

## Chapter 3: International Policy Issues

This chapter discusses three principal areas of international concern: the environment for international trade, the prospects for capital flows and external debt, and energy. As noted in Chapter 2, the issues in these areas are interdependent. A more liberal trade environment improves the export and growth prospects of developing countries, which, in turn, enhances their capacity to service debt and helps to strengthen the structure of international capital flows. As another example, sharp and unpredictable increases in the price of internationally traded petroleum, which increase the strain on the balances of payments of oil importing countries, can induce major industrialized nations to adopt unduly deflationary policies, slowing their own growth and that of developing nations, which rely on them as major markets for exports. Furthermore, in each of the three areas chosen for extended discussion, the developing and industrialized countries have strong, long-term mutual interests. The international community faces the challenge of undertaking informed policy initiatives to realize these mutual interests and to protect them from ill advised actions in pursuit of ephemeral gains.

### **The World Trade Environment**

#### **Trade in Non-fuel Primary Commodities**

In 1976, non-fuel primary commodities accounted for 35 percent of the total merchandise exports of developing countries. Sixty-five percent of these primary exports were purchased by industrialized nations. As noted earlier, the recent slowdown in the growth of primary exports is attributable to sluggish growth in industrialized countries and to a wide range of factors inhibiting the supply capability of developing nations. Part of the supply problem results from the inadequate incentives and low investment priorities that have been accorded to primary production in developing countries. Over the past few years these policies have been reversed in an increasing number of nations and export dividends could soon be forthcoming.

Production and exports of primary commodities have also been hurt by large fluctuations in

their international prices. Recent international decisions appear to have paved the way for the establishment of a Common Fund which, together with individual commodity agreements, could reduce the amplitude of price fluctuations and facilitate a steadier expansion of supply. The scale and scope of the Fund and the procedures governing its operation remain to be determined. Until this occurs and some operational experience is gained, it will be difficult to assess the effect of the institution on the volume and prices of primary commodity exports.

Non-fuel primary exports from developing countries would also benefit from improved access to markets in industrialized countries. While tariff and non-tariff barriers are low or non-existent for non-agricultural primary products, industrialized nations continue to maintain strong restrictions against agricultural commodities that compete directly with domestic farm products. Relaxation of these barriers would be of particular benefit to developing countries of Latin America, North Africa and Southern Europe. Some of the Southern European nations can, in any case, expect to obtain greater access to the European Community market through gaining membership in the Community over the next few years.

#### **Protection in Manufactured Products: Trends and Consequences**

While manufactures amounted to only 27 percent of developing country merchandise exports in 1976, they are the fastest growing category and the one that is likely to supply the bulk of total export growth in the future. It is, of course, true that exports of manufactures largely come from only a few countries, and that for many developing countries non-fuel primary commodities will remain the principal exports for a long time to come. However, the long-term growth of primary commodity markets is expected to remain slow; besides, the ability to expand mineral exports depends in part on chance. Thus the expansion of manufactured exports will be vital for most developing countries, however tenuous their current foothold in world markets.

lation needed to complete the multilateral trade negotiations.

- The US has imposed restrictive "orderly marketing arrangements" against imports of color television sets from the Republic of China and the Republic of Korea.
- The European Community has renewed for another year its "anti-crisis" program in steel, including export restraint agreements with outside suppliers as well as minimum import prices. The evolution of protection in steel and steel products is of significance to developing countries, where steel is a fast growing industry with, in some countries, exceptionally low production costs.
- There has been particularly strong pressure for increased protection in the United Kingdom, with new "voluntary" restrictions that affect Japan above all.
- Subsidies to declining industries, such as shipbuilding, steel and textiles, have reached high levels, especially in some European countries. More general employment and regional subsidization programs are supporting such industries as clothing and footwear.

The outcome of the Tokyo Round of multilateral trade negotiations is also likely to be mixed. On the one hand, the agreements provide for a series of detailed codes relating to subsidies and countervailing duties, government procurement, standards, customs evaluation procedures and other matters, which are designed to constrain the deployment of such non-tariff barriers to trade. Depending on how these codes are implemented, developing countries could gain improved access to markets in industrial countries. The new codes also provide for mechanisms for surveillance and settlement of disputes among nations, though the role of developing nations in establishing and implementing these procedures, and hence their potential benefits from them, will partly depend on their readiness to sign the codes. The Tokyo Round agreements also recognize that developing countries face special problems and make some allowances for these: developing countries can be granted tariff preferences by industrial nations; they can establish preferential arrangements among themselves; and developing country signatories are generally exempted from the ban on export subsidies.

On the other hand, the Tokyo Round tariff cuts discriminate against developing countries. Duties on some product categories of particular

interest to these countries—for example, textiles and footwear—are either being exempted from cuts or are being reduced much less than other tariffs. Furthermore, there is a threat that a proposed new code on "safeguards" could legitimize discriminatory restrictions against successful exporting nations. Another significant problem is that in order to gain legislative approval of the overall package, additional protection may be granted to certain producing interests in industrial nations. Such additional protection is most likely in products such as textiles, steel and sugar which are of special importance to developing countries. Finally, and perhaps most important for developing nations, the Tokyo Round negotiations have not addressed the reduction of existing quantitative restrictions, such as those on textiles, clothing and footwear.

Increased protection in industrialized countries reduces the export opportunities of developing countries. However, it is important to keep the effects in perspective. While the adverse implications for exports of textiles, clothing, footwear and steel have been noted, overall, the potential for growth in the volume of developing country manufactured exports is still good. It is noteworthy that those developing countries against which protection has been principally directed continue to expand their exports faster than others, even though their export levels are already high. The worst result of the increased protectionism may be a greater unwillingness on the part of many developing countries to risk more outward-looking trade policies, even where these are urgently needed. They could, therefore, suffer the consequences of inflexibility and low import capacity usually associated with inward-looking trade regimes—costs that are likely to be particularly high in an uncertain and protectionist international environment, where flexibility is at a premium. Partly for this reason, and partly because very low quotas are being imposed on new entrants in such obvious first industries as textiles and clothing, the adverse effects of heightened protection may be felt more by the poorer and less successful developing countries than by the most successful and visible targets.

Nor is protection in the long-term interest of the industrialized countries imposing it. Industrialized economies have much to gain from expanding trade with developing nations. This trade makes it possible to release workers from

The industrialized countries are the most important markets for the manufactured exports of developing countries, absorbing over three-fifths of the total in 1976. Developing countries themselves accounted for 31 percent and the centrally planned economies purchased only 6 percent. Thus, access to the markets of industrialized nations is a vital concern for developing countries. The rate of growth of industrialized economies is important in this context, first, for its direct effect on market size, and second, and even more important, for its indirect effects on the trade policies of these countries. Though opportunities for new suppliers are generally best in dynamic markets, the enormous size of the markets in question reduces the significance of this constraint. In 1976, developing countries accounted for only 10 percent of the total imports of manufactures by industrialized nations, and for less than 2 percent of their total consumption of manufactures. Even if developing countries succeed in expanding their manufactured exports at the rates projected under the High scenario, the corresponding ratios for 1990 are not awesome (Table 19). The more significant effect of slow growth and unemployment in industrialized economies on the manufactured export prospects of developing countries is through increased protection and other defensive measures to curb the rise in their market shares.

and textiles, where the increase in restrictive measures has been most severe. Good opportunities still survive outside the most affected sectors, but the consequences of present barriers and the continuing threat of further protectionist action constitute clear causes for alarm.

During the past year protectionist pressures in industrial economies have continued to be very strong, although in some countries they have met growing resistance. The results have been mixed. The favorable signs include:

- A determined effort by the United States and others to push the multilateral trade negotiations to a successful conclusion. These agreements could prove to be the most significant development of the past year.
- German-led resistance in the European Community that has restrained the spread of protection and cartelization to new industries.
- A tendency in the US, since mid-1977, to give "escape clause" relief to domestic producers through temporary increases in import tariffs, rather than new non-tariff barriers, though this trend has not continued in the most recent ruling.
- Determined action by France to permit adjustment of domestic industry to imports in such sensitive sectors as steel.
- Measures by Japan to facilitate imports.

**19. Manufactured Exports From Developing Countries as a Share of Markets in Industrialized Countries, Under Alternative Scenarios**  
(Percentages)

	1976	1985			1990			Share in Market Growth 1976-90		
		Low	Base	High	Low	Base	High	Low	Base	High
In Imports	9.9	12.9	13.7	13.8	14.2	15.8	16.2	17.2	19.3	19.1
In Consumption <sup>a</sup>	1.6	2.6	2.9	3.1	3.4	4.0	4.6	6.2	7.2	8.0

<sup>a</sup>Consumption of manufactures here refers to the amount of manufactured goods demanded and supplied for all uses, estimated as gross output plus imports minus exports.

Discriminatory protection against the manufactured exports of developing countries is not new; it has been significant since the early 1960s. While the early measures were troublesome, they did not prevent 15 years of rapid growth. But the recent upsurge of protectionism, described in *World Development Report, 1978*, has had substantial adverse effects on developing countries' exports, particularly in clothing

However, there have also been adverse changes:

- In textile products, where high US protection was until recently the envy of European producing interests, stringent new quotas introduced by the European Community have encouraged US industries to raise their sights in turn. These industries are demanding and apparently obtaining even more non-tariff protection as a condition for supporting legis-

low-skill jobs in declining industries and to create a large number of highly skilled and satisfying occupations. A recent study of the OECD countries reveals that this shift of labor follows naturally from the pattern of developing country purchases from industrialized nations. The study estimates that between 1976 and 1986 trade in manufactures with developing countries will lead to a net loss of almost 200,000 unskilled and semi-skilled production jobs in the OECD area, while the employment of skilled workers, managers and administrators will expand by an almost exactly equivalent amount. In the long run, labor displacement by imports from developing countries can substitute for the crucial role played by agriculture and immigration in many industrialized nations during the 1950s and 1960s—that is, as a source of new workers for more dynamic economic sectors. The data in Table 20 demonstrate the importance of developing nations in stimulating the

creases and increase the purchasing power of consumers. A 1978 survey of all consumer goods except food and automobiles, sponsored by US retail organizations, found that goods imported from Asia and Latin America were, on average, sold for 16 percent less than domestically made products of similar quality. Furthermore, these imports were of greater importance in the expenditures of families with below-average incomes.

