WORLD BANK

RESEARCH NEWS

Volume 3 Number 1

Winter 1981/1982

CONTENTS

World Bank Research News is issued three times a year. It supplements the descriptions of socioeconomic research projects in progress given in the annual *World Bank Research Program: Abstracts of Current Studies,* and the annual *Catalog of World Bank Publications. Research News* is available free of charge to institutions and individuals with a professional interest in development. To be placed on the mailing list or to receive additional copies, please send a complete address, including your title, to the Publications Distribution Unit, World Bank, 1818 H Street, N.W., Washington, D.C. 20433, U.S.A.

Enquiries on particular research projects should be addressed to the individuals or departments cited. Other enquiries, comments, and suggestions for future issues will be welcomed and should be addressed to the Editor, Office of the Vice President, Development Policy, World Bank, 1818 H Street, N.W., Washington, D.C. 20433, U.S.A.

WORLD BANK RESEARCH ON THE HUNGER DIMENSION OF THE FOOD PROBLEM

*Shlomo Reutlinger**
Development Economics Department

Over the last decade, dramatic changes have occurred in perceptions about the nature and magnitude of the food problem in developing countries. Almost exclusive preoccupation with trends and fluctuations in aggregate food demand, production, and imports has been augmented with a new concern for inadequate food consumption by large numbers of people here and now. This evolution in perceptions about the food problem closely parallels the new realization that the preoccupation with economic growth ought to be complemented with an explicit concern for the poverty persisting among large segments of the population.

This new perception of the nature of the food problem, while widely shared, has not been uniformly interpreted, however, in its implications for policy and research. For example, Willi Brandt, in a recent article in the *Economist* reviewing the Cancun summit conference, states the widely held view that increased food production is the key requirement (for eliminating world hunger) and that food aid (presumably also food imports), while valuable, should be used only for temporary and emergency support.[1]

Research in the World Bank on hunger issues is predicated on the basic premise that the extent of hunger cannot be inferred from data on aggregate food production and that to alleviate hunger, accelerated food production and the stabilization of food supplies through buffer stocks are neither sufficient nor necessary. A second premise is that the most important direct determinants of hunger are usually peoples' levels of income and the prices they must pay for food.

Research reviewed in this paper on the hunger dimension of the food problem has primarily focused on the effects of poverty and food prices on the prevalence of hunger. This is not to deny the important contribution food production has made and will continue to make toward reducing hunger—without the "Green Revolution" the problem of hunger would be much worse than it is today. But while the World Bank has an extensive research portfolio on issues related to food supply, research about the impact on hunger of projects and policies designed to promote food production has hardly begun. Accelerated food production will alleviate hunger only to the extent that the scarce resources used in the process yield a larger reduction in poverty and/or food prices than they would if used in other ways.

Hunger in developing countries has essentially two major dimensions: chronically low levels of food consumption among major segments of the population and periodic reductions in food consumption on a national or regional scale caused by failing harvests, abnormally high prices of imported food, or reduced ability to pay for food imports.

Chronic Hunger

How many people are chronically short of food? By how much? Who are they? How does it affect them? How much additional income would the hungry need, to afford the food they require? How are their food shortages affected by the aggregate food supply and the price they pay for food? These are some of the questions that need to be addressed if any meaningful and cost-effective policies are to evolve.

What is the aggregate dimension of chronic food shortages?

The first requirement for assessing the numbers of people short of food in any country is knowledge about how food consumption is distributed. The

*This review is, by necessity, only about research at the World Bank. My intellectual debt to the wider research community and, equally, to the dedicated practitioners in the field is enormous and gratefully acknowledged. This is essentially a very personal overview of the topic and how I see the pieces fitting together. Only what I regard to be some of the most important issues have been reviewed. Hunger is, of course, a symptom of a much broader malaise in societies. One reason for having selected the particular subjects I did is that they are not already treated in the much broader context of the literature on agricultural and general development, income distribution, and so forth.

1. *Economist*, November 28, 1981.

second requirement is an agreed standard of food adequacy. Here it has been pointed out rightly that different people require different amounts of food; hence, it would be inappropriate simply to count people whose intake of food is below an average standard of food adequacy and to assume that they are underfed. Ideally, one would need to know the food requirement and intake of each individual to draw meaningful conclusions about the extent of food shortages. But it is unrealistic to expect that data of this kind could ever be compiled on a scale large enough for the national prevalence of undernutrition to be assessed.

In *Malnutrition and Poverty,*[2] Reutlinger and Selowsky developed a methodology whereby the per capita food consumption of different income groups is estimated by the use of data on the per capita food consumption of a country's total population, income distribution data, and knowledge about the relationship between income and food consumption. By comparing actual per capita food consumption with an average standard of requirement for each income group, it is possible to infer which income group consumes less per capita than its requirement. It seems reasonable to assume further that among people whose incomes are similar, variations in consumption are closely correlated with requirements. On this assumption, all people within an income group whose average consumption is a certain percentage below requirements are underfed by the same percentage.

In a similar study of the prevalence of undernutrition among children, Selowsky shows how the association between food consumption and poverty leads to a higher incidence of undernutrition among children than adults when the association between income and family size—poor families being larger than the average—is taken into account.[3]

The sensitivity of estimates of the number of "underachieving food consumers" to different assumptions about variations in food intake and requirements among individuals within income groups has been explored in a recent paper by Reutlinger and Alderman.[4]

These studies suggest that the numbers of people consuming too little food are much larger than those suggested by independent observations of people with clinical symptoms of health problems related to undernutrition. Though the subject of much controversy, this discrepancy should not be surprising. The standards of energy sufficiency, developed for a range of representative individuals by FAO/WHO and used in conjunction with the Reutlinger-Selowsky methodology, are meant to represent the requirements for food energy of people engaging in moderate activity and having unimpaired access to food. They go beyond ensuring the food energy required to maintain immediate physical health. The obvious implication is that lower standards of food adequacy should be used when the objective is to measure whether food shortages are impairing health. However, further research is required to determine whether and in what context food intake below the FAO/WHO standards inhibits peoples' activity. It is not known whether, for instance, people in poverty exert less energy than might be expected, due to lack of opportunity and social custom, or whether their limited food intake forces them to adopt a less active lifestyle. It should also be borne in mind that the FAO/WHO standards may underestimate the potential efficiency of energy conversion since they are based on studies of people whose means permit them to waste food. These and similar issues are discussed by Srinivasan.[5]

The studies by Reutlinger and others, as well as subsequent analyses of chronic food deficits derived from survey data on household expenditure and food consumption in several countries (India, Pakistan, Bangladesh, Brazil, Morocco, and Colombia) reported in papers by Knudsen and

2. Shlomo Reutlinger and Marcelo Selowsky, *Malnutrition and Poverty: Magnitude and Policy Options.* World Bank Staff Occasional Papers No. 23 (Baltimore and London: The Johns Hopkins University Press, 1976).

3. Marcelo Selowsky, "The Economic Dimensions of Malnutrition in Young Children." World Bank Staff Working Paper No. 294, October 1978.

4. Shlomo Reutlinger and Harold Alderman, "The Prevalence of Calorie-Deficient Diets in Developing Countries." World Bank Staff Working Paper No. 374, March 1980. Reprinted in *World Development* 8 (5/6) (May/June 1980), pp. 399-411.

5. T.N. Srinivasan, "Malnutrition: Some Measurement and Policy Issues." World Bank Staff Working Paper No. 373, February 1980.

Scandizzo,[6] Berg,[7] Austin,[8] and Mohan and others,[9] clearly highlight several basic propositions in connection with the hunger dimension of the food problem:

- In most countries, the prevailing distribution of food consumption indicates that large numbers of households are consuming less than fully adequate amounts of food (by FAO/ WHO standards) and a smaller but still very large number are getting less food than required for normal health and child development.
- In future, the proportion, though not the absolute number, of people consuming less than adequate amounts of food is likely to show a modest decline under realistic assumptions about growth rates of per capita income and food supplies if the distribution of income remains unchanged.
- The total food deficit implied by this "chronic hunger" is only a small percentage of the food supply currently available in most countries and amounts to no more than 2 percent-4 percent of global food supplies.

A recent study by Knudsen and Scandizzo,[10] based on household survey data on consumption, analyzes the determinants of caloric intakes in developing countries to reach three broad conclusions. First, both income and price elasticities of demand for calories are below unity, so that quite large increases in income or reductions in prices are needed before people will consume more calories. These elasticities tend to cluster around 0.50 for the poorer consumers; they are much lower for higher-income groups. Second, even a moderate increase in calorie prices implies a large nutritional sacrifice for the poor if present trends in the growth and distribution of income continue. Third, with policies to redistribute income moderately so that the poor can better afford to buy food, malnutrition could be substantially reduced even with relatively little economic growth and increasing food prices.

Research on policy options

These findings on the nature and magnitude of chronic hunger have important implications for the kind of research needed in support of policies which could substantially reduce hunger. The prognosis from the World Bank's research about the nature and magnitude of the problem is neither pessimistic nor optimistic. Inasfar as the amount of food required to close the gap between current consumption and nutritionally adequate consumption is small, *the world's capacity to produce more food is not likely to be a major constraint.* Even so, the task of defining and implementing policies which would make it possible for hundreds of millions of people to augment their meager diets, albeit by small amounts, is a major challenge. The central thrust of research in this regard should be, therefore, to identify policies which cost effectively provide "hungry" people with more income to purchase more food at existing prices (or to consume more of the food they produce, if they are farmers) and/or make food available to them at lower prices.

In *Malnutrition and Poverty,* Reutlinger and Selowsky compared the cost effectiveness of income maintenance, food stamps, and general subsidies on food prices in augmenting the food consumption of the undernourished.[11] They defined cost effectiveness in terms of the fiscal cost per additional unit of food consumed by the undernourished population. The conclusions are quite stark, but not surprising. General food-price subsidies are extremely cost ineffective if only a small proportion of the population is undernourished and the elasticity of demand for the subsidized food by those who do not need it is fairly high. If, as is often the case, only the imported portion of the available food is subsidized, the fiscal cost effectiveness is improved, but only because the costs to the economy are

6. Odin K. Knudsen and Pasquale L. Scandizzo, "Nutrition and Food Needs in Developing Countries." World Bank Staff Working Paper No. 328, May 1979.

7. Alan Berg, "Malnourished People—a policy view." Poverty and Basic Needs Series, World Bank, June 1981.

8. James E. Austin, *Confronting Urban Malnutrition: The Design of Nutrition Programs.* World Bank Staff Occasional Papers No. 28 (Baltimore and London: The Johns Hopkins University Press, 1980).

9. Rakesh Mohan, Wilhelm Wagner, and Jorge Garcia, "Measuring Urban Malnutrition and Poverty: A Case Study of Bogota and Cali, Colombia." World Bank Staff Working Paper No. 447, April 1981.

10. Odin K. Knudsen and Pasquale L. Scandizzo, "The Demand for Calories in Developing Countries." *The American Journal of Agricultural Economics,* vol. 64, no. 1 (February 1982) (forthcoming).

11. Shlomo Reutlinger and Marcelo Selowsky, ibid.

shifted, in part, to domestic producers. This kind of subsidy reduces efficiency, increases dependence on imports and, possibly, increases hunger among poor farmers and laborers to the extent that subsidized imports depress production. In general, policies that target benefits to the undernourished—food-price subsidies, food-stamp programs, or straight income transfers—are shown to be much more cost effective.

Separate studies by Selowsky[12] and Knudsen[13] show that it is even more difficult to design cost-effective, subsidized food-distribution programs when the target population is more narrowly defined, so as to consist only of children. Selowsky concludes that it is difficult to do better than through an equivalent income transfer. Knudsen suggests that effectiveness can be reasonably assured only if supplementary feeding is restricted to the most needy cases, is carried on for a limited period, and if the ration size is close to the full nutritional requirements of the child.

Applications of cost effectiveness and cost-benefit criteria to the evaluation of projects and policies designed to raise the food consumption of the undernourished population are discussed in studies of a supplementary feeding project for children in Tamil Nadu (India)[14] and the ration shop program in India.[15] In a study of the milk-distribution program in Chile,[16] Harbert and Scandizzo analyzed the extent to which the food given to the household is actually used by the intended beneficiaries (children and pregnant women) and questioned whether the program's economic and dietary benefits ensured a lasting improvement in nutrition. They found that, while some of the benefits go to other family members, a substantial amount still reaches the target group. Among the target group, calorie and protein consumption rose significantly, while weight and height increased.

Scandizzo and Graves[17] analyzed both fiscal and economic costs of policies for broad-based food distribution in several Asian countries. Their results show that such policies tend to be more cost effective in countries with higher food deficits per capita and where a larger share of the population is in deficit and increases its consumption significantly in response to small reductions in food prices. Further, countries in which a larger portion of the distribution cost is sustained by the government, rather than by domestic producers, appear to be the more efficient distributors of low-priced calories.

In a recent analysis of commodities used in US food-aid programs for distribution to selected target groups, Reutlinger developed criteria for measuring the cost effectiveness of alternative commodities and program modalities. Preliminary data indicate large variations in cost effectiveness.[18] For cases in which interventions cannot be targeted to the poor, the work of Timmer,[19] particularly in reference to Indonesia, has shown that subsidizing the distribution of the "inferior" foods consumed in relatively large quantities by the poor can be much more cost effective in reducing chronic hunger than subsidizing foods in high demand by the whole population.

In principle, it would be nice to know not only the cost of inducing a given increase in food consumption by a target population, but also the consequences of doing so. For instance, if the consequences could be expressed in terms of the contribution to national income, one could compare the benefits from a supplementary food program with those of a transport project. Or, if the consequences for health could be predicted and quantified, one could compare the cost effectiveness

12. Marcelo Selowsky, "Target Group Oriented Food Programs. Cost Effectiveness Comparisons." World Bank Reprint Series: Number 127. Reprinted from *American Journal of Agricultural Economics* , vol. 61, no. 5 (December 1979):pp. 988-994.

13. Odin K. Knudsen, "Economics of Supplemental Feeding of Malnourished Children: Leakages, Costs, and Benefits." World Bank Staff Working Paper No. 451, April 1981.

14. Odin K. Knudsen, ibid.

15. Pasquale L. Scandizzo and Gurushri Swamy, "Benefits and Costs of Food Distribution Policies: The India Case." World Bank, Agriculture and Rural Development Department, September 1981.

16. Lloyd Harbert and Pasquale L. Scandizzo, "Food Distribution and Nutrition Intervention—The Case of Chile." World Bank, Agriculture and Rural Development Department, Working Paper No. 27, February 1980.

7. Pasquale L. Scandizzo and J. Graves, "The Alleviation of Malnutrition. Impact and Cost Effectiveness of Official Programs." World Bank, Agriculture and Rural Development Department, Working Paper No. 19, January 1981.

18. Shlomo Reutlinger, "Analysis of the Nutritional Cost-Effectiveness of Commodities." World Bank: Development Economics Department, September 1981.

19. C. Timmer, "Toward a Nutrition Oriented Food Policy: The Case of Indonesia." World Bank (mimeo).

of supplementary food programs with that of other health-promoting investments.

World Bank researchers have investigated two kinds of relationships between nutrition and productivity: the effect of early nutritional deprivation on children's mental development and educational achievement, with its consequences for lifetime earnings, and the effects of adult malnutrition on workers' performance. Studies by Selowsky and Taylor[20] on the former and by Basta and Churchill[21] on the latter show that nutritional deprivation can significantly impair productivity, but that this impairment is difficult to separate from the effects of other factors in the environment. Such a concept of the benefits from improved nutrition is made even more difficult to use as a criterion in project selection because any assessment of the social, as distinct from the private, gains requires additional assumptions about the social value of the current and future marginal product of labor and mental abilities both in the present and many years into the future.

An alternative approach to the evaluation of benefits from additional food consumption is presented in a paper by Scandizzo and Knudsen.[22] They derive criteria for estimating social demand functions, which measure the value society places on various amounts of food consumed by each of its members. The extent to which social demand exceeds private demand is used to measure the gains from enabling poor people to consume more food than they otherwise would.

Given the state of present knowledge and the cost of learning more about the functional and economic significance of undernutrition, it is doubtful that projects or policies designed to reduce hunger could or should be evaluated using cost/benefit analysis. In any case, the cost of human suffering cannot be assessed in any objective manner. Besides, different degrees of compassion and political considerations play an important role in determining the kind and extent of measures adopted in a particular country. In this context, research on the chronic hunger dimension of the food problem can be most relevant when it focuses primarily on identifying which segments of the population are denied access to food by any reasonable standard and on evaluating which are the most cost-effective measures to reduce these deprivations.

