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AFFORDABLE SHELTER AND URBAN DEVELOPMENT: 1972–82

Douglas Keare

The World Bank’s interest in urban development projects, as distinct from other projects located in cities, is of relatively recent origin and stems from the scale and intensity of urban problems in developing countries—of poverty, unemployment, and inadequacy of housing and infrastructure—reflected primarily in the rapidity of overall population growth and the acute shortage of resources for accommodating such growth. In the early 1970s, drastic shortfalls in housing and mounting percentages of urban populations in slums and illegal settlements were evidence of misguided policies seeking to implement unrealistically high building standards in developing countries. It was hardly surprising that in the cities of the developing world relatively few people were well housed, while 40 percent to 68 percent of urban dwellers were unable to afford even the lowest-cost housing then being provided through public-sector programs.

Urban Strategy

The Bank’s first urban policy paper in 1972 approached the housing shortage from the standpoint of effective demand: the only way to bring housing within reach of substantially increased numbers in a relatively short time was to bring the cost of housing down. Upgrading squatter areas that contained the bulk of the existing stock of low-cost housing and sites-and-services development that expanded the supply of low-cost housing, thus, became the core of the Bank’s early urban development strategy.

The strategy was controversial because it differed markedly from previous investment policies in urban services. It advocated new low-cost approaches in shelter and infrastructure, which were intended to mobilize private savings and to relieve the public sector of most of the financial burden for urban housing and services. Underlying the new approach was acknowledgment that the urban sector could and should pay for itself and provide services that the urban poor needed and could afford. Increasingly, this sector was becoming the host to centers of industry, commerce, and trade that attracted large capital investment and offered job opportunities and higher incomes to rural migrants, as well as demanding more shelter, water, sanitation, transportation, and communications. The Bank would not “solve” urban problems; rather, it would exert a catalytic influence on the patterns of growth by integrating water supply, transport, education, and industry into a framework that took advantage of the many complementarities between shelter, infrastructure, employment location, and transport.

Urban Projects and Research Issues

The diversity of urban conditions and policies led to individual projects designed to suit local conditions. Between 1972 and June 1982, sixty-two projects, amounting to $2 billion in Bank lending (with total project costs of $4.6 billion), were approved. They included projects on shelter programs, urban transport, integrated urban development, and regional development. By geographical region, Latin America and the Caribbean and East Asia and the Pacific accounted for the largest shares of the urban lending program. About half of the total project...
costs was expended on shelter projects or components. Countries of Eastern Africa concentrated most heavily on shelter projects, and South Asian countries focused on integrated urban projects, reflecting the multiple needs of large, extremely poor cities and the importance of cost effectiveness in meeting their needs. In the past ten years some 1.9 million households, or about 11.4 million persons, have benefited from these shelter projects alone, which in many cases reduced the cost of shelter and infrastructure 75 percent below preexisting housing programs. Notwithstanding initial skepticism, the estimated rate of return for each type of urban project was high, with the fiscal 1981 average for eight projects at 21.9 percent.

Bank-assisted shelter projects either provided new housing units or improved existing substandard units. Neither approach had preconceived notions about architecture, costs, or building materials. Resistance from policymakers to lowering building and housing standards was countered by reality. Most governments could not afford the cost of conventional housing nor the political costs of bulldozing squatter settlements; furthermore, deficit-ridden budgets and the reappearance of squatter dwellings in new areas were often the result of attempting these approaches.

The first urban development loan by the Bank, financing a large sites-and-services project in Senegal, was approved in June 1972. Early projects in Botswana, El Salvador, Jamaica, Kenya, Peru, and Tanzania also focused on sites-and-services developments. Sites-and-services projects, providing basically serviced land on which low-income groups could construct their own dwellings over time, centered on the concept of "self-help." Varying with respect to land area allocated per family, the utilities and social services provided, the type of tenure conferred, and the construction assistance given, sites-and-services elements made up all or an important part of approximately two-thirds of the projects funded over a subsequent five-year period. Slum-upgrading projects that involved only minimal demolition and relocation and the basic provision of water, sanitation, roads, footpaths, drainage, and electricity were carried out in Colombia, India (Calcutta and Madras), Indonesia, Upper Volta, and Zambia.