Much of the impetus for protectionist action stems from concern over the employment effects of trade with developing countries. It is important to place these concerns in perspective. In one sense, the problem of unemployment is a necessary corollary of the benefits from trade, which come, in part, from the release and temporary unemployment of some factors of production. Compared with other causes of unemployment, labor displacement through trade has the advantage of being almost

**20. Manufactured Exports From Industrialized Countries to Developing Countries, 1970-76**  
(Percentages)

	Product Composition (at current prices)		Shares of Industrialized Countries' Exports Going to Developing Countries (at current prices)		Average Annual Real Growth Rate 1970-1976
	1970	1976	1970	1976	
Machinery and Transport Equipment	53	59	29	36	10
Non-Electrical Machinery	(24)	(24)	31	37	8
Transport Equipment	(18)	(22)	26	34	10
Electrical Equipment	(11)	(13)	39	37	15
Chemicals	13	12	30	29	7
Iron and Steel	8	7	24	29	6
Other Manufactures	26	22	21	24	7
All Manufactures	100	100	26	31	9

Note: Totals may not add due to rounding.

Sources: *Statistics of Foreign Trade, Series C: Trade by Commodities, Market Summaries: Exports*, Vol. 1, Jan.-Dec. 1970, and Vol. 1, Jan.-Dec. 1976 (Paris: Organisation for Economic Co-operation and Development); *United Nations Yearbook of International Trade Statistics, 1977* (New York: United Nations, UN Statistical Office); *Networks of World Trade, By Areas and Commodity Classes, 1955-76* (Geneva: General Agreement on Tariffs and Trade, Studies in International Trade, No. 7, 1978); and *United Nations Monthly Bulletin of Statistics*, March 1979 (New York: United Nations, UN Statistical Office).

expansion of industrialized country exports in high productivity sectors such as machinery, transport equipment and chemicals, which make up 70 percent of the manufactured goods imported by developing countries from the industrial economies. Protection reduces the import capacity of developing countries and damages the growth prospects of these export sectors.

Low-cost manufactured imports from developing countries help to hold down price in-

stantaneously offset through the increase in demand for exports created by that trade. A number of analyses of the consequences of balanced expansion in trade in manufactures with developing countries have been carried out, including studies for Belgium, France, the Federal Republic of Germany, the Netherlands, the US and the OECD as a whole. The estimates of employment implications range from negligible to small net losses. Moreover, these and other

studies emphasize the very limited significance of imports from developing countries in displacing jobs in import-competing industries, in comparison with other factors such as technological change and productivity growth. Indeed, protection against developing country imports has sometimes accelerated the adoption of labor-saving equipment in the protected industry and undermined the objective of preserving jobs. Furthermore, to the extent that unemployment exists because of governmental fears about inflationary pressures, a protectionist policy can worsen the problem by reducing the mobility of productive factors, and thus exacerbating bottlenecks and shortages at a given level of aggregate demand in the economy.

#### **Curbing Protection and Adjusting to Imports**

Despite the strength of the economic arguments against it, protection retains some appeal for governments for two principal sets of reasons. First, growth in imports from developing countries, like all other economic changes, imposes adjustment costs on certain groups in industrialized countries. Second, political factors influence the response to the challenge of adjustment. The pressures of import competition are concentrated on a small set of labor-intensive industries, some of which, such as clothing and footwear, are already depressed by slow market growth. As a consequence of historical and economic forces, these industries are often located in relatively depressed regions, where they offer low wages to their largely unskilled workers. Many of the employees are women who cannot readily move in search of better jobs because of family obligations. Faced with competition from developing countries, some firms have little choice but to seek protection if they are to survive, and if they do not, individual lives are disrupted and earnings lost.

Industrialized economies have handled much greater economic shifts in their recent past; for example, in several countries employment in agriculture more than halved between 1950 and 1970. The problem is that in the present context of relatively high unemployment, governments face strong pressures to adopt short-term palliatives. Even though imports displace relatively few workers, their visibility invites protection. Producers favor protection because it is the form of government assistance that entails the least direct government intervention;

for governments, protection imposes no immediate fiscal burden. Those who lose from protection, such as consumers and export industries, are weakly organized in comparison with the interests seeking protection. Imports from developing countries are particularly vulnerable to political pressures for protection, as these nations offer little threat of retaliation.

If industrialized and developing countries are to realize, more fully, their strong mutual benefits from more liberal trade, steps must be taken to resist or reduce the protectionist pressures from those who fear the consequences of change. Four broad approaches offer promise for this purpose. First, it is essential to impose international restraints on the freedom of action of individual governments. These must include restraints on the use of various protectionist measures, and their effective surveillance. However, juridical restraints alone will not prevent action by sovereign governments in what is considered a crisis. Partly for this reason, it is essential and equally useful to mobilize domestic interests against protection and to educate the public that the "menace" from abroad is not the cause of unemployment problems. Third, and probably most important, it is necessary to promote a return to full employment and better overall economic performance in the industrialized world. While this issue is not considered further here, it is important to stress that policies aimed at improving the adjustment mechanism can only assist with this central aim, while a long-run policy of protection and defensive subsidization is likely to make its achievement more remote. Finally, it is essential to develop microeconomic adjustment policies to lower the social costs of transition and also to redistribute them. In this way, the overall functioning of the economy can be improved and the resistance to trade-induced change can be reduced.

The last three lines of action are all the more important since in one crucial area international agreements are unlikely to be completely effective in restraining protectionist actions by individual countries: the liberalization of non-tariff barriers cannot easily be forced on countries from outside. The protective effects of non-tariff barriers depend enormously on their qualitative details and the exact way in which they are administered. For this reason it is particularly desirable to reduce these barriers and, where some restrictions are deemed absolutely indispens-

able, to switch to more visible instruments such as tariffs.

In designing a better system of adjustment, it can be argued that the market mechanism itself is best equipped to bring about the efficient reallocation of resources, if only it is allowed to work. What is needed, therefore, is a policy that reduces the political resistance to change, which ultimately manifests itself as protection. One possible means of so doing is to compensate those directly affected. To diminish the political support for protection, any program of compensation needs to have a number of characteristics. First, those who are to benefit must be able to rely on the benefits, which entails clear and comprehensible guidelines and speedy administration. Second, compensation must be generous, approximating the private costs imposed on those who are denied protection. Third, the program needs to be seen as fair. Finally, the beneficiaries should probably include all, or at least most, of those who bear major losses and have considerable political power, including owners of capital.

These conditions are not readily satisfied. Thus, any program based on a firm-by-firm examination of the costs imposed by what has already happened tends to suffer from inevitable delays, as well as a certain arbitrariness in eligibility criteria and their application. A possible solution is to certify those employed in whole industries as potentially eligible for compensation, perhaps in connection with petitions for emergency "escape clause" protection or with decisions to eliminate existing import restrictions on specific products. Providing adequate compensation and defining the beneficiaries pose significant practical problems. Virtually any financially feasible program of compensation is likely to be limited to those who leave the industry; in contrast, protection benefits those who stay. Lump sum payments could potentially be given to workers who leave their firms, or whose plants close, based on their age, seniority, and the like, while owners could be compensated according to the book value of their assets (allowing for inflation) as these are scrapped. Inevitably, there will be problems of fairness in setting limits on who will be compensated, not least in regard to industries supplying inputs to the affected industry, and in compensating people who would have left the industry anyway, while not compensating those

who stay. Finally, whatever the political justification for compensating owners of capital, it may be felt that it is their function to anticipate economic developments. For that reason, it may be desirable to limit the sums granted and the size of eligible firms.

Existing compensation programs have had mixed results. The US trade adjustment program is perhaps the most interesting example. It provides the bulk of its benefits in the form of payments to workers who have lost their jobs in import-affected firms. However, the payments do not provide full compensation. In addition, they create a disincentive to rapid re-employment, since they are not in lump sum form but depend on the time spent unemployed. Benefits to firms are provided only for modernization or restructuring rather than for closure—a feature which may postpone some necessary exits. Furthermore, firm-by-firm examination of injury tends to cause delays. Other countries have assisted those employed in industries designated for support and structural adjustment in the face of economic changes. Examples are the United Kingdom's Cotton Industry Act of 1959, and that part of the programs of the European Coal and Steel Community which consisted of help to displaced coal miners. In the former case, owners of capital were compensated for closures with some success. However, as with almost all programs that focus on specific industries, there was a certain confusion of purpose, part of the aim being to modernize and revitalize the industry, which proved rather difficult to achieve. So far, programs for compensation have had only limited success in blunting the political pressures for increased protection.

A second and fully compatible approach to adjustment policy consists of attempts to lower the social cost of adjustment, largely by reducing the period during which displaced productive factors are unemployed. One method is to give direct assistance for the creation of new activities in communities hard hit by plant closures or large layoffs. Successful programs have been organized in the US by the Defense Department's Office of Economic Adjustment, which was established to provide help to communities adversely affected by the closure of military bases. More than 200 communities were assisted between 1961 and 1975. In the Federal Republic of Germany, after Volkswagen's layoffs following its losses in 1974, the govern-

ment provided assistance to encourage new activities in the affected region. Looking at wider regional policies, efforts to help backward regions should focus on increasing the supply of skilled labor and not just that of physical capital. Among economywide measures, training and retraining programs, especially on the job, seem to be a successful approach. A recent evaluation found high returns from programs under the United States Manpower Development and Training Act; of particular interest are the exceptionally high benefits to females, who are apt to make up a large proportion of employees in industries that are vulnerable to imports from developing countries. The Swedish National Labor Market Board estimates that 90 percent of its trainees obtain jobs within six months.

