and 95 percent of foreign exchange earnings. In addition, the mining industry employs 50,000 Zambians. Although the mining industry was nationalized in the early 1970s, the state-owned mining company has entered into joint ventures with foreign-owned firms. (Dean 1978, Hull 1982)

Zambia's economic development during the past 15 years was characterized by a generally unproductive economy, a lagging agricultural sector, and increasing unemployment. Fluctuating prices of copper and decreased demand for cobalt in 1983 have caused a general decline in Zambia's economy: unemployment has increased, industry faces raw material shortages, and foreign

debts have become more and more of a burden on the economy. (Nankani 1979, Miller 1983a)

Three of the problems facing Zambia's minerals sector are: the absence of an education program to train mining engineers, metallurgists and geologists (it has been reported that there are also acute shortages of manpower in science, commerce-based occupations, and in high- and middle-level agricultural jobs); the investment of mining revenues into agriculture and the mineral processing industry; and the promotion of economic stability (to meet balance-of-payments requirements). (Green et al 1979, Nankani 1979, House of Representatives 1980a)

#### 4.0 THE USE OF FOREIGN ASSISTANCE TO INCREASE THE SUPPLY OF CRITICAL RAW MATERIALS

The three components of the International Development Cooperation Agency (IDCA) are the U.S. Government agencies responsible for the U.S. foreign assistance program. These three agencies, the Agency for International Development (AID), the Overseas Private Investment Corporation (OPIC), and the Trade and Development Program (TDP), encourage U.S. firms to become active participants with host countries and indigenous private enterprises in the development of critical materials, as well as encourage developing countries to undertake or maintain natural resources development projects. These three agencies, therefore, can aid the U.S. mining industry in the identification and development of new sources of supply (and thereby diversification of sources of supply) and the maintenance of supplies from existing sources. This will contribute to the reduction of the United States' vulnerability to supply disruptions. These programs, as well as the economic development and assistance goals of the United States, are discussed below.

##### 4.1 United States Economic Development and Assistance Goals

The broad objectives of the U.S. bilateral assistance programs are to promote stability in friendly countries by assisting them to overcome their financial difficulties, and to help developing countries create the conditions for self-sustaining growth of a kind that permits the poor to participate in and to benefit from the growth process. (Holmes 1983)

The two major propositions of economic development assistance are: (1) the economic progress of developing countries is in the long-term political, security, and economic interests of the United States and (2) economic growth and development in developing countries depends fundamentally on their own

efforts and policies. The first proposition is especially relevant to the relationship between mineral resources development and the U.S. critical minerals needs. We supply foreign assistance to countries with the critical raw materials that the U.S. needs: it is a relationship of shared benefits. This proposition is also reflected in the fact that the stability and economic progress of developing countries are of great importance to the maintenance of a stable world and well-functioning economic system: maintenance of such a system is in the fundamental long-term interest of the United States.

The promotion of political and economic security is imperative if the U.S. private sector is to be encouraged to invest in mineral resources development projects and work with the indigenous private sector in developing countries. Therefore, the second proposition means that development assistance, while often of great significance to an LDC's economic growth and development, cannot substitute for the LDC's own efforts. (The role of the private sector in development is discussed in greater detail in Section 4.2.5.)

While contributing to foreign economic development, foreign assistance can also be utilized to meet our economic, national security, and political goals with respect to strategic and critical minerals.

#### 4.2 Agency for International Development

AID can affect mineral supplies through economic assistance (Development Assistance and Economic Support Fund), minerals assessments, training programs, bartering, and its private sector initiatives program. These programs, as well as AID's legislative mandate, is discussed below.

##### 4.2.1. Legislative Mandate

The Agency for International Development is the largest component of IDCA. The general policy framework within which AID operates is based upon

the principal goals set forth in the Foreign Assistance Act of 1961, as amended (hereafter referred to as the FAA):

- (1) the alleviation of the worst physical manifestations of poverty among the world's poor majority;
- (2) the promotion of conditions enabling developing countries to achieve self-sustaining growth with equitable distribution of benefits;
- (3) the encouragement of development processes in which individual civil and economic rights are respected and enhanced; and
- (4) the integration of the developing countries into an open and equitable international economic system.

Section 118 of the FAA authorizes the use of economic assistance to develop and strengthen the capacity of developing countries to protect and manage their environment and natural resources; however, this section has been interpreted as dealing only with resources such as land, vegetation, water, wildlife, and other resources upon which depend economic growth and human well-being, not development of mineral resources.

However, the Foreign Assistance Act of 1974 did amend the FAA to provide AID with specific responsibilities for "strategic raw materials." These amendments authorized the President to furnish economic assistance (as specified in the FAA) or defense articles or services (as specified in the Foreign Military Sales Act) to a recipient country "in exchange for any necessary or strategic raw material controlled by that country" (Section 663).

