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South Africa: Defense Strategy in an Increasingly Hostile World

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Annexes A through E

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SOUTH AFRICA: DEFENSE STRATEGY IN AN INCREASINGLY HOSTILE WORLD

ANNEXES A through E

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Annex A

Economic Strengths and Vulnerabilities

Introduction and Summary

1. This annex examines South Africa's economic strategies and capabilities to meet the threat of economic sanctions that it has faced for two decades. An important, albeit unrealistic, assumption is that non-Communist countries' compliance with sanctions would be widespread, if not complete. Anything short of this would effectively eliminate South African vulnerability.

2. To counter the threat of Western sanctions on South Africa's foreign trade, investment, and financing, Pretoria over the years has attempted to:

— Cushion the impact of potential sanctions by increasing domestic self-sufficiency.

— Reduce the threat of sanctions by encouraging Western dependence on the South African economy.

While highly successful in limiting dependence on imports, South Africa still relies to an important extent on exports of minerals for employment, output, and foreign exchange. Hence, the country could withstand an import cutoff for an extended period, but any large-scale diminution of its exports—whether initiated by the West or by South Africa in retaliation to an import or investment embargo—would hurt South Africa perhaps more than the West.

3. South Africa can supply most essential goods and services from domestic resources. Although heavily dependent on imports for machinery and some raw materials such as natural rubber and bauxite, it could in most cases make up for import losses through stockpiles, spare capacity in existing industry, and flexibility in transferring labor and capital. An import cutoff would be followed initially by a deflation in demand as Pretoria instituted rationing measures to husband vulnerable commodities; thereafter, economic growth would likely resume because of import substitution. If South Africa should also lose foreign investment and loans, its domestic financial resources would be sufficient to finance the renewal of growth.

4. Over the longer run, the economy would fare less well. The inefficiencies of short production runs would push up costs, quality would likely deteriorate, and South Africa—which tends to adapt rather than innovate—would fall further behind the West in technological development. The living standards of the white community would deteriorate, and urban blacks in particular would suffer, as few job opportunities developed and prices rose. As in Rhodesia, however, the slow erosion of living standards could go on indefinitely.

5. A cessation of South Africa's exports to the West would have a greater effect on South Africa than would an import cutoff. South Africa would suffer through sizable job and output losses. Hence, Pretoria is unlikely to initiate an across-the-board cutoff of mineral exports, except in a most extreme case. More likely, South Africa would decide to exercise leverage either by selectively embargoing exports of a few commodities that are important to the West but of limited consequence to the South African economy—such as chrome, manganese, or platinum—or by exerting pressure on neighboring black economies. Many neighboring countries depend on South Africa for transportation, trade, and employment, while South Africa itself would be relatively unaffected if it were to embargo these areas in retaliation against Western sanctions.

Strategies and Tactics

6. In the two decades during which South Africa has felt threatened by economic sanctions on the part of the West, the government has built strategic stockpiles and encouraged import substitution. It hoped thereby to increase domestic self-sufficiency to the point of being able to sustain an interruption in imports lasting from several months to more than a

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year. Pretoria also has attempted to reduce the threat of sanctions by fostering Western and Japanese reliance on the South African economy—particularly on exports of strategic minerals—and by exploiting the issue of black African economic dependence on South Africa. Besides providing protection against sanctions, import substitution and mineral development have served as major engines of economic growth.

7. Government policy toward economic self-sufficiency is probably less rational and coordinated than suggested by the publicity surrounding key programs such as oil stockpiling and coal liquefaction. Numerous councils, boards, and government offices are concerned with economic policy, and measures furthering self-sufficiency often are arrived at more or less independently rather than as part of a "master plan." Pretoria nevertheless has a long-established Contingency Planning Board staffed by government department heads. Since mid-1978, the board has met regularly with a Cabinet committee to study the problems of economic self-sufficiency, hold discussions with private sector representatives, and make recommendations. The board has conducted a thorough review of the stragetic stockpiling situation and has updated and devised new countermeasures against possible sanctions.

8. Expansion of mineral exports and encouragement of foreign economic dependence on South Africa are less obviously defensive measures than import substitution or stockpiling, because they follow a well-trodden path toward economic development and growth. Nevertheless, oft-repeated official statements expressing doubt about the West's willingness and ability to implement sanctions indicate the significance that Pretoria places on its role as a reliable supplier of minerals that are nonexistent or in short supply in the West.

Stockpiling

9. Pretoria has sunk an estimated $2 billion into building and maintaining nonmilitary strategic stockpiles. Oil stockpiling, funded through a special Strategic Oil Fund based partially on tax revenues from retail fuel sales, has accounted for 80 to 90 percent of the outlays. Roughly $100 million has been allocated by Parliament since 1970 for stockpiling strategic commodities other than oil through the National Supplies Procurement Board (NSPB) headed by the Secretary of Industries. Unknown additional amounts undoubtedly have been spent from budget categories outside the NSPB account and from unreported extrabudgetary allocations.

10. During the 1970s, South Africa stockpiled an estimated 100 million barrels of oil in abandoned coal mines in the Witbank area. At 1978 rates of consumption (320,000 barrels per day), these stockpiles, plus an additional 50 million barrels stored aboveground by refineries, would last almost 16 months.[1] Rationing, which would restrict nonessential transportation, would extend stores even longer.

11. Data on size, composition, and quality of stockpiles of individual nonoil items are unavailable. Major government-owned corporations such as the South African Post Office (which operates the telephone and telecommunications systems), the Electricity Supply Commission (ESCOM), and the South African Railways and Harbors Administration (SAR) reportedly have substantial stores. An estimate by a private South African firm puts at about one year's consumption total governmental stocks of spare parts and other items considered critical to industry and commerce. Regular nonstrategic commercial and industrial inventories add to the stockpile cushion, varying in size with the ups and downs of the business cycle.

Import Substitution

12. Even more important for long-term self-sufficiency is the government's program of import substitution, which, rather than creating a semipermanent, self-contained system, aims at keeping the damage from any import cutoff within tolerable limits. Besides the government's own large programs, private enterprise freely uses self-sufficiency as a lever to acquire public funds and protection for new ventures and for old ones that have become uncompetitive with imports. Pretoria's ready willingness to respond to this arm twisting indicates the high premium it places on achieving self-sufficiency and on maintaining living standards at the high level to which the white population is accustomed.

13. To reduce dependence on imports, the government employs a wide range of tactics, including financing, constructing, and operating key industries; setting local content requirements; and instituting tariff, quota, and licensing measures. Specifically:

— Government interests in key projects are served through the publicly owned Industrial Develop-

[1] Some reports indicate that countrywide stockpiles would last from 24 to 36 months with strict conservation and rationing.

ment Corporation or special government corporations, which control production in key sectors such as iron and steel, communications, oil, uranium, and armaments.

— Stiff local-content requirements are applied to the automobile industry, where they have been raised in four successive stages since 1962, to 66 percent by weight across the average of all makes of cars. In January 1980, these requirements for cars as well as for light commercial trucks will be further tightened. Penalties in the form of sales taxes are applied to discourage violations. Outside the automobile industry, local-content rules are less specific; they are generally expressed as goals and are aided by import protection and direct government investment.

— Import protection includes tariffs exceeding 30 percent on critical capital goods such as lathes and 20 percent on such common domestic appliances as dishwashers and vacuum cleaners. Import permits are issued selectively; for example, Pretoria will not issue permits for those grades of denim produced domestically.

14. Less directly, the government furthers self-sufficiency by attracting foreign capital, technology, and managerial skills. For instance, South Africa would have had a difficult time undertaking key self-sufficiency projects such as the SASOL II coal liquefaction plant,[2] the Koeburg nuclear power plant, and the Coalplex and Sentrachem chemical complexes without major foreign inputs. Pretoria has put controls on capital repatriation, and the 1970 National Supplies Procurement Act allows for expropriation for national security reasons. Nevertheless, profits, interest, and dividends are freely remittable, and local participation in foreign ventures is not mandatory except in banking, where foreign equity is limited to 50 percent.

Increasing Western Dependence

15. Attracting foreign capital and investment raises the West's stake in South Africa—a policy Pretoria also has pursued in the area of mineral exports to reduce the threat of sanctions. As in import substitution, the government has encouraged mineral export expansion through (a) direct public investment in the development, sale, and shipment of minerals and (b) tax relief and financial incentives such as an automatic 10-percent bonus to producers on the value-added on exports to encourage private export ventures.

Economic Strengths

16. South Africa's strategies for countering the threat of sanctions have paid off to a considerable degree. Although far from invulnerable to a potential cutoff of foreign economic relations (see table A-1), the country does have the ability to produce adequate supplies of essential goods and services from domestic resources, with stockpiles helping to fill the few gaps. Equally important, Western dependence on South African mineral exports and, to a much lesser extent, Western financial ties to South Africa give Pretoria important leverage over policy in the United States and Western Europe. Finally, Pretoria's ability to impair the economic health of neighboring black countries also serves as a deterrent to sanctions.

Production Capacity

17. South Africa could meet its basic needs in food, clothing, housing, and medical care for an indefinite period, while continuing to supply many of the prerequisites of high white living standards such as good wines and modern furniture. With some exceptions, stockpiles, spare capacity in existing industries, and flexibility in transferring labor and capital would see the economy through for three or four years. A cutoff of the critical exceptions—capital equipment, machinery, and oil—would limit or end economic growth over time.

18. South Africa is self-sufficient in most basic food production and processing, with agricultural imports accounting for only 4 percent of domestic consumption. Agriculture is widely varied, producing surpluses for export of beef, mutton, poultry, eggs, corn, wheat, sorghum, potatoes, citrus and deciduous fruit, subtropical fruits, grapes, sugar, cotton, and oilseeds. White farmers generally use modern methods, and yields and output per unit of labor compare favorably with those in countries similar in climate. About half of the fish catch is exported, and domestic fish marketing (which has been neglected) could be expanded to provide variety and protein. For many of the few products South Africa now imports in sizable quantities, plentiful substitutes of equal nutritional value exist; corn and wheat, for example, could easily replace rice losses. Of the remaining products that are

[2] Planned to be in production by 1980, SASOL II will produce an estimated 40,000 barrels a day of gasoline, diesel fuel, jet fuel, kerosene, and liquefied petroleum gas, and about 10,000 b/d of downstream products such as ethyl and other petrochemical feedstocks. This output will enable South Africa to reduce imports by about 23 percent.

Table A-1

South Africa: Imports as a Percentage of Domestic Consumption

	10 percent or less				More Than 10 Percent			
	1970	1973	1975	1978 [a]	1970	1973	1975	1978 [a]
Raw Materials								
Agriculture, forestry, and fishing	2.9	6.0	5.1	4.0				
Mining, of which:								
Gold and uranium	Negl.	Negl.	Negl.	Negl.				
Coal	Negl.	Negl.	0.6	0.5				
Other [b]	4.2					59.0	83.9	79.0
Intermediate Products								
Textiles					37.3	30.3	24.2	22.0
Leather and leather products					56.8	31.9	15.8	12.0
Wood and wood products					21.4	25.5	17.3	16.0
Industrial chemicals [c]					44.9	28.6	25.0	19.0
Iron and steel					11.9	15.3	20.8	15.0
Nonferrous metals		6.7	9.4	9.0	15.2			
Finished goods								
Processed foodstuffs	7.7	8.3	6.5	6.0				
Beverages and tobacco	8.7	3.1	5.2	5.0				
Clothing		8.3	7.3	7.0	14.8			
Footwear	8.8					10.1	10.4	11.0
Paper and paper products					24.5	23.7	19.1	18.0
Products of printing, publishing, and allied industries	7.9		10.0	10.0		23.2		
Furniture	3.8	2.8	3.4	4.0				
Plastic products		9.4	6.0	4.0	18.4			
Pharmaceuticals and cosmetics					12.8	15.4	12.7	12.0
Other chemical products					37.5	20.0	22.3	23.0
Rubber products		9.4			17.6		13.3	14.0
Metal products					13.1	10.3	14.1	14.0
Nonelectrical machinery					36.1	65.3	64.9	64.0
Electrical machinery					35.2	39.3	43.2	42.0
Motor vehicles and parts					47.4	40.5	44.0	43.0
Transport equipment					31.9	35.8	38.1	37.0
Nonmetallic mineral products	8.6	9.4		10.0			10.3	
Building and construction products	0.3	0.3	0.4	0.4				
Miscellaneous manufactures					35.1	62.6	65.4	65.0
Services								
Electricity, gas, steam, and water	0	0	0	3.0				
Domestic trade	0	0	0	0				
Transport, storage, and communication	8.0					11.3	12.3	12.0
Miscellaneous services	4.2	4.7	4.9	5.0				

[a] Estimated.