Periodic Countrywide Food Scarcities

Periodic poor harvests, high prices of imported foods, and reduced foreign-exchange earnings can sharply reduce the food available to a nation. The effects may be severe for the poor but hardly noticeable for the well-to-do. When aggregate supplies decline and prices rise, the well-to-do can continue to eat the same amounts of food simply by buying cheaper foods or by reducing their nonfood consumption. The poor do not have this option; they must sharply reduce their total consumption of food when the price rises. As a consequence, the chronically underfed have even less food than usual, and people who normally "get by" become underfed periodically, too. Worst hit when harvests fail are poor farmers and the landless, who derive their income largely from food production.

When the World Bank first began its research on instability in food supplies, neither the many causes of observed variations in food supply and consumption nor their implications for the incidence of hunger was explicitly recognized. The main objective of the first study[23] was to estimate the benefits and costs of a national buffer stock under conditions that would be most favorable to its economic justification: the case of a country unable or unwilling to vary food imports or exports in response to variations in its domestic food production. A simulation model was used to transform the probability distribution of production into a probability distribution of price and consumption associated with buffer stocks of

20. Marcelo Selowsky and Lance Taylor, "The Economics of Malnourished Children: An Example of Disinvestment in Human Capital." *Economic Development and Cultural Change*, vol. 22, no. 1 (October 1973): pp. 17-30.

21. Samir S. Basta and Anthony Churchill, "Iron Deficiency Anemia and the Productivity of Adult Males in Indonesia." World Bank Staff Working Paper No. 175, April 1974, and "The Relationship of Nutrition and Health to Worker Productivity in Kenya." Study of the Substitution of Labor and Equipment in Civil Construction, Technical Memorandum No. 26, World Bank, May 1977.

22. Pasquale L. Scandizzo and Odin K. Knudsen, "The Evaluation of the Benefits of Basic Needs Policies." *American Journal of Agricultural Economics, vol. 62, no. 1* (February 1980): pp. 46-57.

23. Shlomo Reutlinger, "A Simulation Model for Evaluating Buffer Stock Programs," in *Symposium on Food Grain Marketing in Asia*," Asian Productivity Organization, Tokyo, 1971.

various sizes. Probability distributions of the costs and benefits of the buffer stock operations were calculated on the basis of a large sample of 30-year sequences of production selected at random from the probability distribution of production. For a range of plausible parameters, it was illustrated that the cost of a buffer stock, relative to its effect on stabilizing price and consumption, increases rapidly with the size of the stock and that for a reasonable level of stabilization the costs would far exceed the gains in consumer surplus associated with the stabilization of prices.

This basic framework of analysis was retained in subsequent studies undertaken over more than a decade, but the model was expanded in many new directions. Additional factors contributing to the instability of food consumption were explicitly considered and studies increasingly emphasized the hunger dimension of food supply and consumption instability.

In a study of global instability in the supply of wheat,[24] the original model was modified in order to investigate the effectiveness of buffer stocks in reducing the likelihood of extreme shortfalls in supply. It was illustrated that this purpose would require a very large and costly buffer stock if the stock were operated by rules which provide for the reduction of general price instability. A much less costly stock of moderate size, however, was shown to be adequate to the task if rules were adopted providing for the release of stocks only in the event of extreme shortfalls in supply.

Further studies of countrywide instability in the consumption of foodgrains investigated the effects of instability both in domestic production and in world market prices under alternative buffer-stock and food-trade policy scenarios. It was shown that under a free-trade regime, with imports filling the gap between food consumption and production at existing world market prices, much of the supply instability caused by fluctuations in domestic production could disappear. The remaining instability would be the result of instability in import prices and the response of consumers to price fluctuations. This source of instability could be eliminated under a stabilizing trade policy, whereby all or some consumers would be insulated from fluctuations in international prices. It was shown, however, that a free-trade policy and, more so, a stabilizing-trade policy in grains would reduce supply instability at the cost of greatly destabilizing the foreign exchange and fiscal accounts. Domestic buffer stock operations could be justified, but only to the extent that they are less costly than financial measures to cope with unstable food trade accounts.[25]

Another study specifically compared the cost effectiveness of buffer stocks, trade policies, and internal food pricing policies for preventing shortfalls in the consumption of food by low-income consumers. This research illustrated that through the redistribution of existing food supplies within the country, periodic hunger could be prevented at a reasonable cost without either large buffer stocks or the excessive demands on foreign exchange which a countrywide supply-stabilization trade policy entails.[26]

Applying this research to the case of India, it has been shown that buffer stocks of the magnitude India has held in recent years effectively stabilize supply, but at a very high cost. Equally effective stabilization could be assured through trade and less stocks, particularly if stocks are replenished when world prices are favorable.[27]

---

24. _____, "A Simulation Model for Evaluating World-Wide Buffer Stocks of Wheat." World Bank Reprint Series: Number 34. Reprinted from *American Journal of Agricultural Economics* , vol. 58, no. 1, (February 1976):pp. 1-2.

25. Shlomo Reutlinger, D. Eaton, and D. Bigman, "Should Developing Nations Carry Grain Reserves?" in Eaton and Steele, eds., *Analysis of Grain Reserves*. United States Department of Agriculture: ERS-634, pp. 12-38. August 1976. D. Bigman and Shlomo Reutlinger, "Food Price Stabilization: National Buffer Stocks and Trade Policies." *American Journal of Agricultural Economics*, vol. 61, no. 4 (November 1979): pp. 657-667, "National and International Policies Towards Food Security and Price Stabilization." *American Economic Review*, vol. 69, no. 2 (1979): pp. 159-163. Shlomo Reutlinger and K. Knapp, "Food Security in Food Deficit Countries: A Brief Historical Review and Probabilistic Simulation of the Effect of Trade and Stock Policies," in Yaron and Tapiers (eds.) *Operations Research in Agriculture and Water Resources: Proceedings* (Amsterdam: North Holland Publishing Company, 1980).

26. Shlomo Reutlinger and D. Bigman, "Policy Options in Attaining Food Security: Feasibility, Effectiveness and Costs," in A. Valdes, (ed.), *Food Security for Developing Countries* (Boulder: Westview Press, 1981).

27. Shlomo Reutlinger, "The Level of Stability of India's Foodgrain Consumption." *World Bank Staff Working Paper No. 279*. November 1979.

In recent years, research in the World Bank on the stabilization of food grain supply has focused increasingly on the international environment and initiatives. In the wake of the food crisis in the early 1970s and its visible consequences in developing countries, the media and international fora issued pleas for new and large investments in national and international buffer stocks. Research in the Bank has demonstrated effectively that such supply-oriented solutions are extremely costly and could ill be afforded. Moreover, on the level contemplated, they would be too small to solve the hunger problem of poor people and poor countries.

In a paper published in 1978, Reutlinger demonstrated that if countries are short of foreign exchange or are unwilling to allocate enough foreign exchange to food imports, their food supplies will continue to be unstable, irrespective of the level of supply stabilization in the international market. Perhaps as often as four out of five times, a food shortage in a country will be caused by poor harvests uncompensated by imports. These occurrences would not be remedied by international supply stabilization through international buffer stocks. (Otherwise, what is the explanation of the repeated supply shortfalls in many countries during a long period preceding 1973 when the world price of food grains was very stable?) Domestically held buffer stocks in each country would be a solution, but a very costly one. The obvious alternative is to seek a solution to the financial constraints that prevent countries from offsetting losses in their own production of food by imports. Research showed that an international financing facility could insure countries against excessive food import bills at low cost, even if the credit were extended on very favorable terms.[28]

The most significant policy initiative traceable to research on food security is the recent modification of the International Monetary Fund's Compensatory Financing Facility (CFF) to compensate countries for shortfalls in export earnings as well as excessive cereal import bills. A current study is analyzing the possible impact on food security (i.e., the prevention of a precipitous decline in food consumption) of countries availing themselves of credit from the CFF. It also considers how domestic pricing and foreign exchange-allocation policies affect the food security of countries with and without access to the new facility. The study includes what is so far the most complete analysis of the sources of instability in a country's food consumption: as well as variations in domestic production and import prices, these include variations in export earnings.[29]

Summary

The focus on the hunger dimension of the food problem has led researchers in the World Bank to look increasingly at the link between hunger and poverty. In this regard, there is a clear symmetry between the problem of chronically underfed people within countries and periodic threats to aggregate food consumption in poor countries. In both cases, the aggregate amount of food—the country's food supply or the worldwide food supply, respectively— plays a role. However, by far the more decisive determinant of whether people and countries obtain enough food is their ability to pay for it. For the chronically hungry, what matters is their income and the prices they must pay for food. Producing more food, if it doesn't generate a sufficiently large wage bill and if it doesn't reduce the price of food faced by those in hunger, will do little to prevent hunger. The food produced might end up in excessive stocks or in exports, or depress prices to farmers and thereby "kill the goose that laid the golden egg." Similarly, the supply of food in poor countries is more likely to be stabilized by providing them with the financial assistance they need for imports than by stabilizing global supplies of food.

Future research on hunger issues in the World Bank and elsewhere might well concentrate more on identifying those hunger conditions which are primarily caused by poverty as distinct from those primarily caused by supply constraints. In either case, it might be easier to become knowledgeable about the causes than about appropriate and cost-effective remedies. Yet without cost-effective remedies little is likely to change in a world which has very limited resources and is preoccupied with much else besides hunger.

---

28. Shlomo Reutlinger, "Food Insecurity: Magnitude and Remedies." World Bank Reprint Series: Number 71. Reprinted from *World Development* vol. 6, no. 9/10 (September-October 1978): pp. 797-811.

29. B. Huddleston, D. Gale Johnson, Shlomo Reutlinger, A. Valdes, *Financial Arrangements for Food Security*. World Bank, Development Economics Department, 1981.)

COMPLETED RESEARCH

All reports cited in this section may be obtained from Philip Mitchell, World Bank Research Documentation Center, Room I 8-203.

Rural Development in China

Ref. No. 671-90

This study, undertaken for the Bank's Policy Planning and Program Review Department (PPR) by Dwight Perkins of Harvard University and Shahid Yusuf of the Bank's staff, is a synthesis of the available material on rural development in China. China has gone a long way toward meeting the minimal needs of its rural population. Except perhaps in very remote areas, severe malnutrition is absent, and most people have access to modern health care for life-threatening diseases. Almost all of China's youth get some education and, increasingly, the better students, even in rural areas, have access to higher levels of the education system.

Not everyone is equally well off. Substantial differences in income remain, and Chinese leaders have spoken of 100 million people who are not adequately fed. Average per capita caloric intake is around 2100 calories per day, a level no higher than that of many other developing countries. But the number of people at semi-starvation levels—around 1500 calories a day—must be much smaller as a percentage of population than in most nations with a similar average.

Outsiders who have tried to encapsulate China's rural development strategy have emphasized different aspects of that strategy. For some, the main issue has been the role that should be played by material incentives for work. For others, the main issue concerns the means of raising production: Does rural development depend mainly on the reorganization of rural society and the mobilization of surplus labor, or mainly on a technological solution (improved seeds, chemical fertilizer, assured supplies of water)? A third approach taken in this study, is to view China's rural development in the context of the nation's overall development strategy. In this light, China's policies can be seen as an attempt to solve the problems of rural poverty and sluggish agricultural growth while minimizing the rural sector's dependence on industrialization and the growth of cities. This isolation of the rural sector was largely the result of measures whose purposes were unrelated to rural development, but it can nonetheless be seen as a test of the efficacy of self-contained rural development. The strategy employed by the Chinese can also be seen as one of the world's most ambitious attempts to improve the welfare of the poor or, more broadly, to develop human resources in the absence of industrialization and urbanization.

After demonstrating how limited were the ties of the rural economy to the urban industrial sector since the mid 1950s, the study looks in Chapter II at the performance of agricultural production. Cereal output is judged to have grown by about 2 percent a year, and agricultural value added by about 2.6 percent a year, between 1955-57 and 1975-79. Though not especially rapid by international standards, these are respectable growth rates since, it is argued, China faces peculiar difficulties in raising agricultural output. First, the rapid agricultural growth achieved by several other countries has been based on cash crops with a high value of output per hectare, with the gap between domestic consumption and production of cereals being filled by imports. In China, any major shift in emphasis away from grains to cash crops could quickly lead to a dependence on imports too large to be sustained. (A level of grain imports comparable to that of the Republic of Korea or Japan, for example, would mean annual foreign purchases of over 100 million tons. Even were China able to afford such purchases at present prices, such a large addition to demand would send world grain prices up dramatically.) Second, when China's rice yields are compared with those of other countries, taking examples from where local production conditions are similar, they appear to be very high. China has already tried many of the known methods of raising rice yields;[1] further increases will depend on techniques as yet untried or unidentified.

Agricultural growth rates have kept ahead of growth in population since the mid 1960s, but the per capita agricultural product is only slightly

1. For example, China had developed dwarf high-yielding varieties of rice by the early 1960s, well before the International Rice Research Institute was established.

above subsistence level. The issue has never been whether to put a major effort into raising agricultural product, but rather of how to go about this. The study looks in Chapter III at the means of raising agricultural output from two interrelated perspectives. The first concerns the direct inputs (such as chemical fertilizers) that are most efficient in improving yields; the second concerns the most efficient way of organizing rural society so as to provide incentives for hard work. Both these issues have long been the subject of controversy in China. The study reviews the policy decisions taken and their effects, detailing the experience with mobilizing labor for public works and the provision of inputs other than labor. It emphasizes that agricultural production did not begin its sustained rise until there was a rapid increase in the flow of inputs from modern industry.

The degree of China's reliance on organizational changes as a means of achieving rural development is what sets the country apart from most others. In Chapter IV, the study analyzes institutional change, discussing, first, the specific reforms pushed and then the reasons for promoting them. It is not much of an oversimplification to say that rural institutions were reformed primarily for political reasons—to consolidate the Chinese Communist Party's control of the countryside—but also with high hopes that production would be stimulated. When the initial impact on production proved to be disappointing, the Chinese leadership discovered new ways of using the existing structure to help alleviate the problems of rural poverty through the direct provision of services.

Even a brief recital of the kinds of reforms undertaken in China after 1949 makes clear the remarkable ability of the Chinese Communist Party to bring about fundamental changes in rural society. The discussion of organizational change seeks some answers to the question of where this remarkable implementation capacity came from. It points out the relationships between China's reforms and its historical and revolutionary experience—not least a long Confucian heritage and a revolution that put the poorest elements of Chinese society in command of that society, and which also systematically destroyed those institutions, such as the extended family, that would interfere with the ability of the Party to carry out its programs.

Could a nation with different traditions, or one lacking an organization like the Chinese Communist Party, carry out a comparable transformation of rural society? An answer to this question would obviously require a detailed analysis of conditions in the particular country. But, as the authors note, in part, the problem is one of distinguishing that which can only be done in a system of collectivized agriculture from the measures that are not tied so intimately to this form of organization. China's extension service, for example, is particularly effective because it has closed the gap between the decision maker at the farm level and the extension worker, by including the extension worker in the team's or commune's decision-making process. Under the commune system, such integration is easy to accomplish because decisions are made by a leadership group, and the commune or team can easily pool its resources and send one of its members for the necessary training. Analogous arrangements within a market economy are possible, but the commune closes the gap more easily than most other extension systems.

It can be argued persuasively that a government with the political will and administrative capacity to follow China's path of radical reform and direct action can accomplish more for the poor in a short time than decades of "trickle down" from rapid economic growth. Recalling how much the growth of China's agriculture appeared to depend on the flow of inputs from modern industry, Chapter V of the study asks whether meeting the basic needs of the rural poor was equally dependent on the rapid growth of industry. Possessing both the will and the capacity to implement social change, was China able to eliminate the worst forms of rural poverty by methods that did not depend on the growth of the modern, urban sector? Agricultural output just kept pace with the growth of population. Average rural income grew only modestly, mainly as a result of changes in the rural-urban terms of trade. A key feature of many, though not all, of China's programs to eliminate rural poverty was indeed the mobilization and redistribution of resources already in rural areas. The income of the poorest peasants was raised less by massive investments in rural infrastructure than by redistributing landlord income. Public health was promoted by "barefoot" doctors with a few months' training, rather than by "urban" doctors with many years of training. But though the

achievements are impressive, the experience suggests some of the limits of a self-contained rural strategy against poverty—and, in particular, the limits to continued progress under such a strategy where growth is relatively slow.

Though the extent of poverty was dramatically reduced between the 1930s and the 1950s, the poverty that remained has proved remarkably resistant. Chapter V of the study shows that China's land reform had a clear-cut effect on the distribution of income: Confiscation of landlord land was thorough, covering roughly 45 percent of the total; a major and largely successful effort was made to ensure that poor peasants and landless laborers received this land, for which landlords were not compensated. Income of the bottom 20 percent of the population rose by 88 percent and that of the bottom 40 percent by 37 percent. Much abject poverty was eliminated.