Development of Urban Research

The urban development loan to Senegal led to an important and innovative research program. As self-help was a new concept among development planners (if not a new practice among the poor in developing countries), accumulated experience and research findings about it were sparse, rendering it impossible to prepare convincing projections of socioeconomic effects and impact (on housing, incomes, health). This lack of data led to an unprecedented program of monitoring and evaluation of early sites-and-services and area-upgrading projects financed by the Bank, starting with projects in El Salvador, Senegal, and Zambia. The evaluation program, cast in a quasi-experimental mold, sought to answer such questions as: How much housing resulted? Were the services supplied, and did the families respond by building or improving their homes? Were these families members of target groups that the Bank sought to assist in the first place? How efficient were the projects, and which components (water, sanitation, roads and paths, credit) made the greatest contributions? Were there discernible increases in employment and incomes? Did families sacrifice expenditures on other basic needs to improve their housing?

Within the Bank's Urban and Regional Economics Division, resources were devoted to studying housing needs and priorities, land markets and policies, urban public finance and administration, and issues relating to rural-urban migration and the increasing incidence of urban poverty. Institutionally, the demand was for research findings that would inform project and policy design aimed at increasing the amount of affordable housing services consumed by the urban poor.

The program was organized and, in certain respects, coalesced in three clusters: housing markets, urban management, and urbanization processes. Research on housing markets concentrated on how markets appeared to work and the relationship between household income, composition, and characteristics and the quantity of housing and services demanded. Added dimensions in the

research on urban management, pertaining to citywide or metropolitan issues, were intersectoral relationships and priorities across sectors, and a need to determine to what extent knowledge and analytical tools developed elsewhere could be used to understand issues and options, and hence to guide operational programs and policymaking in Third World cities. Research on urbanization processes focused on urbanization within the larger phenomenon of economic growth and industrialization. Most development economists both inside and outside the Bank, contrite about decades of neglect of rural populations, tended to focus on rural-urban relationships. This impeded for some time the development of a program to address equity and efficiency in urban and regional patterns of development, the cluster of work that has been slowest to develop.

Drawing on insights gained in early project experience and a sector policy paper devoted to housing issues, the Bank's research in this field burgeoned, principally under two very large research programs. First, the aforementioned evaluation program exclusively devoted to housing issues got under way in 1975. Studies in the initial countries—El Salvador, Senegal, and Zambia—ran through 1980, and the results are still being compiled and disseminated as the program continues in Bolivia, Colombia, Indonesia, Kenya, and the Philippines. Second, the housing sector in Colombia was comprehensively covered by the City Study, the first intersectoral and interspatial research project in a developing country encompassing five components of the urban economy: housing, transport, employment location, labor force, and public finance.

In its early stages, the evaluation program provided a number of conceptual advances, which assisted the Bank's operational and research programs. Advancing beyond self-help as the central concept, the evaluation program demonstrated that progressive development is closer to the mark. Progressive development can be formally defined as a method of housing construction or upgrading achieved through (1) staged development, in which the infrastructure and occasionally parts of the house are built by a contractor and the rest of the shelter is completed by the household; (2) flexibility in housing design, construction time, and materials used; and (3) self-help and/or mutual-help components.8

Supplying Low-Cost Housing

Market conditions. The housing problem exists and persists. In the City Study, analysis of housing markets in Bogota and Cali, Colombia, shows that low-income households are predominantly renters, while higher-income households are generally owner-occupants, who also consume more housing. The housing stock is crowded, and it is apparently only growing slightly less so. For example, in Bogota, between 1964 and 1978 the average number of households per dwelling unit increased slightly, but due to a marked drop in average household size from 6.2 members in 1964 to 4.9 members in 1978, there was a reduction in the average number of persons per dwelling unit, from eight in 1964 to seven in 1978. This decrease probably provided little, if any, relief at the low end of the income scale; yet, in the face of rapid growth of population during this period, the supply of housing outpaced growth. Filtering in the housing market (the process whereby households moving to new units free their old units for occupancy by households of lower socioeconomic status) has not occurred, apparently because of relentless growth in housing demand.

Affordability. The results of the evaluation study indicate that in practice, as well as in theory, plots in sites-and-services projects and subprojects are affordable to the intended target populations; frequently they are affordable to families down to the 20th income percentile—a more effective penetration of low-income groups than contemplated in the relatively cautious estimates for most early projects. Area-upgrading projects have reached substantially lower-income groups, as have the rental spaces provided within both kinds of projects. Thus far, residential turnover of families participating in the projects has been no greater than among nonparticipant control group families, indicating satisfaction as well as the ability to pay for what is provided. These direct and indirect findings, together with generally

Acceptable occupancy and building rates, support the conclusion that the projects are affordable.  