#### 4.2.2 Economic Assistance

AID has undertaken modest efforts to encourage developing countries to keep up their production of certain minerals. AID's bilateral assistance program is designed to promote U.S. interests in the developing world through the promotion of long-term equitable growth in the developing countries. AID

pays great attention to the policies of foreign countries because over the long term it is the foreign country's own policies which are the dominant influence in its economic growth based on its ability to attract foreign capital. The institution of government policies by these countries (such as nationalization, restriction of return on profits to the United States, and the limiting of foreign exchange when it is needed for parts and equipment) has deterred and decreased U.S. investments in foreign mining operations. Although AID does not generally deal with mining investment issues specifically, it does work hard to encourage countries to develop market economies that are open to the outside world. (McPherson 1982, Dept. of State 1983)

Two of the major financing tools that AID uses to promote broadly based, sustained economic growth in developing nations are Development Assistance and the Economic Support Fund (ESF). Development Assistance programs reflect a Congressional mandate to pursue the broadening of economic opportunity through a focus on the sectors that most directly promote equitable growth and have the greatest direct development impact. AID directs its efforts towards those sectors in which the U.S. has a comparative advantage, including energy, agriculture, population, and human resources development. (IDCA 1982, McPherson 1983)

The Economic Support Fund was established to promote economic and political stability in regions where the United States has special security interests. The influx of economic assistance can, theoretically, contribute to internal stability which, in turn, would affect the political posture of the recipient governments; in other words, ESF monies would help to secure

peace or to avert major economic or political crises. ESF aid is provided in the form of either program aid, which includes cash transfers and commodity import financing, and project aid, which consists of capital development projects and technical assistance projects. (GAO 1979) ESF resources are used to meet a variety of needs, including balance-of-payments support and financing of infrastructure and other capital projects.

ESF has been applied to African nations primarily to provide assistance to and evidence support for moderate governments in southern Africa and to support economic stabilization in the Horn of Africa. (IDCA 1982, McPherson 1983) A great deal of ESF assistance for African countries has also been used for balance-of-payments support. Many African countries, including Zaire and Zambia, borrowed extensively during the growth period of the 1960s and early 1970s; however, the worldwide recession caused commodity prices to collapse and left them without the needed foreign exchange to service their debt and purchase imports. These countries required assistance to meet their obligations.

#### 4.2.3 Minerals Assessments and Training Programs

AID has not historically considered mineral resource development as a significant AID activity, but has sponsored some minerals activities because of their importance to a country's economic development. AID has financed mineral assessments and analyses and supplied loans to developing countries for minerals training and institutional development over the past several years. The minerals projects in selected African countries financed by AID in recent years include:

-Analysis of the mining sectors of eight southern African countries. This 1978 study analyzed the mining sectors of Botswana, Lesotho, Malawi, Mozambique, Namibia, Swaziland, Zambia, and Zimbabwe in terms of their economic significance, future constraints and prospects for mineral development, social and employment impacts, and government policies towards foreign investment. The report makes country-specific recommendations on foreign assistance, the reduction of the information gap, support of specialized training, technical assistance, promotion of U.S. mineral searches, balance of payments support, and broadening OPIC's investment and loan guarantee programs. (Dean 1978)

-Review of the phosphate rock industry in North and East Africa. This 1978 study examined the production and economic benefits of the phosphate rock industry in North and East Africa. The mining industry was reported to be important to these areas because it made a substantial and vital contribution to the economy in employment and capital formation and it supplied a much-needed input to increase agricultural production. (Schreiber and Matlock 1978)

-Potential minerals projects for development in Kenya. This analysis was conducted in 1980.

-Overview of the mining sector in Zimbabwe. This 1977 study examined the historical, structural, and economic aspects of the mining industry in Rhodesia as that nation became Zimbabwe. The study noted that the change to majority rule would impact the mining sector in a variety of ways, including prices, wage costs, and employment. The possibility of nationalization was also examined in the study since the mining sector was dominated by large mining companies and foreign investment. (Black 1977)

-Expectations for growth of the minerals sector in Namibia. This 1977 study examined the economic structure and the prospects for the mining sector in Namibia. Mining accounted for 60 percent of Namibia's industrial output at the time the study was conducted so there was national concern over the rate of minerals exploitation; there were implications that limitations might be placed on new mineral extraction operations. The other two issues raised in the study were the employment policies of multinational corporations operating in Namibia (especially those of South Africa, which operated 57 of the 85 MNCs that conducted business in Namibia) and the inadequacy of Namibia's harbor to handle the shipping needs of the mining industry. (Berg et al 1977)

AID has also supported the minerals sector through training and institutional development. It has sponsored training for foreign mining geologists in the United States, and supported the establishment of institutions where geological interpretation is taught in developing countries. AID believes

that it is critical for less developed countries to have their own capacity to develop and apply new innovations in order to support broad, sustained economic growth. (McPherson 1982)