It is commonly believed that the formation of cooperatives and, then, of communes took the redistribution of income a giant step further. There was indeed some redistribution of income within communes, particularly since property incomes were, in effect, eliminated. But the distribution of income in rural China in the late 1970s differed little from that in the early 1950s, following land reform. The isolation of the rural sector played an important role here. Some poor areas became rich, but most backward areas remained so. Poor production teams could catch up with the income level of richer teams if they invested more (unlikely), had better leadership, tried harder because they were poorer, or because more of their people left for the city, leaving fewer at home to share incomes from land. The final alternative was for the state to invest more in the poorer rural areas. Differential rates of migration were not possible, because, in general, migration to the cities was prohibited. Directing state investments toward the poorer farmers was not very effective: State funds for this purpose were not very large, but they were also mainly directed toward projects with the greatest potential impact on productivity, given the already slow growth rate of agriculture. Such projects only occasionally were in the more backward areas.

By the late 1970s, the biggest differences in income levels were not between, but within, provinces. The poorest areas were those most remote from large cities, in particular, communes in the northwest whose remoteness was combined with a shortage of water. Communes near cities benefited doubly: Not only could they concentrate on growing crops, such as vegetables, with a high value per hectare, but their members could take higher-paying jobs in the urban sector, because they could commute to work and hence did not have to apply for permission to live in the city. (Urban employment has grown much faster than urban population.)

The authors suggest that recent policies relaxing controls on rural-urban migration may help to reduce inequality of incomes. Higher farm-gate prices, however, may favor the richer areas since less is marketed from remote mountainous regions than from regions near cities and good transport systems.

The recent shifts in policy toward education, which is the subject of Chapter VII, may also reinforce present trends toward greater inequality. Chinese society had long supported an indigenous educational system which produced, among other things, a highly educated elite. This historical foundation provided the base for a rapid expansion in education after 1949. The educational system was a central target of Mao's attack on urban elitism that began with the Great Leap Forward and was pushed with particular vigor during the Cultural Revolution. Had this effort been pushed by more moderate means, the results might have been different. As it was, the school system, at least at higher levels, was closed down entirely for several years, and internal school discipline was continuously undermined after schools reopened. Little technical education or research took place, even in agricultural subjects. Technical education with a strong elitist flavor was restored after 1977. At the same time, primary education is approaching universality, and an effort is under way to achieve the same goal for middle schools. How the new educational policies will affect agricultural productivity and the distribution of rural income will depend, to a large extent, on whether those now being educated migrate to the cities as industrialization proceeds.

Perhaps China's greatest success in meeting the needs of its rural people is in the area of health care. A crude death rate of 7-8 per thousand is one

indication that the worst problems have been conquered. Chapter VI of the study synthesizes the vast literature on the development of China's rural health-care system and appraises the system's effectiveness. This chapter also reviews China's population policies of the last three decades and the possible causes of the sharp drop in the crude birth rate, from 30 per thousand in the early 1970s to 20 per thousand in 1978.

Beginning in the late 1950s, the government took steps, largely successful, to eradicate those diseases that could be prevented by inoculation. The fact that food was quite equitably distributed (more so than income) must have played an important role in improving health. The Chinese also began to build a curative system that reached down to the brigade and team level. China's experience with rural health care provides mixed support and criticism for both sides of the debate over whether "mass campaign versus technical expertise," or "red versus expert" should provide the impetus for development. Without China's large-scale politically inspired efforts to reorient the work of the urban technical bureaucracy toward the rural areas, the health system would not have become so highly developed. Once the system was in place, however, its effective use depended on the technicians who ran it. Further major advances in public health seem likely to depend on the technical and research expertise that is available, particularly in epidemiology.

In concluding the study, the authors argue that though many basic needs could no doubt have been met without the commune form of organization, the commune system made the task easier in several ways. The commune could maintain a welfare fund to meet the needs of its most destitute members; it could afford to maintain individuals while they acquired training in health; and it could guarantee them a position on their return. Mobilized labor was just as useful in killing snails carrying liver flukes as it was in building irrigation systems.

In promoting agricultural production, the structure of communes, brigades, and teams was less effective than in meeting basic needs. Even here, however, it had advantages that offset its limitations. Where rural public works were needed, the commune was effective in mobilizing the necessary labor. And extension workers, just like health workers, could be sent for training and guaranteed a place on their return. Whether because of the communes or in spite of them, Chinese agricultural production grew at a respectable rate.

The study finds that though China's achievements against poverty are impressive, the country's experience over the past three decades suggests that there are severe limits to what can be accomplished by a rural development effort that is self contained. In the future, except in the unlikely event of a major and sustained rise in the rate of agricultural growth above the levels of the 1960s and 1970s, China's farmers will become rich only if there are fewer of them to share the fruits of the land—and, for that to happen, there must be more urban jobs. If agricultural growth is to be accelerated, that, too, will require an increased effort outside the rural sector: Only a first-class education system at the university level can provide China with the necessary scientists; only large investments by the state can solve the water problems of the north.

A section of the study identifies some of the gaps in what is known about the Chinese economy and its workings and notes some of the analytical techniques developed in the West that are not now in use in China but that might be of value to its economic planners.

Report

Perkins, Dwight H. and Yusuf, Shahid. "Rural Development in China." World Bank, Policy Planning and Program Review Department, January 1981.

Marketing Manufactured Exports: Clothing from Colombia

Ref. No. 671-56

In 1977, when this project was started, research was beginning to throw light on how the manufactured exports of developing countries were affected by trade regimes and export incentives, but in sharp contrast, little was known about the institutional and nonprice aspects of marketing manufactured exports. This research was designed to begin to fill that gap.

In order to export, firms presumably must identify

a market, obtain specific orders, design products to meet buyers' needs, bring together all the resources and inputs required, and establish suitable operations for such tasks as quality control, packaging, fulfillment of government requirements, and delivery of the product at an agreed time and place. Firms and countries trying to export were believed to be encountering major difficulties in some of these areas, but relevant literature and advice were practically nonexistent.

The study analyzed the recent experience with clothing exports from Colombia, a country considered to be relatively typical of Latin America in economic characteristics, size, performance in the export of manufactures, and the timing and nature of its policy changes in the 1960s and 1970s. The clothing industry is similar to others in which developing countries have achieved success in exports, in that average wages are low, the share of wages in value added is high, and economies of scale are unimportant. Perhaps the most important difference between apparel and other industries is that clothing is one of the few in which developing countries face quota restrictions in major markets. So far, however, the existence of quotas has not had a major influence on trends in exports of Colombian clothing.

The country's clothing exports to the United States and Europe rose rapidly in the early 1970s, but, since 1975, have fallen in real value, as Colombian firms were forced out of these competitive markets. This drop was offset, at least in part, by an increase in exports to more easily penetrable markets in Venezuela and the Caribbean. By 1978, Colombia's share of the US market had fallen to 0.6 percent—60 percent lower than it had been three years earlier. After assessing the reasons for these trends, the study asks why Colombia was so much less successful at exporting garments than Hong Kong, the Republic of Korea, and *Taiwan*, China, and whether this helps to explain why Latin America has been less successful than East Asia at exporting most types of manufactured goods.

The research was based primarily on in-depth field interviews, conducted in 1978, with managers or export managers of 30 Colombian firms that exported or had exported clothing and with officials in over a dozen other organizations in Colombia concerned with these exports, including foreign buying offices, private business associations, and government agencies. In March, 1979, executives from 14 of the US enterprises that had bought clothing from firms in the sample, along with officials of an international consulting firm specializing in the industry, were interviewed in New York. Researchers at Fedesarrollo, the Colombian research organization, undertook quantitative analysis of real and effective exchange rates and export incentives for clothing.

For exports to succeed, many demanding conditions must be met simultaneously. Suitably low prices are essential, together with precision in meeting design and size specifications, reliable quality control, and punctual delivery. Buyers also expect the right materials, colors, accessories, labels, packing, and documentation. Whether an enterprise in a developing country undertakes all the necessary tasks, learns what is needed, and succeeds in filling all these requirements depends largely on whether the surrounding policy environment makes it profitable and possible to do so. The single most important reason for the rise and decline in Colombia's exports of clothing to the US and Europe lies with the country's exchange-rate and export-incentive policies. The introduction, in 1967, of a crawling peg exchange rate and export-incentive policies made exports profitable for a time, but from roughly 1973 onwards, as a consequence of changes in the exchange rate and for other reasons (including the inflationary side effects of high export prices for coffee and of illegal exports) exporting clothing again became decidedly less attractive than producing for the domestic market. As an example, a firm manufacturing clothes from domestic fabric in 1978 received effective protection from the tariff and export subsidy system of 30 percent to 100 percent when it sold garments in Colombia, but of -32 percent to -62 percent when it exported them.

Comparisons reveal that Colombia's performance was less successful than East Asia's in spite of its lower wage levels and a considerable potential to compete. Hong Kong, the Republic of Korea, and *Taiwan*, China, have a combined population only 2.5 times that of Colombia, yet their exports of garments to all markets in 1976 were 150 times greater in value than Colombia's. Colombian exporters generally cited cheap labor, heavy

government subsidization, or cheap transport costs as reasons for East Asian supremacy, but on all three counts they were wrong. Wage rates in the garment industry in East Asia are higher than in Colombia or are roughly similar; government export subsidies are nonexistent in Hong Kong and hardly greater in Korea and *Taiwan,* China, than in Colombia; as to transport costs, Colombians can land goods in New York for the same costs as East Asians, while saving up to four weeks in transit time. Nor do US import quotas explain the difference.

The main price-related differences appear to be in labor productivity and fabric prices. Output per garment worker appears to be 30 percent to 50 percent greater in East Asia than in Colombia, so that at least in Korea and *Taiwan,* China, the wages paid per garment are much lower. Differences in the ability of management seem to be the most important reason for this difference in productivity, but cultural and social factors may also play a role. In East Asia, garment exporters are assured of fabrics of top quality at world prices. Fabrics produced in Colombia are priced at 50 percent to 100 percent above world levels, even though they are exported at the world price. Most exporters to the US and Europe import fabrics and reclaim the duty paid, under the provisions of the Plan Vallejo. However, the long, often unpredictable, delays in processing import requests and in clearing imports through customs are often crippling, since the season in the clothing business is short and punctual delivery essential. The export-processing zones established to avoid such problems do not do so.

Perhaps the central finding of the study is that nonprice considerations strongly reinforce the case for the liberal trade policies and policy changes toward a more open economy that are usually recommended today by economists. The policies that matter most are: those that affect real exchange rates and financial inducements to export; protection and the resulting relative profitability of the domestic market; access to imported inputs; the costs and availability of locally made inputs; operating procedures of customs officials; the ease of making necessary international transactions; and the stability and costs of manufacturing generally. Negative influences in the policy environment and deteriorating incentives to export have tended to show up most clearly in Colombia in failures and troubles in the nonprice aspects of export performance.

Among the nonprice reasons for Colombia's inability to compete with East Asia, differences in quality control and punctuality of delivery seem most important. Though the best Colombian clothing firms are as good as those anywhere, a number of others have given the country's exports a bad name. The fact that Colombian producers have been sheltered from the competition of imports in the domestic market may have contributed to this; so may the unreliability of domestic suppliers of textiles (in the quality and timing of deliveries) and delays in importing inputs. Making garments for export is also riskier in Colombia than in East Asia, since few foreign buyers maintain full-time contact there.

Some of the interconnections between policy and the determinants of export potential can only be guessed at. How much effect the policy environment has, as against other long-term influences, is unknown in such areas as work habits, cultural attitudes, management know-how, technical proficiency, or local tastes and patterns of demand, all of which tend to affect export performance. To some extent, modifications could be made— for example, through well-aimed education and training—without changing the policy mix. Though the study does not neglect these subjects, it does not provide definitive answers.

The study suggests measures that would help Colombia's garment exporters to become more competitive with East Asia's. They include, first, raising the real effective exchange rate for clothing exports to a level that exporters can feel confident will be maintained for at least five to ten years. (Long-term policy commitments are more difficult to make in Colombia than in East Asia, however, since a bi-party agreement would probably be required.) Second, to assure exporters access, with minimal delays, to duty-free fabrics of top quality at world prices, tariffs on imported textiles might be lowered and import licenses for textiles abolished. Suggestions are made for adjustments in the Plan Vallejo, in export subsidies, and on the management of free zones for export processing. Third, various strategies might be tried to improve the country's management. As New York buyers

repeatedly stressed, price, quality, and punctuality are all necessary; the absence of any of these elements disqualifies a would-be clothing exporter from serious consideration. Price may be the most important factor, however, since if exporting were made more profitable, entrepreneurs and foreign buyers would have a strong incentive to overcome the other problems on their own.

Some of the conclusions of the study may also pertain to other Colombian manufacturing industries. The country's exports of manufactured goods have followed a pattern similar to those of clothing to all destinations—a rapid rise through 1974-75 followed by very little real increase. The study suggests that the most important problems that have restricted Colombia's clothing exports affected other industries there, as well. More important, many of the problems outlined may occur in manufacturing for export in other Latin American countries.

Report

Morawetz, David. *Why the Emperor's New Clothes Are Not Made in Colombia* (New York: Oxford University Press, 1981).

Management and Organization of Irrigation Projects

Ref. No. 671-34

Irrigation projects, however well planned and constructed, will not perform at their best unless the systems are well organized and managed. What good organization and management comprise, however, is still largely a matter of subjective judgment, since in irrigation there is no consensus as to the criteria for efficiency. Studies on organizational frameworks, procedures for operation and maintenance, and principles and costs, do not provide all the information needed for valid comparisons among projects. Further, though the relationships and allocation of responsibilities among the overall organization of a project, other public agencies, and farmer groups, have important influences on project performance, they have often been neglected in project planning and analysis.

As its lending for irrigation and the development of small farms grew, the World Bank, in 1975, commissioned a study with three broad objectives: to obtain information on the management, organization, and operation of irrigation projects; to analyze and evaluate the effectiveness of the management and organization of these projects; and to develop, on the basis of case studies, a framework for monitoring and evaluating the use of resources in the management and operation of irrigation projects. The study sought, in particular, to identify the restraints (institutional, social, political, legal, economic, technical, and physical) that might limit the effectiveness of irrigation organizations and the ability of small farmers to obtain water when and where needed.

The study was undertaken by the Overseas Development Institute (London, England). As well as reviewing the English-language literature on the subject, the project undertook field studies in India, Indonesia, Pakistan, and *Taiwan,* China. The findings are summarized in "Comparative Study of the Management and Organization of Irrigation Projects" by Anthony Bottrall.

The study concentrated on the management of water distribution and the ancillary functions of system maintenance, mainly because there was perceived to be an immense potential for improving current practices in water distribution. Several studies suggested that water distribution within the publicly operated part of the canal (or canal and tubewell) system may be the area of greatest weakness in large irrigation schemes. In many projects, the distribution of water strongly favors farmers near the head of the distribution system. It seems likely that making distribution systems more efficient would both raise overall agricultural production and bring particular benefits to the poorest producers—especially small farmers in tail-reach areas.

The study confirms that the reform of management holds immense potential for improvements in the performance of irrigation projects. It was not possible to quantify how far deficient management of water distribution may contribute to poor performance. However, the International Rice Research Institute found that, in a project in the Philippines, quite modest changes in water distribution procedures, combined with minor technical improvements, were associated with a 97

percent increase in production overall, and a 149 percent increase in production at the tail end of the system, over a two-year period.[2] A case has been recorded in Sri Lanka in which the introduction of strict managerial procedures enabled 50 percent more rice to be produced within a single season than would have been possible under normal operating conditions.[3] Rough calculations for Pakistan suggest that with better management of water distribution, together with some modest physical improvements, the water saved would amount to 20 percent of that available for productive use.[4]

In South and Southeast Asia, at least, better distribution of water is the key to overall improvement in the management of projects. Only if the main distribution system is well operated can other important objectives be achieved (for example, improved management of the watercourse and of water at the farm level, or higher water charges), and only then can high returns be obtained from a system of agricultural extension and the use of complementary inputs.

The management of water distribution has two main dimensions, each with a different set of problems and associated remedies: a technical dimension that relates to the appropriateness of water distribution methods and their capacity to balance supply and demand; and a sociopolitical dimension that concerns the ability and inclination of officials to ration water equitably, despite pressures to do otherwise. Taking these perspectives in turn, Bottrall's study reviews performance and ways of improving it. He argues the need to take a much more comprehensive approach to evaluating irrigation projects than has been customary. Conventional evaluations of irrigation projects generally restrict themselves to the results achieved by management, not on the management *process* that has largely caused those results. It is essential to try to understand the causes of performance in evaluating and appraising projects whose principal purpose is to assist poor producers. Such projects cannot be well designed without an intimate understanding of the social and political contexts in which they are to be implemented and of the administrative and institutional measures that are likely to be most appropriate in those contexts.