Accessibility. The populations in these projects, although poor, cover in practice a fairly wide range of incomes. The great majority of beneficiaries is in the bottom half of the income distribution, although some may have household incomes as high as the 70th percentile. In the projects studied, and the same appears to be true for a number of other projects, most beneficiaries fall between the 20th and 50th percentiles of the urban income distribution. In the case of sites-and-services projects, the occurrence of beneficiaries in the middle-income range appears to be due, in part, to the difficulties of verifying the incomes of families at entry, coupled with the shortage of middle-class housing. Subsequent projects have used various methods of differential pricing and improvements in physical design to reach below the 20th percentile.

For the upgraded squatter areas studied, mean incomes were much the same although more of the very poor were included (30 percent to 40 percent of beneficiaries were in the lowest two deciles), and significant numbers of residents had above average incomes. Therefore, the income range was somewhat broader in upgraded areas than for the sites-and-services areas. This was an unexpected and important finding. While such neighborhoods may vary considerably in income mix from location to location, both these studies and other evidence support the view that a considerable proportion of families in unserviced, low-rent residential areas are not as poor as their constrained housing conditions indicate. Consequently, it is considerably more difficult than initially expected to target upgrading benefits solely to the lowest-income groups. Yet, upgrading projects in Botswana, Brazil, Tanzania, and Thailand have reached people in the lowest 10th of the income-distribution scale. On the other hand, the heterogenous nature of project populations is not necessarily a negative factor, as it is likely to mean that the communities involved are more representative of their society as a whole and offer greater employment opportunities for their low-income members. Covering a broader swath of the income distribution than suspected, they are not necessarily ghettos of the poor.

Cost reduction. Whether proceeding rapidly or deliberately, the construction undertaken in the projects has been efficient, succeeding very well in keeping costs down, as indicated by results from El Salvador. Based on the low-cost approach, the costs of housing units built by the Fundación Salvadoreña de Desarrollo y Vivienda Mínima (FSDVM) were substantially lower than those of any public or private housing produced in El Salvador by more traditional methods. In part, these reductions can be attributed to the designs developed by the FSDVM and their efficient execution by participants, and to economies made by families themselves during the construction process. Designs concentrated on conserving land, one of the scarcest resources in El Salvador, by achieving high densities in the total shelter package that are consistent with a satisfactory living environment. The use of two-story units, reduction of the frontage of lots, concentration of lots around communal areas, and design of larger projects were features of the designs.

Improvements in layouts, particularly reductions in the proportion of land assigned to vehicular traffic and parking, increased the proportion of residential area to total area. Grouping houses around green areas that provide access to interior plots resulted in the exchange of a limited private area by household for a larger, shared recreational area; the effect is maximized in large projects where mini-parks can be most efficiently complemented by larger open areas. Residential area as a percentage of total area has increased from an average of about 50 percent in projects during 1972–74 to approximately 70 percent in those started in 1975–77. At the same time, the number of units per hectare of residential area has steadily increased. These and other changes in design and density have motivated the World Bank to develop small-unit planning models to deal efficiently with such trade-offs in project design.  


Supply response and constraints in markets. A buoyant supply of housing, the absence of monopoly profits for builders, and high rates of mobility among renters are evidence that the low-income end of housing markets functions very well, if not unduly constrained by policies. This finding comes from the City Study which focused especially on housing supply for low-income groups and on the characteristics of pirate developments, that is, those wherein developers subdivide land without the approval of the relevant authorities and sell lots with minimal public services to households whose members then construct dwellings on the lots. In recent years, nearly half the new dwelling units in Bogota, Colombia, have been constructed illegally (without a building permit) and most of them have been built in such *barrios piratas*. The analysis shows that, contrary to general belief, pirate development is a competitive business, not a monopoly, and that the developers earn a normal rate of return. In 1978, the highest profit rates were earned on authorized developments of the type known as “minimum-norm” barrios. These are developments consisting of lots with certain essential (or minimum) public services meeting standards previously approved by the local authorities.

Initially, when very few minimum-norm barrios were approved, their developers obtained a scarcity rent caused by the restricted supply of suitable development sites. Although minimum-norm developments have been successful, they would have been socially more successful had a larger total area been developed in this fashion, as more lots would have been available and the prices of lots would have been lower. However, allowance should be made for the fact that, even if the supply of minimum-norm lots was better, pirate developments would not disappear. They have fewer services than minimum-norm lots, cost less, and are, therefore, more accessible to lower-income groups. Moreover, pirate lots are generally larger than minimum-norm lots (averages of 120 m$^2$ and 90 m$^2$, respectively, in 1978) and are preferred by larger households or households seeking to rent out accommodations.