#### 4.2.4 Bartering

Barter and barter-type agreements are employed primarily by developing and centrally-planned countries in trade of both agricultural and non-agricultural products. Developing countries generally use barter agreements when they face deteriorating terms of trade for their principal export commodities, balance-of-payments deficits in order to save scarce foreign exchange, or to offset fluctuating sales. Centrally planned countries have generally use barter arrangements to counteract the problems associated with their chronic shortages of hard currencies, which Western companies usually prefer to accepting goods in partial payment for their products. (Vogt et al 1982)

The U.S. Government has also used barter arrangements in the past. Barter was used primarily as a means to facilitate trade in products that were difficult to export through normal trade channels, establish trade relations with countries which were obliged to barter (because of a shortage of convertible currency), reduce some of the dollar drain caused by U.S. Government agencies spending abroad, and acquire strategic materials.

The United States embarked upon its barter program in the 1950s. While farm surpluses were accumulating in U.S. Government-held commodity stockpiles, most of the world's less developed nations were unable to buy food. The Congress authorized the Commodity Credit Corporation of the U.S. Department of Agriculture to barter or exchange agricultural commodities for certain strategic and critical materials for which the United States domestically

produced less than it needed. CCC-owned agricultural commodities were bartered for approximately 60 different strategic materials (with a value of over \$1.2 billion) from more than 50 countries during the 1954 to 1962 period. These strategic and critical materials were then placed in a Supplemental Stockpile. The barter program was designed to alleviate the world food problem, reduce U.S. stocks of agricultural commodities, and add to our supply of strategic and critical materials. (FEMA 1982)

The program also provided developing nations with a method of receiving commodities and generating foreign exchange that they needed and other items which would not be sold on world markets. In addition, the bartered materials had the additional benefit of fostering the development of new markets while not replacing current sales. (Vogt et al 1982)

PL-480 barter arrangements for strategic materials were curtailed starting in 1963 as the focus of the Barter Program was shifted to procure foreign-produced supplies and services used in construction projects for the Department of Defense and in projects of AID. USDA suspended the Barter Program in 1973 when CCC's stockpiles of commodities were largely depleted and the supply of private sector stocks no longer justified the need for a barter program.\*

As noted in Section 4.2.1, Congress authorized the President to barter economic assistance or defense articles or service in exchange for strategic raw materials in the Foreign Assistance Act of 1974; however, neither the

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\*The U.S. Government's barter program has recently been revived as part of the Caribbean Basin Initiative after a 10-year period of inactivity. Under a Memorandum of Agreement with the Government of Jamaica, the United States exchanged surplus dairy products for bauxite with Jamaica.

President nor AID has ever used this authority.\* This section of the FAA offers the potential for AID to help supply part of the United States critical materials needs because many of the countries now receiving assistance under PL-480 or other assistance programs possess supplies of critical raw materials, while helping those countries to improve their balance-of-payments problems and debt service load.

A new impetus to barter is provided by the current state of the U.S. agricultural sector, with large public and private stocks of surplus commodities now available; the developing country debt and general economic situation, with the reduced availability of foreign assistance and multilateral bank credit to meet such problems; and the desire by the Reagan Administration to provide a greater role for the private sector in the critical materials supply cycle.\*\*

The Reagan Administration and Members of Congress have expressed renewed interest in re-instituting a barter program as an alternative to the purchase

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\*This barter authority is similar to the authority conferred on the Executive Branch by Congress in the Commodity Credit Corporation Charter Act of 1949 and PL-480 (and in 1979 in the Strategic and Critical Materials Stock Piling Act of July 30, 1979).

\*\*Although the most common method of barter for the U.S. Government had been through direct government-to-government agreements (such as in the recent Jamaican barter arrangement), the private sector can be involved in a barter program as well. One example of such an arrangement would be the barter of an agricultural commodity for a critical material. A barter arrangement involving agricultural commodities and a critical material would entail two separate contracts, the bartering company, the developing country, and the U.S. General Services Administration (GSA), which is responsible for stockpile acquisitions). The private company holding the commodity would enter into one contract with the developing country to exchange the commodity for the critical mineral, and then into a second contract with GSA to sell the mineral to the stockpile. (Patton 1983)

of strategic materials. The Interior Department, working with the State Department, began a study in 1982 to explore the impacts of a new barter program. In addition, President Reagan indicated in his April 1982 National Materials and Minerals Program Plan and Report to the Congress that the Administration will seek cases where barter can be used as a more efficient and effective mechanism than open market transactions for acquiring material for the strategic stockpile.

Senators James McClure and Chic Hecht and Representative Cooper Evans raised this issue during hearings on "The Geopolitics of Strategic and Critical Materials" in July 1983. In addition, legislation calling for a new barter program to exchange agricultural products for critical raw materials has been introduced in the House and the Senate (by Congressman Evans and Senators McClure, Hecht, John Tower, Gordon Humphrey, Steven Symms, and Don Nickles).