The study emphasizes the importance of the source of recurrent finance for motivating staff and making the project work efficiently. What was perhaps the best managed of the four projects studied in detail was atypical, in that it relied heavily on users' fees. If managers and staff had failed to provide good service, fees would be more difficult to recover, revenue would have declined, and salaries and numbers of staff might have had to be cut. Good service seems to have encouraged high fee recoveries. The other three projects are financed by the governments concerned irrespective of their performance either in increasing agricultural production or in recovering funds; the performance of staff was noticeably poorer than in the first-mentioned project. Further, since proceeds from these three projects go into general revenue with no direct link to local investments, farmers have no incentive to pay water charges.

The study also examines the division of responsibility for planning and maintenance among the project management, farmers' groups, and independent technical agencies. Bottrall does not recommend giving farmers responsibility for management at the project level in developing countries. Farmers' groups should, nonetheless, be responsible for management below each watercourse outlet, participate in developing each season's water allocation plan, and monitor the irrigation agency's day-to-day performance. Farmers' groups set up to manage watercourses are sometimes difficult to establish and sustain; the study discusses the conditions under which farmers appear best able to organize themselves for this purpose.

The paper offers guidelines (in Annex A) to help evaluators identify the causes of weak performance as a basis for proposing improvements. During the past decade, awareness has increased that improve-

2. A. Valera and T. Wickham, "Management of Traditional and Improved Irrigation Systems: Some Findings from the Philippines." UN Food and Agriculture Organization Farm Management Notes, 5 January 1979.

3. K. Shanmugarajah and S.C. Atukorale, "Ranjengane Scheme: Lessons from the 1976 Yala Cultivation." Paper presented to Commonwealth Workshop on Irrigation Management, Hyderabad, India, October 1978.

4. By World Bank staff (in 1976) for a special agricultural sector review.

ments are needed, not only in the physical infrastructure of many irrigation projects, but also in their organization and management. Nevertheless, programs for improvement still tend to emphasize new physical investment at the expense of reforms in the use of administrative resources. The proposed approach to evaluation is designed to identify clearly and objectively the opportunities for such administrative reforms. The author advises giving priority to measures requiring relatively few major decisions and relatively little capital outlay: for example, undertaking (1) reforms in management procedures, training, and incentives, before planning (2) major changes in organizational structure or before proposing (3) major capital investments.

Bottrall suggests that reforms in water distribution are likely to have their greatest impact if they are introduced through "action research," carried out on selected sections of larger irrigation schemes. The principal objectives of such research would be: to identify the procedures and institutional arrangements most likely to succeed in similar environments; to demonstrate to politicians, administrators, and farmers the precise benefits and costs of these measures; and to test hypotheses. The action research should form part of a wider-ranging action program. Such a program would almost certainly include investments in training in water distribution, improved agricultural extension, and, in many cases, a substantial program of physical improvement to complement the improvements in management.

Report

Bottrall, Anthony. "Comparative Study of the Management and Organization of Irrigation Projects." World Bank Staff Working Paper No. 458, May 1981.

International Trade Policy for the Development of Bangladesh

Ref. No. 671-75

This project is another in the family of studies on industrial incentives and comparative advantage that has been undertaken by the Bank for a wide range of countries over the last ten years.[5] Its results, which became available in 1980, have helped to provide the basis for a new program of reform in Bangladesh's policies toward trade and industry.

When the government of Bangladesh requested the Bank to undertake the study, the country's balance-of-payments situation was highly delicate, export earnings paid for less than half the country's import requirements, and more than two-thirds of export earnings came from jute and jute products—one of the highest concentrations of trade of any nonoil exporting developing country, and in a product for which the long-term demand prospects are not good. Removing the foreign-exchange constraint was seen as the central prerequisite for a viable economy.

The research was designed to provide a better empirical and analytical basis for evaluating policies affecting industrial development and trade and/or analyzing new investment projects. It assessed the relative efficiency and comparative advantage of economic activities, mainly in industry, but also including jute and rice production. Comparative advantage was assessed in terms of the domestic resource cost of foreign exchange. The study assessed the effects on profitability of the existing incentive system and calculated a set of shadow prices that measured the "true" scarcity of resources. The research also sought to provide an analytical framework in which measures of domestic policy, for example interest rates, tax exemptions, or preferential government purchases, can be harmonized with Bangladesh's international economic policy so as to stimulate production in accordance with comparative advantage.

The research was carried out for the South Asia Country Programs Department by Gustav Papanek and Daniel Schydlowsky and associates at the Boston University Center for Asian Development Studies, in collaboration with the government of Bangladesh, three of whose officials worked full-time on the project at Boston University. The research was designed as a cooperative venture so

5. See, for example, Bela Balassa and associates, *The Structure of Protection in Developing Countries* (1971) and *Development Strategies in Semi-Industrial Countries* (1982, forthcoming), published by The Johns Hopkins University Press. Some of the Bank's studies in this area are noted in *Research News* vol. 2, no. 3, pp. 11-14.

that the ability to replicate and extend the analysis would exist in Bangladesh when the study was completed.

The analysis of effective rates of protection was based on a survey of 146 firms. It is noteworthy that the executives of most of the firms did not know the world price of their products, or of the inputs they used. For the study, world prices were estimated on the basis of domestic prices and tariff data. Since estimates of domestic resource costs and effective rates of protection tend to be very sensitive to the valuation of inputs and outputs, particularly in sectors where domestic value added is a small proportion of gross output, in retrospect it would have been desirable to have devoted more of the project's resources to collecting accurate information on world prices.

The results of the study confirmed that Bangladesh has a very inefficient industrial structure: Only 32 of the 69 activities analyzed were found to have a comparative advantage in the short run, and only 23 had a comparative advantage in the long run—that is, taking account of capital costs. As is the case in many developing countries that have espoused inward-looking policies for some time, the present policy framework appears to foster industries with a comparative disadvantage and to penalize those with a comparative advantage; to inflate the cost of labor, relative to that of capital (for example, for unskilled workers, the shadow price of labor was found to be only 15 percent to 30 percent of the market wage); and strongly to discourage the growth of export industries. Tariffs and quantitative restrictions allow the government to maintain a highly overvalued exchange rate. Several of these actual effects are at variance with the objectives of the policies.

On the basis of these results, the Bangladesh government identified a need for corrective actions in export policies, tariffs, and fiscal and other incentives, as well as in the planning of industrial development and the promotion of private investment. With the recent deterioration in the terms of trade for Bangladesh and the poor aid climate, measures to diversify and expand exports and to encourage investment in efficient industries have taken on even more urgency.

Work recently started on a program of Trade and Industrial Policy Reform, for which the research results provided the genesis. Managed by the Bangladesh Planning Commission and supported by the World Bank, it is to be executed by various branches of the government and the Bangladesh Bank. It includes the following elements:

- improved planning for public and private investment in industry, including the development of analytical tools for macroplanning in industry and the provision of guidelines for microinvestment decisions, especially in the public sector;
- rationalization of overall protection for industry, translating the results of detailed studies of effective protection into the basis for a program to restructure tariffs, and development of an institutional framework for giving continuing advice to government on tariff setting;
- a detailed study of actual and desirable investment incentives;
- analysis of the criteria used in the allocation of import entitlement certificates and determination of appropriate entitlement levels in the light of studies of effective protection;
- improvement of Bangladesh's industrial statistics; and promotional activities for private investment, including preinvestment counseling, prefeasibility studies, and a range of services to firms;
- encouragement of new exports, including preparing investment packages, identifying sponsors, whether foreign or domestic, and organizing finance.

The reform program will support other measures to be taken by the government, such as adjustments in exchange rates. Detailed knowledge of the net effect of the existing policy framework should enable the government to change incentives so as to increase efficiency. Alternatively, if the government wishes to implement policies based on other criteria, the analysis being carried out under the program will make it possible to quantify the cost of such policies to the economy.

Reports

Farashuddin, Mohammed, *et al.* "Shadow Prices for Bangladesh: A Country-Specific Second Best General Disequilibrium Approach." Center for Asian Studies, Boston University, June 1980.

Farid, Shah M., *et al.* "Bangladesh Trade Policy." Center for Asian Studies, Boston University, May 1980.

Islam, L., Azizul, A.B.M., *et al.* "The Industrial Comparative Advantage of Bangladesh." Center for Asian Studies, Boston University, June 1980.

Koss, Esther. "Estimation of Input-Output Coefficients of Currently Nonexistent Industries: An Application of a Methodology to Explain Choice of Techniques of Production." Center for Asian Studies, Boston University, June 1980.

Papanek, Gustav F., and Schydlowsky, Daniel M. "Shadow Prices, Comparative Advantage and Trade Policy for Bangladesh Industry: Executive Summary." Center for Asian Studies, Boston University, August 31, 1980.

Ramirez, Luis. "Benefit-Cost Methodologies: Untangling Their Equivalences and Discrepancies." Center for Asian Studies, Boston University, April 1980.

Labor Migration from Pakistan and Bangladesh to the Middle East

Ref. No. 671-83

Since the mid-1970s, rapidly increasing numbers of workers from Pakistan and Bangladesh have migrated to take part in the economic transformation of the oil-exporting countries of the Middle East. By 1978, workers' remittances to Pakistan, mainly from the Middle East, were much higher than the country's total net receipts of foreign aid. Bangladesh has a much smaller proportion of its workers abroad, but by 1977 remittances to this country from the Middle East had reached about US$80 million—an amount greater than earnings from any commodity export except jute.

For the sending countries, these remittances had a very welcome effect on the balance of payments. Other effects of migration on the economy were less clear. In these countries, where a high proportion of the unskilled cannot find enough productive work, where development is held back by a shortage of professionals in many disciplines, but where certain other professionals appear to be too numerous, more information was needed about who was leaving for the Middle East and for how long. And while remittances supplied badly needed foreign exchange, there was speculation that they were largely spent on imported luxury items or domestic real estate, thereby fueling inflation and doing little to help the growth of domestic production.

With the concurrence of the two governments, the World Bank helped to fund and organize research on these questions by national institutions, starting in 1978. Reports from the project have recently been issued. Its aims were to assess the private and social benefits and costs of migration of different types of workers; to analyze how remittances were being used, and what their use meant for the home economies; to provide an empirical and analytical basis for planning policies and programs (particularly in education and training, but also to influence the recruitment of workers and the investment of remittances) designed to maximize the benefits of migration; and to establish a framework for forecasting the implications of future changes in flows of remittances. It turned out to be difficult to accomplish these objectives fully, because data were limited and because temporary outflows of workers have so many ramifications. Nonetheless, the reports from the study offer many valuable insights.

In both countries, data were gathered from departing migrant workers or official records and from a household survey of a subsample of their families. Cost-benefit analysis was attempted to measure the gains and losses to the sending countries. The project drew on the results emerging from a concurrent study of Labor Migration and Manpower in the Middle East and North Africa (Ref. No. 671-63, see note in *Research News* vol. 2, no. 1). In Bangladesh, the researchers took into account the shadow prices that were being calculated as part of a study on trade and industrial policy (see Ref. No. 671-75 above).

Turning to the findings of the study, estimates of the number of Pakistanis employed in the Middle East range from 500,000 (Bureau of Emigration and Overseas Employment)[6] to well over 1 million (Pakistan Institute of Public Opinion). For the

6. The Bureau's figures record only migrants who have gone through government channels or through licensed recruiting agents.

project, a survey was taken of about 15,000 migrant workers at the three international airports, and a subsample of their families was traced to 250 villages and 50 towns and cities.

Roughly 84 percent of the Pakistani migrants are production workers, with 43 percent unskilled and 41 percent skilled; professional, clerical, and service categories constitute a minority. The unskilled workers are mostly general laborers, but 12 percent are reported to come from the agricultural sector. Among skilled labor, the prominent occupations are construction workers, drivers, tailors, mechanics, and machine operators. Engineers are the largest group of migrants in the professional category; accountants, teachers, and nurses are next in number, though the proportion is much smaller. Cooks and security guards are the most numerous migrants in the service sector.

The typical Pakistani migrant leaves his wife and family behind and works overseas for two to four years, visiting home once a year. It is not clear whether migrants tend to renew their contracts beyond this period. Most of the skilled migrants have little or no formal vocational training but have years of experience on the job. They come largely from lower-income groups, though not from the poorest of them, and originate from all four provinces; both the costs and the benefits of migration are thus likely to be felt throughout the country. On an average income in Pakistan before migration of Rs 9,000 a year, migrants typically spend Rs 7,000 to arrange their overseas employment. Their average annual earnings in the Middle East are Rs 58,000.

The individual endures the hardships of migration in return for the short-term, and possibly longer-term, benefits from remittances. The household survey suggests that on average, a Pakistani migrant remits Rs 28,000 (about US$2,800) in cash annually for two to four years. Official balance-of-payments data indicate that total remittances from Pakistanis working overseas—predominantly those in the Middle East—increased from US$339 million in fiscal 1976 to over US$2 billion in fiscal 1981. These substantial transfers enable workers and their families to purchase assets and dramatically increase their consumption.

The survey of migrant households also indicates that 85 percent of Pakistan's workers in the Middle East remit their earnings through banks. This high percentage indicates that banking services are generally satisfactory. Out of an annual average cash remittance of Rs 28,000, Rs 7,500 are brought on home visits. (Additional remittances in kind are estimated at under 10 percent of those in cash.) Roughly 25 percent of the estimated savings are not remitted; the proportion varies between occupational groups, the highest being for the business category and the lowest for professionals.

Analysis of the expenditure pattern of migrants' households indicates that consumption is not as lavish, and the amounts invested not as insignificant, as is widely alleged. The migrant and his household consume 62 percent of remittances, invest 22 percent in real estate (of which 14 percent is in housing), and devote another 13 percent to other forms of investment and savings.

As the experienced and skilled workers leave Pakistan for jobs abroad, they have tended to be replaced by relatively inexperienced and less skilled labor who render lower-quality service at higher unit costs. The withdrawal of technical and managerial talent has also disrupted production, lowering productivity further. If one assumes that the labor force of Pakistan is about 23 million and migration over 1 million, roughly 5 percent of the labor force is working in the Middle East. The drain of labor in the construction sector has been particularly noticeable. Wages of skilled and unskilled labor in Pakistan have risen substantially in recent years. Though there are not enough data to be certain, it seems likely that migration has significantly contributed to this rise. While the expansion of the supply of domestic manual labor has been moderated by migration, the growth in domestic demand for labor has been buoyant due to growth in gross domestic product of 5 percent to 6 percent since fiscal 1978; rising purchasing power, fueled by remittances, has itself contributed significantly to this increase.

It would appear that, so far, migration has on balance been beneficial to Pakistan and that the main direct and indirect benefits have gone to relatively low-income households. As to the future, evidence of rising wages and production costs suggests that Pakistan is paying a substantial price

for the benefits deriving from lucrative overseas employment. As foreign demand shifts in favor of skilled and professional labor—a trend documented in the Middle East migration study referred to earlier—this price is likely to rise.

Conservative estimates place the gap between Pakistan's demand and supply of skilled and semi-skilled workers at 50,000 a year until 1985. Recognizing the need to expand vocational training to narrow this gap, the government has launched various training programs, but finance and personnel to manage them are scarce. Typically, vocational training helps to replace skilled by semi-skilled workers who, after sufficient work experience, also tend to migrate. Estimated costs of vocational training incurred before migration amount, on the average, to Rs 23,000, while (as already noted) remittances average Rs 28,000 annually for up to four years. On preliminary calculations, therefore, the social return seems positive, while the private return is significant. Greater private participation in vocational training should be encouraged.

Further, although a large share of remittances already flows through official channels and although a significant proportion of remittances is invested, scope remains for improvement in both areas. One possibility is to establish investment advisory centers (where there are large concentrations of Pakistanis) to provide information about investment opportunities in Pakistan.

In Bangladesh, a sample was taken of 10 percent of the workers who migrated in 1977 and 1978 under the auspices of the Bureau of Manpower, Employment, and Training (BMET), which is estimated to have handled about a third of the 58,000 registered migrants from Bangladesh to the Middle East in 1976-79. Ten percent of the migrants selected had their families interviewed under the project.

Workers from Bangladesh make up a maximum of 2 percent of the migrant labor force in the Middle East. From 6,000 in 1976, the documented flow of Bangladeshi workers on fixed-term contracts in the Middle East had risen to 23,000 in 1978 and an estimated 24,500 in 1979. This is a relatively small proportion of a domestic labor force of 30 million, and indeed, almost all other Asian countries encouraging migration have more nationals working in the Middle East than does Bangladesh. Nonetheless, the remittances from Bangladeshi workers are of substantial importance to the country's economy as a source of foreign exchange.