Yet another set of policies consists of removing obstacles to mobility, such as non-transferable pensions, rent-controlled housing and losses on owner-occupied dwellings. The last has been a feature of the US Defense Department program mentioned earlier. Firms can be helped by encouragement to locate labor-intensive activities overseas, either through direct foreign investment or subcontracting; this is a part of the Netherlands' adjustment program. If they are to take advantage of such inducements, firms need to be assured of security for their foreign investment. This needs inter-governmental negotiation. Finally, the dynamism of the entire economic system is absolutely crucial. Not only does this demand success with macroeconomic stabilization policy; it also depends upon the rapid development of new and vigorous industries. Apart from general support for research and development, which is characteristic of most industrialized country governments, Japan has been particularly successful thus far in picking the "winners" of the future.

It is important to recognize here that much of what is currently referred to as adjustment assistance is really strongly defensive. Much existing manpower policy consists of subsidizing declining industries, and the same is true of industrial policy. Furthermore, existing investment subsidies in poor regions often lead to the concentration of just those industries most vulnerable to competition from developing countries.

A third approach to adjustment policy consists of temporary protection or direct support

for vulnerable industries, either to slow their decline and thus ease the process of adjustment, or to provide a "breathing space" and assistance for modernization and re-equipment in order to make the industry internationally competitive. The goal of slowing down the process of adjustment is a reasonable one, but it has proved very rare, in practice, for protection to major industries to be short-lived. More commonly, the "temporary" protection has been used for new investment in the hope, frequently unfulfilled, of restoring competitiveness. Subsequently, there has been strong pressure to renew and extend protection to make these further investments viable. The textile and clothing industries exemplify this tendency to convert short-term relief from import competition into permanent protection. An alternative strategy is deliberately to restructure an existing industry in accordance with a given plan, often negotiated among the various affected parties (other than consumers). While this approach could conceivably facilitate adjustment, experience from a number of industrialized nations has revealed some severe problems: bringing firms and employees together to develop an industrial plan is apt to engender a well-organized plea for protection; if substantial parts of the industry are unviable, they generate strong pressures for a significant commitment of subsidized funds to pursue the elusive objective of restoring their competitiveness; and lastly, within a market economy any industrywide plan tends to be difficult to administer and to become rapidly outdated. Re-equipping firms works best where they are well managed, and have strong markets rather than declining ones.

This review of adjustment policies suggests some tentative conclusions. First, programs of adjustment assistance are likely to be more effective if they work together with market forces, rather than when they attempt to swim against their tide. Second, assistance in finding alternatives for affected workers and communities is more likely to succeed than programs designed to support declining industries. Third, the efficacy of adjustment programs hinges on the details of their design and implementation. Finally, adjustment assistance can only be expected to supplement and not to substitute for general economic policies that promote rapid growth and high employment, and thus create overall conditions that facilitate adjustment to imports from developing countries.

### Developing Countries' Trade With One Another and With Centrally Planned Economies

If protectionism in the industrialized countries were to get still worse, are there ready alternatives? One possibility is more rapid expansion of inter-developing country trade. This trade has been buoyant in recent years. Brazil now trades more with other developing countries than with the United States, and India's exports to developing countries are increasing faster than its exports to the industrialized nations. Trade in manufactures among developing countries has increased rapidly, roughly keeping pace with their manufactured exports to industrialized countries. This has been an impressive accomplishment, since the expansion has involved chipping away at the numerous obstacles, including protective and institutional barriers and weak marketing connections, on many fronts at once. Most of these manufactured exports go from more to less industrialized developing countries; only about one-fifth is traded among countries at similar levels of industrial development. The products exported are typically characterized by substantial economies of scale in production, have demanding skill and capital requirements, and come from industries established mainly to supply local markets. In these respects this trade contrasts with many of the typical labor-intensive exports to richer countries.

Little of the trade in manufactures among developing countries depends on regional integration involving exchanges of protection, preferential tariff treatment, or joint industrial proj-

ects: as Table 21 shows, only about one-sixth of this trade takes place within Latin America and Africa, the only two regions where these arrangements have been significant in the past. Although a great deal of the trade taking place under regional arrangements is likely to have occurred anyway, the benefits from judiciously designed regional trading arrangements should not be underestimated.

It is the developing countries' import regimes and export capabilities that largely determine their potential both as markets for, and suppliers to, one another. The expansion of this trade tends to be closely related to their overall export performance, since export earnings largely determine the capacity to purchase imports, including those from other developing countries. Furthermore, many products can only be sold to, or bought from, industrialized countries. Thus, trade with other developing countries should be seen as a complement to trade with industrialized countries, and not as a substitute for it. Excessively inward-looking arrangements made in a quest for "collective self-sufficiency" pose a danger of technological backwardness and the loss of valuable trading opportunities. However, within a satisfactory international environment, inter-developing country trade can be expected to grow rapidly and should, in the process, weaken such commonly cited barriers as costly shipping and inadequate institutions. One kind of institutional assistance could be especially helpful: the recent growth of capital goods exports from the more advanced developing countries to the less

**21. Trade in Manufactures Among Developing Countries, 1976**

To From	Destination of Manufactured Exports (percentage of total)						Total Manufactured Exports Traded Among Developing Countries (billion current US dollars)
	East and South Asia	Latin America and Caribbean	Middle East and North Africa	Other Africa	Southern Europe	All Developing Countries	
East and South Asia	26.6 <sup>b</sup>	2.3	11.8	5.5	1.3	47.6	9.0
Latin America and Caribbean	0.4	13.9	0.3	1.0	0.6	16.1	3.1
Middle East and North Africa <sup>a</sup>	0.9	0.2	7.6 <sup>b</sup>	0.2	0.4	9.3	1.8
Other Africa	0.4	0.4	0.5	3.0	0.5	4.8	0.9
Southern Europe	2.4	4.9	7.2	5.0	2.8	21.2	4.2
All Developing Countries	30.7	21.7	27.4	14.6	5.6	100.0	19.0

Note: Capital surplus oil exporters are included with developing countries in this table, while trade in manufactures excludes SITC 9. Totals may not add due to rounding.

<sup>a</sup>Includes the capital surplus oil exporters; excludes Algeria and Morocco which are counted in "Other Africa".

<sup>b</sup>Includes substantial re-exports of goods manufactured elsewhere.

Sources: Computed from *United Nations Yearbook of International Trade Statistics, 1977*, Vol. 1, Table B (New York: United Nations, UN Statistical Office), and *United Nations Commodity Trade Statistics, Series D* (New York: United Nations, UN Statistical Office) for individual countries.



developed ones could be further encouraged by expanded export credit and insurance facilities in the exporting nations.

Centrally planned economies buy only 6 percent of the developing countries' manufactured exports, and although both groups would benefit, trade between them is unlikely to expand dramatically. Given their current policy of buying technology from leading industrialized countries, their strained payments situations and growing foreign debts, centrally planned economies are likely to be more important as competitors to developing countries in the industrial world than as their trading partners. In fact, much of the recent protectionism in the industrial nations of Western Europe has been aimed strongly at the centrally planned economies of Eastern Europe. Concern over these countries' ability to reduce their export prices artificially has contributed to this protectionism. In the decades ahead, the People's Republic of China could become a significant source of competition for the developing countries in industrialized country markets for labor-intensive products.

#### **Priorities for International Action**

Much of what matters most, in halting and rolling back protection, can only be achieved within individual industrialized countries and the European Community. Nonetheless, actions at the international level can play a valuable complementary role. The emerging results of the Tokyo Round help to show the extent of what can be achieved in the face of strong protectionist pressures. It will now be necessary to push hard to turn these results to the advantage of the developing countries, and all nations, by implementing the new codes and procedures so that they exert a strong positive influence, and by building up a body of case law, precedents and procedures that will effectively stand in the way of abuses. The process of implementation offers significant potential for strengthening the international machinery for surveillance, enforcement and the settlement of disputes. Trade barriers outside, and contrary to, the framework of the General Agreement on Tariffs and Trade need to be tackled. There is an urgent need for a moratorium on further trade restrictions affecting the export prospects of developing countries. In addition, efforts at negotiating reductions in existing non-tariff barriers merit high priority.

Further efforts could be made to clarify and agree on the process of "graduation" whereby special tariff treatment, privileges and immunities from international trade rules presently granted to developing countries can be progressively reduced as countries develop. For the nations affected, pressures to meet new standards can reinforce the case for desirable but difficult policy shifts. Such shifts in policy can be induced and aided by guarantees of improved market access and the provision of additional capital flows to ease the foreseeable strains on the balance of payments. With the progressive graduation of some developing nations, those left behind should benefit from a more exclusive status.

Efforts also need to be made to improve the Multi-Fibre Arrangement and liberalize the associated trade barriers in textiles and clothing. In these industries, after more than 15 years of bilateral quota protection against developing countries, the system appears too entrenched to be quickly removed or allowed to lapse. In these circumstances, attention ought to be directed toward revising and liberalizing non-tariff barriers so as to minimize their damage to the poorer and less advanced of the developing countries. What is most needed here is assurance of market access over a long period, up to quite substantial export levels, for what are now the less industrialized developing countries, in order to reopen labor-intensive manufacturing for export as a potential path of development to countries that need it most. Today most of the textile imports and almost all of the clothing imports from developing countries come from the more industrialized of the developing countries; improving market access for the others would carry little immediate threat of a surge of imports and would not require rapid structural adjustment in importing countries. Given the spread of textile quotas under a bilateral system—European Community quotas or equivalent arrangements now extend to over 35 developing countries and threaten even Lomé partners—and the great difficulties encountered in rolling back non-tariff barriers in agriculture, where they have proliferated as well, it is also crucial to avoid the creation of any similar sanctioned system of barriers in other industries such as footwear or steel.

#### **External Debt and Capital Flows**

The rapid growth in the aggregate indebtedness of developing countries after 1973 led to

**22. Developing Countries: Medium- and Long-term Debt Outstanding and Disbursed at Year-end, 1970-90**  
(Billion current US dollars)

	1970	1977	1985	1990
To Private Creditors	32	155	438	771
Low Income Countries	2	10	16	19
Middle Income Countries	30	145	422	752
To Official Creditors, including Multilateral	37	104	302	507
Low Income Countries	15	39	108	183
Middle Income Countries	21	66	194	324
Total	68	258	740	1,278
Total at 1975 Prices	113	231	348	449
Gross International Reserves	22	103	266	441
Low Income Countries	3	11	23	38
Middle Income Countries	19	92	243	404

Note:  
Reserves in Months of Import Coverage<sup>a</sup>      3.0    4.0    3.3    3.1

Note: Totals may not add due to rounding.