[b] Includes most refining of nonferrous metals.

[c] Includes the petroleum and coal products industry.

largely imported—coffee, cocoa, hard liquor, and natural rubber—only the loss of natural rubber would be potentially damaging, since synthetic rubber cannot substitute for natural rubber in heavy truck tires because it cannot withstand the high heat buildup over long-distance runs.

19. In the important area of basic metals, South Africa imports less than 15 percent of domestic consumption. In particular, the iron and steel industry, which is based entirely on domestic iron ore deposits, is well diversified, supplying nearly all domestic needs. (See table A-2.) In 1978, steel output totaled 7.7

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Table A-2

South Africa: Steel Products Produced Domestically

Steel Product	Producers * ISCOR	Dunswart	Highveld	USCO
Rounds	√	√	√	√
Squares	√	√	√	√
Flats	√	√	√	√
Equal angles	√	√	√	√
Unequal angles	√	√	√	√
Channels	√	—	√	√
T-bars	√	—	—	—
Universal sections	—	—	√	—
Rails	√	—	√	—
Plates	√	—	—	—
Floor plates	√	—	—	—
Sheets	√	—	—	—
Wire	√	—	—	—
Wire rod	√	—	—	√
Corrugated sheet	√	—	—	—
Window sections	√	—	—	—

* South Africa has four major steel producers: the South African Iron and Steel Corporation (ISCOR), Dunswart Iron and Steel Corporation, Highveld Steel and Vanadium Corporation, and Union Steel Corporation (USCO).

million tons, of which 1.5 million tons were exported. Only about 100,000 tons were imported, almost all high-carbon and alloy specialty steels. Although currently not producing these steels—which are used in specialty applications such as the blooms for the shafts of the turbine generators at Koeburg—South Africa probably has the technical knowledge to manufacture them, albeit at high cost and reduced quality.

20. Even in the weakest areas of basic metals—aluminum and lead—the gaps are small. Although South Africa does not currently mine bauxite, aluminum requirements are small, with annual per capita consumption of only 3.1 kilograms (as compared with 21 kilograms in the United States). In any event, aluminum most likely is heavily stockpiled, other metals are workable substitutes for most applications, and bauxite deposits in Natal are being evaluated. Lead, which is now mined in Namibia, is largely recycled from used batteries and it may soon be produced from deposits in the Northwest Cape region.

21. South Africa is also relatively invulnerable in the field of chemical production. It turns out practically all of the basic chemicals required by local industry, including synthetic rubber, synthetic fibers, and the five major polymers that form the rudiments of plastics requirements. Now being produced from coal at the country's new Coalplex plant, these polymers require less than 5 percent of total oil imports. Gaps in chemical production such as analine and rayon are well known and in some cases probably heavily stockpiled; in other cases, the domestic capacity to expand production exists but has not been utilized because of stiff competition from high-volume, higher quality overseas producers.

22. In other categories of manufactured goods, progress has perhaps been most notable in the textile industry, which has steadily increased the range of raw material and finished products fabricated at home. Long a producer of wool and cotton, South Africa now also manufactures nylon and polyester. Local industry has expanded from clothing production to a wide range of industrial applications such as belting for conveyers, carpeting, belting and woven fabrics for tires, and ropes, twines, bags, and sacks.

Technological Capabilities

23. South Africa's strengths in technology lie largely in copying and developing foreign designs to meet local conditions and—for most industries—in high standards of maintenance and operation of equipment. Key areas where South Africa is recognized among world leaders in technological development include underground mining—particularly shaft sinking, ventilation and pumping techniques, and deep mine operations—and coal liquefaction. South Africa also has developed and applied advanced techniques

and materials in the refining of minerals, including the use of superior flotation reagents and other methods developed by local chemical and engineering companies working closely with major mining concerns.

24. Recognizing its technological gaps, South Africa established the Council for Scientific and Industrial Research (CSIR) in 1945 with a broad mandate to train research and technical staff, support university and other research, and provide library and information services. Research under CSIR auspices covers most sectors of the economy, from food and nutrition to oceanography. Under sanctions, the CSIR would represent an important reservoir of knowledge and talent to help reduce costs and improve feasibility of short production runs, although major scientific breakthroughs and applications would be unlikely.

Mineral Wealth

25. As a principal source of a number of essential minerals, South Africa can exercise leverage over the West and Japan. (See figure A-1.) Whether as a result of sanctions applied to exports or of South African retaliation to import sanctions, a cutoff for several years of South African supplies—particularly of chromium, manganese, platinum group metals, and vanadium—would cause shortages on world markets, push up mineral prices sharply, and force the Free World into the use of substitutes and mineral supplies from the Soviet Union.

26. Pretoria is a major force in the world mineral supply situation, because:

- South Africa accounts for more than 50 percent of non-Communist production of platinum group metals, gold, and vanadium and 30 percent or more of chromium, manganese, and antimony.
- South Africa is the world's third largest producer of uranium, of which it is rapidly increasing output and exports.
- The country produces about half of the diamonds sold to the international producers' association (the Central Selling Organization) controlled by DeBeers Consolidated Mines, Ltd.; the association handles about 80 percent of annual world diamond sales.
- South African gold sales dominate the supply of the international gold market; output is more than double that of the USSR, the world's second-ranking producer.

27. In addition, the importance of South African ferroalloys of chrome and manganese has grown rapidly in the 1970s. Because of the cost advantages of building alloying plants near mine sites, South Africa has been able to undercut the established alloying industries of the developed nations. Of the major steel-producing countries, only Japan and West Germany produced more ferroalloys in 1976 (the latest year for which complete data are available) than in 1970. Over the same period, South African output increased by 92 percent, then jumped another 14 percent in 1977. The dependence of the industrial countries on South African alloys grew accordingly.

28. South African mineral exports are of major importance to the United States, as well as to Japan and Western Europe. Lacking commercial deposits of chromium, manganese, diamonds, and the platinum group metals, the United States must import all requirements as well as 40 percent of its vanadium and antimony needs. South Africa supplies some one-third or more of US imports of these minerals; in the case of platinum group metals it supplies three quarters of US imports. Repeal of the Byrd Amendment effectively ended US chromium imports from Rhodesia, and US dependence on South Africa for supplies of chromium ore and ferrochrome has increased to about 50 percent of needs. The United States could turn to its strategic stockpiles of minerals to cushion the impact of an embargo for a year or more, but in the longer run would find it difficult to endure a cutoff of South African supplies.

29. There are few alternatives to South African mineral exports. (See table A-3.) The USSR is almost the only other supplier for the platinum group metals and is a major producer of gold, industrial diamonds, high-grade chromium ore, manganese, and vanadium. Unlike South Africa, the USSR itself is a major consumer of these minerals and probably could increase the present level of exports only a little. Moreover, the USSR would increase prices sharply as scarcities developed just as it increased chromium ore prices following the UN embargo against Rhodesia.

30. Non-Communist sources could expand production of manganese and vanadium, although it would take years to make up the loss of South African exports. (Major manganese producers are Gabon, Brazil, Austria, India, and the United States; vanadium is produced by Finland, Norway, Chile, and the United States.) Output of chromium ore and the platinum group metals by non-Communist suppliers could sim-

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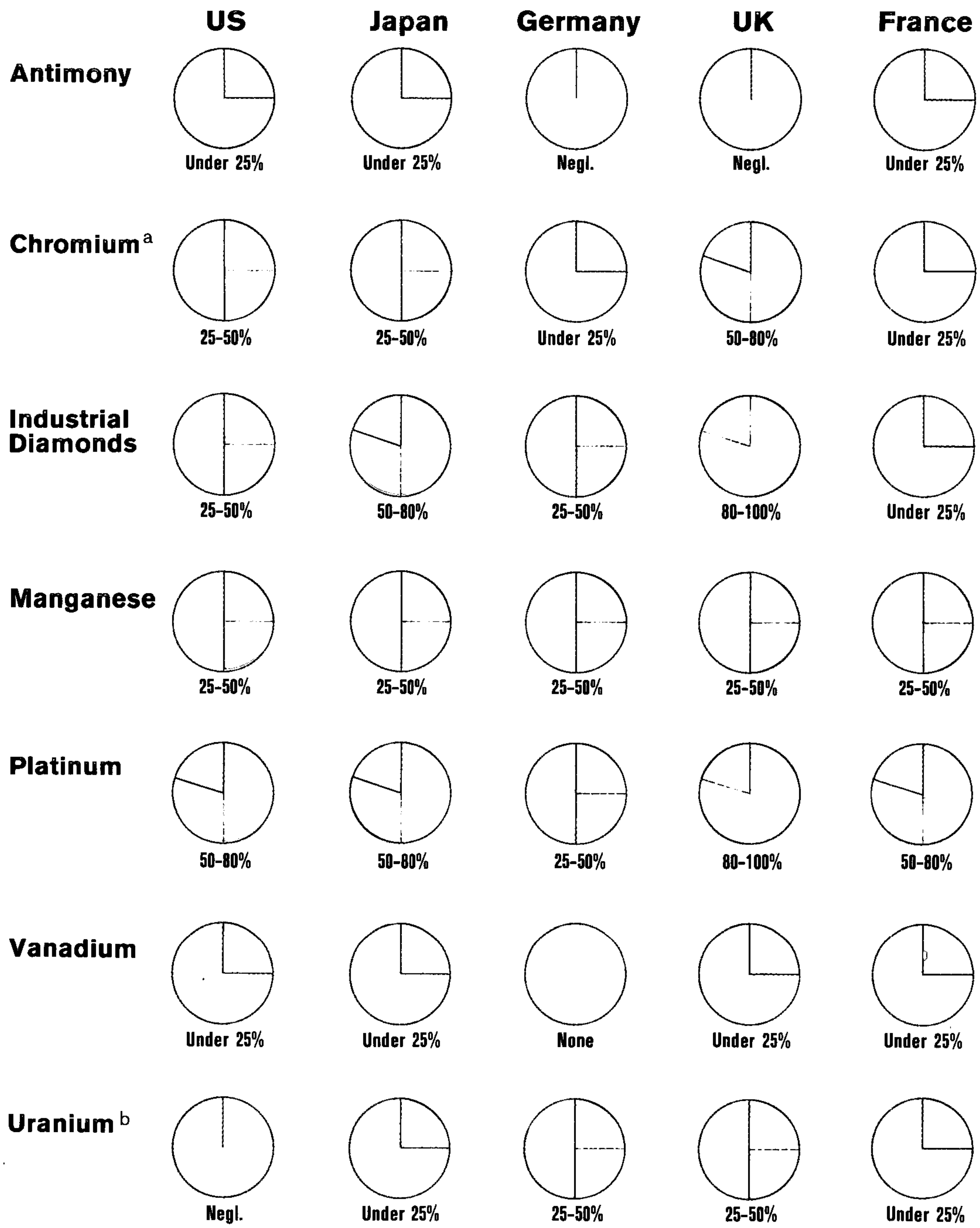
Figure A-1

South Africa:
Exports of Critical Minerals as Share of Consumption in Major Countries



a. Includes ores and metal

b. Estimated.

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Table A-3

South Africa: Importance of Principal Minerals

	1978 Output	Percentage of Free World Output	Percentage of World Output	Other Major Producers (Percentage of World Output)
Antimony (metric tons)	15,800	29	21	Bolivia (18), China (14), USSR (10)
Chrome (metric tons)	3,200,000	53	30	USSR (33), Albania (10), Rhodesia (6)
Gold (troy ounces)	22,900,000	73	56	USSR (22), Canada (4), US (2)
Industrial diamonds (carats)	4,500,000	21	15	Zaire (37), USSR (27), Ghana (7), Botswana (8)
Manganese (metric tons)	4,200,000	35	19	USSR (45), Gabon (10), Brazil (8)
Platinum group metals (troy ounces)	2,950,000	87	46	USSR (47), Canada (6)
Vanadium (metric tons)	11,250	56	39	United States (16), USSR (31)
Uranium U_3O_8 (metric tons)	4,500	13	?	United States, Canada, Niger, USSR, Namibia

ply not be increased enough to offset South African losses, even in the longer term. Non–South African uranium supplies are now adequate to meet demand, but, if world requirements grow at projected rates, South African uranium production will be essential to meet increased European demand in the 1980s.

31. The loss of South African supplies of chromium, manganese, and vanadium would have a serious impact on the steel industries of the non-Communist countries, particularly on the output of specialty and high-temperature steels used in aircraft, missile, space, and other defense-related programs. While substitutes could be used, the costs would be high and in many cases there would be a loss in performance characteristics. Moreover, increased demand would cause shortages of the substitutes, pushing up costs even more.