Bangladeshi migrant workers may be the cheapest source of labor for Middle Eastern employers. It is estimated that, in the late 1970s, about 72 percent of Bangladesh's workers were in construction (much the largest category), transport, and production, with about 30 percent skilled and almost 60 percent semi-skilled or unskilled. Eighty-two percent had less than a secondary education. Like Pakistani migrants, most are between 20 and 35 years old. Before migrating, just under 30 percent of the workers were unemployed or were students; another 31 percent were in unskilled jobs.

Contracts tend to be short: two-thirds of the workers are engaged for only a year, and fewer than one-fourth of them stay more than two years. Nearly a third of the migrants go to the United Arab Emirates; most of the others go to Kuwait, Libya, Oman, Qatar, and Saudi Arabia.

Home remittances from Bangladeshi workers in the Middle East, as distinct from those in other countries, are difficult to determine, because a substantial proportion is routed through Western financial markets. The best estimate is that, during the first half of 1979, remittances originating in the Middle East averaged about TK 37,000 (US$2,400) annually per migrant. The amounts remitted by Bangladeshis vary greatly among countries of employment; in some countries, notably Bahrain and Oman, Bangladeshis appear to have accepted very low-paying jobs. Arrangements for remittance payments are inadequate. Banks are used relatively little and fraudulent practices have been frequent.

The survey of migrants' households reveals that, even more than in Pakistan, remittances are used for investments rather than for lavish consumption. Migrants' families appear to save 60 percent-70 percent of their receipts from the Middle East and to save more of their income than other households in the home country. Over a five-year period, half of the remittances received in Bangladesh appear to have been used to purchase land and housing, though another substantial part was used to repay

old debts. Very little was invested in agriculture, industry, or business. The use of these funds for productive purposes has been limited by the small size of the amounts remitted per worker and a lack of money market instruments to provide higher yields than those in real estate.

Very few migrants come from the poorest families in Bangladesh. Estimates were made of how remittances affect income for the families remaining in Bangladesh of migrants in various types of jobs. For the families of migrant professionals, subprofessionals, and technicians, income rose sixfold to sevenfold; for those of skilled workers, about fourfold, and for those of semi-skilled and unskilled workers, fivefold to sixfold.

Bangladesh loses little from the migration of its unskilled and semiskilled nationals, who lack sufficient employment and have cost little to educate and train. When skilled workers, technicians, and professionals migrate, and do so in numbers that make up 30 percent of the migrant flow, the economy loses significantly in terms both of the output forgone and the cost of their training and on-the-job experience. The export of professionals has had particularly deleterious effects in medicine, public utilities, engineering, and support for agriculture.

The outcome of the study is to recommend ways of increasing migration, which is one of the Bangladesh government's policy goals, and of mitigating the problems caused by a rapid outflow of workers. The last chapter of the report, "Policy Recommendations and Implications for Promoting Manpower Export from Bangladesh," argues that Bangladesh must try to evolve from a supplier of cheap labor to a competitor for construction and other projects, to be managed and executed by Bangladeshis. Looking at the future, it observes that:

- Close to half of the additional demand for expatriate workers in the Middle East is likely to be in Saudi Arabia, with another one-fourth in Iraq and Libya.
- Additional vacancies will be created by the policy of the manpower-importing countries to diversify their sources of supply.
- Many of these additional vacancies, including those arising out of the replacement of workers returning home, will be filled by workers from the Republic of Korea, the Philippines, and *Taiwan,* China, which have proved their ability to undertake turnkey projects with their own capital, technology, and manpower, relieving the employer of the troublesome tasks of recruiting and managing expatriate workers. Among South Asian countries, India has developed this capability, both in the private and public sector, and Pakistan has begun to do so.
- Bangladesh, with acute shortages of foreign exchange and a low technology base, is not likely to be in a position to secure such turnkey projects, though it may be successful in securing subcontracts from firms securing these projects.

The study recommends the adoption of a merit-based recruitment process by recruiting agencies in the public and private sector; the expansion of air communications, banking, postal, and telecommunications facilities between Bangladesh and the Middle East; efforts by the government and the money market to offer adequate investment opportunities to small investors from amongst those working abroad and efforts by the banking system to attract deposits from nationals working abroad; and changes in education and training to produce workers with the necessary skills for both the Middle East and the domestic labor market.

The research was managed for the Bank by Marinus van der Mel in the South Asia Regional Office. In Pakistan, the research was directed by Ijaz Gilani on behalf of the Pakistan Institute of Development Economics; Stephen Guisinger, Roe Goodman, and Nermin Abadau-Unat also participated, and UNICEF contributed financially and otherwise. Bangladeshi institutions participating in the research included BMET, the Bangladesh Bank, the Planning Commission, the National Foundation for Research on Human Resource Development, and the Institute of Statistical Research and Training of Dacca University; the project was coordinated locally by a steering group initially chaired by A.M.A.H. Siddiqui, then Director-General of the BMET, and later by Taherul Islam of Dacca University; A.K. Md Habibullah was Project Director.

Reports

Ali, Syed Ashraf, *et al.* "Labor Migration from Bangladesh to the Middle East." World Bank Staff Working Paper No. 454, April 1981.

Gilani, Ijaz; Khan, M. Fahim; and Iqbal, Munawar. "Labor Migration from Pakistan to the Middle East and its Impact on the Domestic Economy" (three parts). Pakistan Institute of Development Economics Research Reports 126, 127, and 128, June 1981.

Incomes and Welfare in Colombia, 1964-78

Ref. No. 672-05

This study by the Fundacíon para la Educacion Superior y del Desarrollo, (Fedesarrollo), the Colombian research institute, was undertaken for the World Bank's Latin American and the Caribbean Regional Office. It measured the extent to which different socioeconomic groups among the poorest in Colombia benefited during the 1964-78 period of rapid growth with high inflation, and assessed the relative success of the principal government programs and policies designed to alleviate poverty.

The study assembled and analyzed data from various sources on the employment and incomes of different occupational and income groupings. This task included a comparative assessment of the quality and coverage of the various available household surveys and the 1970 census. A special household survey taken in Cali in 1970 and repeated in 1974, 1976, and 1980, covering the same families, provided information on changes over time in income levels, nutrition, education, quality of housing, and other socioeconomic indicators.

The study shows that, contrary to previous indications based on superficial reviews of wage and salary data and to generally held beliefs, income distribution in Colombia did not worsen during the high-growth/high-inflation period of the 1970s and the proportion of the population living in poverty declined significantly. Real incomes of the poorer segments of the population increased substantially during the decade, in absolute and in relative terms. This was in large part, though not totally, because additional family members were able to secure employment. There was a relative decline in the real incomes of the middle class. The incomes of the richest 5 percent of families apparently did not increase as much as commonly believed, although these families do not appear to have lost in their share of national income. With regard to poverty, the study indicates some increase in the proportion of families in absolute poverty during the first half of the 1970s and a substantial decline in this proportion during the second half of the decade. It is significant that this reduction in absolute poverty in the latter part of the 1970s occurred during a period in which government policies and programs were increasingly being directed toward the poorer segments of Colombian society.

The analysis of the Cali survey provides some interesting insights into changes in conditions over time. In general, the trends in income distribution and poverty noted above are confirmed by this survey. The survey further shows that the increase in the participation rate in the 1970s was greater for lower-income families than for others, accounting in large part for this group's relative income gains. This increase in participation rate was mainly the result of women entering the labor force in larger proportions. Moreover, the gap in wages between women and men in lower-income groups fell. Poor families obtained relatively greater access to public services and better housing and increased their per capita consumption of food and durable goods. Lower-income workers changed their occupations very rarely, and the great majority of those who were heads of households had no permanent employment connections. This suggests that during the decade, workers improved their income more rapidly when they sacrificed the stability in employment offered by the formal sector of the economy.

As to the determinants of the changes in income during the 1970s, the drying up of excess labor in the countryside, combined with structural changes favorable to employment creation, appears to have been important. These structural changes include a shift in production toward labor-intensive export industries; technological changes in the coffee industry that increased the demand for labor; and the more intensive use of capital in the early 1970s, occasioned by periodic foreign exchange crises that

disrupted imports of capital goods. The opening up of the economy during the latter part of the period probably favored employment, also. An increase in the supply of educated manpower and inflation are cited as probable reasons for the slower growth in middle-level incomes, as are institutional arrangements in the organized labor market, which were not well-adapted to cope with accelerated inflation. In the traditional sector, where wage contracts do not exist or are made only for short periods, wages were better able to adjust to inflation. The disappearance of dualism in the labor market, the impact of fiscal policy, and an increase in illegal activities, which were concentrated in a few hands, are also thought to have contributed to income trends during this period.

The study brings out the following policy implications: that rapid growth in a relatively open economy can lead to a healthy growth of employment in spite of accelerating inflation; that only when excess labor in agriculture is significantly reduced can a dent be made in absolute poverty levels; and that directing public expenditures toward the poor can have an important effect on welfare.

Report

Urrutia, Miguel. "Winners and Losers in Colombia's Recent Growth Experience." Bogota: Fedesarrollo, July 1981.

NEW RESEARCH

Adjustment in Oil-Importing Countries

Ref. No. 672-74

Oil-importing developing countries were significantly affected, in the 1970s, by the twin external shocks of deteriorating terms of trade and a reduction in the growth of export volumes arising from the recession in the industrial market economies. These effects called for both national and international adjustment—that is, the transfer of either real resources or claims on future resources to oil-exporting countries. This research studies the different ways in which national adjustment has been effected. It will identify the broad features of adjustment through cross-country comparative analysis, isolate the key relationships that must underlie models of macroeconomic adjustment, and assemble policy-focused case studies of archetypal countries distinguished by the structure of production and trade. The project is intended to contribute towards the formal incorporation of adjustment analysis in the Bank's country economic work.

The *World Development Report 1981* uses a common analytical framework to impose order on the diversity of country experience and to interpret the process of adjustment in selected countries.[1] The methodology compares the actual performance of import and export prices and quantities against counterfactual trends. The deviations from trend are then decomposed into those effects arising from changes in exogenous variables and those due to changes in a nation's economic performance. This leads to a "patterns of adjustment" analysis covering a large number of countries, in which the relative reliance on different modes of adjustment—trade adjustment (export expansion, import substitution), financial adjustment (additional external financing), and slower growth—may be related to production and trade characteristics, the development strategy pursued, and the magnitude of external shocks.

This research complements and extends the above methodology. It will develop two decomposition methods for the purpose. These methods will exploit the observation that adjustment requires raising private and public national saving in relation to investment or, alternatively, that it requires driving a wedge between gross domestic product and domestic absorption of resources. This leads to a description of adjustment in terms of categories such as the mobilization of public and

1. The analytical framework was developed by Bela Balassa, in "The Newly Industrializing Developing Countries After the Oil Crisis," *Weltwirtschaftliches Archiv*, 1981 (Band 117), and World Bank Staff Working Paper No. 437, October 1980; "The Policy Experience of Twelve Less Developed Countries,1973-78," World Bank Staff Working Paper No. 449, April 1981; and "Adjustment to External Shocks in Developing Economies," World Bank Staff Working Paper No. 472, July 1981. For a statement of the version used in the *World Development Report 1981*, see pp. 121-123 of that report.

private resources, changing efficiency of investment, and increased public current expenditures. It can also allow an exploration of the distributional consequences of adjustment in countries for which the requisite data are available. The two "internal" decomposition exercises will be made consistent with the earlier trade decomposition. Together, the three approaches, especially when supplemented by information on movements in major policy instruments, can yield a rounded picture of the adjustment process in a country and indicate areas to which models or case studies should pay particular attention. These methods and their variants will be applied to about thirty developing counties and perhaps two oil-importing developed countries.

The exercises described above will produce about thirty brief studies of country adjustment interpreted in the light of the framework developed above. These studies will be used for two purposes: (1) to assemble "stylized facts" about adjustment and (2) to put together detailed case studies for perhaps four countries that are representative of sub-groups of oil-importing developing countries: a semi-industrial country, an agriculture-based primary producer, a mineral-based primary producer, and a least-developed country. The four country studies will concentrate on modeling certain key relationships uncovered by the cross-country analysis and aim to focus on the interaction between structure and policy. It is planned to formulate and estimate two-gap models as disequilibrium models for perhaps two of these archetypal countries.

The accounting-for-adjustment methodology developed by Balassa for trade-related variables and to be extended in this project to study the internal sector of an economy has been used to interpret historical developments. The methodology could potentially be used for country projections. The research seeks to show that differences between alternative future scenarios may be decomposed into the effects of exogenous factors and national economic performance, using the language and categories of adjustment analysis. The approach, therefore, has the potential of being formally integrated with the Revised Minimum Standard Model used by the Bank for country economic projections.

The principal researcher is Pradeep Mitra in the Development Research Center. The project will take two years. Reports on the cross-country analysis will be available in late 1982.

A Model of Energy Demand in Developing Countries [2]

Ref. No. 672-63

The future growth of demand for energy in developing countries has implications not only for the economic prospects of these countries, but also for conditions in the world energy market, of which they constitute a growing share, and hence for conditions in the world economy at large. Up to now, the projections of this demand made by the World Bank's Economic Analysis and Projections Department (EPD) have been based on data available from the United Nations and those collected in the course of the Bank's operational work. For individual developing countries, demand for energy is calculated as a function of energy prices and the rate of economic growth, and the demand for the main individual fuels is projected on the basis of past trends in their shares of total energy demand.

Since 1973/74, knowledge about the use of energy in developing countries has increased enormously. A study sponsored by EPD will draw together new information from a large number of sources to improve this forecasting framework. In the first stage of the project, econometric models of energy demand will be developed for four countries—Brazil, India, Kenya, and Malaysia. Demand for energy will be analyzed and projected separately for the main fuels used and the main economic sectors of each country. Based on these country-specific models, a minimum standard model of energy demand will be constructed that can be applied, without complicated adjustments, to a large number of developing countries. This is the approach behind the Minimum Standard macroeconomic model used by the Bank in its country economic work.

The study will be able to draw, to some extent, on methods developed to analyze energy demand in

2. Excluding the capital-surplus oil-exporting countries.

industrialized countries. These methods are unlikely to be adequate, however, for considering such questions as noncommercial energy use, the efficiency of energy use, and substitution of one kind of fuel for another. Formal modeling of supply will not be attempted; experiments in industrialized countries have shown that far more data are needed for this than are yet available in developing countries.

The new forecasting framework will not only improve the Bank's global energy projections, and hence its global economic projections; it should also deepen understanding of the interactions between energy use and economic growth and change and, in particular, of the effects of higher energy prices on the various economic activities in developing countries. The project is being undertaken by Lutz Hoffmann and associates at the University of Regensburg in the Federal Republic of Germany, in collaboration with researchers at Sao Paulo University in Brazil, Penang University in Malaysia, and the Indian Council of Applied Economic Research. The project is managed for the World Bank by Peter K. Pollak in EPD.

The Welfare Implications of Alternative Energy Pricing Policies in Indonesia

Ref. No. 672-70

The government of Indonesia is concerned about the implications for the welfare of various income groups of making adjustments in domestic energy prices. With the analytical tools available in Indonesia at present, it is difficult to predict the effects that such adjustments would have. A research project just starting will supply information on how the welfare of different groups of consumers would be affected. Groups will be distinguished by income level, region, household size, and other characteristics that affect the demand for energy.

The project will extend a methodology developed by Jorgenson, Lau, and Stoker to analyze the oil price decontrol program in the United States.[3] It will concentrate on the household sector, which accounts for 30 percent of the energy used in Indonesia, but will also draw on the insights provided by a study on industry and a planned one on the transport sector. (The industrial, transport, and household sectors together account for over 90 percent of Indonesia's energy consumption.) The basic measure of welfare to be used is the net "compensating variation." This is the minimum amount of additional expenditure needed, for a group of consumers in a given district, to enable the group to maintain its original level of utility after the policy change. The net compensating variation is calculated taking into account the needs and tastes of different groups of consumers and the adjustments they make in response to changes in prices, incomes, limitations on supplies, and other government policies.

The compensating variations to be calculated specific to each group will also be used collectively to assess the distribution of welfare gains and losses and to identify the groups of households that would be most adversely affected by particular policy changes. Simulations will be made of alternative policy measures—in particular, different price levels for energy and time paths for the elimination of subsidies—to determine their effects on particular groups of consumers. Information from this part of the analysis could be used to design energy conservation efforts so as to minimize reductions in the consumption of particular groups. Policies may be simulated by the model at the regional as well as the national level. The model can also project the quantity of aggregate energy consumption that is associated with particular energy prices, incomes, and distributions of household income among groups with different attributes.