<sup>a</sup>This measure expresses gross international reserves in terms of the number of months' imports they could pay for, with imports at the average level for the year in question.

a heightened concern about their debt problems. Between 1973 and 1977 their medium- and long-term debt outstanding and disbursed increased at 21 percent a year in current prices. But the attention paid to this rapid growth obscured the fact that the developing countries' outstanding debt had also doubled in the period 1969-73, and that in real terms the debt grew considerably more slowly in 1973-77 than in 1969-73. Medium- and long-term debt outstanding totaled US\$258 billion at the end of 1977. In addition, the developing countries had outstanding short-term obligations of US\$50-60 billion and out-

standing International Monetary Fund (IMF) credits of about US\$8 billion. Because of the rapid growth in private lending, the proportion of debt owed to private creditors increased from 47 percent in 1970 to 60 percent in 1977. Ninety-four percent of the debt owed to private sources at the end of 1977 was held by Middle Income countries (Table 22).

Despite the increase in aggregate debt, various indicators of indebtedness have remained acceptable. For the Middle Income countries as a group, debt service as a percentage of exports did not increase significantly between 1970 and 1977, even though there were substantial increases in some country groups (Table 23). Most of the private debt was owed by relatively few countries, most of which had good growth prospects and reasonably sound economic management. A somewhat belated recognition of these facts, combined with the reduced current account deficits of the developing countries in 1976 and 1977, helped to allay concerns about the aggregate indebtedness of developing countries. However, some countries, such as Peru, Sudan, Turkey, Zaire and Zambia, have encountered significant problems of debt management in this period. In some other nations such as Brazil, Indonesia, Mexico and the Philippines, increased borrowings have resulted in higher indebtedness and debt service ratios but have caused no significant liquidity problems. The increases in debt service ratios projected for some groups of Middle Income countries indicate the growing challenge that will confront these nations in managing large flows of external capital and avoiding liquidity shortages.

In addition to the debt problems of individual countries, the principal concerns that have emerged in recent years with respect to inter-

**23. Middle Income Countries: Debt Service Ratios, 1970-90**

	As Percentage of Exports of Goods and Services				As Percentage of Gross National Product			
	1970	1977	1985	1990	1970	1977	1985	1990
East Asia and Pacific	6.5	5.7	11.6	10.4	2.5	3.1	5.6	5.1
Latin America and Caribbean	15.9	20.9	24.1	24.2	2.5	4.3	4.8	4.7
Middle East and North Africa	10.3	6.7	12.7	15.8	2.0	2.7	4.9	5.7
Sub-Saharan Africa	5.9	8.5	19.9	27.6	1.5	2.9	6.1	7.8
Southern Europe	8.2	13.1	23.6	23.6	1.1	2.5	4.7	5.0
All Middle Income Countries	10.2	11.8	18.3	19.2	2.0	3.3	5.0	5.3

Note:  
Percentage Shares of Total Debt Service

Repayment of Principal	70.7	68.2	74.0	74.6
Interest	29.3	31.8	26.0	25.4

national capital flows are the worsening maturity structure of debt, the prospects for the continued growth of commercial lending, the efficiency with which the international monetary and financial system handles liquidity crises, the prospects for enhanced quantity and quality of Official Development Assistance flows and the special needs of the poorest countries. In broad terms, the principal concerns of many Middle Income countries relate to possible liquidity problems; the prospects for commercial borrowing and the mechanisms for handling liquidity crises are particularly relevant to their situation. The key issue for Low Income countries is the adequacy of real resource transfers, although some of these nations may also undergo liquidity strains.

#### **Sources of Instability**

Liquidity crises occur when a country's external debt situation worsens as a result of external factors or domestic policy failures or a combination of both, which can then lead to reactions that compound the problem and engender the need for debt reorganizations and painful adjustments in domestic economic policies. Various sources of instability can spark the initial worsening of a debt situation. These include a decline or slackening in the growth of foreign exchange earnings, due for example to fluctuations in prices or volumes of commodity exports, increased barriers in export markets, or declines in workers' remittances. Sharp increases in foreign exchange expenditures are another source of instability. These may result from changes in the prices or volumes of imports of basic food and fuel, bunched debt service payments, or fluctuations in interest payments on loans with floating interest rates. Domestic economic measures, such as overly ambitious government expenditure programs, or excessive recourse to short-term foreign borrowing to finance medium- and long-term development needs, are other frequent initial causes of instability.

In view of the varied causes, solutions to liquidity problems depend on a wide range of policies and institutional mechanisms. Nor can debt questions be handled in isolation, as they are inextricably linked to many other economic issues. In a broad sense, successful debt management calls for sound domestic economic policies and the fostering of mutually beneficial trade and financial links with industrialized nations. More specifically, a number of issues and

measures should be considered by the international community, first, to forestall liquidity crises, or to reduce their frequency and severity, and second, to alleviate their effects when they occur.

The maturity structure of the medium- and long-term debt of developing countries has worsened during the 1970s, largely because of the increasing share of private debt, which typically has shorter maturities than official debt. As a result, nearly 50 percent of the developing countries' total debt outstanding, including that undisbursed, at the end of 1977 was scheduled to be repaid during the five years 1978-82. The share of private debt to be repaid by 1982 was considerably higher, at about 70 percent. Of official debt outstanding, only 24 percent was scheduled to be repaid by 1982, with another fourth to be repaid during the subsequent five years.

These maturity structures imply that the Middle Income countries, which account for most of the borrowing from private sources, face a heavy burden of debt repayment in the next few years. During 1978, this bunching of repayment obligations was relieved to some extent through voluntary refinancing of loans arranged in earlier years. Because the main borrowing countries in this group have reasonably strong long-term growth prospects, their capacity to service external debt over an extended period is not really at issue. What causes concern is the risk of temporary interruptions in debt service, which in some cases could be associated with rescheduling exercises. Most Low Income countries, by contrast, have more limited growth prospects and confront a more attenuated profile of debt service obligations, to predominantly official creditors. Both of these reasons would make it more difficult to enhance their debt servicing capacity through deferring current and near-term obligations to the late 1980s.

The concern about the maturity structure of external debt arises not because creditors will be unable to roll over the repayments of principal when they become due, but because the larger the proportion of debt that is subject to annual review and recommitment, the greater the danger that initial changes impairing a country's debt situation could trigger loss of confidence and a debt crisis. The concentration of private debt among debtors and creditors makes lenders sensitive to developments in the major borrowing countries. Seven countries (Algeria,

Argentina, Brazil, Indonesia, Mexico, Spain and Yugoslavia) accounted for over half the debt outstanding to private creditors at the end of 1977. Among US banks, about three-fourths of the total claims on developing countries are held by ten large money-center banks. For the developing countries, shortening maturity structures increase the degree of uncertainty with respect to future flows of capital. Lengthening the maturity structure of debt and achieving greater diversification among lenders and debtors remain desirable objectives in the efforts to strengthen the international financial system.

Last year's *World Development Report* noted another potential source of instability relating to capital flows, namely the uncertainty about the rate of growth of lending from private commercial banks. Diversification among lenders was identified as one trend which would enhance the outlook for stable growth in private lending. During 1977 and 1978, this trend has been strongly in evidence, with non-US commercial banks expanding their lending much faster than US banks. Whereas US bank claims on developing countries grew by only about 10 percent in 1977 and by a similar magnitude in 1978, reflecting such constraints as the adequacy of their capital base, portfolio concentration, and changes in the regulatory environment, total commercial bank exposure in developing countries is estimated to have increased by over 30 percent in both 1977 and 1978, with much of the growth coming from German and Japanese banks.

Aside from the general growth of international financial markets, the main factors that increased the interest of German banks in lending to developing countries in the 1970s were the strength of the German mark, the increase in German direct foreign investment, and the slackening of domestic demand for credit. German bank loans tend to be linked to exports, and untied general purpose loans are limited. The principal constraints on the future growth of German bank lending to developing countries are limits set by the banks on their exposure in individual countries; high portfolio concentration in external assets and profits; concerns about creditworthiness caused by recent debt difficulties in some developing countries; and the reluctance of some borrowers to accept loans denominated in marks. In Japan, after low activity in 1975-76, overseas lending began to surge in 1977 as a result of abundant

liquidity, slack domestic demand for loans and some relaxation of restrictions on international lending. Japanese banks have limited their lending to a few prime creditworthy borrowers, because their international branch network is limited, and because of a desire to expand exposure cautiously. Although there may be some regulatory concerns and self-imposed limits on exposure in individual countries, the Japanese banks could continue to expand their lending to developing countries as they acquire greater experience and broaden their clientele. Swiss banks have a very limited exposure in developing countries, most of which is in short-term trade financing and correspondent banking; any large increases are considered unlikely.

A major impetus for the external borrowing by developing countries is the need for international reserves to cover normal foreign currency transactions, to cope with unforeseen fluctuations in foreign exchange receipts and obligations and, more recently, in countries such as Brazil, for use as a hedge against adverse developments in capital markets. As was shown in Table 22, between 1970 and 1977 the reserves of all developing countries increased by more than US\$80 billion, which was equivalent to over 40 percent of the increase in their medium- and long-term debt outstanding.

Several aspects of this phenomenon are noteworthy. First, to the extent that the borrowings undertaken in the past year or two have been anticipatory in character, taking advantage of the relatively liquid state of international financial markets, the interpretation of recent growth in external debt needs to be modified. The overwhelming bulk of the reserves is held in the major money-center banks in industrialized countries. While carrying this additional liquidity may impose certain costs on the borrowing countries, it can hardly be argued that the additional debt used to finance reserve accumulation has lowered their debt servicing capacity. Second, although this major component of developing country borrowing does not weaken the national "balance sheet" for external finance, it does add to the need for recommitment or roll over of private loan funds. Third, though countries with a strong balance of payments and good growth prospects have managed to accumulate resources through borrowing from private sources at market terms, nations in less favorable circumstances have found it difficult, and sometimes impossible, to obtain general

purpose loans from private capital markets. Greater availability of IMF resources, whether in the form of increased access to the Fund's various facilities or through larger allocations of Special Drawing Rights, is important precisely because these resources supplement and complement those from private lenders.