32. Curtailment of the platinum group metals would effectively end the US automotive catalyst program for pollution control. Requirements for the platinum metals in automobile converters will continue to be high for many years before recovery from discarded units will become an important source of supply. The loss of South African platinum will have a much smaller effect on the petroleum industry because recovery of the platinum catalyst in this area is almost total; new refinery capacity, however, would be inhibited without foreign platinum.

33. The loss of industrial diamonds would have the greatest impact on metalworking industries, machinery and transportation equipment, and construction. Although alternative producers such as Zaire could help supply Western countries, the cost would be greater. Some forms of industrial diamonds can be produced synthetically, but the wonderstone from which they are made is also imported from South Africa. In any event, the cost of diamond substitutes is high, and they are less efficient.

34. Gold from South Africa serves on international markets as a limited alternative to speculation in currencies and as an important noncommercial metal consumed in the production of jewelry and electronics and in dentistry. A sharp reduction in South African gold sales would drive up gold prices sharply. While initially such an action might cause a flurry on world money markets, gold plays a relatively small role in the international monetary system. Over time, some impact might be felt on exchange rates, reflecting differences in the share of gold in official reserves among countries.

Foreign Capital and Debt

35. South Africa could also exert limited influence over Western policy through threats of nationalization of foreign assets, blocking profit and dividend remittances, and freezing repayments of principal and interest on foreign debt. The impact of such actions on any single country would be moderate. In the case of the United Kingdom—the largest foreign investor in the country—South African assets represent 10 percent of direct foreign investments and 2 percent of foreign currency loans. The impact, of course, would be much more severe on individual companies and banks.

36. Cumulative direct foreign investment in South Africa amounted to $10 billion at the end of 1977. (See figure A-2.) British holdings accounted for more than half, including much of the investment in chemicals, textiles, motor vehicles, banking, and capital goods output. South African statistics indicated that US investment was $2 billion at yearend 1977, half of which was in manufacturing.

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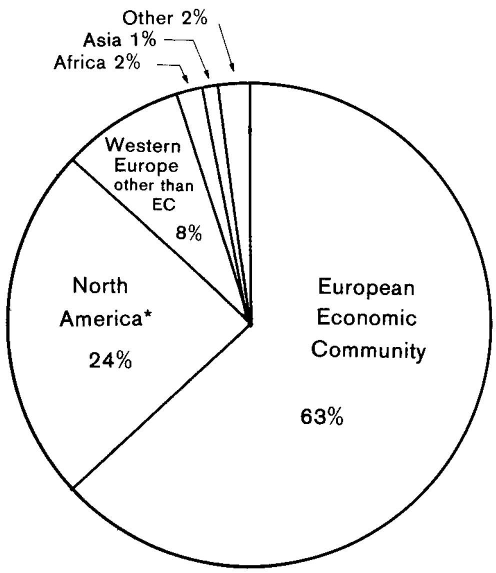
South Africa:
Direct Foreign Investment, 1977

Figure A-2

$10 billion



*About 75% from the United States.

37. South African investments have been highly profitable in recent years, often yielding up to an 18-percent return on capital. Expropriation would be a significant loss to banking and multinational firms, although the loss to any given country would be moderate.

38. South Africa is heavily indebted to foreign countries through commercial bank borrowing and portfolio investment. Liabilities to private foreign lenders and holders of portfolio investment more than doubled between 1973 and 1977, to $14.5 billion. Most has been used for funding large energy projects such as SASOL II and the Koeburg nuclear power reactors and for transportation upgrading and expansion to handle rising mineral exports. Principal lenders have been large international banks in the United States, Britain, West Germany, Switzerland, France, and the Benelux countries.

Economic Weaknesses

39. Despite South Africa's ability to meet basic requirements, loss of foreign trade, investment, and financing would appreciably reduce the living standards of the white population and would severely worsen joblessness and poverty among urban blacks. Shortages would quickly appear in supplies of consumer goods such as coffee, fuel for pleasure driving, up-to-date styling in clothing, and new automobiles. Over time, capital goods shortages would become acute. Finally, the economy in its struggle to keep up with technological progress would fall further behind.

Production Vulnerabilities

40. Despite two decades of high-priority attention and substantial progress in selected industries, South Africa's import substitution drive has not freed the economy from heavy dependence on foreign capital equipment and machinery. In some capital goods industries, imports account for an even higher share of domestic consumption today than at the start of the 1970s. In contrast to other industries, spare domestic capacity is not available for the production of most capital goods. Although facilities to produce a large variety could be constructed and put into operation over a period of three to four years, there would be a sharp reduction in quantity and quality of products, which would cost much more.

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41. Capital goods predominate in four out of five sectors in which imports account for 40 percent or more of domestic consumption. Import dependency is particularly high in the following areas:

— Nonelectrical machinery: industrial engines and turbines.

— Electrical machinery: electrical generators, motors, transformers, switching gear, and insulated wires and cables.

— Heavy transport equipment: heavy or specialized trucks for mining or defense, agricultural and construction tractors, railroad traction and rolling stock, commercial airliners, and specialized ships for container transport or defense.

— Motor vehicles and parts: major components for the assembly or repair of automobiles and commercial trucks such as engines, transmissions, and other drivetrain parts.

42. This lack of progress reflects a low level of technological innovation and the limitations imposed

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by South Africa's small domestic market. With short production runs, South African producers are denied the economies of scale enjoyed by high-volume foreign producers, forcing increased unit costs which must be offset by government subsidies or passed through in the form of higher prices. In this situation, investors are reluctant to sink money into expansion, particularly of high-cost items that are certain to be uncompetitive with overseas products.

Technological Gaps

43. Except for underground mining and coal liquefaction, there are few machines, techniques, or advanced developments that are uniquely South African. Development efforts have been focused on improving and adapting foreign processes to local conditions rather than on pure scientific research. With the exception of nuclear enrichment, no major technological breakthroughs can be ascribed to South African research and development.

44. Ironically, imported technology has been the key to several important self-sufficiency projects:

— Recent acquisitions of giant multimillion-dollar Bucyrus Erie earth shovels, Euclid 170-ton-capacity trucks and Caterpillar bulldozers (all of US origin) are critical for the operation of new open-pit mines in South Africa and for South African–controlled uranium and diamond mines in Namibia.

— West European interests such as Hoechst (West Germany), Shell (the Netherlands), and Distillers Corporation (United Kingdom) were heavily involved in the financing, design, and construction of the Sentrachem complex, which is now the only local producer of synthetic rubber, phthalic anhyride, soft detergent alkylate, high-density polyethylene, and agricultural herbicides.

— The $265 million Coalplex complex (essentially producing plastics from coal) depended almost exclusively on foreign design and construction for the two 33-megawatt furnaces that form the heart of the carbide plant (Ellson of Norway), the acetylene plant (Udhe of West Germany), the diaphragm electrolyte cells for chlorine production (Diamond Shamrock of the United States), and the vinyl chloride monomer plant (Crawford and Russel of the Netherlands).

— The $2.9 billion SASOL II coal liquefaction plant is dependent on the Fluor Corporation of the United States for contract management; on three West German firms (Deutsche Babcock, Lurgi, and Linde) for power stations, gasifiers, and product recovery facilities; on Air Liquide of France for oxygen units; and on Badger Incorporated of the United States for gas purifiers.

— The nuclear power plants at Koeburg are contracted to a consortium of French firms, including Framatome for the reactors, Framateg for project management, Alsthom for turbine generators, and Spie Batignolles for civil engineering. A US firm was appointed to monitor the quality standards of the French performance. In addition, South Africa relies almost exclusively on foreign technology for electronics. Companies such as IBM and Burroughs (United States), International Computers, Ltd. (United Kingdom), and Siemens (West Germany) market and service computers and advanced communications gear. The four small local companies making electronic components are licensed by foreign firms.

45. Overall, payments for foreign technology far outweigh domestic research and development outlays. For instance, in the finished goods manufacturing sector, payments for imported technology run some $60 million a year (half in license and royalties and half for technical services), roughly four times the amount spent on domestic research and development in the sector. In total South Africa devotes only 0.5 percent of its gross national product to R&D, as compared with up to 2.5 percent of GNP in the West, and much of this is concentrated in defense and in investment.

Manpower Vulnerabilities

46. A major impediment to reduced technological dependence on the West is the small domestic pool of qualified personnel—a limitation also found in the areas of management and skilled labor. South Africa has a good higher-level technical training system for whites, but, in proportion to its entire population, white and nonwhite, the educational system does not produce as many graduates in scientific and technical fields as most Western countries. Scientific and technical training for nonwhites remains limited, although increasing opportunities for advanced training are being opened to them as the country's skilled manpower shortage worsens. The quality of advanced scientific and technical training has been hurt by the

same apartheid policies that are present in other sectors of society. Faculties at universities and advanced technical colleges have been weakened by the emigration of faculty members who object to apartheid as well as by the difficulties apartheid imposes on efforts to hire replacements from overseas.

47. For whites, engineering courses are offered at seven of the 10 universities; nuclear science is offered at three; and mining, metallurgy, and geology at three. Because the country's economy is so heavily based on minerals extraction, mining and metallurgy curriculums are particularly strong. In addition to the scientific and technical curriculums offered at the universities, South Africa has a strong advanced technical education program for whites at other secondary institutions. There are six "colleges for advanced technical education" which are, in effect, technical universities designed to train students for supervisory or management positions. They undertake some scientific research, often in collaboration with local industries to solve specific problems. There are also 27 technical colleges and 34 technical institutes. Combined, the technical institutions train students in all scientific, technical business, and commercial fields. They work particularly closely with the big mining corporations to train their officials.

48. Advanced technical education for blacks is offered at only two colleges, in Lebowa and in Kwazulu. There are, in addition, four universities for blacks and one each for Coloreds and Asians, but they offer few advanced courses in scientific and technical fields. A new black university in Bophuthatswana does have faculties in medicine, dentistry, and veterinary medicine. Several thousand nonwhites attend the "open" white universities for engineering, medicine, and other scientific and technical fields of study, but the vast majority attend the University of South Africa, a correspondence school that is open to all races.

49. The apartheid system also reduces the available pool of domestic managers and skilled laborers, forcing South Africa to depend heavily on foreign management and training to run its economy. The low pay of top executives relative to that offered overseas creates a brain drain and adds to domestic shortages. Top pay in South African non-family-owned businesses runs from $70,000 to $90,000 a year; affiliates of multinationals pay $100,000 to $200,000, while executives in the United States and Western Europe command $500,000 a year or more.

50. Besides managers, South Africa also lacks shop foremen and firstline supervisors. In the textile sector, for instance, companies often send workers overseas for advanced technical training, only to have them hired away by foreign textile concerns. Major breakdowns of machinery often must be repaired by foreign technicians. Although textile companies have substantial training and apprenticeship programs, progress has been slow so far. One problem is that the industry has trouble attracting whites or persons of mixed blood to shop-floor positions, and blacks have not been provided with enough education to help them cope with the demands of technical and scientific training.

51. Recognizing domestic gaps, the government for more than a decade counted on 30,000 to 40,000 white immigrants annually to fill the managerial, technical, and skilled labor gap. In 1977-78, however, net migration turned negative, with the greatest losses coming from the professional ranks. South Africa also has given construction contracts on large plants requiring sophisticated management to foreign concerns, even when the technology has been well known in South Africa (as in the case of SASOL II). Finally, government contracts with foreign firms for technologically advanced plant and equipment, such as the Koeburg nuclear power plant and the Post Office's computerized telecommunications system, include requirements for training of local personnel in management and operation.

Foreign Investment and Financing

52. While foreign direct investment and lending give Pretoria leverage over the West, the foreign presence is also important for South Africa's economic growth. This is because:

- Foreign investment accounts for almost 10 percent of South Africa's capital stock and is a major determinant of output and employment. Foreign companies are prominent in almost every sector of the economy.
- Net inflows of direct foreign investment averaged $650 million a year in 1970-78, or 9 percent of South African fixed capital investment. While the ups and downs of these inflows are not closely correlated with swings in economic growth, direct investment is an important supplement to domestic financing. In addition, the retained earnings of foreign affiliates probably account for another 3 to 4 percent of domestic capital formation.
- Private international bank claims on South Africa tripled in 1975-78 to more than $8 billion; these

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inflows helped sustain a higher rate of imports than would otherwise have been possible.