#### 4.2.5 Private Sector Initiatives

The role of the private sector is predominant in and the major thrust of the Reagan Administration's economic development strategy. The Reagan Administration established a Bureau for Private Enterprise (PRE) within AID to provide a better focus for the organization, implementation, and coordination of the private sector initiatives. AID has indicated its belief that foreign mineral investment by the U.S. private sector remains an effective means of managing and limiting U.S. resources vulnerability.

As this private sector initiative takes place at AID, many developing countries have come to the realization that they cannot industrialize their economies on a large scale without the cooperation of developed countries and

their associated private sectors (especially large mining companies and multi-national corporations) which have access to world markets and marketing systems, possess and control mining technologies, and can call upon the managerial and financial resources needed for development. (El-Shafie & Abdel-Rahman 1980) Many countries also seem to have realized that nationalization and expropriation policies only reduced much-needed foreign investment funds and threatened to cut the flow of essential technical assistance at a time when the worldwide economy was in a state of recession. In addition, the critical debt situation of most developing countries requires that the financing of mineral resources projects comes from developed countries or the private sector.

As a result, many developing countries are now beginning to adopt policies other than expropriation in pursuing their efforts to gain greater control over their mineral resources and to increase the benefits they derive from their productive process. Such policies include requirements that foreign investors form joint ventures with majority local ownership, restrictions on repatriation of profits, and demands for increased transfers of technology and greater local control of management.

These factors make AID's private sector initiatives program of critical importance to the minerals industry. This program is based on the theory that the developing countries that have made the greatest strides towards self-sustaining growth have been the ones that have relied to a relatively great extent on market forces in their economy. The financial, technological, and minerals and business management expertise of AID, the U.S. private sector, and other sources can be used to foster the growth of indigenous private sectors in developing countries.

The key elements of this program are to:

- (1) encourage recipient country policies that create an environment in which private enterprise can flourish;
- (2) use relatively small amounts of public sector funds to attract great amounts of private sector resources; and
- (3) use AID project activities more creatively to help support projects developed by both indigenous and U.S. private sectors. (IDCA 1983)

PRE has identified ten developing countries in which it believes that the private sector could play a greater role in economic development. Four of these ten countries are in Africa: Egypt, Ivory Coast, Kenya, and Zimbabwe.

One of the instruments that AID can utilize to spur private sector development is financial leveraging. Financial leveraging is the use of limited financial resources to attract larger amounts of internal and external capital to a country for use in specific projects developed both by indigenous and U.S. private sectors.

#### 4.3 Overseas Private Investment Corporation

OPIC offers to the mining industry programs involving political risk insurance and project financing. These minerals-related programs, as well as OPIC's legislative mandate, are discussed below.

##### 4.3.1 Legislative Mandate

The Overseas Private Investment Corporation, the second component of IDCA, was created by Congress in the Foreign Assistance Act of 1969 to mobilize and facilitate the participation of United States private capital and skills in the economic and social development of less developed countries. To achieve these goals, OPIC can provide insurance, financing, and reinsurance to U.S. companies, as well as various investment encouragement and pre-investment services, for specific development- and investment-related projects.

Specific references to nonfuel minerals operations appear in two sections of OPIC's mandate on investment insurance. Section 234(c), which provides guidelines on direct investment, states that "the aggregate amount of loans [for direct investment] to finance operations for the mining or other extraction of any deposit of ore or other nonfuel minerals may not in any fiscal year exceed \$4,000,000." Section 234(d), which deals with investment encouragement, limits OPIC's activity in this area so that expenditures "during any fiscal year on surveys to ascertain the existence, location, extent or quality of, or to determine the feasibility of undertaking operations for the extraction of nonfuel minerals may not exceed \$200,000." These two provisions were added to the FAA as part of the OPIC Amendments Act of 1978 (Public Law 95-268; 92 Stat. 214) and amended sections under the FAA that had prohibited or been more restrictive with respect to OPIC's involvement with the mining industry and nonfuel minerals.

#### 4.3.2 Minerals Initiatives

OPIC's minerals initiative, composed of political risk insurance and project financing, is regarded as one of the primary bilateral tools for encouraging investor interest in developing country mining projects. The program was developed in 1977 in response to the decline in U.S. direct foreign mining investment in developing countries and to an interagency task force report that called for changes in OPIC's policies and operations. In 1977, the U.S. mining industry was in the midst of a depressed minerals market and developing countries were taking the initiative to control more of the resource extraction industries located in their countries. The task force recommended that OPIC develop more effective programs to increase minerals

exploration and development in developing countries and spur U.S. mining investment in those countries. (GAO 1982)

OPIC's response to the task force recommendations came in the form of policy and program changes that the agency believed would enable it to better serve the mining industry's particular insurance needs and to more actively promote U.S. mining investment in developing countries. These changes included:

- (1) protection against host governments' breaches of specified contractual provisions during the exploration, development, and production phases;
- (2) providing protection against business interruptions caused by war, revolution, or insurrection in the host or adjacent countries;
- (3) offering a consistent level of coverage for a 10-year period following completion of construction; and
- (4) operating special promotional efforts to spur U.S. investor interest in minerals exploration and development opportunities in the Third World.