#### **International Initiatives**

Uncertainties regarding the availability of commercial bank funds, the implications of worsening maturity structures of debt, and the growing reserve needs of developing countries all highlight the need of these nations for more stable and longer-term flows of development capital. Expansion in financial flows from multilateral institutions and official export credit agencies would improve the maturity structure and stability of overall capital flows. Recent measures to increase the resources of the IMF and proposals being considered to increase the capital base of the World Bank and other international financial institutions will augment the medium- and long-term resources available to developing countries.

However, among the official sources of financing presently available, there is a gap between the relatively short-term balance of payments accommodation provided by the IMF and the long-term project financing available from institutions such as the World Bank. The gap relates to the substantial, medium-term balance of payments support required by many developing countries to tide them over extended periods of economic adjustment to major changes in the international economic environment, such as those of the past few years. During the 1970s this gap has been filled largely by the rapid growth in private bank lending. Aside from their short maturity structure and potential instability, commercial loans are frequently not available in adequate volume and on appropriate terms to a significant number of developing countries. The Extended Facility of the IMF, launched in 1974, has helped to address this problem, but there are strong indications that more needs to be done. The scope for new initiatives remains significant.

Various other proposals that seek to enhance the transfer of capital to developing countries have been put forward in recent years. To buttress the chances of success of any such program, it would be desirable to ensure that the funds transferred under it are on better terms

than they otherwise would have been, that the distribution of capital flows among developing countries is improved, that the funds can be disbursed rapidly, and that the existing structure of international capital flows is not weakened.

Some international discussions have already occurred on measures to increase the access of developing countries to bond markets in industrialized countries. Although still small in relation to their total capital needs, bond issues by developing countries in the Eurobond market and the industrialized countries rose from less than US\$0.5 billion in 1970 to nearly US\$5.5 billion in 1978. Most of the increase has been in the Eurobond market and in the national markets of Switzerland and, more recently, Japan. In general, industrialized countries have taken only limited action to provide preferential access to bond issues by developing countries. Some of the industrial countries regard their capital markets as sufficiently liberal already; others feel that giving preferential access to developing countries would not help, because bond sales essentially depend on investors' preferences; while some countries argue that their balance of payments situations preclude granting preferential access.

Proposals are being discussed to change the financing facilities available to compensate for sharp fluctuations in export earnings. Access to the Compensatory Financing Facility of the IMF was liberalized in 1975, since which time there has been a substantial increase in the use of the facility by developing countries. Further possibilities for liberalizing the facility include enlarging its scope to cover fluctuations in exports of services and in the costs of essential imports such as cereals; raising the maximum limits on compensatory drawings; and changing the method of measurement of export shortfalls so as more accurately to reflect the extent of the fluctuations around export trends. The enhancement of compensatory financing facilities, and the implementation of any new international initiatives that improve the maturity structure and stability of medium- and long-term capital flows, would also help to reduce the need of developing countries to hold expensive precautionary reserves.

The measures discussed above would improve the maturity structure and stability of capital flows to developing countries and help to forestall liquidity crises. But improvements are also desirable in the mechanisms and pro-

cedures to deal with such situations when they occur. Though the necessity for some change is now generally accepted by both creditors and debtors, their concerns and priorities differ. Developing countries consider the multilateral debt renegotiations through the Paris Club too limited in coverage, since they pertain to only part of the debt. The terms of repayment are considered to be too short, in most cases, and not sufficiently attuned to the specific circumstances of the borrowing country. The creditor countries view the Paris Club as *ad hoc* meetings to prevent imminent default threatened by bunched repayment obligations; their aim has been to provide temporary debt relief, rather than to negotiate a long-term adjustment of the debt burden. They also wish to keep debt renegotiations separate from the provision of concessional assistance. Finally, modifications of present practices would be complicated by the fact that an increasing proportion of developing country debt is owed to private sources, and no formal mechanism exists to renegotiate such debt.

In deciding the coverage and terms of debt renegotiations the medium-term prospects of individual countries ought to receive greater consideration than is commonly given at present. First, as in aid group consultations, Paris Club meetings could, as a matter of course, ask multilateral institutions to present a detailed evaluation of the medium-term prospects and needs of the country concerned. Discussions have recently been initiated on a proposal of this nature. Systematic assessments of medium-term prospects would serve both as a background for the renegotiations and also as a basic scenario against which the implications of different terms of debt renegotiation could be considered. This would permit, under the auspices of the present *ad hoc* mechanisms, the debt covered and its amortization and grace periods to be adjusted according to the expected balance of payments situation of the debtor country. Moreover, if it was considered warranted in the particular case, concessional terms of repayment could be negotiated to provide resource transfers through debt relief, as has been done for Ghana and Indonesia. Second, *bisque* clauses,<sup>1</sup> which were used for Indonesia in 1970,

could be used more generally to provide for later adjustments in the agreed repayment terms if the evolving economic situation so warranted. Finally, in certain cases, there may be advantages to closer coordination between official creditors and commercial banks in debt renegotiation exercises. The present system of separate renegotiations with official and commercial creditors leads to long delays, resulting in protracted foreign exchange shortages and unnecessarily high costs in terms of forgone growth for the developing nations affected.

The Low Income countries and some of the poorer Middle Income nations will continue to rely primarily on Official Development Assistance for their external capital needs. Although the projected ODA flows are modest as a percentage of donors' GNP, they will still require early and substantial increases in commitments by the major donors. In recent years, there has been a marked increase in the concessionality of ODA, and during the last year various DAC members have announced debt relief measures for the least developed countries, including cancellation of outstanding concessional ODA debt, conversion of undisbursed concessional loans to grants and, in some cases, the provision of compensation in the form of grants or soft loans for debt service payments due. Detailed arrangements still have to be worked out in many of these cases and legislative approval will be required. Further efforts will also be needed if these debt relief actions are to add to the ODA that would have otherwise been available. In addition to increasing the flow of official resources, the share of such resources going to Low Income countries needs to be raised.

On occasion, disbursements of committed ODA project finance have been hampered, for a number of reasons, including the complexity of projects, especially in relatively new areas such as rural development and education, and, in some countries, limitations on absorptive capacity. Improvements in technical assistance and aid procedures can help to reduce such difficulties. Better coordination among different donor agencies could reduce competition for projects in the same sector and enhance the complementarity of resource flows. In bilateral aid programs, more program and sector finance, more finance for local currency expenditures, untying of aid, better technical assistance and streamlining of aid procedures in donor countries would all work to increase the rate of aid

<sup>1</sup>A "*bisque* clause" written into the Agreed Minutes of the debt renegotiations permits the debtor, under certain conditions, some agreed amount of further debt relief without cumbersome renegotiations.

disbursement. Such measures merit special emphasis for the least developed nations.

Aid from OPEC countries has been substantial, particularly since 1974. Net disbursements of concessional assistance by OPEC members amounted to 2.7 percent of GNP in 1975. Since then, the decline of OPEC aid as a share of GNP has reflected the reduction in the current account surpluses of these countries. Although the terms of OPEC aid are somewhat harder than those of DAC members, a much greater proportion of OPEC aid is untied. The distribution of OPEC aid has widened from a small group of recipient countries, and is increasingly being channeled through aid institutions that have been established in some OPEC nations. While general balance of payments support and the provision of oil on concessional terms—the dominant forms of OPEC aid in earlier years—continue to be important, there is a growing emphasis on project assistance. A striking feature of OPEC aid is the significant extent of co-financing of projects with other bilateral and multilateral aid agencies.

#### **Private Direct Foreign Investment**

Net private direct foreign investment in developing countries was equivalent to about 15 percent of the net inflows of medium- and long-term loans between 1975 and 1977. During the 1960s, direct foreign investment had increased by only about 4 percent a year in real terms, reflecting the control of such flows by developing countries and regulations by some major industrialized nations. The growth of these flows accelerated temporarily in the early 1970s, because of the rapid economic growth and more pragmatic policies toward transnational firms in Middle Income countries, as well as the raw materials boom of this period. Between 1960 and 1976, France, the Federal Republic of Germany, Japan, the UK and the US accounted for more than 80 percent of the total flows. Nearly 40 percent of foreign investment during 1966-76 went to Latin America and the Caribbean, and about 25 percent to East Asian countries. Several developing countries, particularly in Latin America and East Asia, have begun to undertake direct foreign investment in other developing countries.

The character of links between private transnational firms and developing countries has been changing in recent years. First, equity participation is being gradually replaced by the use of loans and suppliers' credits. Second, di-

rect managerial control by the parent company is being superseded by management participation, technical assistance agreements, production sharing and supply contracts. These changes have resulted partly as a response of multinational corporations to host country controls on foreign investment, and partly from the growth of competition from new suppliers, who are increasingly willing to design arrangements to suit host country requirements. The term "private direct foreign investment" as it is currently understood—equity participation by a foreign firm with an effective voice in the management of the enterprise—does not encompass these shifts. Consequently, information based on traditional definitions of equity participation tends to underestimate the role of transnational firms in capital flows to developing nations in recent years. More important, policies based on the traditional concepts would not address the new economic realities.

In devising policies to encourage foreign investment and to increase the flow of net benefits to the host country, a developing nation's overall economic policies are of crucial importance. Many case studies confirm that these, together with a country's economic structure and stage of development, are much more important in attracting foreign investment than are special incentives. The latter are costly and frequently ineffectual. Many developing nations deploy performance-oriented policies of control on foreign investment, for example by requiring foreign firms to use domestic inputs and labor, and controlling access to the local financial market. Sometimes such policies can have adverse effects on the host country, for example by creating a local labor elite. The effective implementation of these and other controls on foreign direct investment poses significant administrative burdens, which need to be periodically assessed and weighed against the benefits the controls are designed to secure. In the industrialized countries, where the bulk of foreign investment originates, policies which do not discriminate between domestic and foreign investment would normally be desirable and would help to deal with the different pressure groups involved. International institutions, such as the UN Conference on Trade and Development and the UN Center on Transnational Corporations, are engaged in articulating general rules of conduct, providing technical assistance for some developing nations, and encouraging

bilateral action on taxation agreements between home and host countries.