**Specific Findings**

**Housing demand.** Results from the analysis of housing demand in Bogota and Cali, Colombia, imply that in the presence of rising incomes among low-income households, their housing consumption increases at a slower rate than income. Similar findings were obtained for cities in El Salvador and the Republic of Korea. The part of income spent on housing is quite high for low-income households, ranging up to 50 percent at the lowest-income levels. As income increases, the share falls. Among the most affluent households, it is often between 10 percent and 15 percent of income. The average proportion of income spent on rent in 1978 was 16 percent in Cali and 22 percent in Bogota, a difference probably ascribable to Cali’s lower housing prices and the fact that less housing is consumed there. Comparisons of quantity of housing consumed between Bogota and Cali show that households in Cali consume less housing than their Bogota counterparts at all income levels, possibly because of climatic differences, Cali being semitropical while Bogota has a cold climate.

**Investment, housing quality, and value.** Most striking, particularly in view of early misgivings of policymakers in many (probably most) countries, who feared that squatter upgrading would perpetuate existing slums and sites-and-services projects would create new ones that deteriorate over time, is the fact that beneficiaries have been stimulated to produce a quality of housing higher than expected.

A study conducted in the Philippines compared housing values in the large Tondo foreshore area in Manila before and after “reblocking” (the name chosen for the process of repositioning houses onto their newly defined lots in improved areas). Within six months of reblocking, two-thirds of the households had commenced improving their houses, even though the great majority had not yet completed the process. Taking the sample as a whole (and the reduction in average response the above information implies), most measures indicated some degree of improvement in housing quality. The changes were especially evident in the increased proportion of houses with solid walls and concrete foundations; lot and building areas were also larger on average, as was the average number of floors. Statistical techniques also revealed that average housing values in the Tondo project area had already increased from 60 percent to 85 percent; or, in monetary terms, housing value immediately

11. Site of the first Bank-assisted urban development upgrading project in the Philippines, and one of the evaluated projects.
following reblocking had nearly doubled—the absolute increase ranging from $800 to $1,000, nearly twice the gross national product per capita at the time of the study. Within a very short period, the project stimulated private housing investments which, in turn, raised dwelling quality and value by a substantial magnitude.12

Determinants of value. Squatter communities have not been included in the housing statistics of many developing countries, and the value of their structures had not previously been studied. Yet, squatters constitute a large portion of urban dwellers, and their dwelling units are obviously not without value. It is important to estimate the determinants as well as the magnitude of those values for use in the evaluation of housing and urban development projects or for eventual use in housing-demand studies. The determinants of the value of squatter dwellings tend to be similar to those for conventional dwellings in the formal sector. The external appearance and quality of materials used in construction are among the most important variables. Interestingly, however, the findings indicate that water and sanitary facilities may not be valued as much as expected in the market, which contrasts with most economists’ expectations that such facilities, based on gains in health and aesthetic appeal, should be socially valued above cost and eagerly consumed. Finally, there is preliminary evidence that age may be positively correlated with value, because housing services are improved more gradually in squatter communities and longevity in a particular area is a sign of reduced risk. Overall, squatter-housing markets seem to fall within economically rational patterns similar to those of conventional markets. Squatter housing should be accounted for in any analysis of housing markets in developing countries, and it appears that simple household surveys are reasonably effective in obtaining the requisite information for such work.

Investment stimuli. The evaluation results indicate strongly that the provision of secure tenure and public services does, in fact, stimulate construction. In Bogota’s barrios piratas, the average volume of building increased with the provision of utility services. In all cases where utility service is connected to a particular lot, average dwelling size exceeds the general average for size and the building process is completed more quickly. Provision of utility services at the right time adds to the supply of low-income housing. Strict legality of tenure may not, however, be a serious impediment to housing construction in pirate developments. In recently developed barrios piratas, nearly half the owner-occupants purchased their lots from other households and not from the original developer. This ready market for pirate lots indicates that ownership rights have a quasi-legal status. There are many types of settlements which, though not strictly legal, are sufficiently secure by convention to promote substantial housing construction. Others are so insecure that only the most rudimentary shelter is ventured. However, absence of legal tenure can certainly be an obstacle to the installation of public services, such as water supply and sewerage, and the construction of additional housing that is usually stimulated by such services.