OPIC has steadily expanded its capacity to take on large mining and minerals projects from several years ago. OPIC examines the merits of each project and its relation to program levels on a case-by-case basis.

However, OPIC's mineral initiative has not produced the results that the interagency task force hoped because of the weak minerals markets in recent years and procedural restraints on OPIC's activities (the requirement for international arbitration of disputes). In fact, mining projects have accounted for only 1.2 to 6.8 percent of the total number of projects insured or financed by OPIC between fiscal years 1970 to 1980. (GAO 1982)

The exploration for sources of strategic minerals is important to the interests of both the U.S. and friendly developing countries. OPIC, which

recognizes the potential contributions that can be made by the private sector (both national and foreign) to the development process, asserts that it is committed to helping U.S. businesses in the strategic minerals sector overcome some of the major obstacles that hinder investment overseas. OPIC has provided assistance to numerous U.S. investors involved in strategic minerals projects in developing countries: since Fiscal Year 1978, OPIC has insured or financed 15 mining projects in nine developing countries. These projects have involved \$747 million in total U.S. investment and \$1.8 billion in total project involvement. To date, OPIC has written 119 mining contracts in 25 countries, amounting to \$3.7 billion in coverage; approximately 40 percent of the mining projects that OPIC insures or finances has involved strategic and critical minerals. (Holmes 1983, Mansbach 1983)

#### 4.3.3 Political Risk Insurance

Of the two major programs that OPIC operates in support of U.S. private investors in the strategic minerals sector, the largest program by far is insurance. The protection afforded by OPIC's insurance programs is designed to encourage American companies engaged in strategic minerals exploration and production to enter international markets by reducing some of the perceived political risks associated with such projects. The mining program offers U.S. companies highly flexible and innovative coverage for their investments in mineral exploration and development. OPIC will cover up to 90 percent of an eligible investor's initial investment plus an equal amount of retained earnings, with total exposure generally not to exceed \$150 million. The coverage protects against risks of inconvertibility, expropriation, and war/revolution/ insurrection/civil strife. In addition to the standard war

coverage, insurance may be offered to cover consequential losses due to the closing of operations because of events of war/revolution/insurrection or civil strife. The contract term for this coverage is for the exploration/construction period, plus ten years of operation. (Holmes 1983, West 1983)

In addition to the mining programs, OPIC provides ancillary financial services to mining contractors, specialized equipment lessors, and institutional lenders in mineral projects. Under OPIC's contractors' coverage, an investor can insure the risks associated with the performance of contracts between U.S. suppliers of goods and services and foreign governments or foreign companies. Letters of credit posted as bid, performance, advanced payment, and delivery guaranties may be insured against arbitrary drawings. Insurance for risks associated with performance of the underlying contract can be insured against losses resulting from currency inconvertibility, expropriation of tangible property or bank accounts, war/revolution/insurrection/civil strife, or failure to adhere to contractually specified disputes resolution mechanisms.

OPIC's leasing program can cover cross-border equipment lease transactions against losses resulting from currency inconvertibility, expropriation, or war/revolution/insurrection/civil strife. Coverage is also available for equity investments in and loans to those equipment lessors who plan to conduct their operations through the establishment of offshore leasing companies. Finally, OPIC also offers a program to address the needs of institutional lenders: OPIC insures debt investment to cover the lender against a default on a scheduled payment stream of principal and interest because of currency inconvertibility, expropriation, or war/revolution/insurrection/civil strife. (Holmes 1983)

A 1982 U.S. General Accounting Office report, Federal Encouragement Of Mining Investment In Developing Countries For Strategic And Critical Minerals Has Been Only Marginally Effective, indicated that the general \$150 million insurance limit may be inadequate to meet mining investor needs because the costs of mine developments have increased so dramatically during the past 10 years. (It is not unusual for a large mining project in 1983 to cost \$1 billion.) (GAO 1982)

#### 4.3.4 Project Financing

As a complement to its insurance programs, OPIC's finance program offers loan guaranties which provide medium-term and long-term funding support for mining ventures generally involving substantial equity and management participation by U.S. business. OPIC participation often is in the form of project financing, which is based on the economic, technical, marketing, and financial soundness of the project itself. OPIC aids the financing of large scale mining projects through the issuance of OPIC all-risk guaranties to eligible U.S. financial institutions which then furnish funds for an acceptable venture on terms approved by OPIC. The OPIC guaranty, ranging up to \$50 million, is an irrevocable commitment to the lender that principal and interest will be paid promptly by OPIC if for any reason, commercial or political, the borrower fails to pay according to the loan agreement. The finance program has committed \$343.9 million to eight investors in petroleum and strategic minerals projects in eight countries. (Holmes 1983)