The nine-month project will be undertaken by one of the authors of the methodology, Lawrence Lau, in conjunction with Armeane Choksi of the Bank's East Asia and Pacific Country Programs Department.

Planning Investments in Electric Power in Indonesia

Ref. No. 672-54

Only 6 percent–7 percent of Indonesia's people have access to electricity. Sales of the national

3. D. W. Jorgenson, L. J. Lau, and T. M. Stoker. "Welfare Comparison under Exact Aggregation," *American Economic Review*, vol. 70, no. 2 (May 1980), pp. 262-272.

power utility, PLN, have been growing at over 20 percent a year since 1978, and there are long waiting lists for supply. Large investments are needed in facilities for power generation, transmission, and distribution. The World Bank has made 11 loans to Indonesia for power generation and distribution, a 12th is in preparation, and further loans are envisaged.

This application of research is to develop an analytical framework with which PLN and the Bank can plan Indonesia's future investments in power generation, transmission, and distribution. The project will apply the analytical techniques developed in previous research on Programming in the Manufacturing Sector (Ref. No. 670-24)[4] and the computational facilities of the General Algebraic Modeling System (Ref. No. 671-58). These techniques have been used successfully to analyze investment options in sectors that exhibit strong interdependencies and economies of scale, notably fertilizer, steel, and petroleum (see *Research News* vol. 2, no. 1).

The model to be developed will make it possible to define an optimal investment program that takes account of issues posed by the scale of facilities, their location, the timing of investments, choices among technologies, and the reliability of facilities once they have been installed. The model will be used to select projects and programs, and also as a simulation device to evaluate the costs and benefits of alternative policies and government proposals.

Indonesia is endowed not only with oil and natural gas but also with coal, hydro and geothermal resources, and uranium. The model will examine alternative ways of meeting the demand for electricity efficiently, taking account of how alternative investment programs could be financed. World market prices, the availability and prices of domestic energy resources, and demand for electricity will be specified exogenously. Running the model under different assumptions about these factors will help to indicate how investment planning should respond to uncertainty: for example, whether a particular technology or source of energy should be used regardless of whether, say, prices change, or whether, say, a slight change in international prices would give one a different set of priorities. Government may wish to depart from the power investment program that is economically optimal, for example, to satisfy such goals as subsidizing electricity consumption by the poor or to promote interregional equity. The model will make it possible to quantify the costs to the economy associated with decisions of this sort.

Staff of the Bank's East Asia and Pacific Country Programs Department (AEA) and the Development Research Center (DRC) will collaborate with PLN in developing the model and installing it in Indonesia. For further details, contact Alexander Meeraus in the DRC or Armeane Choksi or Michael Walton in AEA.

Tax and Contractual Arrangements for Exploiting Natural Resources

Ref. No. 672-71

The long-term rise in oil prices and the need to adjust to it has stimulated interest in three broad areas of research in the World Bank: domestic and external macroeconomic issues, energy demand, and energy supply. Several projects on macroeconomic issues have recently been started. Among them are studies of Egypt (Ref. No. 672-25), Thailand (Ref. No. 672-47), Yugoslavia (Ref. No. 672-26), development options in oil-exporting countries (Ref. No. 672-49), and adjustment in oil-importing countries (Ref. No. 672-74—see above). In the demand area, the Economic Analysis and Projections Department is starting work on a minimum standard model of energy demand (Ref. No. 672-63, see above). The present project

4. The Planning of Investment Programs, a series edited by Alexander Meeraus and Ardy Stoutjesdijk. David Kendrick and Ardy Stoutjesdijk, *Volume I: The Planning of Industrial Investment Programs: A Methodology* (Baltimore and London: The Johns Hopkins University Press, 1979); Armeane M. Choksi, Alexander Meeraus, and Ardy Stoutjesdijk, *Volume II: The Planning of Investment Programs in the Fertilizer Industry* (Baltimore and London: The Johns Hopkins University Press, 1980). A book, combining volumes I and II, has recently been published in French under the title, *La Programmation des Investissements Industriel, Methode et Etude de Cas* (Paris: Editions Economica, 1980). The series is currently planned to contain four more volumes, three of which are at an advanced stage of preparation. These volumes deal with investment analysis in the steel and forestry industries, and with investment analysis in a multicountry context.

addresses microeconomic issues related to oil supply. Its findings will also be relevant for other nonrenewable natural resources.

A vast majority of developing countries depend on imported oil. Among these are 64 countries, including some of the poorest, that depend on imports for more than 75 percent of their commercial supplies. It is vitally important for these countries to attract foreign companies to explore for oil. But it is not enough merely to attract these companies, for if no oil passes to the government or no government revenues are generated, the problem is not alleviated at all. It is important for these countries to provide adequate incentives to foreign companies, in a way that ensures that as much benefit (or rent) accrues to the government as possible.

As was stated in 1979, "Very many of the developing countries need advice in framing or amending legislation relating to the energy sector, or in adapting policies and procedures that would improve the prospects of cooperation with foreign prospecting and production organizations."[5] In the area of natural resources generally, the Bank has long been interested in issues related to exploration, extraction, and processing, especially in many African and other small economies where mining is the dominant sector and the main source of export earnings and budgetary revenues.

The ultimate objective of a new research project in the Development Economics Department is to design policies for taxes and contracts that will provide sufficient incentives to attract foreign firms to explore for and produce exhaustible natural resources in developing countries, while maintaining as much of the rent for the producing country as possible. This search for optimal policies will also take account of the risks borne by the contracting parties. Inherent in the process of exploration for a natural resource in a given tract of land is the possibility of a change in the value that the firm and the government assign to the tract before and after exploration. This raises the possibility that one of the parties may want to change the terms of the contract once exploration is completed if the penalties for doing so are small. Such possible changes include expropriation by the government, as well as the firm abandoning the enterprise after some initial exploration. Tax and contract terms can be designed to minimize such risks and consequently increase the (*ex ante*) expected benefits to both parties. Also to be taken into account are imperfections in the markets for natural resources and in the knowledge available to contracting parties.

The research builds on two major bodies of work. One relates to the analysis and simulation of different forms of contract and bidding procedures in the context of uncertainty about the amount and value of the resource stock; most of this work has been done in the context of US offshore leasing (Outer Continental Shelf). The other is concerned with the effect of the various taxes on the extraction of a fixed stock of a natural resource, and the simulation of the development expenditures and production profiles that firms adopt under different conditions. Again, much of this analysis refers to conditions in the developed countries.

The first phase of the research, taking about nine months, will concentrate on simulating the forms of taxation and contracts that are currently recommended, using available simulation models, including that in use by Bank Energy Department staff. The results from this analysis will be used, in the second phase, to develop a more efficient framework for analysis that would be usable by Projects staff charged with advising on taxes and contracts. In the course of the research, a typology of countries will be constructed, classified by characteristics such as the energy balance, the degree of riskiness versus possible returns as seen by extraction firms, and the degree and success of past exploration activity. Particular attention will be given to countries (many of them in sub-Saharan Africa) with little past exploration or production activity.

For further details, contact Arvind Virmani in the Development Economics Department.

---

5. *A Program for Accelerated Development of Petroleum Resources*, World Bank, 1979.

Public Policies in Agriculture: Studies of Selected Market Interventions in the Republic of Korea and Thailand

Ref. Nos. 672-61 and 671-62

These two projects address a subject—public intervention in agriculture—whose pervasiveness in the developing world has stimulated much research. Theoretical advances have greatly increased understanding of the likely consequences of agricultural policies, but the analytical approaches used in research have been difficult to duplicate in practical work. In predicting the effects of interventions, policy makers and their advisers have had to rely largely on their personal experience and judgment. The broad goal of the present studies—to adapt and apply up-to-date analytical techniques to typical kinds of policy problems on which the Bank's regional economists are asked to advise—is one being pursued increasingly in the Bank's research program as it comes of age. Examples include the work on industrial incentives and comparative advantage (see *Research News* vol. 2, no. 1), new research on policies to influence mineral exploitation (Ref. No. 672-71, see above), and collaborative research with the Cyprus government in preparation for the 1982-86 Five-Year Plan (Ref. No. 672-38—see *Research News* vol. 2, no. 2).

Since agriculture is so important to their economies, in most developing countries public intervention in agriculture can result in large changes in both the allocation of resources and the distribution of income. Such interventions serve a variety of possible goals, including correcting market failures, raising revenue, redistributing income, improving nutrition, or achieving national self-sufficiency in particular commodities. They include measures to influence input or product prices, quantitative controls, and public provision of goods and services. The creation of wedges between rural and urban prices is a conspicuous and common policy; so is the subsidization or taxation of agricultural commodities. The public expenditure occasioned by these policies has often become burdensome, especially in resource-poor countries.

These studies seek to provide a framework that can be used to evaluate the effects of the various policy instruments for different predetermined levels of public expenditure and to compare the performance of these instruments in meeting various public objectives. The studies will draw on two bodies of previous research. The first of these is the considerable amount of empirical work sponsored by the Bank on the responses (of households, agricultural producers, and prices) to interventions in agriculture.[6] The second source is the literature on applied welfare economics, including both the traditional approach based on consumer and producer surplus and the more recently developed public-finance methodologies in which desirable policy interventions are identified by seeking the maximum increase in aggregate welfare while meeting the public budget constraint and other exogenously specified requirements.[7]

The techniques will be used to analyze selected policies in the Republic of Korea and Thailand, countries that exemplify two contrasting forms of intervention in agriculture. In the first, the public sector influences private sector activity by means of taxes, subsidies, or controls. Producers and consumers face a new configuration of prices, but production is still governed by the principles of private profit maximization. In the second, the public sector influences private sector activity by itself producing goods or services. Production, or at least that part of it under public control, need not be consistent with profit maximization and, depending on the public sector's approach to cost recovery, market prices may or may not change.

Korea provides a typical example of price intervention. Relative to international prices, domestic production of fertilizer is subsidized. The subsidy is partly financed by selling fertilizer to farmers at prices above the cost of importing but below the cost of production, and partly by general revenue.

---

6. See, for example, Howard N. Barnum and Lyn Squire, *A Model of An Agricultural Household: Theory and Evidence* (Baltimore and London: The Johns Hopkins University Press, 1980) and C. Ahn, I. J. Singh, and L. Squire, "A Model of An Agricultural Household In a Multi Crop Economy: The Case of Korea," *Review of Economics and Statistics*, vol. LXIII, no. 4 (November 1981), pp. 520-525.

7. See Arnold C. Harberger, *Taxation and Welfare* (Boston: Little, Brown, 1974) and A. Atkinson and J. E. Stiglitz, *Lectures on Public Economics* (Maidenhead, United Kingdom: McGraw-Hill, 1980), Chapters 12, 14, and 15.

This policy causes an excessive allocation of resources to the production of fertilizer, a suboptimal use of fertilizer by farmers, and transfers of income from farmers and the general taxpayer to the producers of fertilizer. Domestic production of rice is also subsidized, relative to international prices. Moreover, whereas rural consumers and producers pay the same price for rice, urban rice consumers receive a further subsidy. Among the implications of this policy are an excessive allocation of resources to rice production and a transfer of income from the public sector to the private sector that favors those with large farms relative to those with small farms and favors urban consumers relative to rural ones. While these policies were motivated, at least in part, by a desire for self-sufficiency, their obvious costs, as revealed by a large budget deficit, have led the government to reappraise its approach. The Korean study will therefore compare different price-tax instruments that would reduce the existing deficits and study their impact on output, marketed surplus, and on the distribution of income, as measured by their effects on different groups in the rural and urban sectors.

Price intervention is also important in Thai agricultural policy but the latter also provides for the public production of goods and services.[8] Much of the recent expansion of rubber replanting, for example, has been supported by public provision of budwood, budded stumps, and free fertilizer to participating farmers. Among other things, the study will investigate whether the replanting program was a response to an observed market failure or whether the heavily subsidized public provision of replanting materials retarded the development of private sources of supply. The rubber cess and the heavy taxation of rubber exports used to finance the program will also receive attention. In particular, the study will compare the present system with one in which rubber taxes are reduced and farmers are charged full costs for all replanting materials. The implications of these alternatives for the allocation of resources and the distribution of income will be examined, as will the consequences for the development of private sources of replanting materials. The Thai study will also investigate similar issues in the sugar market, in particular, the role of public sugar mills in a sugar-processing industry that is largely in private hands, and price intervention in the markets for sugar cane and sugar. Policies toward both rubber and sugar are currently being reviewed by the Thai government and the Bank.

It is hoped that the projects will produce a relatively simple, replicable approach to giving more soundly based advice on agricultural policies. Since the two studies will allow an assessment of the reliability and applicability of both the traditional and more recent approaches to applied welfare economics, it is hoped that the research will provide guidance for the Bank's operational staff on the most appropriate mode of analysis. It is also hoped that the framework to be developed will be found attractive by policy researchers in member countries.

The projects are sponsored by the Development Economics Department (DED) and the East Asia and Pacific Country Programs Department. For information, contact Avishay Braverman (for the Korea study) or Lyn Squire (for the Thailand study) in DED.

Economic Consequences of the Coffee Boom in East Africa

Ref. No. 672-65

The years 1976-78 saw a fourfold, though temporary, increase in the world price of coffee. For those developing countries in which coffee is a major source of foreign exchange and domestic income, this increase led to a large, temporary shift in relative prices and a large injection of income from abroad. The consequences of the coffee boom differed among countries, depending on the underlying structure of their economies, the types of policies being followed, and the policy responses to the change in coffee prices.

This study will explore the consequences of the coffee boom in Kenya and Tanzania, two countries

8. Government policy has been especially influential in the markets for rice, rubber, and sugar. Since extensive research has been done on the economics of rice production, and since the issues of concern in this study arise more sharply in the rubber and sugar markets, the study deals only with the latter markets.

in which coffee is a major smallholder crop and a significant source of foreign exchange. The structure of the two economies is quite similar: Both are low-income, predominantly agricultural nations with populations of around 15 million, quite heavily involved in external trade, and dependent on agricultural exports and external assistance for most of their foreign exchange receipts. But there are marked differences in the policy regimes of the two countries, especially in regard to smallholder agriculture, the principal source of livelihood in both nations. In particular, government policy in response to the coffee boom differed radically in the two countries. In Tanzania, some 60 percent of the incremental coffee income was paid to the government in taxes to support a level of public expenditure higher than would otherwise have been feasible, while in Kenya 95 percent of the incremental income was retained by smallholder coffee growers.

The project will investigate the experience of the two countries to shed light on a number of issues of macro and micro policy. It is hoped that the results will be directly relevant to the design of government tax and expenditure policies, agricultural pricing, projects and programs in agriculture, and the form of external assistance.

Most studies of the economic consequences of price instability for major agricultural exports have concerned themselves only with macroeconomic changes. The approach in the present study will be unusual in tracing these consequences to the microlevel. Computable general equilibrium (CGE) models will be developed to:

- evaluate alternative types of policies for alleviating poverty, giving particular emphasis to the relative efficacy of export-crop pricing policies versus public expenditure policies;
- draw lessons as to the best response of domestic policy to sharp fluctuations in agricultural export prices, looking at both the temporary and the lasting economic consequences of such fluctuations;
- augment the quantitative analytical bases for evaluating economic structures and policies in Kenya and Tanzania.

The general equilibrium framework will assure that the microeconomic consequences will be aggregated into familiar macroeconomic terms of savings/investment, balance of payments, and growth. However, the grounding in microeconomic analysis is likely to have the advantages of a detailed assessment of the consequences for income distribution of export-price instability and alternative policy regimes and responses and hence, a more detailed and compelling set of results on the domestic policies to be preferred in coping with such instability.

Whether the lot of the rural poor can be bettered more effectively through increasing producer prices for smallholder cash crops or by expanding public-expenditure programs to improve well-being and enhance productive capacity is a central policy issue that has spawned much debate. In the East African context, empirical research is needed before the debate can be resolved. With this in mind, the project will devote a major effort to modeling smallholder agriculture. Here, the model of farm-household behavior developed by Squire and Barnum, in which decisions about production and consumption are treated together in the same analytical framework,[9] will be extended to incorporate the asset behavior of farm households and the role that remittances from urban family members play in facilitating agricultural modernization. The country models will trace the links between (and within) the smallholder sector and the rest of the economy through product markets, labor demand and migration, urban-rural flows of remittances, and the incidence of taxes and subsidies. Efforts will be made to specify, in some detail, how government tax and expenditure policies affect and are affected by production, incomes, and consumption in a smallholder economy. Constructing this fiscal module will be an innovative step in CGE modeling. Here, the researchers will draw on the work of Meerman for Malaysia and Selowsky for Colombia.[10]

The project will take, as a starting point, existing economywide models of Kenya and Tanzania and will build on a substantial body of research on

9. Howard N. Barnum and Lyn Squire, *A Model of an Agricultural Household: Theory and Evidence* (Baltimore and London: The Johns Hopkins University Press, 1980).