Minerals as a Double-Edged Sword

53. While critically important to the West, exports of strategic minerals are essential for South African economic growth as well. Minerals and mineral products are the backbone of South African trade, accounting for more than 60 percent of export value. Mining alone accounts for 16 percent of local employment, 12 percent of national output, and the bulk of foreign exchange earnings; processing, refining, and transportation provide many jobs and considerable output.

54. The impact of an export cutoff on employment would be particularly harsh. (See figure A-3.) The 700,000 mining workers are the breadwinners of families numbering nearly 3 million persons. About 90 percent of the mining employees are black, although blacks absorb only about one-half of the wages and salaries paid in the sector. South Africa would simply not have the financial resources needed to subsidize or stockpile mineral production to maintain employment. About 450,000 black migrants from neighboring countries (principally Lesotho, Mozambique, Botswana, Swaziland, and Malawi) would also be adversely affected by a cutback in mining output.

The Bottom Line on Self-Sufficiency

55. South Africa has achieved its key self-sufficiency objective—the ability to sustain partial or complete import cutoffs for more than a year. Except for major items of capital goods and machinery, the obvious gaps in local production—oil, bauxite, natural rubber—undoubtedly could be filled from stockpiles for some time. In the short run, even the loss of capital imports would not substantially undermine economic well-being because of South Africa's ability to overhaul and repair existing equipment. In a situation that would be perceived as little short of war, loss of the numerous commodities that contribute to the high white standard of living—coffee, rice, hard liquor—would not create undue unrest.

56. While sanctions would not irreparably harm the South African economy, their initial impact would undoubtedly deflate demand. Not only would consumer and investor confidence sag, but, to stretch out stockpiles, rationing would have to be imposed on those items that are not produced locally. The contraction would probably be followed by a spurt of economic growth, which could last for several years, as domestic firms—protected from foreign competition by sanctions—moved into high-cost, low-volume production of important embargoed goods and services. Even if an import embargo were accompanied by a ban on investment and lending, plentiful funds to finance the growth surge would be available from retained earnings and other domestic sources—and possibly from the blocked profits and dividends owed to the parent companies of foreign affiliates.

57. Over the longer run, the loss of access to foreign capital equipment and machinery, technology, management, and skills would lead to a gradual erosion of living standards. The quality of life would slip for whites. Blacks on the lower end of urban industrial life would be severely hurt by insufficient job opportunities, requiring a growing program of welfare aid to maintain urban subsistence. Over time, the inefficiencies of subsidizing a mounting number of unemployed and of maintaining a high-cost industrial sector would further erode living standards.

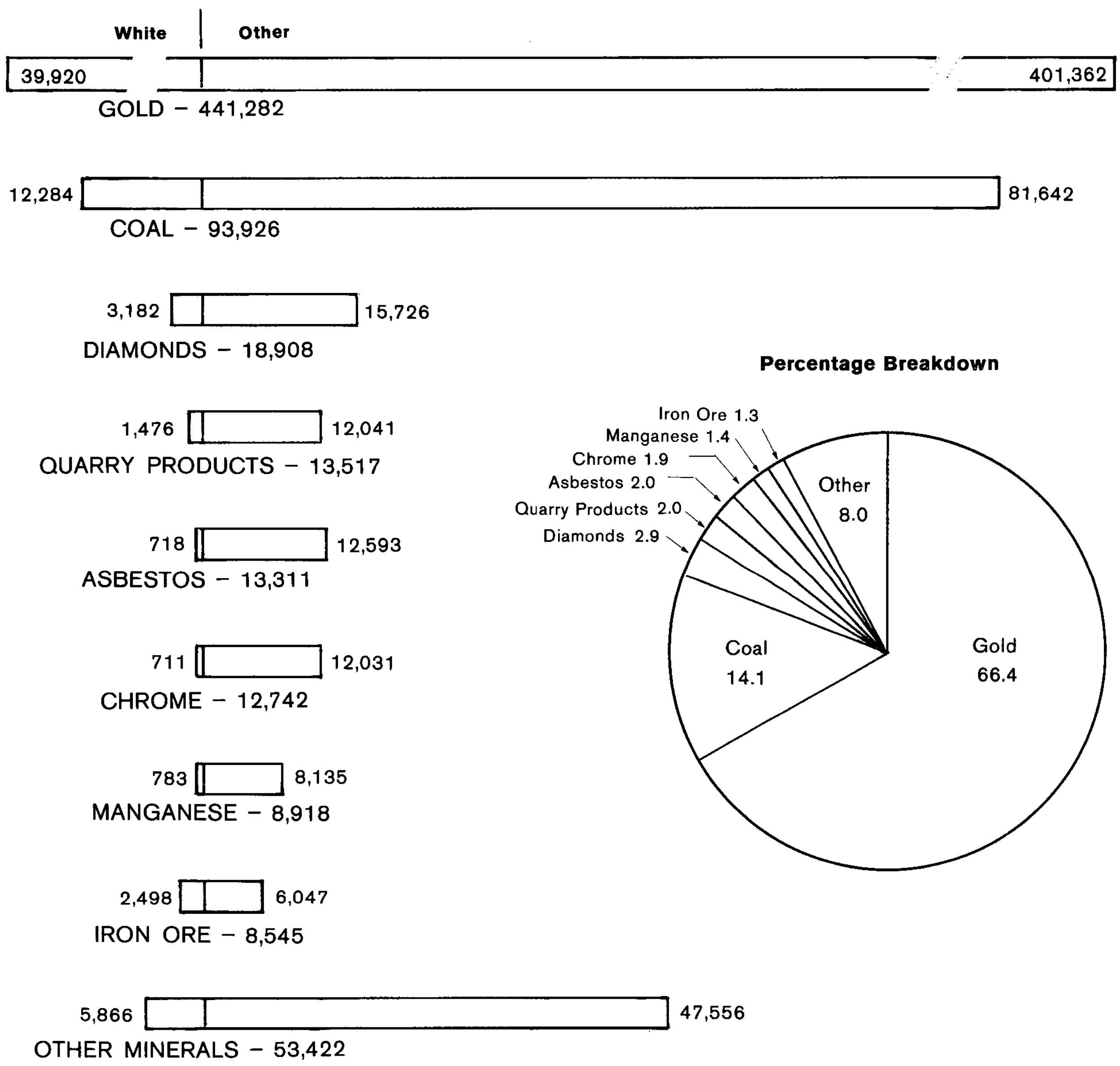
Leverage Against the West

58. Although its mineral exports give it a powerful weapon to retaliate against sanctions, South Africa would be very reluctant to use this weapon. While economies in the West and Japan would experience skyrocketing prices for key minerals, an export cutoff would lead to deep cuts in South African employment, income, and output—particularly if the cutoff involved gold, diamonds, and coal. Because the hardships that would be involved could spark civil unrest, particularly among blacks, Pretoria would have to be virtually certain of public support for a cutoff and fully confident of its ability to control dissidence before proceeding. In any event, in order to moderate the domestic impact, South Africa seems more likely to opt for a cutoff of only a few key minerals.

59. Pretoria would be less hesitant to exercise its leverage over neighboring black countries in retaliation against sanctions. The loss of transportation, trade, and labor that this would entail would seriously impair nearby economies but would have only a small impact on South Africa itself.

South Africa:
Employment in Mining, 1978*

Figure A-3



*Mining employment (664,571) is about 15% of total employment in South Africa.

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Annex B

Attitudes of Major European States Toward Sanctions on South Africa

1. The major West European governments would be extremely reluctant to impose meaningful economic sanctions on South Africa. Fear of the domestic economic impact of sanctions, as well as skepticism concerning their effectiveness in changing South African policies, keeps most governments from imposing a trade embargo or a ban on investment. The possibility that other countries would increase trade and investment at the expense of countries honoring sanctions militates strongly against their adoption.

2. ***The United Kingdom,*** with the most extensive ties to South Africa, is the most staunchly opposed to sanctions, on both political and practical grounds. In a debate on 25 May 1979 in the House of Commons, Minister of State for Trade Cecil Parkinson outlined the Conservative government's opposition to economic measures against the republic. Parkinson stated that "civil trade should be determined by commercial considerations, not by the character of the governments." He went on to say that foreign investment is needed for South African growth, which he regards as the best hope for peaceful change and a source of better economic conditions for black South Africans.

3. Because London views sanctions as a threat to the health of the British economy, the Thatcher government has said that it would not yield to pressure to impose them. Although South Africa accounts for only 2 percent of British exports and imports, the value of British direct investment in South Africa exceeds $9 billion—about 10 percent of the total UK direct investment overseas. Another $7 billion in indirect investment has also been placed in South Africa by Britons. Disruption of the economic relationship could cost the United Kingdom 70,000 to 200,000 jobs, depending on multiplier effects. The steel and other metals industries, which rely on South African ores, would be particularly hard hit by an abrupt trade cutoff.

[redacted]

4. The opposition Labor Party dislikes sanctions almost as much as the Conservative Party. While the Labor Party does not view trade with South Africa as morally neutral, it is even more sensitive than the Conservative Party about the potential loss of jobs, which would affect primarily the blue-collar workers who constitute the base of its support. When the Labor Party was in office, some ministers said publicly that the South Africans would circumvent sanctions by buying goods elsewhere, leaving Britain to pay the economic price without getting any results.

5. ***France*** is likely to drag its heels on imposing sanctions, particularly those directed against specific sectors such as air transport, food products, and oil trade. If all countries could agree, Paris would prefer broad-scope sanctions that would include removal of incentives for trade, elimination of aids to investment, and prohibition on transfers of capital. The French believe that these measures would be less discriminatory among South Africa's various trading partners. Paris would not even consider sanctions against high-technology goods like nuclear equipment unless these were part of a framework of general economic sanctions.

6. ***Italy*** probably would avoid taking an independent position, waiting for its partners in the European Community to reach a consensus. In the absence of an agreement binding the European Community, Rome would be likely to follow France's lead.

7. ***West Germany,*** like the other major West European countries, would be wary of any sanctions having real teeth. Chancellor Helmut Schmidt believes that the West Germans should be free to pursue their economic interests in South Africa unless all the Western countries agree to unified action. South Africa now accounts for 1 percent of West German

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exports and imports, and more than 300 enterprises in South Africa are German owned. Schmidt would be reluctant to hand an issue for the upcoming election to the opposition coalition of Christian Democrats and Christian Socialists; its flamboyant leader, Franz Josef Strauss, could be expected to denounce the effects of sanctions on the 20,000 ethnic Germans in Namibia and on the West German economy.

8. The reliance of black African states on South Africa for trade and transport contributes to West European reservations about sanctions. Botswana, Lesotho, Swaziland, Mozambique, Malawi, Zambia, and Zaire all have vital economic relations with South Africa. By cutting off food, fertilizer, machinery, or oil shipments to these countries, or stopping export transshipments through South African ports, Pretoria would leave these nations with little choice but to call on the West for costly rescue operations.

9. There is nonetheless a measure of ambiguity in the European attitude toward sanctions. France in particular would find it awkward to oppose sanctions explicitly, because of its large interests in West and Central Africa. Other countries may also face some domestic political pressures, especially from the left, if they appear to obstruct international sanctions against apartheid. Most public European concern, however, has indeed focused on measures consistent with continued economic ties with South Africa—for example, the European Community's code of conduct for firms operating there.

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Annex C

South Africa's Regional Policy: The "Constellation" of Southern African States

The Current Setting: South Africa's Leverage

1. South Africa's economic leverage in southern Africa varies in degree from country to country. The most dependent countries in the region are Namibia, Rhodesia, and the B-L-S states—Botswana, Lesotho, and Swaziland. Zambia, Malawi, Mozambique, and Zaire rely on South Africa in specific but crucial respects, while Angola's economy is largely independent of the republic's.

2. Namibia, also known as South-West Africa, is a former German colony that was given to South Africa by the League of Nations to administer after World War I. Over the years, South Africa's economic ties with all sectors of Namibia's economy have grown so extensively that Namibia is considered another South African province by many whites. Namibia is a member of the Southern African Customs Union (along with South Africa, Lesotho, Botswana, and Swaziland) and depends on South Africa for a wide range of imports and capital as well as for budgetary subsidies. Namibia's transport links are entirely controlled by South Africa.

3. Namibian economic data are included with South Africa's, making a clear picture of its economy difficult to draw. It is apparent, however, that Namibia has stronger economic ties with the republic than any other nation, with the exception of the "independent" and dependent homelands in South Africa itself.

4. Rhodesia's longstanding economic links with South Africa were strengthened by the imposition of UN mandatory sanctions in 1966. South Africa has acted as a commercial middleman in circumventing sanctions, supplying Rhodesia with such vital imports as oil and military hardware and providing investment capital. Rhodesia's economy has been able to function as well as it has over the past years largely because of the support from South Africa.