OPIC also advises and assists U.S. sponsors in securing financing from these institutions because its finance program is designed to complement and supplement the lending and investment facilities of commercial banks, local,

regional, and international development banks and entities like the Export-Import Bank of the United States. (Holmes 1983)

The 1982 GAO report also questioned OPIC's loan guarantee program. GAO saw the general \$50 million per project limit and the budget ceiling of the finance program as a discouragement in minerals investment. (GAO 1982)

#### 4.4 Trade and Development Program

TDP offers trade enhancement and financing to the mining industry, primarily in the form of technical assistance and feasibility studies. These programs, as well as TDP's legislative mandate, are discussed below.

##### 4.4.1 Legislative Mandate

The Trade and Development Program is the third component of IDCA. A trade and development program was created by the International Security and Development Cooperation Act of 1981 (Public Law 97-113; 95 Stat. 1536) and formally established by a delegation of authority from IDCA in 1980. It was charged with several areas of responsibility, which included facilitating the economic development of developing countries and the sale of U.S. technology, goods, and associated services with major development projects. (McPherson 1983)

TDP's legislation also mandated a mineral resources role for the agency by authorizing the U.S. to facilitate "open and fair access to natural resources of interest to the United States." President Reagan also outlined an important role for TDP in the April 1982 materials and minerals program plan. He indicated that TDP was giving new emphasis to strategic minerals and metal-related activities in order to broaden opportunities for the U.S. private sector to participate in the development and diversification of foreign sources of supply of strategic and critical materials. (Reagan 1982)

#### 4.4.2 Trade Enhancement and Financing

TDP's efforts are directed principally at middle-income developing countries that can finance their own development through either domestic resources or international financing. TDP's efforts, therefore, complement AID's bilateral assistance programs (which focus on the poorer developing nations) while opening new business channels between the United States and middle-income countries that no longer receive AID assistance. (IDCA 1983)

TDP offers two general types of assistance. First, TDP makes available technology, technical services, and training from U.S. Government agencies on a reimbursable basis. Following these actions, TDP offers project planning services that include definitional studies, pre-feasibility studies, feasibility studies, and technology workshops. TDP reports that it evaluates its projects on the basis of development priority, export potential, funding availability, country eligibility, and access to natural resources. TDP-sponsored projects reportedly offer the potential for U.S. business to provide tens of millions of dollars in technical services and equipment during the project development cycle. (IDCA 1983)

#### 4.4.3 Minerals Activities\*

One of TDP's three major objectives is to broaden opportunities for the U.S. private sector to participate in the development and diversification of foreign sources of supply of strategic and critical materials. TDP, aware of serious shortages of critical materials vital to U.S. industries and national defense, began to develop an assistance strategy designed to satisfy both U.S.

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\*Unless noted otherwise, all information in this section is referenced from Holmes 1983, Royce 1983a, and Royce 1983b.

and developing country needs early in the Reagan Administration. After consultations with representatives of the public and private sectors and the Congress, TDP selected cobalt, chromium, manganese, and the platinum-group metals as its first phase development targets.

TDP's early efforts in critical minerals development were designed to increase the sales of U.S. technology, goods, and services to developing countries. These efforts were reflected in two major projects: (1) workshops that brought U.S. mining firms and experts into contact with Moroccan government and private sector mining enterprises and (2) reimbursable technical assistance to Peru where U.S. engineers assisted in the renovation of four ports and transport systems (to move minerals from the mines to the ports). The latter project, approved in January 1981, cost TDP over \$320,000; TDP projected that this project would result in potential U.S. exports of \$20 million.

TDP is currently involved in many mineral projects that are designed to produce short-term benefits through the sales of technical services and equipment and long-term benefits by reducing U.S. supply vulnerability (by identifying and developing new sources of strategic and critical minerals). These projects have been concentrated in nations that are political allies of the United States and are generally located in the Western Hemisphere, such as Mexico, Peru, Morocco, Colombia, and the Philippines. Such considerations are important for assuring continued access to these much-needed minerals. Some of these projects are summarized below.

-Cobalt in Morocco. TDP followed up a 1981 seminar on minerals in Morocco in early 1982 by fielding a team of experts to examine cobalt arsenide deposits in Morocco and assess the economic and legal factors affecting

future joint mineral ventures involving U.S. private sector mining firms. The team found the Moroccan Government prepared to extend depletion allowances; duty-free import of mining machinery; and a 2% incentive reduction in interest on capital borrowed in Morocco by substantial joint mining ventures. It was also willing to provide 50 percent of the cost of project-related infrastructure development. Morocco's cobalt deposit is unique because its cobalt is mined mainly for the cobalt values and not as a by-product of copper or nickel as is done elsewhere in the world (which means that development of this lode would not result in excess copper being dumped onto the world mineral market that would negatively affect U.S. copper producers).