## Energy

### The Outlook for Commercial Energy

Global energy prospects have been extensively researched. Estimates of future demand and supply vary considerably, depending on the assumptions made about resource availabilities, economic growth, pricing policies, the responsiveness of energy demand and supply to changes in prices and incomes, and political and environmental factors. The projections in Table 24 should be viewed not as a forecast but rather as an illustration of the broad orders of magnitude involved. They assume that economies will grow at the rates assumed in the Base scenario and that reasonable conservation efforts will be undertaken. As indicated, after 1985, world demand for energy is likely to outstrip supply, adding to upward pressure on the price.

However, the increase in the real price of energy during the next decade, above present levels, need not be large, if sustained efforts are made to develop both oil and non-oil energy resources and to restrain demand for energy, and if there are no major production setbacks as a result of political disturbances or oil conservation policies. Several factors support this view. First, there are the possibilities for in-

creased use of oil substitutes, particularly coal and nuclear power, and, in the longer term, there is potential for using resources such as shale oils, tar sands and solar energy. Second, increases in domestic energy prices and other types of energy conservation measures taken in the industrialized countries have slowed the growth of their energy consumption: prior to 1973, energy consumption had increased at about the same rate as aggregate output, whereas between 1973 and 1977 their energy consumption increased by only 3 percent, while their GDP expanded by about 9 percent. Third, increased international energy prices have made the exploration and development of energy resources much more profitable. Dramatic oil finds such as those in Mexico may be unlikely, but the prospects for more modest discoveries and increased exploitation of known resources are good.

The international energy balance is nonetheless likely to continue tight, and substantial concerns remain. Heavy dependence on foreign sources of supply makes the majority of countries concerned to ensure access to energy in the required volumes at reasonable prices and on an uninterrupted basis; short-run instability, marked by disruptions in supply or temporary increases in oil prices, can arise easily, as shown by recent events. As the principal source of

### 24. Commercial Primary Energy Balances, 1960-90

	Million Barrels a Day of Oil Equivalent						Average Annual Percentage Growth Rate			
	1976		1985		1990		1960-76		1976-90	
	Pro- duc- tion	Con- sump- tion	Pro- duc- tion	Con- sump- tion	Pro- duc- tion	Con- sump- tion	Pro- duc- tion	Con- sump- tion	Pro- duc- tion	Con- sump- tion
Developing Countries <sup>a</sup>	26.5	16.8	41.5	27.3	51.3	38.4	6.7	6.7	4.8	6.1
(Net Oil Exporting Countries)	(20.0)	(4.2)	(28.4)	(6.9)	(32.8)	(9.9)	(7.2)	(6.9)	(3.6)	(6.3)
(Net Oil Importing Countries)	(6.5)	(12.6)	(13.1)	(20.4)	(18.5)	(28.5)	(5.2)	(6.7)	(7.8)	(6.0)
Industrialized Countries	46.5	69.8	61.0	91.5	70.7	109.7	2.6	4.1	3.0	3.3
Capital Surplus Oil Exporters	16.1	0.8	23.5	1.5	25.5	2.3	10.7	13.9	3.3	7.8
Centrally Planned Economies	37.9	34.4	54.7	52.1	66.7	64.3	4.4	4.3	4.1	4.6
Bunkers and Others	n.a.	5.3	n.a.	6.5	n.a.	7.0				
Total	127.0	127.1	180.7	178.9	214.2	221.7	4.5	4.5	3.8	4.1

Note: Primary energy here refers to coal and lignite, crude petroleum, natural gas and natural gas liquids, hydro and nuclear electricity, expressed in barrels a day of oil equivalent.

<sup>a</sup>Here, as throughout this report, the group of "developing countries" excludes only the capital surplus members of the Organization of Petroleum Exporting Countries. Thus, the energy balances of other OPEC members—Algeria, Ecuador, Gabon, Indonesia, Iran, Iraq, Nigeria and Venezuela—are included in those for developing countries.



petroleum for many importing nations, OPEC production is the critical balancing factor, and hence changes in output in OPEC nations can significantly alter the global energy balance. Second, bringing new energy sources into production requires large investments with long lead times. Partly because of these long gestation periods, the decline in the share of oil in total world energy consumption is likely to be gradual, from 45 percent in 1976 to about 40 percent in 1990. Third, there are uncertainties on the demand side, the future economic growth of the industrialized countries being the most crucial factor. Small changes in their rate of growth can substantially affect world demand for energy. Finally, energy conservation policies in certain key oil importing nations have, so far, been weaker than desirable.

The energy problem over the next two decades should be seen as one of transition, in which countries need to adjust to higher energy prices and ensure that their incremental needs can increasingly be met from sources other than oil. World oil production is expected to peak around the end of this century. Actions are needed now to assure increased production from both oil and non-oil sources in the late 1980s and 1990s. Price and non-price measures are also required to control the growth of demand. All the major groups of countries have their own problems of transition. For the industrialized countries, the main issues lie in the conservation of demand, improvements in the safety of nuclear power and the development of synthetic fuels. For the OPEC countries, and other major oil exporting countries, the principal concerns include the determination of the rate at which to exploit their non-renewable resource, and the design of a development strategy that will ease the transition to a post-oil future. For the oil importing developing countries, the priorities are to explore and develop domestic commercial energy sources, to increase the efficiency of non-commercial and non-conventional sources, and to adjust to higher energy prices.

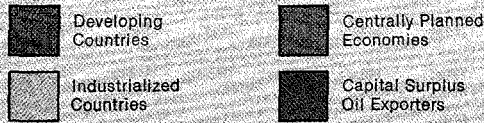
Though different groups of countries face different sets of transitional problems, virtually all nations share a strong interest in assuring that the transition is a smooth one. Oil importing nations need a stable and predictable supply. To the extent that the preservation of balance in the global energy market requires real price increases over the next two or three decades,

gradual and predictable increases in oil prices would be more advantageous than sharp changes at unpredictable intervals. This would facilitate investment planning in alternative energy sources and permit orderly adjustments in the oil importing nations, even though the weaker and worst affected oil importing developing countries would nevertheless need special balance of payments support to permit phased adjustment to the price increases. Conversely, the health of the world economy, especially of the major oil importing industrialized nations, is important for maintaining a strong market for the oil sold by the petroleum exporting countries and for preserving the value of the key currencies in which the latter hold their financial wealth. The oil exporting nations constitute substantial markets for goods, technology and skills exported by industrialized and developing nations—elements that are necessary for the development of these oil nations.

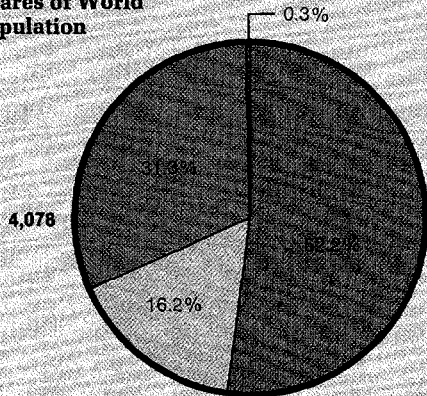
Industrialized countries dominate the energy market, accounting for more than a third of world production and more than half of world consumption (Figure 5). Energy production in these nations is expected to increase by about 3 percent a year between 1976 and 1990. Coal and nuclear power are each expected to account for about 40 percent of the anticipated production increases, with relatively modest overall increases in petroleum and natural gas production. Some of the major issues affecting the development of coal and nuclear power are environmental preservation, safety, and the uncertainties related to oil prices. These factors have resulted in long delays and cost overruns in nuclear power development—problems that are likely to be exacerbated by recent events in the US nuclear power industry, which have heightened the sensitivity to safety hazards and increased the costs of insuring against them. Increasing reliance on coal-fired electricity, including the conversion of existing oil-fired plants, poses additional problems, since coal can be costly to transport and inconvenient to handle, and, in Japan and Europe, coal will be progressively more costly to extract from deep underground mines. Non-conventional energy sources are unlikely to be quantitatively important in this century. Energy consumption in the industrialized countries is expected to grow more slowly than in 1960-73, partly as a result of the slower rate of economic growth and partly because of demand conservation. OECD

Figure 5

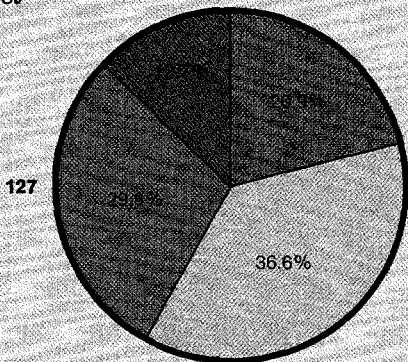
**Population, Energy Production and Consumption, 1976**



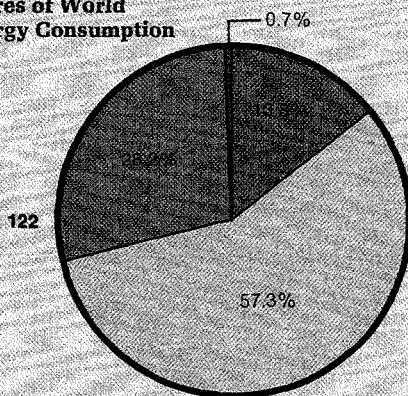
**Shares of World Population**



**Shares of World Energy Production**



**Shares of World Energy Consumption**



Note: Numbers beside pies indicate world totals. Population is measured in millions; energy production and consumption are in million barrels a day of oil equivalent. Percentages may not add to 100, due to rounding.

estimates indicate that with proven technology, considered economic at present prices, conservation measures could save 16-20 percent of the total consumption otherwise projected for 1985, with 40 percent of this conservation potential in the transport sector and about 30 percent each in the industrialized and residential-commercial sectors. Industrialized countries need to devote urgent attention to realizing as much as possible of this conservation potential, which is equivalent to half of the present oil production of OPEC countries. Since the US consumes about 25 percent more energy per unit of GDP than Western Europe, the scope for conservation is likely to be greater in the US.