5. For the B-L-S states, South Africa's economic control is so extensive that these countries are often referred to as "economic hostage states." The source of 80 to 100 percent of their imports, South Africa operates the transport links on which those goods are shipped and, through the Customs Union, is the collector of 40 to 70 percent of B-L-S revenues other than foreign aid. Moreover, South Africa employs one-fourth to one-half of the labor force of the three countries in its mines, farms, and industries. A comparison of Botswana's narrow and vulnerable alternative road transportation link to the north (through Zambia) with the more extensive network oriented south, indicates heavy dependence on South Africa. Also, the republic is an important outlet for beef, which is traditionally Botswana's single most important export. (The area's major transport routes are shown on the accompanying map.)

6. The B-L-S countries also depend heavily on South Africa for investment capital for development. In Botswana and Lesotho, South Africa is the key source. In Swaziland sources of development capital are more diverse, with South Africa accounting for 27 percent of total foreign investment.

7. Economic links between B-L-S and South Africa are growing in important respects. Swaziland has just completed a 90-kilometer rail link to the South African system, enabling it to use Richards Bay port as an alternative to Maputo in Mozambique. DeBeers diamond-mining investments will be increasingly important to Lesotho and Botswana. Lesotho has agreed to study jointly with South Africa a vast project to supply electric power to Lesotho and water to the Johannesburg area.

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8. Receipts from the Customs Union—already the largest government revenue source for the B-L-S

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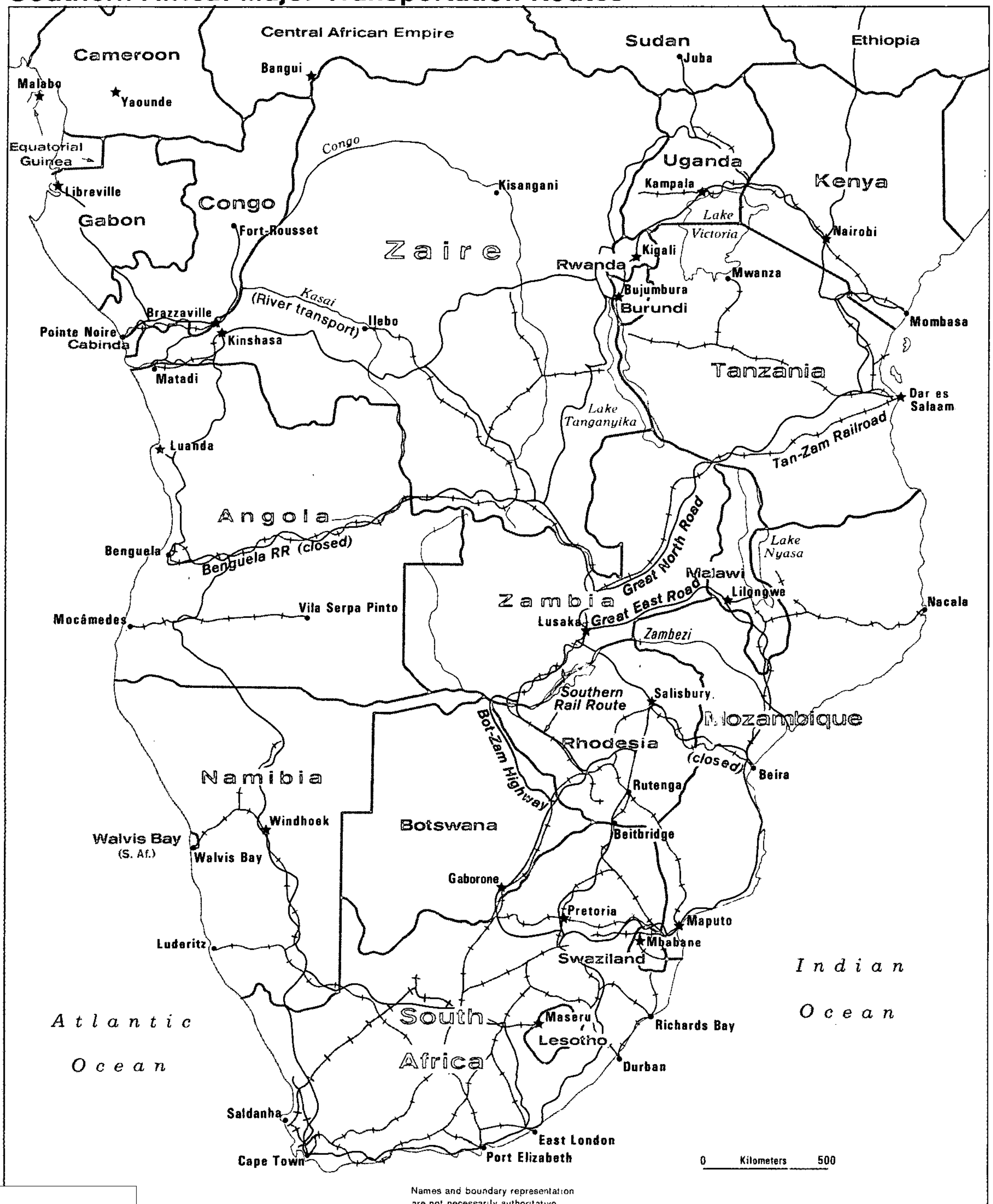
Southern Africa: Major Transportation Routes



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countries—are expected to rise in the short term. Bound by South Africa's tariff structure (designed to protect South African industry from overseas competition), the B-L-S states must pay higher prices for imports, with adverse effects on investment as well as on consumption.

9. South Africa's economic influence on its other neighbors is less than its leverage over Namibia, Rhodesia, and the B-L-S. It wields significant influence, however, on Zambia, Zaire, and Mozambique with respect to food and transport.

10. After the serious difficulties it encountered with importing much-needed fertilizers in late 1978, Zambia reopened its border with Rhodesia to allow the resumption of Zambian imports and exports on the rail line through Rhodesia and South Africa. Zaire was permitted to use the line even after the 1973 closing, and most of the copper exports from Zaire's Shaba Province exit via the "southern route." The southern route is very important for exporting minerals (copper and cobalt) from the copperbelt region of Zaire and Zambia. Of the other major transport routes, the Benguela rail line is closed because of security problems in Angola, the Tanzara (Tan-Zam) line through Tanzania is hampered by operational delays, and the route through Zaire is slow and expensive.

11. The recent food and oil crisis in southern Africa has increased the region's trade with and dependence on South Africa. Zambia and Zaire have been hard hit by a drought that is causing food shortages. Both countries need South African maize—although it is not certain how much they will be able to afford to buy—and the transport system to get the food in time.

12. Malawi—often criticized by other African countries for its tacit support of South Africa—is the only sub-Saharan state that has diplomatic relations with Pretoria. It also has strong ties with South Africa: 37 percent of total imports come from the republic; a large number of Malawians work in the South African mines; and South Africa has extended about $10 million in aid to help build the new capital at Lilongwe.

13. Mozambique has substantial economic ties with South Africa, centering on transport and employment. A part of the pay of Mozambican mineworkers in South Africa is remitted directly to the Mozambique Government in gold. This is an important source of foreign exchange for the regime, although it benefits less now than under the original agreement with South Africa, which allowed Mozambique to take advantage of the difference between international and South African gold prices. Mozambique's rail system and its major port, Maputo, are partly assisted by South African technicians. Maputo ships out much of eastern South Africa's coal, and the transit revenues are an essential source of foreign exchange. South Africa continues to draw about 10 percent of its electricity from the Mozambique Cabora Bassa dam, while selling power back to Maputo.

The "Constellation" Concept

14. The basic "constellation" concept—a loose association of southern African states centered on South Africa—dates back decades. Current thinking, however, is complicated by two somewhat different perceptions within the government in Pretoria: a "forward option" (generally backed by the military) and what might be called the "consolidation option" (generally backed by the Department of Foreign Affairs). While both strategies foresee the need for some sort of southern African regional cooperation and would rely largely on economic leverage over neighbors for effective control, there are significant differences between them.

15. The forward option envisions a formal relationship between South Africa and a buffer zone composed of friendly, black-ruled states, particularly Namibia and Rhodesia. A formal defense pact and an economic structure such as a customs union, with South Africa at their center, would provide the basis for the arrangement. The B-L-S states and the "independent homelands" would also be encouraged to join. This idea has the backing of the Chief of the South African Defense Force, General Malan, and parts of it have been supported publicly by Prime Minister Botha.

16. The consolidation option favors a less formal arrangement, and would play down military links. It would promote internationally recognized settlements of the Rhodesian and Namibian issues and would attempt to cooperate economically with whatever governments come to power. Its proponents believe this option would reduce South Africa's burdensome defense budget, improve relations with the West, and promote growth in South Africa's economy by reassuring foreign investors of the area's stability.

Economic Implications of a Regional "Constellation"

17. Exponents of the forward option envision ever-tightening economic bonds that would bring greater

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political and economic control over the area. Implementation of a formal arrangement such as a free trade area with a common external tariff is probably out of the question because of the opposition for political reasons that would arise from South Africa's neighbors. If it were to be implemented, however, there would be economic benefits as well as detriments for its non–South African neighbors.

18. Under this system, the member countries would benefit from easier access to less expensive South African products, capital, advanced technology, and larger markets. They could expect added budgetary revenues from an expansion of the Southern African Customs Union. Close economic cooperation would no doubt facilitate transport arrangements, which would especially benefit Zaire and Zambia.

19. Economic detriments, along with the political obstacles, would outweigh those benefits, however. For example, a free trade area with a high tariff barrier would encourage imports of South African products over sometimes lower cost imports from elsewhere and would stifle indigenous industrial and agricultural development in non–South African member countries. Further, those countries would lose a large degree of independence in setting tariff rates and would be forced to increase dependence on customs revenues controlled by South Africa. Finally, Western aid donors and investors would probably be officially discouraged from providing financial resources in an area formally dominated by South Africa.

20. For South Africa, a formal regional arrangement would offer many benefits with few drawbacks. Existing sub rosa trade, investment, tourism, transport, and other economic links would become publicly acknowledged and would no doubt expand. An areawide tariff structure would increase sales of South African goods and services to other members. Moreover, the supply of cheap foreign labor would be assured by a formal constellation. An uninterrupted supply of foreign labor is of major importance for South Africa's mining sector, which traditionally has not had to rely on higher cost domestic labor. Currently, about 45 percent of South African mineworkers are foreign. Of these, 21 percent come from Lesotho, 10 percent from Mozambique, 5 percent from Malawi, and most of the rest from Botswana, Rhodesia, Swaziland, and Namibia. These workers are usually less willing to make demands for improved working or living conditions than their South African counterparts.

21. Proponents of the consolidation option recommend few formal changes in the current situation other than emphasizing regional development cooperation and more open economic ties. They do not envision expansion of the Customs Union. Assuming that Namibia and Rhodesia are internationally recognized and there is not a common tariff structure, South Africa's neighbors would have more economic choices—relative to the forward option—available to them. For example, because they would have individual control over tariffs, they would be able to take advantage of the lowest cost producer. Without trade protection, South Africa would not gain a special costs advantage. Additionally, a less formal arrangement—that is, under conditions not much different from what exist today—would offer better chances of continued or even increased Western aid and investment.

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Annex D

The South African Security Forces

1. South Africa is preparing its military to meet a wide variety of threats. To improve its defensive capabilities, the South African Defense Force (SADF) has revamped its manpower policies to increase the size of the standing force and draw more on the nonwhite community. It has also reorganized the services and is building new installations. It continues to augment stockpiles of armaments, both by procurement abroad and by local production, and to build up its strategic reserves of petroleum, so that the military's ability to conduct operations will be largely unaffected by cutoffs of foreign supplies. Military leaders advocate strengthening regional ties as another way to keep enemy forces distant from South Africa, and they are working to upgrade the SADF's capabilities against both conventional and guerrilla forces.

2. ***Manpower.*** The South Africans will make progress toward achieving their goals for military manpower, but not without some dislocations. For economic and demographic reasons, South Africa has maintained only a small standing military. Although Pretoria has taken steps since the mid-1960s to increase the size of the active-duty forces, operations in Angola during its civil war and the subsequent deployments of troops to Namibia showed those forces to be too small and inadequately prepared. Those conclusions prompted South Africa to enlarge the Permanent Force (the career cadre), to increase the number of men inducted each year as National Servicemen, and to lengthen reserve duty in the Citizen Force and the Commandos. Table D-1 indicates our estimates of South African military manpower growth for the next few years. (Tables D-2 and D-3 list selected armaments and major tactical units of the SADF.)