-Cobalt in Peru. TDP investigated the cobalt potential of Peruvian iron mines in 1982. It was found that pyrite carrying more than 2,000 tons of cobalt metal had been mined, separated, and stacked yearly for nearly thirty years. Since the U.S. consumes between 6,000 and 9,000 tons of cobalt each year, TDP believes that Peru could supply a substantial portion of U.S. cobalt requirements. It should be noted, however, that among the factors yet to be determined is whether the Peruvian cobalt is of a grade that will meet U.S. defense applications.

Hierro Peru, a Peruvian Government enterprise, has expressed its preference for U.S. equipment and technology over the French and Finnish equipment which it had been offered. Therefore, TDP has set aside \$400,000 for the foreign exchange costs of a bankable feasibility study of modifying the concentration plant at San Nicolas, Peru to recover a cobalt concentrate compatible with the feed requirements of the only operational cobalt refinery in the U.S. at Port Nickel, Louisiana. If the feasibility study results are positive and financing is made available, TDP expects that more than \$50 million worth of U.S. goods and services will be exported to help modify the plant, and the U.S. cobalt supply base will be broadened effectively.

-Chromium in the Philippines. In early 1983, TDP sent a team of scientists to evaluate the potential for increasing U.S. chromite off-take from the Philippines. As much as 100 million tons of indicated and inferred reserves of chromite ore may be available for exploration and development. The Philippines encourages joint ventures for minerals development, with foreign ownership up to 40 percent. The TDP team's report, indicating several alternative chromite involvements for U.S. firms, is now being distributed to U.S. mining companies.

-Manganese in Mexico. In 1983, TDP examined the potential for U.S. involvement in manganese mining operations in Mexico. Geologists from Compania Minera Autlan, a Mexican firm, have outlined more than 28 million tons of measured economic reserves of carbonate ore, analyzing 25.7 percent manganese and 900,000 tons of battery-grade oxide ore from 1.5 billion tons of indicated and inferred economic reserves that run approximately 25 percent manganese.

A TDP report that examined a number of interesting possibilities for joint ventures was distributed to U.S. mining firms in July/August 1983. One U.S. firm is already preparing a previously conceived joint venture project which they plan to submit to Autlan and to TDP at the end of August 1983.

To inform the minerals industry of its activities, TDP sends news items on projects to industry and trade journals. Mining companies that are interested in these projects are invited to attend briefings on the projects. TDP reported that the mining industry has been very responsive to this approach.

TDP also has a wide range of future programs planned for late 1983 and 1984 that are designed to reduce U.S. minerals supply vulnerability. These include:

-Manganese. TDP will make appropriate responses to joint venture requests in Mexico following circulation of its report on Autlan's manganese deposit. TDP also plans to assist the U.S. private sector in evaluating and participating in large new Brazilian manganese finds at Carajas and elsewhere.

-Chromium. After U.S. mining groups have had time to study TDP's report on Philippine chromites, TDP will give serious consideration to resulting joint venture proposals. TDP has also been invited to send a team to assess Turkish chromites. Turkey is a traditionally public sector oriented supplier of chrome ores, but is now prepared to offer joint ventures to U.S. miners. In addition, Turkey has nearly 24,000 square kilometers of unexplored or partly explored ultra-mafics with a high potential for additional chromite discoveries. TDP is also studying reports of chromite deposits in the Sudan and southwestern Greenland to determine whether these deposits merit further investigation.

-Platinum-Group Metals. Colombia has been recovering platinum from placer deposits in river beds for several hundred years. TDP plans to attempt to locate other placers, and perhaps the origin of the platinum, utilizing NASA satellite imagery and scientists from NASA, American University, the U.S. Bureau of Mines, and the U.S. Geological Survey. Should their studies of satellite imagery, known geology, and tectonics indicate favorable target areas, a TDP team will evaluate their potential in Colombia.

-Cobalt. No additional cobalt studies are planned since the Peruvian project is about to get underway. Further work with this mineral will depend on results at Marcona and/or substantial cobalt market changes.

## 5.0 RECOMMENDATIONS

Several important conclusions, which serve as the basis for the recommendations below, may be drawn from this report. First, many developing countries have the supplies of strategic and critical minerals most needed by the United States. Second, mineral resources development can serve as an effective development assistance mechanism and as a means of developing new or maintaining current supplies of strategic and critical minerals for the United States and other Western nations. Therefore, it is a relationship of shared benefits: foreign assistance and foreign policy should be utilized to meet U.S. economic, national security, and political goals with respect to strategic and critical minerals, while meeting the development needs of selected developing countries.