OPEC countries produce about one-fourth of the world's commercial energy. Consequently a 5 percent change in the net energy requirements of the non-OPEC world would imply a 20 percent change in OPEC production to meet the needs. For the capital surplus OPEC countries and major oil exporters such as Mexico, rates of production will be determined partly by non-economic considerations and partly by the expected real rates of return on financial assets. In view of the oil conservation policies being followed by some of the OPEC countries, and the oil reserve situation and technical constraints on increasing production in others, OPEC oil production is likely to rise much more slowly than in the past. These countries are likely to increase their production and domestic use of natural gas. Like other countries, OPEC members need to channel more public resources to the exploration and development of additional energy resources. Private investment in exploration, and the ratios of proven reserves to production, are declining in some of these countries, while their domestic consumption of oil is rising.<sup>2</sup> For the long run, as is argued in Chapter 8 below, all oil exporting countries need to develop the non-oil sectors of their economies, to maintain the growth of income as their oil reserves are depleted.

Energy production in centrally planned economies, which account for about 30 percent of world production, is expected to grow more slowly than in the past, primarily because of the slower growth of oil production expected in the USSR, where a growing proportion of output

<sup>2</sup>Oil reserves are considered proven when exploratory drilling has confirmed the existence of measured quantities of oil that are recoverable from known fields at current prices and costs using presently available technology.

increases will have to come from smaller oil fields in more difficult terrain. This slowdown is likely to be only partly offset by rapid growth of coal production in the People's Republic of China and of natural gas production in the USSR. As a group, centrally planned economies are expected to remain marginal exporters of energy.

Developing countries account for a relatively small share of the world's production and consumption of commercial energy. The growth of energy consumption in these countries slowed down to an average of about 5 percent a year during 1973-76, though it was typically faster than this in oil exporting developing countries. Electricity consumption continued to increase rapidly, with its share in total energy consumption rising from 16 percent in 1960 to 25 percent in 1976. In the years 1976 to 1990, the developing countries' energy consumption is expected to grow faster than that in industrialized countries, reflecting their higher expected economic growth rates and rising levels of industrialization and urbanization. Moreover, commercial energy is likely to substitute increasingly for non-commercial energy in developing countries. Their share in world energy consumption is expected to rise from under 14 percent in 1976 to about 17 percent in 1990. Although the developing countries as a group will remain net exporters of energy, oil importing countries are projected to require increasing amounts of imported energy.

The Base case projections outlined in Chapter 2 assumed that the real price of traded energy would remain constant at its average level of 1975-78. If the real price of internationally traded energy is 30 percent higher in 1990 than it was in 1975-78, then the additional annual burden on the balance of payments of oil importing developing countries would be an estimated US\$30 billion by 1990 (at current prices). While this amount is equivalent to no more than 3 percent of the projected total exports of these countries in that year, it is equivalent to about 20 percent of the projected net disbursements of medium- and long-term capital to these nations in that year. Moreover, the burden of additional payments for energy is likely to be particularly severe for some of the poorest developing countries.

#### **Commercial Energy Development in Developing Countries**

The relative importance of different energy sources in the production and consumption of

commercial energy in broad groups of developing countries may be gauged from Table 25, which presents estimates for 1976 and 1990. The appropriate combination of energy policies in particular countries will depend on their specific energy demand and supply conditions. Here the discussion dwells on three areas of general relevance: development of indigenous resources, possibilities for demand conservation measures, and energy pricing.

The rise in international energy prices has increased the incentives for developing known energy resources in developing countries and has also justified increased expenditure on resource exploration and pre-investment activity. However, on the basis of the limited information currently available, it appears that relatively few developing countries have significantly increased the proportion of national investment allocated to energy development. Though this partly reflects the inherently long lead times in energy sector projects, it is also a consequence of impediments to energy resource development in these nations.

Increases in the price of oil and gas have been sufficient to cover the cost of exploiting known oil and gas reserves that were previously uneconomic, because of their small size, the expense of the enhanced recovery methods needed for low-pressure wells, or high transport costs. Exploration for petroleum has also become commercially viable in previously unattractive areas. A study prepared for the World Bank identified 70 developing countries with a potential for oil and gas production, of which only 22 already produce oil and gas or are about to do so. Of the remainder, 38 countries have prospects of finding significant quantities of petroleum to help meet their domestic needs, but in only seven has exploration been adequate, and in another seven moderate.<sup>3</sup> Oil importing developing countries, which have 2 percent of the world's proven oil reserves, may account for 15 percent of the world's ultimately recoverable reserves. Even so, the number of exploratory wells drilled per thousand square miles in these countries has been only a small fraction of that in the industrialized countries. The main impediments to the exploration and development of the petroleum and gas resources in developing countries are the scarcity of

<sup>3</sup>An adequate level of exploration is considered as one that is likely to lead to the early identification of exploitable reserves.

**25. Developing Countries: Commercial Primary Energy Balances, 1976 and 1990**  
(Million barrels a day of oil equivalent)

	All Developing Countries <sup>a</sup>		Net Oil Importers		Net Oil Exporters	
	1976	1990	1976	1990	1976	1990
Production	26.5	51.3	6.5	18.5	20.0	32.8
Petroleum	19.5	27.6	1.2	3.8	18.3	23.8
Gas	1.8	8.6	0.4	1.2	1.4	7.4
Coal	3.6	8.4	3.5	8.0	0.1	0.4
Primary Electricity	1.6	6.7	1.4	5.5	0.2	1.2
(of which nuclear)	(0.1)	(2.4)	(0.1)	(2.0)	(.)	(0.4)
Consumption	16.8	38.4	12.6	28.5	4.2	9.9
Petroleum	10.0	20.5	7.2	14.6	2.8	5.9
Gas	1.4	3.5	0.4	1.2	1.0	2.3
Coal	3.8	7.7	3.6	7.2	0.2	0.5
Primary Electricity	1.6	6.7	1.4	5.5	0.2	1.2
Net Imports	-9.7	-12.9	6.1	10.0	-15.8	-22.9
Petroleum	-9.5	-7.1	6.0	10.8	-15.5	-17.9
Gas	-0.4	-5.1	(.)	(.)	-0.4	-5.1
Other	0.2	-0.7	0.1	-0.8	0.1	0.1

Note: Primary energy here refers to coal and lignite, crude petroleum, natural gas and natural gas liquids, hydro and nuclear electricity, expressed in barrels a day of oil equivalent.

<sup>a</sup>Here, as throughout this report, the group of "developing countries" excludes only the capital surplus members of the Organization of Petroleum Exporting Countries. Thus the energy balances of other OPEC members—Algeria, Ecuador, Gabon, Indonesia, Iran, Iraq, Nigeria and Venezuela—are included in those for developing countries.

risk capital for exploration, inadequate analysis of the data derived from exploration, and a shortage of skilled personnel and institutions to deal effectively with international oil companies. Many developing countries find that though they have potentially economic exploitable resources, they cannot attract international oil companies, either because not enough is known about the characteristics of these resources, or because the petroleum deposits are believed to be too small, or because the contract terms offered are inappropriate. These countries would benefit from external capital to finance exploratory drilling, and from assistance in training and institution building. The total investment requirements during 1976-85 of non-OPEC developing countries for the exploration, development and production of oil and gas—including installation of crude oil pipelines—are estimated at about US\$7 billion a year (at 1977 prices). These countries also need help in negotiating agreements with international oil companies and in modifying legislation and procedures to facilitate such cooperation. The World Bank's recent decision to expand lending and technical support for such activities goes some way toward meeting these needs.

Coal production in developing countries increased by 7.6 percent a year between 1973 and 1976, compared with only about 3 percent a year in industrialized countries. Over 90 percent

of the increase came from countries with large and established coal industries, such as India, the Republic of Korea, Turkey, Yugoslavia and Viet Nam. In the years to come, the production of coal in developing nations is expected to increase by over 6 percent annually, so that its share in their total commercial energy production would rise from less than 14 percent in 1976 to over 16 percent in 1990. Developing countries are estimated to have nearly 15 percent of the world's proven reserves of coal. India accounts for over half of these reserves, and Brazil and Yugoslavia for another fourth. About 20 developing countries, including Bangladesh, Bolivia, Cameroon, Honduras and Madagascar have coal resources but had not started production as of 1978, notwithstanding the sharp increases in oil prices in 1973-74. Starting new coal production anywhere is apt to be a lengthy and difficult process, but in developing countries the difficulties are often compounded by a lack of adequate transportation, insufficient investment funds and technical know-how, uncertainties regarding export demand and, most immediately, a lack of detailed geological data on which to base coal investment projects. By contrast with petroleum, the problem is less one of identifying the existence of resources, and more of determining their quality and economic viability. During the coming decade, national and international strategies should be directed main-

ly toward detailed exploration and pre-investment studies of known coal resources, along with investments in coal mines and associated infrastructure where proven and commercially viable reserves exist.

Hydro-electric power plants already account for 40 percent of the installed capacity for electricity generation in developing countries, but the unexploited hydro potential remains vast. It is estimated that in developing countries of Africa only 2 percent of the technically feasible potential has been exploited, while the corresponding proportions in Latin America and Asia are 6 percent and 12 percent, respectively. These proportions are only indicative as they do not take account of production and distribution costs and market potential. The development of hydro-power has been held back by its high capital costs, a lack of sufficient preparatory work for formulating projects and, in some cases, disagreements between riparian states, which limit the use of water resources and the export of hydro-power.

A few countries, including Argentina, the Republic of China, India and Pakistan already have nuclear power while others, such as Brazil, Iran and Mexico, are expected soon to become producers. Serious problems remain with respect to the disposal of radioactive waste, safety, and environmental considerations. Furthermore, the demanding requirements of technical and managerial expertise, and the need for plants to be large to be commercially viable, tend to limit their use to Middle Income and large countries.

Looking beyond the next decade, note should be taken of the very substantial untapped resources of shale oils and heavy oils in developing countries. Brazil, the People's Republic of China and Zaire, for example, possess substantial shale oil resources, while Ecuador, Peru and Venezuela have large deposits of heavy oils. These resources can be expected to become commercially viable in a world of higher petroleum prices and improved extractive technologies.