3. The Permanent Force instructs and supports the conscripts and the reservists when they fulfill their annual refresher training obligation. In 1977, the government authorized a doubling by 1981 of the Permanent Force's share of the total Defense Force strength—at that time 7 percent. At midpoint, however, only about one-third of the desired increases have been achieved; so South Africa almost certainly will not attain its expansion goal for regular servicemen. Making a military career competitively attractive has always been problematic, causing a consistently high turnover rate, especially for men with highly valued skills, such as pilots. Those shortfalls are more evident now that the career cadre's workload is heavier, and, if unremedied, they could eventually hurt the quality of training.

4. To ensure that a larger force is readily available, South Africa revised its national service laws. As of January 1978, all white males became obligated to spend two years of initial service and then 30 days annually for eight years on reserve duty. (Previously, the requirement was for a year of active duty, 19 days

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Table D-1

South African Defense Force: Estimated Manpower Strengths, 1979-83

	1979	1981	1983
Permanent Force (regulars)	25,000-30,000	40,000	40,000-45,000
National Servicemen (conscripts)	60,000	70,000	75,000
Citizen Force (firstline reserve)	140,000	120,000	120,000
Commandos (homeguard reservists)	105,000	120,000	120,000

Table D-2

South Africa Defense Force: Estimated Inventory of Selected Armaments

ARMY	
Medium tanks	250+
Armored infantry fighting vehicles	300+
Armored reconnaissance vehicles	1,200+
Field artillery	
Towed, 100-mm and over	90
Towed, up to 100-mm	135
Self-propelled	50+
Air defense artillery	
57-mm and over	15
Up to 57-mm	250
AIR FORCE	
Light bombers	8
Jet fighters	
Supersonic	84
Subsonic	91
Maritime patrol	25
Transports	
Medium range	21
Short range	43
Helicopters	158
Fighter trainers	
Jet	159
Propeller	125
Surface-to-air missile launchers	60*
NAVY	
Submarines	3
Frigates	3
Guided-missile patrol combatants	6
Minesweepers/minehunters	6
Coastal patrol craft	8

* Operational status uncertain.

annually of reserve duty for the next four years, and then five years of "standby" reserves.) These requirements represent a compromise among the competing interests of the military, the economy, and the servicemen themselves. The military traditionally has been staffed almost exclusively by white males, even though whites make up only 17 percent of the total population. Increasing the time that servicemen must spend in uniform means a decrease in availability for work in the civilian sector; this takes on special significance when it involves professional or technically skilled personnel, who are in short supply. To complicate matters, they are usually white, and the whites' proportional representation in South Africa is shrinking because of a low birth rate and quickening emigration.

5. To keep more men in the armed forces for longer periods, Pretoria has had to make adjustments elsewhere, particularly by increasing the number of nonwhites in the military. A 1978 general staff study of the military's manpower needs recommended a nonwhite augmentation of 10,000 to 13,000 men, a substantial increase over the 2,000 or so then in the active duty force. The figure is now around 5,500 and growing. The Army has the largest number of nonwhites—some 4,000—but the Navy has the highest ratio, because over one-fifth of its personnel are Coloreds and Indians.

6. The need for nonwhites in the defense forces will continue. Although an SADF regulation issued in 1978 specifies that racial or sexual discrimination is impermissible, some apartheid practices remain in key areas. Nonwhites are paid less than their white colleagues, the career prospects for whites are considerably brighter, and segregated facilities are still the norm. The military is eliminating inequities for nonwhites to attract recruits, but those personnel may still be reminded that they are "second class" citizens in a

Table D-3

South African Defense Force: Major Tactical Units

ARMY

Permanent Force
- 2 armored battalions
- 7 infantry battalions
- 1 airborne battalion
- 2 field artillery regiments
- 1 air defense artillery regiment
- 1 mechanized infantry battalion

Citizen Force
- 1 corps headquarters
- 2 division headquarters
- 7 brigade headquarters
- 46 infantry battalions
- 2 airborne battalions
- 2 tank battalions
- 8 field artillery battalions
- 6 air defense artillery battalions

Commandos
- 260 light infantry units

AIR FORCE
- 2 fighter squadrons
- 7 fighter-bomber squadrons
- 1 light bomber squadron
- 3 transport squadrons
- 5 helicopter squadrons
- 2 reconnaissance squadrons

NAVY
- 1 submarine squadron
- 1 frigate squadron
- 1 strike craft squadron
- 1 minesweeper squadron

system they would be asked to defend. Pretoria has yet to come to terms with citizenship issues for blacks in the SADF. According to orthodox interpretations of apartheid, these people are obliged eventually to become citizens of their respective homelands. Nevertheless, the response to nonwhite recruitment has been excellent.

7. Coloreds seem to be the primary target group for recruitment efforts among the nonwhites. They already make up two-thirds of the nonwhite contingent of the SADF, and the government apparently is considering a form of the draft for them that was used before obligatory national service was instituted for whites. Under this system, all eligible Colored males would be registered for service, but actual callups would be determined by a lottery.

8. The SADF is tapping other nontraditional sources of manpower to bolster its rolls. Women have been able to join the Army since 1971, and, although they still cannot serve in the combat arms, their numbers are increasing, freeing more men for operational service. In addition, the military has decided to draw from the pool of immigrants. Under a 1978 citizenship law, 18- to 25-year-old male foreigners who declare their intent to become citizens—and thereby make themselves eligible for National Service—can gain citizenship after only half the normal five-year waiting period.

9. ***Force Restructuring.*** Revised threat assessments have affected the organization of the military, and the SADF will continue to make adjustments as conditions warrant. Restructuring has been designed to facilitate tactical employment, enhance mobilization, and improve command and control. Operations in Namibia have led to a reorganization of command structures to ensure that the forces deployed in operational areas near the border with Angola can respond quickly and effectively to the SWAPO (South-West Africa People's Organization) insurgency. Once military strategists began seriously to consider the possibility that South Africa would someday be confronted by well-equipped and well-trained enemy conventional forces, they began to develop an appropriate counterforce. That has resulted in the establishment of a tactical corps composed of two divisions—one armored and one infantry—in the Citizen Force. Plans for further changes are not known to be on the boards; the Army now seems to be set on improving the performance of these reserve units.

10. The Air Force may have recently undergone structural changes that would result in a "flattening" of the organization, in contrast to the Army's alterations. The intermediate command level between bases and Air Force headquarters was to have been jettisoned on 1 July, and base commanders were to control the units stationed at their installations. Moreover, the service is reportedly planning to group similar types of aircraft at airfields—nothing but transports at Waterkloof, for example—and is continuing to centralize the headquarters staff in Pretoria. With these revisions and the concurrent installation of advanced automated communications equipment, the Air Force hopes to develop a more flexible and responsive organization.

11. The Navy is also remodeling. Reflecting the political decision to disclaim responsibility for patrolling the cape sea route—a mission for which South Africa never had adequate resources—three subordinate command echelons with regional responsibilities were created to improve the Navy's ability to carry out its coastal patrol and counterterrorist missions. The transfer of Naval Headquarters from Cape Town to Pretoria was designed to improve coordination with the other armed services.

12. ***New Construction.*** Sizable military construction programs are still under way. Pretoria has authorized them to support larger standing forces, to improve defenses, and to permit heavier deployment in the areas of greatest threat. Now that the logistics infrastructure for operations in Namibia is well established, more funds are available for building in South Africa proper. This is enabling the armed forces to augment housing for personnel; construction of family quarters will receive special attention during the next few years.

13. Some construction is intended to enhance capabilities. The Army, for example, recently opened a Battle School at which it can stage large-scale maneuvers and sharpen its abilities to confront hostile conventional forces. Paying heed to potential enemy airstrikes, the Air Force has built at Hoedspruit in the Transvaal the first in a series of "hardened" airbases with concrete hangarettes to shield aircraft from destruction. To foil infiltration by guerrilla groups, the military has cleared some areas and planted sisal plant barriers, primarily along the northeastern frontier.

14. New construction, other than accommodations, probably will be concentrated on the northern perimeter, near Mozambique, Swaziland, and Rhodesia. A

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new Army garrison is situated in the same general area as Hoedspruit, and the majority of the planned airbases probably will be located in upper Transvaal, where the military anticipates increased enemy activity. The location of the Navy's newest facility—a forward base at Richards Bay on the Natal coast—also mirrors the SADF's assessment that deployment close to South Africa's borders is necessary for rapid deployment against threatening forces.

15. ***Prospects for South African Military Assistance to Neighboring States.*** South Africa has for more than a decade extended modest amounts of military assistance to its neighbors in an effort to maintain buffer regions against the threat it believes to be building up against the republic. Military liaison and intelligence exchange relationships existed with the Portuguese before they lost their colonial African empire. Malawi has benefited from low-key South African advisory efforts. Several Navy advisers still work with the Malawi Young Pioneers Naval Detachment. Rhodesia has depended for its survival on South African military and financial support, and has long received fluctuating amounts of arms, ammunition, training, advisory, and combat support from the South African security forces. The SADF and South African Police fight the insurgent war in northern Namibia. Botswana and Lesotho are developing their small armed forces without South African help, but Swaziland has acquired arms from the republic.

16. The "forward" regional security policy favored by the SADF perpetuates the idea of military connections and cooperation. Although SADF leaders favor establishing formal military ties with neighboring states, they probably do not envision heavy military commitments. They hope instead that with modest military assistance—training, some arms and supplies, and perhaps a minimal SADF presence—the threat to the republic's border can be reduced or at least delayed. The military also hopes that Rhodesia and Namibia will be able to establish internal security adequate to prevent any large-scale exodus of their populations into South Africa, and to prohibit the buildup of anti–South African guerrilla bases on South Africa's borders. The SADF is already occupied with the Namibian insurgency and recognizes the stress on the South African economy and manpower resources that deep involvement in another outside conflict could bring.

17. South Africa's first priority is, of course, its own military needs. The SADF is unlikely to feel that it could spare large amounts of arms and ammunition; heavy troop commitments, especially for an extended period; or sophisticated weaponry such as jet fighters. Limited quantities of materiel could be provided, however. There are shortages of specialized personnel within the Permanent Force, so South Africa would have to balance the readiness and training of its own troops against the benefits from offering advisers or technicians to neighboring countries. The SADF could, however, provide small numbers of officers, NCOs, and specialists for advisory or short-term combat missions. South Africa could also facilitate arms purchases by making available its transportation network and its considerable expertise in utilizing the international arms market.

18. South Africa would conduct rescue and evacuation operations in Rhodesia if it were called upon to do so. An involvement of this nature might engage one or two brigades for several weeks. Beyond this level, military assistance to Rhodesia would depend heavily on the kind of government that evolves in Salisbury.

19. Overtures of military assistance to the tiny states near South Africa will be for modest and virtually symbolic amounts of aid. Swaziland might accept some aid, but Lesotho and Botswana, which avoid military connections with Pretoria, would not. As long as President Banda continues in office, Malawi will probably maintain its assistance agreement with South Africa, but neither state is likely to seek a wider version of that arrangement. Pretoria will continue to provide token levels of security assistance to these "independent" homelands where it is welcome.

20. ***South Africa's Capabilities for Conducting Military Operations Beyond Its Borders.*** Small-scale retaliatory or preemptive strikes are the most likely kinds of operations that South Africa would conduct beyond its borders; its capabilities for larger scale operations are much more limited. The SADF goal is to keep opposing forces off balance before assaults can be launched. It has the capability to mount quick cross-border strikes into any neighboring territory. Ground forces and specialized units such as armor, airborne, and reconnaissance commandos are well trained and experienced. The Air Force would perform well in supporting deployed forces with tactical airstrikes, delivery of paratroops or commandos, strategic bombing, or intelligence gathering. Air-to-ground coordination needs improvement but the Air Force's pilots excel in individual skills. While South Africa's advanced jet fighter inventory is limited

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by spare parts shortages and constraints on acquiring replacement aircraft, numerous second-line aircraft equipped for counterinsurgency or ground attack roles are available.

21. While the Navy to date has had no important role in cross-border operations and could not move large numbers of troops for operations into neighboring countries, it is capable of mounting intelligence-gathering operations, inserting small reconnaissance commando units into southern Angola and Mozambique for intelligence and sabotage purposes, and providing limited offshore fire support. It could probably carry out some minelaying operations. Moreover, in support of SADF operations beyond the republic's borders, it could to a very limited degree harass shipping in the Mozambique Channel, off the Cape of Good Hope, or off the Angolan coast.