IDCA's component agencies endeavor to assure and promote reliable access for U.S. minerals investment in developing countries in order to maintain existing or develop new supplies of critical raw materials. These programs rely heavily on projects and a policy dialogue that encourage economic growth and development in developing countries and utilize the private sector to the fullest extent; however, IDCA and its components have limited financial and manpower resources with which to operate its programs. Therefore, IDCA's components should continue to direct many of their resources towards those countries that need assistance that have the critical materials most needed by the United States.

There are many actions that may be taken by IDCA, AID, OPIC, and TDP in order to assure the United States an adequate supply of critical raw materials while at the same time helping developing countries to achieve their economic growth and development goals. These recommendations are detailed below.

5.1 International Development Cooperation Agency

IDCA should develop an intra-agency policy position that includes a statement of policy and program goals on critical raw materials. Two of the goals of the U.S. foreign assistance program should be to (1) secure current sources of supply of critical raw materials through the promotion of long-term equitable growth in developing countries and (2) provide opportunities to diversify current and identify new foreign sources of minerals to lessen U.S. vulnerability by encouraging countries to develop market economies that are open to foreign minerals investment. Another element of this policy position should be that continued U.S. economic assistance to a particular country is to be conditional on the continuity of U.S. access to critical raw materials in that country. Finally, this policy position should emphasize that the United States believes that the best method for assuring the development of the minerals sector in developing countries is to encourage the participation of U.S. and indigenous private sectors.

IDCA should initiate greater cooperation on minerals issues with the Cabinet Council on Environment and Natural Resources and the Department of State and Interior in order to be a participant in the critical materials policy dialogue and decisionmaking process.

5.2 Agency for International Development

AID's primary role in the minerals sector should be to help to ensure the existence of an appropriate host country environment that allows for extensive access of foreign firms to investment opportunities in developing host country mineral resources, and tries to ensure that the benefits of such investment are broad-based.

AID should encourage the promotion of economic development and political stability in developing countries in order to improve the chances for success of the mining sector. The mining sector cannot develop adequately if the economy as a whole is extremely weak, as mining is extremely capital intensive, requiring large investments.

AID should seek to ensure the optimal use of available mineral resources to assure economic development and the growth of indigenous enterprises in developing countries. In this vein, AID should encourage host countries to direct mining revenues into continuing productive investments in other sectors, such as agriculture, industry, and infrastructure. (This is one method that may also be used to mitigate the effects of economic dislocation in developing countries due to minerals development.) Careful evaluation needs to be given to the type of assistance provided to indigenous minerals processing sectors. U.S. assistance should not be provided if it can be shown that such assistance would negatively affect and have an unfair competitive advantage over the U.S minerals processing industry.

AID should work with the private sector and the host country to work out a series of development and investment guidelines that deal with the major issues involved in minerals resources development, including the level of U.S. private sector ownership, investment, or operation in mineral resource development projects and infrastructure development responsibility. While it appears that AID regional bureaus are not staffed to handle negotiations between the U.S. private sector and the host country government, AID's Private Enterprise Bureau may want to coordinate such activities with the commercial attaches in U.S. embassies.

AID should place increased emphasis on training and educational programs for mining and minerals-related activities.

AID should support mining-related infrastructure development in selected country and regional development strategies. In this vein, there may be a role for AID to play in the planning phase of minerals-oriented infrastructure to ensure that, whenever possible, the infrastructure projects serve other sectors of the economy (in addition to the minerals sector).

AID should develop a plan to implement the barter provisions of Section 663 of the Foreign Assistance Act of 1961, as amended. AID should work with the U.S. Department of Agriculture and the Federal Emergency Management Agency in the development of this plan, as these are the agencies most experienced with the bartering of commodities for strategic materials and with the Strategic and Critical Materials Stockpile's goals.

### 5.3 Overseas Private Investment Corporation

OPIC should continue to increase its insurance limits and be more flexible in providing insurance services to better meet the needs of and be more responsive to U.S. mining industry. The Congressional restrictions on OPIC financing for mining programs should be raised to better enable OPIC to meet the needs of the mining industry. Unlike the other components of IDCA, OPIC's level of involvement in minerals projects is dependent on the general state of the economy, the world market for minerals, and the health of the U.S. mining industry. However, it may be possible that the insurance and financing that OPIC offers may still be at levels too low to attract mining investors when the mining industry recovers from its economic slump. It should be noted, however, that the imprudent allocation of financial resources to the minerals

sector might come at the expense of other U.S. Government objectives embodied in OPIC's enabling legislation, such as OPIC's mandate to operate on a self-sustaining basis and with due regard to principles of prudent risk management.

#### 5.4 Trade and Development Program

TDP's minerals program should be subjected to greater Administration and Congressional oversight because of its potential contribution to U.S. economic, national security, industrial, and defense interests. Most TDP-sponsored projects are currently in the planning stage or have just begun. It is, therefore, too early to know whether these projects will produce the short-term (sales of technical services and equipment) or long-term (reducing U.S. supply vulnerability by identifying and developing new sources of strategic and critical minerals) benefits that have been promised.

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