There are significant possibilities for conserving energy demand in developing countries, particularly in the industrial and transport sectors, which together account for 70-90 percent of final commercial energy consumption in these nations. Energy use in industry can be limited by adopting the more energy-efficient techniques developed in industrialized countries, as old capital stock is replaced. In the Federal Republic of

Germany, for example, from 1953-73, the use of energy per unit of industrial output fell by over 40 percent; in practically all industries the fall was greater than 10 percent. Energy can be conserved in the transport sector by encouraging the use of mass transit, rather than private vehicles, and through improvements in fuel efficiency attained by increased use of trucks with diesel engines, phasing out steam locomotives, and upgrading railroad rolling stock. In the power sector, energy can be saved by encouraging larger system sizes—an objective which in some regions, such as West Africa and Central America, would entail the interconnection of national power systems. Higher overall efficiency can be attained in industrial areas by cogeneration schemes, which supply power jointly with process steam for industries. Where the natural gas byproduct of crude oil extraction is flared at present, it can be harnessed for power generation, industrial uses or re-injection for secondary oil recovery; a project of this nature is being prepared in Egypt. The conversion of electricity generating plants from oil to coal, as has been done in Chile, is another possibility to be considered. The potential for saving energy in the residential sector is limited except in some of the richer Middle Income countries.

Despite these possibilities, developing countries have not yet given much emphasis to demand conservation measures, partly because in many of them the absolute level of energy consumption is low, and partly because conservation measures are difficult to implement and require substantial use of scarce capital and technical and managerial skills. Greater attention will need to be given to demand conservation in the future as energy consumption expands with industrialization and urbanization. Conservation efforts that focus on improvements in urban mass transit systems and in energy-intensive industrial activities are likely to yield the quickest rewards.

Energy pricing is a complex issue. Most developing countries subsidize different forms of energy to pursue a variety of objectives. Kerosene is frequently subsidized to benefit poor consumers. Energy for industry is priced below cost to encourage industrialization. In oil exporting countries, domestic consumer prices are kept well below international levels, because it is politically difficult to do otherwise, in view of the low costs of production. In a number of

countries an inactive energy pricing policy is based on the belief that the importance of the public sector in production, processing and consumption of energy blunts the allocative role of energy prices. The complex energy pricing policies of many developing countries allow certain producers and consumers to reap unintended windfall gains, and also distort production incentives. The subsidization of electricity prices, for example, frequently weakens the capacity to finance power development and sometimes benefits better-off groups in society.

Since the oil price increases of 1973-74, developing countries have made significant progress in increasing energy prices to domestic users, though scope remains for further price rises. Between 1973 and 1977 the prices for the most commonly used petroleum distillates registered increases averaging over 40 percent in real terms in the oil importing developing countries, compared with an average increase of about a third in industrialized nations. Nevertheless, prices for most petroleum products in developing countries remain significantly below the levels prevailing in industrialized nations. Moreover, electricity prices in developing countries rose by only about a third of the average increase in energy prices. Policies for the management of energy resources and uses in developing countries will require attention to elements other than pricing, such as environmental controls, safety standards and strategic requirements. But the potential benefits from further reform of energy pricing should not be underestimated. With the future supply and international prices of energy subject to so much uncertainty, further efforts are desirable to move domestic energy prices toward international levels, reducing excessive and general subsidies, so as to encourage the conservation of demand and the development of indigenous energy resources. To avoid severe political difficulties the reforms could be implemented gradually, and selective tightly targeted subsidies for low income users and infant industries may need to be retained.

#### **Non-commercial and Non-conventional Energy**

The traditional sectors of developing economies rely heavily on energy from firewood, charcoal, plant and animal residues, human and animal effort, solar energy, and, to a lesser extent, wind and water power. Many of these sources are referred to as non-commercial, al-

though they are often bought and sold. Some of them are also referred to as non-conventional energy sources. Such forms of energy only supply about 5 percent of world energy consumption. But they account for about half the total energy production of oil importing developing countries, supplying more than 85 percent of the requirements of rural areas in many developing countries. Some Low Income nations, such as Mali, Nepal and Tanzania, rely on non-commercial sources for 90 percent of their energy needs. The demand for such fuels is dominated by household uses, primarily cooking. About half of the world's population today cooks with non-commercial energy.

Despite the importance of non-commercial energy in developing countries, neither national nor international institutions have yet given sufficient attention to the sources and technologies being used, their economic and environmental consequences, or to the development of alternatives. The acute scarcity of reliable information calls for more attention to data gathering and research. However, some of the emerging problems are so pressing that corrective actions and policies must be initiated on the basis of existing knowledge.

Deforestation and fuelwood shortages have become a critical problem and are appropriately labeled "the other energy crisis." In Nepal, the growing demand for fuelwood, fodder and cultivable land is denuding the hillsides and causing severe erosion, which is reducing the fertility of the soil and its capacity to retain water during the dry season. If the present rate of deforestation continues, Nepal's hillsides will be completely bare in 15 years. Deforestation and soil erosion are also serious problems in other countries, including El Salvador and Haiti; in the Sahel and Sudan they have accelerated the process of desertification. Estimates indicate that at least 12 nations are currently using fuelwood at an annual rate faster than their forests can sustain. This does not mean that deforestation is not a serious problem in other countries. Most nations suffer from severe fuelwood shortages around densely populated areas. This is true even of nations as rich in timber as Zaire, which uses only a small fraction of its sustainable forest yield. In many other countries, as fuelwood becomes more difficult to obtain, the use of other fuels, such as animal and crop residues, is increasing, with serious implications for soil fertility, crop yields and the availability of

livestock feeds. This is of particular significance in the drier areas of Africa, much of South Asia, and some parts of Latin America.

Programs for afforestation and reforestation are urgently required. Current progress in this area falls far short of needs. According to rough estimates, the present rate of afforestation in developing countries may be less than a tenth of that necessary to ensure that these nations are reasonably self-sufficient in fuelwood at the end of this century. However, the traditional solution of merely planting trees will not work. The history of failed reforestation projects provides some cautionary guidance. In particular, it is extremely difficult to prevent trees from being felled prematurely to satisfy urgent basic needs for fuelwood. It is therefore essential to start afforestation programs early, before the situation becomes critical.

It may also be useful to integrate forestry projects in rural development programs, which are perceived by the rural population to address their basic needs, and which take account of the close interconnections between forestry, fodder and food production. Moreover, forestry projects could include the promotion of low-cost stoves, which need only half as much firewood as open fires. Such provision has already been made in a number of projects, supported by the World Bank, in countries such as Burundi, Niger, Nigeria, Pakistan and Tanzania. Afforestation efforts are likely to be more successful if the central government is committed to decentralizing control, so that village and district level administrations can effectively participate in managing local resources. With proper management, and appropriate fast growing species of trees, an area can yield five times as much fuelwood as a natural forest. Some countries, including the Philippines and the Republic of Korea, have launched promising afforestation programs on a large scale.

Though the use of commercial energy tends to increase with development and industrialization, because of its high cost large sections of the world's population will continue to rely on non-commercial sources for the foreseeable future. Hence in most developing countries plans for energy development should seek to improve the availability and efficiency of these sources. For example, roughly 300 million households in developing countries have no electricity. Even if it were technically feasible, to provide connections to them using presently

available technology would cost several hundred billion US dollars. It would be more practical to improve the locally available traditional fuels while efforts are made to reduce the costs of rural electrification. Similarly, in many places the immediate introduction of agricultural machinery and chemical fertilizers is impractical, both because of their high monetary costs and because of the effects of mechanization on the demand for labor. Efforts to promote the use of draft animals and traditional fertilizer can help to make agriculture more productive without adding to the demand for commercial energy.

Several non-conventional energy technologies are practical and competitive in developing countries at present prices. The improved wood stoves already mentioned can be constructed largely from local materials for about US\$5-10 each; with stronger promotion and the development of extension services and artisan training schemes, the use of these stoves could be greatly extended. Charcoal yields can be doubled by the introduction of better-designed kilns. Biogas plants are in use in various countries, including the People's Republic of China, the Republic of China, India and the Republic of Korea. However, economies of scale make them more viable for relatively wealthy families with four or five head of cattle and enough land to use the sludge produced for fertilizer. An Indian subsidy program for biogas plants was discontinued when it was found to have increased the effective price of dung, causing hardship to the poor. Solar dryers can be used to dry crops and can reduce losses in storage. Solar water heaters are economical, and solar power is being used to distill water in some parts of the world. Windmills of traditional and advanced designs are worth considering in areas with adequate wind and poor rainfall. Micro-hydro schemes can be used to provide electricity in small isolated communities. Ethyl alcohol can be readily produced in most developing countries by fermenting and distilling agricultural products with a high content of starch or sugar. The resulting crude alcohol can be used as a fuel for cooking and, after dehydration, can be used as an additive to automotive gasoline, or even as a substitute for it, if engines are suitably modified. In most cases, however, alcohol from fermented agricultural products remains more costly than gasoline, and production is still small relative to fuel demands, except in Brazil, where an ambitious effort is under way.

The opportunities for further development and improvement of non-conventional energy sources and uses are substantial: existing technologies need to be systematically evaluated, and new ones developed. The priorities for policy in this area depend on the stage of technological development. Where economically competitive technologies exist, but their current use is limited, policies should focus on promoting their use and resolving implementation problems. Where technologies are at an early stage of development, further design efforts and implementation trials are necessary before the new technologies can be propagated in homes and communities. At present, research and development concentrate disproportionately on mechanical power and electricity; more widespread benefits may be gained from shifting the emphasis to cooking needs and the more efficient use of draft animals. Systematic research is

necessary to improve the data base on non-conventional and non-commercial energy uses and technologies, and to assess the environmental damage that might result from their application. International cooperation and exchange of information can help to avoid duplication of effort.

To sum up, the energy outlook for all countries in the next two decades is fraught with considerable uncertainty. For energy importing nations, rich and poor, it is desirable to err on the safe side—overdoing demand conservation and undertaking “excessive” investments for increased energy production—because the disruptive effects of shortfalls can be serious. In the long run, such risk-averse behavior by energy importing nations is also in the interests of today’s energy exporting nations, which stand to gain from rapid and non-inflationary growth in the world economy.