Construction methods. The projects have placed a substantial premium on identifying those construction methods that reduce costs and contribute to efficient implementation. There are many options: project-provided, contractor-built housing; construction through mutual help, or group construction; self-help in which families hire a contractor; self-help in which families hire and supervise individual workers; and self-help in which families build their homes themselves. Each of these methods involves different rates of construction and costs and different implications for housing quality, affordability, accessibility, and replicability. The number of trade-offs involved is considerable. So, it was important to attempt to discover what families chose to do—under the circumstances offered by the projects—and how.

The most interesting study so far has been an application by Jimenez of a model with three factors (own labor, hired labor, and materials) to data from the El Salvador project to explain parameters facing households when they decide whether or not to engage in self-help housing production.13 Further, it derived the optimal mix of self-help and hired labor.

The wage rates of a household’s members in relation to the price of hired labor and the productivity of the individual household in construction work were the primary determinants of its choice of construction method. The influence of wage rates led to strong substitution effects. The wage rate acted as a measure of opportunity cost; the higher the household’s income, the less time the household was willing to set aside for house building. In cases of “self-help” (those using own labor entirely or in part), the wage-rate elasticity of housing consumption was estimated to be significantly lower than the general income elasticity of demand. So, while increases in income have a net positive effect on the demand for housing, this effect is diminished in the presence of the effects of substitution of labor. This implies that a policy that attempts to stimulate self-help housing through increases in wage income (many projects sponsored by multilateral aid agencies incorporate some sort of income-employment generation scheme) may lead to lower than expected levels of housing consumption. At the very least, poorer households may postpone consumption of housing services by not building immediately.

On the other hand, the research shows little scope for substitution between labor and material inputs in building low-income dwelling units in developing countries, because production is characterized by relatively fixed technical coefficients, that is, labor and materials have to be provided in fixed proportions to each other. Thus, in situations of a fixed supply of family labor, subsidized loans to buy materials only may not lead to substantial increases in production, because not enough additional labor may be available to utilize fully the available materials.

Using family-based construction methods in progressive development schemes, certain families in El Salvador saved up to 30 percent of building costs, and their houses are comparable in quality to those constructed by skilled builders. Yet, such methods can absorb great amounts of time. The opportunity cost of labor, especially for skilled workers and small businessmen was high, and their time could have been much more profitably employed elsewhere. For the majority of participants in the El Salvador projects, weekends were the least favorable times to participate in mutual help, as this was when their (informal sector) earnings were typically the highest. “Sweat equity” in general was not as relatively abundant as assumed. As a result, as many as 51 percent of households in the Santa Ana and Sonsonate projects in El Salvador used hired labor alone to bring their core housing up to habitable levels, as opposed to 27 percent who used family labor only and 20 percent who used a mix.

In Bogota’s pirate developments, almost half of the dwelling units were built with some assistance from contractors, and one-fifth solely by contractors. As a rule, family units with relatively high incomes—for instance, older families—use contractors.

**Interhousehold transfers.** Financial transfers, principally from within the extended family, are a much more important factor in the accounts of low-income households than has been generally realized, based on evidence from the evaluations in El Salvador, the Philippines, and Senegal, as well as from a related investigation in Cartagena, Colombia. This source is most important for the lowest-income families. In Santa Ana, for example, recurrent transfers were found to augment the incomes of roughly one-third of the families living within the “informal” housing sector, including 58 percent of those in the lowest and 48 percent of those in the next lowest deciles.14 Transfers in that city represented a stable source of approximately 40 percent of household income for the two lowest deciles, as opposed to 10 percent for the total sample.15 Similar patterns appeared among the project area populations in the Tondo area of Manila, the Philippines, and in the South Orient zone in Cartagena, Colombia. Total income, then, rather than the wages of primary or secondary earners, is a more appropriate measure of the sum of a household’s disposable resources and purchasing power.

**Housing finance.** Access to credit increases the use of contractors and speeds the completion of dwelling

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14. The average monthly amount transferred was roughly $34.40 per recipient.
units. In 1978, in Bogota, loans for nonspecified purposes and withdrawals from retirement funds accounted for 29 percent and 19 percent, respectively, of the funds put into housing. Savings were used by 34 percent of households, while 8 percent sold assets to produce the necessary funds. Surveys of barrios piratas residents indicate that pirate developments are the entry point to homeownership in Bogota for low-income households. Their lots have minimal services, while self-help construction is the primary mode in which dwelling units are supplied. Households below the 30th percentile of the income distribution are rarely able to afford ownership and instead they rent one or two rooms. Without subsidies or even lower building costs, the bottom third of the income distribution may be able to obtain better housing only through programs that emphasize rental. The age of the head of household is also a significant determinant of homeownership, suggesting that it takes time for a household to assemble the funds required to cover the downpayment on a pirate lot. Accordingly, more attractive financing mechanisms may enable households to become owner-occupants earlier in the household’s life cycle.