22. Even in the case of small-scale strikes, the defense forces must take into consideration certain constraints. The Air Force has a limited lift capability; virtually the entire inventory of medium transport aircraft would be required to move the Army's parachute brigade. Under present circumstances, range limitations are most pertinent to planning for heliborne and ground force operations, although the loss of bases in Namibia would inhibit the use of other aircraft. Small holdings of certain types of aircraft—notably the long-range light bombers and the transport helicopters—will prompt defense planners to employ those resources judiciously, particularly in areas where the risk of loss is high. Finally, support considerations, including a reportedly weak aerial resupply capability, are likely to affect the duration and location of operations.

23. Large-scale—multibrigade—operations in neighboring countries would pose serious difficulties for the South African military. Commitments elsewhere would impose a major constraint. If South Africa were required to maintain some 10,000 to 15,000 troops in Namibia, with air support and current logistic demands, it would be hard pressed to mount a multibrigade deployment into another neighboring country. A brigade-size movement of short duration would be more feasible, however, if lines of communication were not too long and internal security problems were not severe or widespread.

24. The Air Force's ability to provide logistic support to the Army, while adequate for present needs, could be easily taxed by the demands of supporting a large unit deployed any distance from South Africa. The Air Force has 21 medium-range transports (seven C-130s, nine C-160s, five C-54s) and 43 C-47 short-range transports (plus nine VIP aircraft of other types)—all of which are currently worked hard and full-time as it is. Maintenance is good, but spare-part acquisition is problematic and normal wear may gradually degrade the fleet in the future. It would be possible, however, for the South African Government to compel Safair—a partially government-owned company with 16 L-100s—to take on more internal logistic flights, relieving Air Force transports for duty supporting troops abroad.

25. Levels of stockpiles would also determine the size of an effort abroad. Little is known about present SADF stockpiles. While they are adequate for prolonged low-level border defense or short-duration conventional defense, the SADF would probably be hard pressed to support a long-duration conventional military effort. The SADF, despite its self-sufficiency claims, is girding for increased security problems in years to come and expects supplies to be a problem. It therefore applies conservation policies that limit its willingness to engage in heavy combat abroad.

26. Popular attitudes toward the effort would also have to be carefully considered. Some discontent occasionally surfaces from the low but continuing death rate on the Namibian border. A heavy death toll, especially if not in direct support of South Africa's own defense, would drain the white public's support as well as the available manpower pool. Moreover, because the SADF is primarily a reserve force, the military must carefully balance the number of reserves on duty at any one time, lest long or heavy reserve callups strain the South African economy.

27. In any military operations beyond its own borders, South Africa would weigh the risk of provoking the involvement of an outside power, particularly Cuba or the Soviet Union. The South Africans have little fear of black African military capabilities, but a military encounter with Soviet-backed Cubans or the Soviets themselves would press the republic severely.

28. ***Counterguerrilla Capabilities.*** With good reason, the South African Government believes that the security forces can handle any insurgent threat that is likely to develop against the republic for the next several years. The SWAPO insurgency in Namibia is being contained, and the SADF can maintain control as long as it can exert continuous pressure on the guerrillas through counterinsurgency operations in northern Namibia and strikes against SWAPO bases in

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Angola and Zambia. Other guerrilla organizations, although becoming more active, pose a threat considerably less significant than SWAPO's, and the security forces are unlikely to experience difficulty in countering them.

29. ***Police and Intelligence Capabilities.*** South Africa views its police force as one of the most efficient in the world. Although the primary mission of the police is internal security, they are also capable of providing a ready force for deployment against insurgent forces, patrolling hostile borders, and conducting counterguerrilla activity. The South African Police (SAP) are capable of dealing with almost all internal security problems. In the case of large-scale disorders, however, they would depend on support from the military forces. South African confidence in its internal security forces was demonstrated recently by publication of an amendment to the Police Act which authorizes the use of the SAP outside the republic's borders in the event of war or other emergency. Moreover, several SAP companies are currently serving in the border operational area of Namibia.

30. The SAP has an authorized strength of 36,920. Despite reports of an abundance of applicants to join the force, its strength is below the authorization at about 35,000. Almost half this number is nonwhite. Additionally, there is a reserve pool of some 22,000.

31. The SAP is well trained. In addition to preparing for crime prevention, maintaining law and order, and performing investigative work, all South African policemen are trained in basic infantry tactics and are qualified to use the R-1 rifle, the standard weapon of the South African infantryman. There are also schools that train police in counterinsurgency tactics up to the level of a company-size unit. About 3,000 members of SAP, including some nonwhites, are specially trained for a military role.

32. The police are equipped with modern small arms, more than 4,000 motor vehicles, light armored vehicles, 80 Saracen armored personnel carriers, Alouette helicopters (borrowed from the Defense Force), and a number of light utility aircraft. Mobile companies are equipped as light infantry and are capable of operating in rural areas.

33. The police force is not, however, without its problems. A Division of Public Relations was established earlier this year to improve the police image, which has been tarnished by the handling of detainees. In an effort to overcome its reputation as an undereducated force and to improve a lagging morale, the SAP is now basing promotions in part on educational qualifications and merit, moving away from seniority criteria. All SAP applicants now must be high school graduates. There is also more stress on ability to speak English as well as Afrikaans, the language of most whites in the police force.

34. The government's policy promotes policing of each racial group, as far as possible, by its own people. This policy is reflected in the SAP training program, which has separate facilities for whites, blacks, Coloreds, and Indians. After graduation, new constables are usually assigned back to the area from which they were recruited. Although assignment of police officers by racial group creates opportunities for participation in sabotage or other forms of sympathy for radical groups, there have been no indications of loyalty problems. Economic constraints, professionalism, and perhaps the fear of retribution militate against disloyalty. There would probably have to be severe nationwide unrest to cause a widespread problem of disloyalty.

35. There are three primary intelligence organizations in South Africa—the Department of National Security, the Security Branch of the police, and Military Intelligence. The Department of National Security (DNS) is charged with coordinating and evaluating all national intelligence and transmitting it to the Prime Minister and the State Security Council. The DNS formulates national intelligence policy and coordinates the operations of the departmental intelligence organizations. Covert collection abroad is the exclusive prerogative of the DNS, while covert internal collection is shared by the DNS with the South African Police. The DNS is available for other duties as assigned by either the Prime Minister or the State Security Council. It is under this clause that the DNS is given permission to follow the activities of various far-right elements in the National Party, in that they could be considered threats to state security.

36. The Security Branch of the police is responsible for the preservation of the internal security of South Africa. In that capacity, the Security Branch maintains

thousands of subject and personality files. Military Intelligence, proscribed from conducting covert operations abroad, is responsible for collection of overt intelligence of a strictly military nature. Additionally, it is responsible for the internal security of the South African Defense Force and for compiling loyalty checks on all defense personnel. Collectively, the South African intelligence organizations appear to be extremely capable of dealing with internal security problems.

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Annex E

Military Self-Sufficiency

1. The South Africans now are able to produce most of the equipment they require to maintain internal security and to sustain counterguerrilla operations. Domestic production has enabled them to expand and improve their inventories of conventional arms. Their achievements, however, have failed to eliminate completely the need for foreign-made weapon systems, spare parts, ammunition, and technology. Because military strategists have begun to factor well-equipped enemy conventional forces into their defense planning, maintaining a diverse collection of sophisticated weapons for all contingencies has assumed greater importance, and domestic production of all required armament is an objective that South Africa cannot fulfill.

2. Military self-sufficiency has been a high-priority objective since 1963, when the UN Security Council passed a resolution requesting all countries to terminate the sales of arms, ammunition, and military vehicles to Pretoria. Although a number of nations chose to ignore this voluntary embargo, it nonetheless put the South Africans on notice that relying on foreign sources for weaponry could jeopardize their defenses. At that time, South Africa produced few of its own armaments.

3. The willingness of other countries to fill the gap created by London's eventual decision to honor the embargo—the United Kingdom had been South Africa's primary and traditional supplier—was instrumental in helping Pretoria to expand and improve its arms production capabilities during the 1960s and 1970s. France and Italy served as its major helpers, although South Africa drew on the resources of several other countries as well. Pretoria used those opportunities to rapidly bolster its forces by purchasing a wide range of modern armaments. Whenever possible, it tried to include assembly or production rights in the purchase package to give the local arms industry additional experience while adding much-needed items to the inventory.

4. The foundation built during those years helped South Africa weather the embargo that went into effect in 1977. Compliance with the embargo was no longer a matter of choice for the UN membership; this time the resolution was mandatory and the Security Council broadened its provisions to close the loopholes of the earlier version. Besides prohibiting the transfer of hardware, ammunition, and supplies to the South African security forces, it sought to forestall additional assistance to the local arms industry. Member states are exhorted to withdraw support for the manufacture of arms and equipment, to refuse to enter into new licensing agreements for production of weaponry, and to terminate all outstanding contracts.

5. ***Domestic Production.*** South Africa's ability to produce the arms and equipment used by its military and police forces is the direct result of liaison with foreign manufacturers, who provided support, including licenses and components, for manufacturing programs. The South Africans have been able to parlay this assistance into a number of successful ventures, including some in which the "lessons learned" were incorporated into local design projects.

6. Improved technology has increasingly become a byword of South African foreign military procurement, as Pretoria has come to perceive that licensed assembly and production are only the first steps in achieving self-sufficiency. It has also learned that such programs do not necessarily eliminate the vulnerabilities to an embargo that are usually associated with buying foreign equipment. The government now speaks more often of technological self-sufficiency, whereby it will become truly independent—able to fabricate suitable alternatives to what it is denied as well as produce new generations of weaponry for its arsenal. This is a difficult goal to achieve, however.

7. South Africa now makes the bulk of its ammunition and small arms. It produces—in various calibers—handguns, rifles, submachineguns, and machineguns. Continuing purchases of foreign-made small arms, however, may reflect output limitations as well as the desire to accumulate large stockpiles. Ammunition

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shortages during the Angolan incursion prompted high-level reevaluations of assumptions about wartime consumption estimates, satisfactory reserve levels, and prospects for resupply. Since then, the military has established a production line that permits increased output as well as the manufacture of larger caliber shells, and it plans to phase out some systems, such as the 25-pounder and 3.5-inch guns, for which ammunition is not made locally. But so long as the military retains a multiplicity of foreign-made armaments—as it will for the next several years—South Africa will be obliged to fill some of its ammunition requirements abroad.

8. Except for tanks, the Army's needs for armored fighting vehicles are satisfied through local production. A few US-made Sherman tanks remain on hand, but South Africa's main battle tank is the British Centurion. Following the Angolan civil war, when South African troops encountered Soviet armaments on the battlefield for the first time, Pretoria, with assistance from Israel, began to refurbish its Centurions. The revamped tanks reportedly mount a 105-mm gun instead of a 20-pounder, are powered by a diesel rather than a gasoline engine, and have improved fire control systems. Military planners have considered manufacturing a few hundred copies, a project that would require a foreign supply link for such critical components as engines, transmissions, and fire control devices. Any tank program that South Africa embarked on, whether it involved production or rebuilding, would falter without outside support.

9. Armor that South Africa does make includes the Ratel armored infantry fighting vehicle, the Eland armored reconnaissance vehicle (the French Panhard AML-245), and a series of trucks and utility vehicles. South Africa's achievements in this area would have been slowed considerably if France had not granted a production license for the Eland. Up to 1,000 of those vehicles, fitted with either a 90-mm gun or a 60-mm mortar, have been made since the mid-1960s, and production shows no sign of ending. That assembly experience proved useful when the military started to think about a follow-on replacement for the British Saracen, the Army's main armored personnel carrier. A few Eland features were incorporated into the native-designed Ratel, which went into series production in 1976. The vehicle uses a German diesel engine, and stocks of engines apparently have been sufficient to sustain production. A few hundred Ratels are now in the Army's inventory, enabling the service to mechanize some units and consider retiring some of the Saracens. Production of the armored trucks and utility vehicles is strictly a local venture, which mates a variety of vehicle bodies with armor plating to turn out hardy counterinsurgency equipment.

10. Until the South Africans are able to make enough of what they call a domestically designed 155-mm field artillery piece to supplant their older British models, they must depend on foreign sources for spare parts and ammunition to keep the weapons operational. Series production is said to have started in early 1979, but output probably will be too low to phase out the British guns quickly. The only other "South African" field gun that has been produced was an improvised union of a 90-mm antitank gun barrel (courtesy of the Eland program) and a 6-pounder gun carriage.

11. Although a number of the Air Force's trainers, utility aircraft, and fighters were put together in South Africa, military planners cannot count on local production to meet all requirements. Atlas Aircraft Corporation, the country's lone aircraft manufacturer, has no significant experience in aeronautical design work—a shortcoming that inhibits its ability to devise suitable models for the military. Production of sufficient spare parts and engines, even for some of the aircraft assembled in country, is not assured because of the limitations of licensed manufacturing, and that in turn could have an adverse impact on operational readiness.