10. Jacob Meerman, *Public Expenditure in Malaysia: Who Benefits and Why*, and Marcelo Selowsky, *Who Benefits from Government Expenditure? A Case Study of Colombia* (both New York: Oxford University Press, 1979).

these economies done in the course of the Bank's country economic work. It will make use of the large amount of micro-survey data that has become available for the two countries over the past five years. The models will be documented so that they can be used after the study has been completed.

The two-and-a-half year project will be supervised by David Greene and Robert Liebenthal in the East Africa Country Programs Department I and by Shankar Acharya in the Office of the Vice President, Development Policy. The Institute of Development Studies, Nairobi, and the Department of Economics, University of Dar es Salaam, will participate.

National Accounts Statistics of Centrally Planned Economies

Ref. No. 672-73

Centrally planned economies (CPEs) account for about a third of the world's population and a fifth of its output. In view of their importance in the world economy, they need to be included in international comparative studies. The World Bank also includes them in several documents with universal coverage—particularly the World Bank *Atlas* and the *World Development Indicators* . The Bank's *Atlas* is the only source of regular estimates of income per capita in US dollars for nearly all countries of the world; these estimates are widely used and, for most countries, are widely regarded as authoritative. Further, several CPEs are members of the Bank (China, Laos, Romania, Viet Nam, and Yugoslavia). In order to analyze their economies, Bank staff need to understand their macroeconomic accounting frameworks and price systems.

The CPEs' national accounts are based on the concept of net material product, which differs from the concept of the gross national product used in market economies. Prices in CPEs are generally set administratively and, to a considerable extent, are independent of the scarcity of goods and services. For all the aspects of Bank's work mentioned above, it is necessary to derive GNP levels and growth rates from country data that are based on the concept of net material product. At present, the Bank lacks sufficient understanding of the national accounting concepts being used in CPEs and has, therefore, had to use a fairly rough and mechanical methodology for translating the statistics based on them into concepts comparable with Standard National Accounts. Though the statistical offices of several centrally planned economies have carried out and published illustrative computations of GNP, there is no systematic effort among CPEs, or between CPEs and any international organization, to produce a consistent set of GNP figures in dollars for these countries.

Funds were approved recently for research to identify the best methods for computing the levels and growth rates of GNP of selected centrally planned economies. The study will concentrate on eight countries—Bulgaria, Cuba, Czechoslovakia, the German Democratic Republic, Hungary, Poland, Romania, and the USSR.

Comprehensive and internationally comparable data will be produced on the size of GNP, on the appropriate factors for converting income figures in national currencies into US dollars, and on growth rates. The findings and methodology should be readily adaptable to most non-European CPEs, including present and potential members of the Bank. The project should substantially advance understanding of the national accounts, development history, and development plans of CPEs.

For further information, contact Sang Eun Lee in the Economic Analysis and Projections Department. Results are expected early in 1983.

Indian Urban Development

Ref. No. 672-64

Work began recently on the first phase of a collaborative research program on Indian urban development and urban problems. Nearly 80 percent of India's population still lives in rural areas. Yet the country's present urban population, of about 135 million, is among the largest of any country. Even at present income levels and population densities, living conditions for the majority of urban residents are deplorable, and the problems faced by city managers are immense.

The first phase of the research is concentrating on national and state issues. It will consist partly of

historical and partial analyses of urbanization trends, using regional and international comparisons. This analysis will be supplemented by studies of relationships between urban and agricultural development and of rural-urban migration. The study will also examine trends in the sizes of urban areas and the causes of these trends. A simulation model of Indian urban development to be constructed under the project will be used to assess the effects of various government policies on urban areas and their growth and to make forecasts of urbanization.

The project will test various hypotheses that have implications for the design of policies. For example, there has been much alarm that India's largest cities, those with at least 1 million people, may have been growing faster than total urban population, but the available evidence from India, and the experience of other developing countries, suggests that this is unlikely to be the case. Second, though a high proportion of new urban residents rely for employment on a bloated services sector, it seems unlikely that India's urban growth rate will accelerate unless there is an acceleration in the growth of industrial employment. Third, looking at the relationships between agricultural and urban change, it seems likely that investments in technologies that are labor saving, such as mechanization, stimulate more migration to cities than do investments which are land saving, such as irrigation.

For further information, contact Douglas Keare in the Development Economics Department or Vinod Thomas in the South Asia Country Programs Department. Working relationships are being developed with several Indian institutions, including the Ministry of Works and Construction, the Planning Commission, the Institute of Economic Growth, the Sardar Patel Institute, the Indian Institute of Public Administration, and the Indian Institute of Management (Bangalore).

Industrial Location Policies for Urban Deconcentration: Republic of Korea

Ref. No. 672-58

The development policies of a number of countries give explicit consideration to the spatial distribution of economic activities. Some have the stated objective of decentralizing large congested capitals, or closing the gap between rich and poor regions. But experience with such policies has emphasized the lack of conceptual and empirical work to provide principles for their formulation.

The Development Economics Department began a program of research on National Spatial Policies in 1980 (Ref. No. 672-13, see *Research News* vol. 1, no. 2). This program has three main aims: to develop an analytical framework that will begin to identify the determinants of urban concentration; to analyze the determinants of individual firms' choice of location; and to trace the effects on spatial development of different types of government policy. To further the third aim, a study recently began of the experience with spatial policies in the Republic of Korea.

The present study is expected to yield methods for quantitatively evaluating the efficiency of spatial policies and for assessing losses in welfare that these policies may cause. The analysis will concentrate on the location of manufacturing industry, which plays the leading role in the process of urbanization, and which is characteristically the main focus of spatial policies in middle-income countries.

Korea's experience is of particular significance, as few other countries have pursued spatial policies so persistently or used such a diverse range of instruments to affect the location patterns of development. The broad aims of Korea's spatial policies have been to deconcentrate population and economic activity within the Seoul region (which, in 1978, accounted for 40 percent of the country's manufacturing employment); to decentralize economic activity away from the Seoul region; and to reduce regional imbalances by providing incentives for the development of lagging regions. These policy objectives were reflected in the establishment of a greenbelt around Seoul and a ten-year plan, introduced in 1977, for redistributing population away from Seoul, largely made up of provisions affecting the pattern of industrial location.

The first phase of the study, which addresses issues of urban deconcentration in the capital region, will document changes in the location patterns of employment in the Seoul region, verify the extent

of policy influences on such changes, and establish a methodological framework to be used for empirical analyses. Results of this phase should be available by June 1982. Actual empirical work and policy studies are expected to be carried out in fiscal 1983.

The project manager is Kyu Sik Lee in the Development Economics Department.

Income Formation and Expenditures of Poor Urban Households

Ref. No. 672-57

This project is designed to yield more definitive information on the real resources at the command of urban families, and thus on the ability of these families to afford shelter and other essentials. A long tradition of sociological literature has been based on the assumption that urban households behave as autonomous units, receiving most of their income from the labor earnings of permanent members of the household. It has been argued that one of the effects of urbanization has been to break the ties of the urban household with the extended family group and to eliminate many of the supportive functions that are carried out by family networks in rural areas. Based on these assumptions, the designers of urban development projects have tended to see the potential participant household as a discrete entity and its earnings as the indicator of what it could afford to pay for services. In projects that must cover their recurrent costs, it has not been uncommon to exclude the poorest families from the target population, on the grounds that with their low earnings they could not afford to pay for the services to be introduced.

Background work done by the Development Economics Department in El Salvador and the Philippines has shown that an important part of the total income of many poor families comes from other households. For instance, 58 percent of the households in the lowest-earnings decile in the city of Santa Ana, El Salvador, receive income transfers. For recipient households in that decile, transfers make up a third of total income. In the second-lowest earnings decile, nearly half of the households receive transfers, which contribute one fourth of their total incomes.[11] It appears that the recipient households would otherwise lack sufficient resources to meet their basic needs or respond to new investment opportunities. Results from El Salvador suggest that poor families headed by women and/or with women who are not working are most likely to receive transfer income.

In studies of household expenditure behavior, it has been customary to use the level of total income as one of the main explanatory variables. The possibility that the composition of income may affect expenditure behavior—with receipts from different sources earmarked for different types of expenditure—has largely been overlooked. So has the possibility that a household's income may rise in response to specific opportunities for expenditure or investments. The background work for the present study shows that the structure of income does affect the pattern of expenditures. A significant proportion of transfer income appears to be earmarked to meet basic needs (food, health care, education, and shelter). The results from El Salvador suggest that a poor household receiving most of its income in the form of transfers will spend 75 percent of its income on basic needs, 10 percent on other expenditures, and save the remaining 15 percent.[12] An equally poor household that derives most of its income from earnings will devote only 62 percent to basic needs.

Furthermore, other things being equal, a household directly affected by an urban development project will receive more transfer income than a comparable household that is not so affected. If households with the prospect of benefiting from a project can elicit additional income, there are important implications for project planning.

The present study is examining the sources of income and types of expenditure of urban households. It will use both anthropological and econometric methods, concentrating on the household's economic interactions with other families. It seeks a better understanding of the determinants of income

11. Results from Manila, Philippines, show transfers to be even more significant. Although comparable detail is not available, there is corroborating evidence on the general importance of transfers from Indonesia, Senegal, and Zambia.

12. This representative poor household is located around the 20th percentile in the distribution of urban income.

transfers, the motivation for these transfers, and the rights and obligations associated with them. It is hoped that the study will yield important insights into the capacity to pay for housing and related services and into the appropriate criteria for selecting project beneficiaries.

The results are likely to shed light on a number of allocative and distributive issues. For example, by studying the interactions among the family network, it should be possible to assess how interhousehold exchanges affect the overall distribution of welfare among the urban poor. Second, investigating the sources of and motivations for transferred incomes, their reliability, and the uses to which they are put by recipients, will improve knowledge of the role of the family network as a substitute for imperfect formal capital markets.

The research will be undertaken in an area of Cartagena, Colombia, where an urban development project is being supported by the Bank.[13] Existing data sets on the area will be supplemented by household surveys to be carried out by the Instituto SER de Investigacion, which is collaborating with the Bank in the study.

The study is managed jointly by the Latin America and the Caribbean Projects Department and the Development Economics Department (DED). For more information, contact Michael Bamberger in DED.

Participant-Observer Evaluation of Urban Projects

Ref. No. 672-59

Since 1972, the World Bank has pioneered the development of several types of poverty-oriented urban investment, most notably sites-and-services projects, slum upgrading, and credit schemes for small-scale enterprises. The concepts on which the Bank's urban projects have been based are now being widely applied by authorities in developing countries and bilateral aid agencies. Exceptional efforts were made to evaluate some of the first urban projects, involving relatively expensive statistical overview methods. Partly as a result of those evaluations, major changes in design were made for more recent projects.

Given the lead time required to build up a significant program and the additional time needed for the detailed preparation and construction of individual projects, it is only recently that a large number of Bank-financed urban projects have begun to benefit the poor. More extensive evaluation of urban projects is needed if the Bank is to continue "learning by doing."

Some aspects of such projects' actual effects on their thousands of intended beneficiaries are likely not to be adequately discovered by project agencies using statistical overview methods. How effectively are the intended beneficiaries of a project being involved in project planning, for example? How does the power structure of a neighborhood influence the distribution of the benefits when a large slum is upgraded? It seems likely that such questions could be more fully answered by a trained observer living in a project area than by a team of interviewers and outside observers. "Participant-observer" evaluation of a project in Nairobi, Kenya, suggests that this method is potentially useful in supplementing statistical methods of evaluating "new-style" urban projects. This approach needs to be field tested, and a more precise analytical framework developed, before its widespread use is considered.

A study is just beginning under which an observer will live in poor parts of Guayaquil, Ecuador, and La Paz, Bolivia, that are being improved under Bank-assisted urban development projects. He will observe his neighbors and participate with them in activities under the projects, for example, by taking out a loan for slum upgrading and using it to upgrade his residence. His work will supplement the customary statistical evaluation work being undertaken by project authorities.

The study will seek to clarify which types of information are better obtained by direct observation than by survey methods, and which questions can only be reliably answered by survey methods. The findings will be used to make recommendations on project design and management, as well as on evaluation methods. The approach being used is

13. The findings of the study will make no difference to the contractual undertakings relating to recovery of the project's costs.

also likely to yield hypotheses that can be tested definitively by other means.

The study is expected to take about two years. It will be managed by David Beckmann in the Latin America and the Caribbean Projects Department with some contributions from the Development Economics Department in the design of the research.

Research and Development: Handpumps for Rural Water Supply

Ref. No. GLO/79/010/INT/81/026

Well over a billion people in the rural areas of the developing world have no adequate supplies of safe water and no adequate facilities for sanitation. The UN has declared the 1980s to be the International Drinking Water Supply and Sanitation Decade. The program for the decade puts special emphasis on the installation of handpumps. In areas where groundwater is easily available, installing these pumps in wells is one of the simplest and cheapest ways of supplying rural people with safe water. Meeting the goals of the decade would require the manufacture and installation of some 5 million-7 million handpumps.

The United Nations Development Programme (UNDP) and the World Bank are undertaking a joint four-year project for laboratory testing, field trials, and technological development of handpumps. Previous research and development have not solved a number of serious technical problems with handpumps, manifested in unsatisfactory performance, short working life, and frequent breakdowns. The performance of these pumps is what ultimately determines the success or failure of large investments—of both human effort and finance—in engineering hydrology, bore-hole drilling, well digging, and pump installation.

The first phase of the project, to be concluded in 1982, provides for laboratory testing to evaluate established and innovative designs made in developing and industrialized countries. The second phase, started in 1981, provides for field trials in 15 to 20 developing countries. Twenty-five to 50 specimens of each of three or four different types of pump will be tested at each site. Handpumps will be installed and monitored by the project staff and the local project participants. Detailed data will be collected, analyzed, and disseminated.

One of the main concerns of project research and development will be Village Level Operation and Maintenance Pumps (VLOMP) that can be manufactured in developing countries and repaired by trained village operators. Unlike conventional pumps, these light, simple pumps can be repaired without incurring the delay and expense of employing heavily equipped, highly skilled mobile maintenance units.

The project is expected to make significant contributions to programs for low-cost water supply in developing countries. The project will develop a standard method for testing handpumps so as to identify quickly the principal faults and select the models that are most effective. It will provide local training and technical assistance to district-level teams in operating, maintaining, and monitoring the effectiveness of handpumps. Manuals will be prepared to assist in the selection, installation, and maintenance of pumps. The project may also promote and assist in the development and local manufacture of appropriately designed handpumps.

It is anticipated that the project will enable governments to obtain greater benefits from funds available for rural water supply. Moreover, by improving the effectiveness of handpumps, the project is also expected to encourage increased investment in rural water supply during the decade and thereafter.

Initial contacts with governments interested in participating in field trials are under way. For more information, contact Saul Arlosoroff, UNDP Projects Manager, in the Transportation, Water, and Telecommunications Department of the World Bank.

Determinants of Fertility in Rural Bangladesh

Ref. No. 672-60

Funds were recently approved for the Bank to collaborate with the Bangladesh Institute of Devel-

opment Studies (BIDS) in the analysis of a large body of data on the fertility and socioeconomic characteristics of households in Bangladesh. The study builds on several activities already supported by the Bank. The data were collected by BIDS under the IDA-supported First Population Project credit to the country, and Bank research funds have been used to help process and assemble them into a manageable form during the past year (see *Research News* vol. 2, no. 1).

The data cover about 4,000 households in four contrasting areas. They have been collected in several rounds, starting in 1976; some subrounds were completed in 1981. They will be used to extend previous analysis by the Development Economics Department of fertility questions and family planning in Bangladesh.[14]

Broadly, the study will be concerned with the relationship in rural areas between poverty and fertility. Multivariate analysis will be used to examine the influences of household characteristics on fertility, giving particular attention to earnings from different sources, expenditures and savings, women's participation in the labor force, and expenditures on child education and health (expenditures that may reflect a conscious choice between having many children, poorly educated and in poor health, and fewer, more privileged children). Interrelationships between fertility and child mortality will be studied in detail; so, too, will the effects of access to various services, notably health care, family planning, education, and agricultural credit. The results will help in predicting the effects on fertility of maternal and child health services and of schooling (assuming that if existing children have a better chance of surviving and being educated, parents may plan fewer additions to the family). They are also likely to point to the socioeconomic circumstances (including, for example, the family's access to non-farm jobs, and the equality of land distribution in the village) in which families are most prone to limit their fertility.