Despite certain problems, loans for materials in the early projects were instrumental in enabling households not facing other constraints to undertake construction. Tying credits to specific materials or confining acquisition of materials to specific stores caused problems. Although mechanical replicability was facilitated by the “tied” credit option, the technique was compromised in cases where the materials were too costly or too difficult to acquire and distribute. In Zambiam, for example, problems in stocking on-site stores initially led to families queuing for as many as 20 hours per week to receive items. In the Philippines, project stores did not stock the cement, hollow blocks, or steel bars most desired by households; Tondo dwellers on the whole found cheaper, yet acceptable, materials elsewhere, with the Housing Materials Loans Program (HMLP) providing only 25 percent of beneficiaries with construction materials. The essential lesson is that credit and acquisition programs may be useful only if they increase, rather than restrict, the overall options of the consumer.

Cost recovery. The one factor that threatens replicability of the Bank’s approach to affordable housing projects on a large scale is a checkered experience with cost recovery, although the causes and severity of problems vary significantly. In the early stages of the Zambian project, for example, more than 50 percent of families were in arrears, with many having made no payments. An assessment of the problem by the evaluation team revealed that it was not attributable to underlying affordability problems: there was no correlation between cost-recovery performance and income. Rather, the investigation indicated a more complex issue, including the need for clearer explanation to participants of what was expected of them, and how this related to project benefits; coordination of the commencement of utility services and repayments; and accurate record keeping. The fact that nonpayment of charges for public services was endemic in other sectors in the country, and in the housing sector generally, is also highly relevant. In addition, in the Zambian case, it appeared that cost recovery was complicated by the fact that the local politicians, who were assigned the responsibility, perceived that they had little to gain by attempting to enforce efficient collection. That these factors are quite fundamental is borne out by the fact that, despite substantial efforts, the arrearages have not declined.

The experience in the Philippines has many similarities and, though reasonable performance has been slow to develop because of inadequate planning at the outset, the overall result is much better. By contrast, in the El Salvador project, where the executing agency was private rather than public and where ample attention was paid to cost recovery and measures throughout the project cycle to ensure its achievement, including the ultimate use of sanctions to enforce timely payment, the record with cost recovery was good.

The apparent lesson from project experience is that the low-income housing projects as conceived and executed are basically affordable for the intended beneficiaries and cost recovery is achievable, provided that, above all, governments and implementing agencies are committed to fulfilling this goal and are willing to plan and supervise necessary procedures for its attainment in the same way that they execute other facets of a project.

Ongoing Research

Analysis of the willingness of households to pay for the “composite good” embodied in housing is of high
relevance to the Bank's operational staff and policymakers in developing countries. Differences in household income (and its sources), demographic characteristics, tenure patterns, housing market features, such as price levels and their rate of change, availability of finance, and the presence of market interventions, such as rent control and large-scale public-sector housing programs, are under scrutiny in research projects on “Housing Demand and Housing Finance in Developing Countries” (Ref. No. 672-46) and “Income Formation and Expenditures of Poor Urban Households” (Ref. No. 672-57).

Both are part of the process of designing better housing finance systems for Bank loan programs, complemented by a small number of detailed country studies and a general “position paper.” The study of housing demand will contribute to other aspects of project and program design by exploring the determinants of land and housing values through hedonic regression analysis. The objectives are to establish the implicit valuations placed by the marketplace on major land and housing features such as lot size, interior space, durability of construction, building condition, utility connections, access to transportation and to workplaces, and access to public and private facilities such as schools, clinics, and shops. Such valuations will indicate areas of high returns to public investment in land development and housing and ways of maximizing cross-subsidies by choosing an appropriate mix of housing and locational attributes in a project.

As the findings of the City Study reveal, space is an important variable when attempting to plan and otherwise influence the development and operation of cities, including the scope and location of housing within or adjacent to their boundaries. The analysis of spatial patterns in locating housing, transport, and commerce and industry that provide optimal interlinking efficiency and development continues to be the subject of several research projects at the World Bank. The polar forces of centralization and decentralization in the placement of housing and employment opportunities in national urban centers are examined, and the policy instruments that can be used effectively in locating infrastructure, housing, and transportation facilities are explored in the research projects “National Spatial Policies: Brazil” (Ref. No. 672-13) and “An Evaluation of Industrial Location Policies for Urban Deconcentration” (Phases I and II) (Ref. Nos. 672-58 and 672-91). Informed assessments of the probable impact of spatial policies in the context of urban, regional, and national development objectives will be useful in the Bank's lending operations.