12. The Impala (Aermacchi MB-326) program is Atlas's most well rounded experience. Starting in the mid-1960s with a license and major subassemblies, Atlas has progressed to actual manufacture of the trainer and ground attack versions of the Italian aircraft, including the British-designed engine. Only a few minor components are still bought abroad. Most of Atlas's other endeavors are essentially assembly operations. Forty-eight Mirage F-1s, for example, were made in France, then disassembled for shipment to the South African factory. Italian assistance enabled Atlas to assemble two types of light aircraft as well.

13. South Africa is not in a position to depend on local industry to satisfy the military's needs for modern tactical missile systems, including antitank, air-to-surface, and surface-to-air. It once had a coproduction arrangement with France for the Crotale air defense missile system, but differences that developed between the two countries allowed South Africa to acquire only nine batteries. More recently, after a decade of effort, South Africa declared that its Whiplash air-to-air missile was operational. Apparently modeled closely

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after the US Sidewinder, the missile is unlikely to replace the Air Force's French Matras until its reliability and performance are clearly established. Output of the Whiplash and an antiship missile reportedly under development—which may be a modified Israeli-made Gabriel—may in any case be slowed by problems with propellant production.

14. Most of the South African Navy's ships are British. Nonetheless, the South Africans intend to assemble under license up to nine Israeli-designed Reshef missile boats, a local design program is scheduled to turn out 30 harbor launches, and Pretoria is considering constructing as many as six corvettes, with considerable outside help. The corvettes probably will not come off the building ways until well into the next decade, but the other two programs are providing the Navy with some of the boats it requires for its newly emphasized coastal patrol missions.

15. ***The Arms Embargo and Foreign Military Procurement.*** The 1977 arms embargo has failed to stop all shipments of weapons and equipment to South Africa, and, short of a full-blown blockade, military materiel will continue to get through. Private arms dealers have become the primary source of foreign-made armaments during the past two years, but they cannot offer the variety and volume of modern weapons or the technology to advance local production that might come from government-to-government or government-proprietary relationships. Additionally, the brokers' prices and terms are much less favorable and the quality controls less stringent than in legal arms deals.

16. The experience since 1977 suggests what South Africa will get from arms merchants in the next few years. Most of what is available to South Africa on the international market are weapons and equipment already in the inventory. Into this category fall items such as Centurion tanks, mortars, small arms, transport aircraft, and ammunition and spare parts. A few weapons that might be purchased would be new entries into the armed forces' holdings.

17. It is not clear how successful Pretoria has been in matching the military's requirements to what has been available through the arms dealers and from the occasional government willing to continue selling to South Africa. Israeli Reshef missile boats (both in completed and kit form) are the most visible deliveries from abroad in the past two years. Another major deal added British-made Centurions to the Army's inventory, but even in the case of these tanks the exact number acquired is unknown. Less prominent weapons are, of course, more difficult to monitor.

18. Stealth will remain a prime characteristic of South Africa's foreign military procurement so long as there is an embargo, and new ploys would be developed to avoid detection in the event of sanctions. One of the schemes for evasion uses false labeling. This is how South Africa reportedly acquired some Mirage fighter spare parts from Israel earlier this year; they were called "steel products," on which there are no restrictions. Pretoria has also used intermediaries to conceal the final destination for denied items. India, for example, may have unwittingly sold some Centurion tank hulls to South Africa through a Spanish representative who portrayed local forces as the end users. Complicated transshipment arrangements have moved prohibited items into South Africa as well. Chartered ships and aircraft have declared another destination, then unloaded in South Africa; materiel is also shipped to a location that functions as a forwarding area.

19. ***Staying Power of the Military.*** The South African military will not grind to a halt even if sanctions are imposed during the three-to-four-year period covered by this memorandum. Because the government has been preparing for 16 years, the armed forces could manage, albeit with diminished capabilities, even if strictly enforced international economic actions should be taken. Selective foreign procurement, improved management and conservation of resources, and the emphasis on domestic production all have strengthened South Africa's ability to withstand such measures. Preparations also have included the stockpiling of fuel. Pretoria reportedly has strategic reserves amounting to a two-year supply at current consumption rates, and it is enlarging storage depots while working to increase the share of its petroleum needs met locally.

20. The Army would be the most durable of the services in the event of sanctions. If the measures were put into effect in the near future, the Centurion projects might suffer and the Army probably would use certain armaments more sparingly, particularly aging foreign specimens, but ground force capabilities would be largely unimpaired. The resources that the Army currently has and can acquire locally are adequate to sustain any foreseeable operations for some time, even if sanctions are imposed. What bothers some military leaders is the possibility of a combination of more effective supply cutoffs, the acquisition

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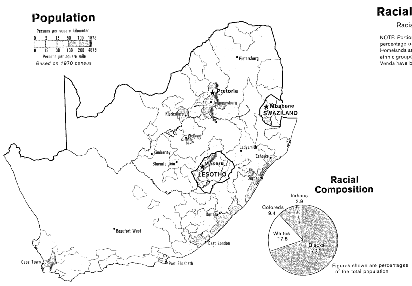
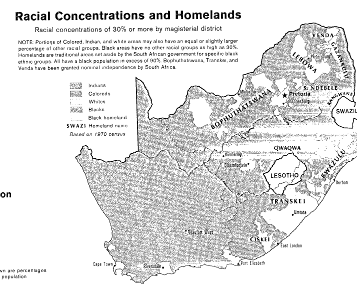
of new generations of armaments by South Africa's enemies, and intensified military pressure, a scenario that is improbable at this time but would indeed strain the Army's capabilities.

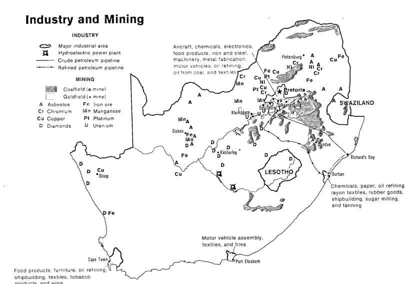
21. The Air Force would suffer from the imposition of sanctions. Even now there are indications of shortages of spare parts—engines mostly—for older foreign-model aircraft such as the Canberras and Buccaneers. As time goes on and the Air Force's spares are used, the availability rate for those aircraft will fall because stock replacements will probably not match consumption rates. Transports, interceptors, maritime reconnaissance aircraft, bombers, and helicopters are especially vulnerable. South Africa has no hope of producing any of these aircraft in the foreseeable future.

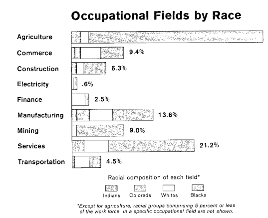
22. At least for the next few years, the Navy would be fairly resistant to sanctions, and its abilities to perform its coastal patrol duties, now the most important of its missions, would be largely unaffected. However, the corvette project, highly dependent on foreign assistance, would probably fall victim to economic measures, and the Navy would be concerned about its ability to replace those portions of the fleet that are of 1950s vintage.

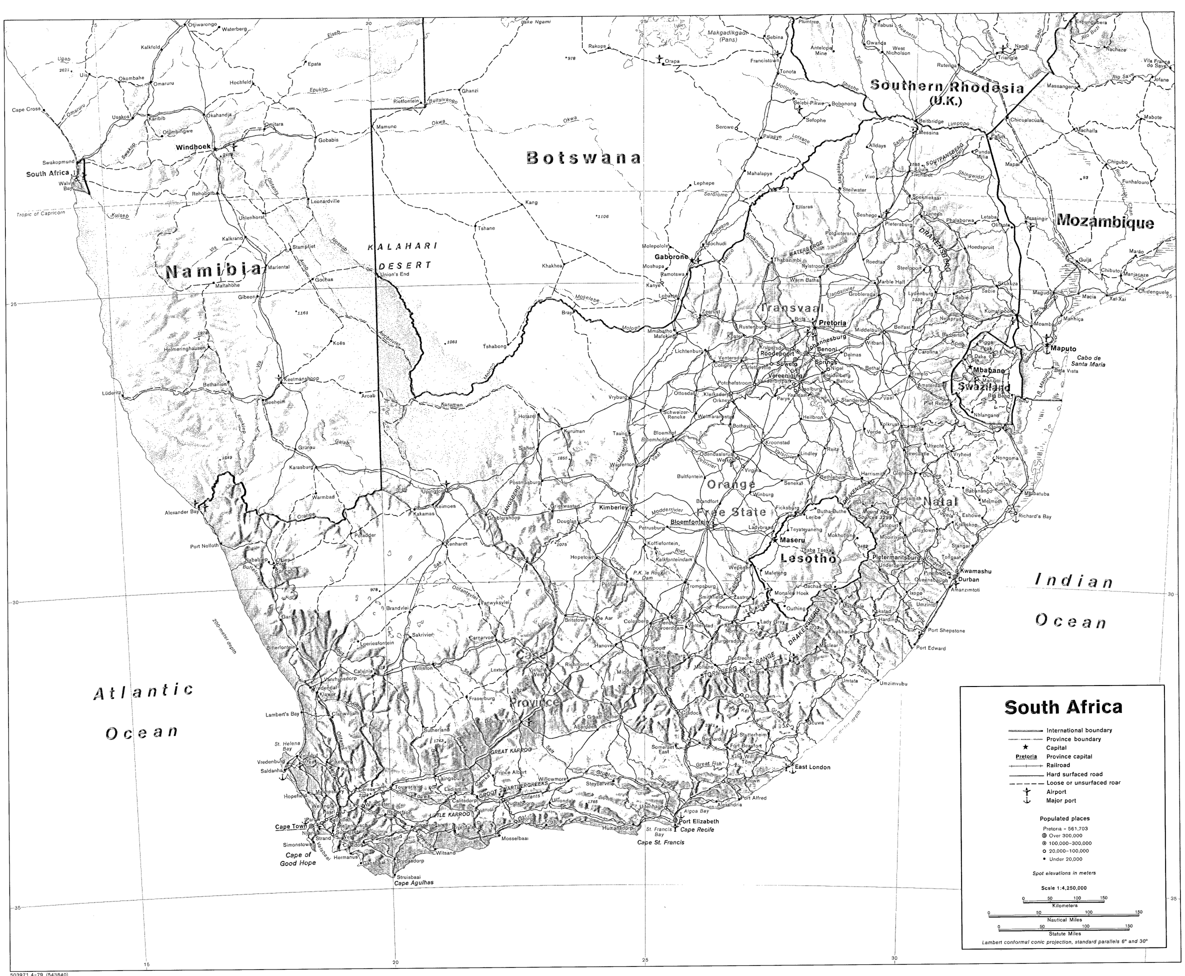
23. Government leaders on the whole probably feel fairly confident about the near-term outlook for the military under a continued embargo and even under more severe restrictions. Some requirements for foreign purchases most likely would be fulfilled, although sanctions could make the process more difficult and the gains smaller. Major pieces of equipment, such as aircraft, would be considerably harder to obtain and conceal, although Pretoria might be successful in acquiring such items as spare parts and ammunition. Judged by what it has, can make, or is likely to be able to buy abroad, South Africa has the wherewithal to conduct a prolonged and successful defense against armed liberation groups or the conventional forces of neighboring black states. A dramatic change in the holdings or capabilities of its foes could alter that balance, but, as noted above, such a development is unlikely to occur in the next few years. South Africans have considerable reason to believe that their military dominance in the region will remain intact.

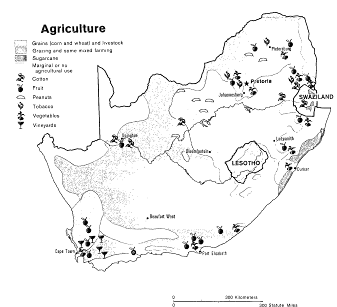


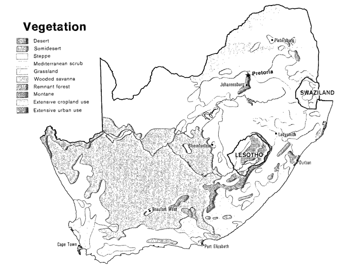


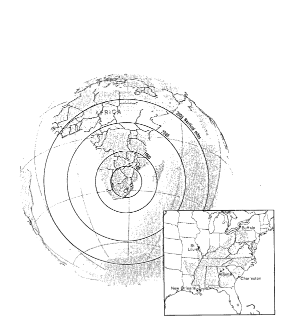












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