For information, contact Rashid Faruqee in the Development Economics Department or David de Ferranti in the Population, Health, and Nutrition Department.

Demand for and Willingness to Pay for Services in Rural Mali

Ref. No. 672-72

How do households respond to policy interventions that change the availability of public services? There is growing agreement that to predict the demand for public services, data from household surveys need to be supplemented by information on the availability of services in the community and by regional data on the labor market so as to discover the "prices" households face for public services, as well as for their own labor time.

The difficulty of specifying demand for public services is a particularly important one in sub-Saharan Africa, where levels of health and education lag behind those elsewhere in the world, and where the fiscal burden of improving and extending public services is very large. Services as they are now constituted and financed would be impossibly expensive to extend to the whole population. To choose among other options—for example, to increase efficiency for the same level of spending or to introduce user charges to recover some of the costs—it is necessary to know about the determinants and structure of demand. With regard to user charges, for example, an important question is whether their introduction would constrain demand among the lower-income groups that may need the services most.

This small project will study household demand for a range of services in rural Mali, particularly for health (traditional and modern medical care and drugs), schooling, and clean water supply. It will use household expenditure data collected in 1981 in preparation for a Bank investment project in water supply and health. The study should yield some insight about the usefulness of household survey data analysis for the design of public programs in health, education, and water supply in poor rural areas of Africa.

14. R. Amin and R. Faruqee, "Fertility and its Regulation in Bangladesh," World Bank Staff Working Paper No. 383, April 1980.

The analysis will have three parts. The first, in which the demand for services is to be quantified, will use standard methods of consumer demand analysis, taking into account local prices. The second will be a detailed study, in about 20 villages, of the services actually available and trends in income and its sources; its main purpose is to establish whether demand exceeds supply. The third part will compare households' professed willingness to pay for services with their effective demand for them, as measured by expenditures.

The project manager is Nancy Birdsall in the Development Economics Department. Staff of the Société Nationale d'Etudes pour le Développement (Bamakou) and the University of Dijon will participate. A report will be available at the end of 1982.

NEW AND FORTHCOMING PUBLICATIONS

The full range of World Bank publications is described in the World Bank *Catalog of Publications*, issued annually. The new books listed below, which are published by outside publishers for the World Bank, *are obtainable through booksellers or by writing to the publishers*. Prices are subject to change. The other items listed, as well as the *Catalog*, are available from:

Publications Distribution Unit
World Bank
1818 H Street, N.W.
Washington, D.C. 20433, U.S.A.

NEW BOOKS

The Agricultural Economy of Northeast Brazil

Gary P. Kutcher and Pasquale L. Scandizzo

The Johns Hopkins University Press, January 1982. 304 pages.

LC 81-47615

ISBN 0-8018-2581-4. $25.00 hardcover.

The rural northeast of Brazil contains the largest pocket of poverty in the Western Hemisphere. Most of its 18 million residents depend on agriculture and exist at or near subsistence levels in a country that has vast economic resources and an otherwise impressive record of development. Several large governmental and internationally supported programs have failed, largely because of improper focus and inadequate information.

This study is based on an agricultural survey of 8,000 farms by the Superintendency for the Development of the Northeast (SUDENE) and the World Bank. It reveals that incomes from agriculture and farm productivity are lower than previously believed and traces the root cause of rural poverty to the suboptimal performance of large farms and the general inability of the poorest agricultural households to gain entrepreneurial access to land.

Econometric analyses of the region's problems are supplemented by simulations of policy and project options from a large-scale mathematical programming model of the agricultural economy. The results suggest that traditional interventions involving subsidized wages, technical progress, and market expansion would have only a minimal effect and that the region's poverty could be significantly alleviated only by a courageous land reform. This conclusion is supported by the survey findings that 50 percent of the agricultural land is owned by only 4 percent of the farmers, that upward of 15 million hectares of agricultural land are potentially productive but unused, that small farms apply twenty-five times the labor per hectare of large farms, and that 75 percent of the poorest households own no land at all.

Aspects of Development Bank Management

William Diamond and V. S. Raghavan, editors

EDI Series in Economic Development

The Johns Hopkins University Press, April 1982. About 320 pages.

LC 81-48174

ISBN 0-8018-2571-7. $29.95 hardcover.

0-8018-2572-5. $12.95 paperback.

This volume brings together papers prepared for a two-week seminar on Development Bank Management conducted by the Economic Development Institute of the World Bank. At the seminar, top executives of development banks discussed the principal problems they face in managing their institutions and the roles they play as managers. The papers reflect diverse experiences and viewpoints, but the problems analyzed fall into the following broad categories: the functions of top management; establishing long-range corporate objectives and policies; investment-selection criteria; monitoring investments; mobilizing resources; planning and internal controls; personnel development and organization; financial policy; and evaluation of corporate policy.

Development Strategies in Semi-industrial Economies

Bela Balassa and Associates

The Johns Hopkins University Press, April 1982. 416 pages.

LC 81-15558

ISBN 0-8018-2569-5. $32.50 hardcover.

This volume provides an analysis of development strategies in developing economies that have already established an industrial base. The investigation analyzes the systems of incentives that governments apply to influence production and trade and how these incentives affect economic performance. Though the economies studied are at similar levels of average income, they have pursued very different incentive policies; as a consequence, there are marked differences in the character of their industrial development and trade.

The study carries further the lines of enquiry and analytical methods that were developed in an earlier volume, *The Structure of Protection in Developing Countries*, by the same principal author. The concept of effective protection introduced in that volume is extended here to derive the effective rate of subsidy—that is, the ratio of the combined value of credit, tax, expenditure, and protective instruments to the value added in processing. The relative incentives given to exports and to import substitution provide a basis for classifying development strategies as outward oriented or inward oriented. Other characteristics of alternative development strategies and their economic effects are also examined.

The volume contains individual case studies of six semi-industrial economies, as well as chapters on conceptual and measurement issues, cross-country comparative analysis, and recommendations for an "ideal" system of incentives and how such a system might be achieved.

First Things First: Meeting Basic Human Needs in the Developing Countries

Paul Streeten, with Shahid Javed Burki, Mahbub ul Haq, Norman Hicks, and Frances Stewart

Oxford University Press, 1981. 224 pages (including appendix, bibliography, index).

LC 81-16836

ISBN 0-19-520-36B-2. $18.95 hardcover.

0-19-520-369-0. $7.95 paperback.

The basic needs approach to economic development is one way of helping the poor emerge from their poverty. It enables them to earn or obtain the necessities for life—nutrition, housing, water and sanitation, education, and health—and thus to increase their productivity.

This book answers the critics of the basic needs approach, views this approach as a logical step in the evolution of economic analysis and development policy, and presents a clearsighted interpretation of the issues. Based on the actual experience of various countries—their successes and failures—the book is a distillation of World Bank studies of the operational implications of meeting basic needs. It also discusses the presumed conflict between economic growth and basic needs, the relation between the "New International Economic Order" and basic needs, and the relation between human rights and basic needs.

The International Comparison Project—Phase III. World Product and Income: International Comparisons of Real GDP

Irving Kravis, Alan Heston, and Robert Summers

The Johns Hopkins University Press, April 1982. About 304 pages.

LC 81-15569

ISBN 0-8018-2359-5. $30.00 hardcover.

0-8018-2360-9. $12.95 paperback.

This volume reports on the third phase of the United Nations International Comparison Project. The ICP was established at the end of the 1960s to fill an important gap in the world's statistical system. For lack of a common currency, the gross domestic product (GDP) and other national-accounts estimates of different countries could not be compared directly. Use of exchange rates for such comparisons was known to yield estimates that misrepresented the actual purchasing power of currencies.

The volume relates and extends the methodology set out in the first two volumes. Like the first two, it combines a report on methodological work with actual comparisons. Particular attention is given to the problem of comparing services and to the conflicting demands of regional and global estimates. The main results provide comparisons of real GDP per capita for 34 countries in 1975. Quantity and price comparisons are given also for personal consumption, capital formation, and public consumption. These new estimates considerably expand the sets presented in the earlier volumes.

Because the benchmark studies provide estimates of detailed components of GDP, they afford insights into comparative economic structure. For example, they show the extent of country-to-country price differences in investment goods and other components of GDP, thus making possible a comparison of the shares of investment goods and other components of GDP in real (price-corrected) terms. A variety of structural relationships involving both quantities and prices are explored. Some applications to demand analysis of the results are presented in the last chapter.

Estimates are also provided of real GDP per capita for the 34 countries for selected years between 1950 and 1979. In addition, the 1975 distribution of world product by region and per capita income class is estimated. The results for 1975 confirm relations between both quantities and prices and per capita income found in the earlier volumes.

Poverty and Human Development

Paul Isenman and Associates

Oxford University Press, March 1982. 96 pages (including statistical appendix, bibliography).

LC-82-2153

ISBN 0-19-520389. $7.95 paperback.

The text of this book is reprinted from the World Bank's 1980 *World Development Report*, of which it formed Part II. The volume contains a new introduction and concluding section.

Human development—education and training, better health and nutrition, and fertility reduction—is shown to be important not only in alleviating poverty directly, but also in increasing the incomes of the poor and GNP growth.

The laudable objectives of human development, though, are far from easy to achieve. Nor are they

without cost. The volume draws on World Bank experience—in the analysis of projects, sectors, and national economies, and in research—to examine the causes and effects of progress in human development and what it takes to implement successful programs in this area.

WORLD BANK STAFF WORKING PAPERS

No. 490. Sociocultural Aspects of Developing Small-Scale Fisheries: Delivering Services to the Poor. Richard B. Pollnac. October 1981. iii + 61 pages (including references). Stock No. WP-0490. $5.00.

No. 491. The Functional Use of Mass Media. Shigenari Futagami, *et al.*, Education Department. October 1981. v + 124 pages (includng bibliography). Stock No. WP-0491. $5.00.

No. 492. The Political Market for Protection in Industrial Countries: Empirical Evidence. Kym Andersen and Robert E. Baldwin (consultants), Economic Analysis and Projections Department. October 1981. 27 pages (including references). Stock No. WP-0492. $3.00.

No. 493. On Protectionism in the Netherlands. K.A. Koekkoek, J. Kol, and L.B.M. Mennes (consultants), Economic Analysis and Projections Department. October 1981. ii+68 pages (including 3 annexes, references). Stock No. WP-0493. $3.00.

No. 494. Patterns of Barriers to Trade in Sweden: A Study in the Theory of Protection. Lars Lundberg (consultant), Economic Analysis and Projections Department. October 1981. 24 pages (including references). Stock No. WP-0494. $3.00.

No. 497. Labor Productivity: Un Tour d'Horizon. Susan Horton (consultant) and Timothy King, Development Economics Department. October 1981. ii + 70 pages (including bibliography). Stock No. WP-0497. $5.00.

No. 498. The Determinants of Labor Earnings in Developing Metropoli: Estimates from Bogota, Colombia. Rakesh Mohan, Development Economics Department. October 1981. 135 pages (including 2 appendixes, bibliography). Stock No. WP-0498. $5.00.

No. 499. A Simultaneous Equation Model of Price and Quantity Adjustments in World Primary Commodity Markets. Erh-Cheng Hwa, Economic Analysis and Projections Department. October 1981. 48 pages (including references, appendix). Stock No. WP-0499. $3.00.

No. 500. India: Papers on Demand and Supply Prospects. J. Harrison, South Asia Programs Department, Jon A. Hitchings, Treasurer's Department, and John Wall, South Asia Programs Department. October 1981. 133 pages (including 5 appendixes, references, annex). Stock No. WP-0500. $5.00.

No. 501. Pollution Control in Sao Paulo, Brazil. Vinod Thomas, South Asia Country Programs Department. November 1981. 127 pages (including annex, references). Stock No. WP-0501. $5.00.

WORLD BANK REPRINT SERIES

The following recent articles, arising from research undertaken at or for the World Bank, have been reprinted with permission and are available free of charge.

No. 177. Perspectives and Problems of Development in Sub-Saharan Africa. Shankar Acharya. From *World Development,* vol. 9 (1981), pp. 109-47.

No. 178. Malnutrition: Some Measurement and Policy Issues. T.N. Srinivasan. From *Journal of Development Economics,* vol. 8 (1981), pp. 3-19.

No. 179. Attitudes Toward Risk: Experimental Measurement in Rural India. Hans Binswanger. From *American Journal of Agricultural Economics,* vol. 62, no. 3 (August 1980), pp. 395-407.

No. 180. Trade in Manufactured Goods: Patterns of Change. Bela Balassa. From *World Development,* vol. 9, no. 3 (1981), pp. 263-75.

No. 181. Growth Policies and the Exchange Rate in Turkey. Bela Balassa. From *The Role of*

Exchange Rate Policy in Achieving the Outward Orientation of the Turkish Economy, papers from a conference in Istanbul, July 20-21, 1979 (Istanbul: Meban Securities Brokerage and Finance Corporation, 1981), pp. 15-59.

No. 182. Fungibility and the Design and Evaluation of Agricultural Credit Projects. J.D. Von Pischke and Dale W. Adams. From *American Journal of Agricultural Economics*, vol. 62, no. 4 (November 1980), pp. 719-26; **Towards an Operational Approach to Savings for Rural Developers.** J.D. Von Pischke. From *Savings and Development*, vol. 2, no. 1 (1978), pp. 43-55; and **Rural Credit Project Design, Implementation, and Loan Collection Performance.** J.D. Von Pischke. From *Savings and Development*, vol. 4, no. 2 (1980), pp. 81-90.

No. 183. Resource Allocation to Housing Investment: Comments and Further Results. Bertrand M. Renaud. From *Economic Development and Cultural Change*, vol. 28, no. 2, (January 1980), pp. 189-99, copyrighted by the University of Chicago; **The Demand for Housing in Developing Countries: The Case of Korea,** Bertrand Renaud, James Follain, and Gill-Chin Lim, from *Journal of Urban Economics*, vol. 7 (1980), pp. 315-36; and **Determinants of Home Ownership in a Developing Economy: The Case of Korea,** Bertrand Renaud, Gill-Chin Lim, and James Follain, from *Urban Studies*, vol. 17 (1980), pp. 13-23.

No. 184. Project Evaluation in Risky Markets. Pasquale L. Scandizzo. From *Operations Research in Agriculture and Water Resources*. Edited by Dan Yaron and Charles S. Tapiero, Proceedings of the ORAGWA International Conference in Jerusalem, November 25-29, 1979 (Amsterdam: North Holland, 1980), pp. 161-178.

No. 185. Principles of Modern Electricity Pricing. Mohan Munasinghe. From *Proceedings of the IEEE*, vol. 69, no. 3 (March 1981), pp. 332-48.

No. 186. Rural Africa: Modernization, Equity, and Long-term Development. Uma J. Lele. From *Science*, vol. 211, no. 6 (February 1981), pp. 547-53.

No. 187. Interrelationships in Energy Planning: The Case of the Tobacco-Curing Industry in Thailand. Gunter Schramm and Mohan Muhasinghe. From *Energy Systems and Policy*, vol. 5, no. 2 (1981), pp. 117-39.

No. 188. Prospects for Export Growth in an African Economy: The Kenya Case. Tigani E. Ibrahim. From *Vierteljahresberichte: Probleme der Entwicklungsländer*, no. 80 (June 1980), pp. 121-38.

No. 189. Market Equilibrium Computations in Activity Analysis Models. Roger D. Norton and Pasquale L. Scandizzo. From *Operations Research*, vol. 29, no. 2 (March-April 1981), pp. 243-62.

No. 191. Agricultural Policies and Development. A Socioeconomic Investigation Applied to Sri Lanka. Martha H. de Melo. From *The Journal of Policy Modeling*, vol. 1, no. 2 (May 1979), pp. 217-34.

WORLD BANK COUNTRY STUDIES

World Bank country studies are prepared mainly for the Bank's own use with distribution restricted to member governments and international organizations that deal with development problems. Where the issues studied have attracted a wide interest, where it appears that the Bank's study could contribute substantially to knowledge and understanding of these issues, and where the authorities of the country concerned are agreeable, such reports are made available to a wider audience. Potential readers are advised that these are working documents, not prepared with a view to broad distribution.

Peru: Major Development Policy Issues and Recommendations. Ulrich Thumm, chief of mission, and others. June 1981. vii + 220 pages (including 3 annexes, statistical annex). English and Spanish. Stock Nos. RC-8102-E, RC-8102-S. $20.00 paperback.

Brazil: Integrated Development of the Northwest Frontier. Denis J. Mahar, chief of mission, and others. June 1981. vi + 101 pages (including annex). Stock No. RC-8101. $20.00 paperback.