Project Results

The “treatment” advanced by the Bank in stimulating and financing sites-and-services development and improvements to previously illegal or quasi-legal residential areas—the progressive development approach—has worked. It has revealed useful information for the design of lending programs and policies, as evaluation and research results, complemented by project management records, indicate. In effect, no intractable design, engineering, or management problems have been encountered and, apart from the infrequent case of the manifestly redesigned project, implementation of the infrastructural portion of these projects has proceeded with no more than the normal amount of delay or cost overruns expected under Bank loans in all sectors. Families benefiting from self-help/progressive development schemes have proved able to regulate their housing expenditures in accordance with their incomes and to extend their housing investment in accordance with their incomes and needs.

Individual projects covered by the evaluation have increased the production of low-cost housing in the client countries by up to 50 percent. In the case of Zambia, almost half the population of Lusaka was affected by a project, while in secondary cities of El Salvador up to 20 percent of the total population from the 3rd to the 6th income deciles was affected. Though less can be said, and with less authority, about the impact on the socioeconomic conditions of participants, the process of house construction and upgrading has generated substantial amounts of employment and income. For example, in El Salvador, a typical Bank-financed project of 7,000 housing units produced about 3,700 person/years of employment and $4.2 million (1978–79) in wage

income. More difficult to estimate, though nevertheless visible in each of the projects, are the effects of infrastructural investment as stimuli to small commercial and fabricating enterprises which can take advantage of improved vehicular access. According to the City Study, dwellings in pirate developments also provide the owner-households with a significant source of income; nearly one-third obtain income from commercial activities, businesses, or the rental of rooms, averaging one renter per dwelling unit. Originally the investment aspect of housing programs for the poor was ignored or even discouraged by controls on the leasing of rooms and limitations on sales. Later, the leasing of rooms became recognized as one of the most effective ways of increasing incomes of the plot holders, of tapping new sources of finance for housing, and of increasing the supply of housing. This source of profit is an important factor making plots affordable to participant families. In the process, low-income renters are simultaneously provided with access to a wider range of housing and community services.

The high proportion of hired labor used in construction (for example, 59 percent in El Salvador and roughly two-thirds in the Philippines) suggests the willingness and capacity of at least some households to continue to expand their participation in the formal labor market, in lieu of working in self-help household construction, based on an assessment of the trade-offs involved. Adjusting for household size, studies of income, expenditure, and affordability show that the source of income has an impact on how it is used: a larger share of nonlabor income, such as remittances and interhousehold transfers, than of wage earnings is spent on housing.

The same applies to the earnings of secondary workers relative to those of the household head. Finally, there is some suggestion from studies in El Salvador that labor force participation and earnings, specifically among secondary workers, improve for participant families relative to control groups. Further estimation and data sets encompassing longer time spans are required to determine whether a stable relationship exists. What may be most important is that the affordable housing projects have not had negative effects on expenditures for food and other basic necessities.

The projects have successfully demonstrated that progressive development enables housing to be produced which, at a similar level of quality, is substantially cheaper than that produced by conventional methods. In Zambia, for example, a complete new house in one of the upgraded overspill areas usually costs less than one-fifth as much as the cheapest government housing. In El Salvador, the better-quality project houses cost less than one-half as much as the cheapest conventional house. In these countries, as well as many others, such experience is beginning to be reflected in evolving housing policies and programs.

Publicly constructed housing, the model of the 1950s and 1960s, is giving way to private investment through self-help in Brazil, Burundi, Ecuador, Jordan, Kenya, Lesotho, Mali, Morocco, Tanzania, Thailand, and Tunisia. Major changes have occurred in the areas of designing urban projects: setting design standards, recovering costs, reaching the poor, providing land tenure, and changing design procedures. Sites-and-services and upgrading have consequently become the new orthodoxy in some countries. Concepts such as affordability, replicability, low-cost design, and an integrated urban perspective are now central principles in the urban lending of all key agencies.  

Yet, it is sometimes difficult to avoid becoming discouraged that such a substantial accumulation of experience and knowledge is not having more of an impact. Even where there is long-standing experience with successful projects and programs, there is periodic backsliding on the part of senior officials and conflicting policies and programs are pursued at the same time.

Characteristically, both direct housing construction by government agencies and the provision of credit are directed toward the top half of the income distribution. The present problem is one of encouraging public-sector agencies to attend to the housing needs of lower-income groups, but without disrupting the mechanisms that now provide housing for them. Fostering the private rental-housing market and extending utility services may be the most effective means of meeting the short- and medium-term housing needs of the poor. The type of progressive housing development found in Bogota’s pirate developments is to be encouraged, for it efficiently provides a considerable volume of hous-

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ing for the poor. Regulatory intervention, if undertaken in these markets, should be designed most carefully or it may, as in the case of minimum-norm developments, enrich developers while helping low-income households very little. Access to credit both speeds construction and encourages homeownership; small-scale schemes for providing credit have the potential for improving the access of middle- and lower-income households to ownership of their own dwellings.

The accumulated evidence confirms the progressive development model as a substantive step forward in urban project design. The evidence from research also suggests areas for further improvement, such as the design of credit programs, administration of construction loans, and approaches to cost recovery. Such questions have been addressed at the project level as problems become apparent and, in most cases, the result has been improved design for subsequent projects. The program needs to move beyond the mere improvement of projects and their extension to countries not so far involved. It must persuade the countries’ policymakers to think in terms of correcting their policies, giving housing markets a better chance to work, and stimulating them by devising and providing better and larger housing finance programs.

The need to increase institutional capacity, whether in providing new infrastructure or shelter, or in maintaining and operating existing investments, remains a key lesson of project experience. The enduring success of urban development projects depends on the simultaneous improvement of institutions working in the sector in staffing their operations, planning and budgeting effectively, and carrying out their responsibilities during implementation. Institutional development, then, is the sequential step in developing urban shelter projects, and is the precondition for national replicability. The institutional framework of a project, land acquisition and tenure, cost recovery, shifts in construction standards, and project management have special implications for replicability. The Bank’s research in urban finance and land policy has revealed an array of problems that can complicate urban projects or, alternatively, improve their chances of success.19

A lending program amounting to $4 billion through 1986 for ninety urban projects is now under way. It involves one-and-a-half times the number of projects conducted in the preceding ten years. About half the program consists of repeater projects that build upon the success of earlier ones. Operations are proposed for fifty countries, of which twenty-five will be new urban borrowers. The majority of operations is expected to focus on strengthening institutions responsible for the provision of urban shelter and infrastructure. As cities triple in size, adding one billion residents in the next two decades, supplementary applied research will be needed to improve policies for future lending. Ongoing research in such areas as housing finance, housing demand, national spatial strategy, and the role of employment location in regional development will provide valuable insights. The importance of housing markets, the role of institutional finance, and the efficiency of urban management and its links to productivity will be emphasized in the forward-looking research effort.

Reports


COMPLETED RESEARCH

All internal reports cited in this section may be obtained from the Bank Research Documentation Center, Room 18-203. To ensure prompt handling of requests, include payment for items marked with *

Natural Resources and Planning: Issues in Trade and Investment

Ref. No. 671-09

The aim of this study was to formulate and apply commodity models in selected sectors, with the objective of providing the analytical tools and the data format to analyze global supply and demand conditions of important natural resources and resource-based secondary commodities. The resources included bauxite, copper, phosphate, and forestry products. The project consisted of a number of subprojects focusing on three general topics: investment planning, energy, and the behavior of commodity markets. Analytical tools were developed to determine globally optimal output and investment and trade patterns for these commodities, given any interdependencies among them.

Some of the principal output of the project stems from worldwide investment analysis of copper and aluminum. Regional demands were projected exogenously. The use of a multiperiod, mixed-integer linear programming framework minimized the discounted global costs associated with meeting demand from existing and new production facilities, taking economies of scale into account. The major innovation was the endogenous consideration of declining ore grades as a result of increasing exploitation at a given mining location. This work illustrated the feasibility of worldwide investment analysis, and it particularly provided insights into the requirements for data, as well as the uses and limitations of this type of analysis. A more systematic assembly of a data base for projections was incorporated in “The World Aluminum Industry Study” (Ref. No. 672-43A), a follow-up study, reported in the World Bank Staff Working Paper on aluminum, cited under “Reports.”

In collaboration with the Food and Agriculture Organization (FAO) of the United Nations and with partial financing from the United Nations Development Programme (UNDP), work on a model of the worldwide pulp and paper industry was begun, and an analytical framework for the project developed by Bank staff was adopted by FAO’s World Pulp and Paper Industry Program as a basis for data collection in several regions of the world. Problems of cyclical imbalances in supply and demand and the consequent variations in real price levels and profit margins were addressed in the effort. Data collection and analysis were completed only for the Southeast Asian (Association of South East Asian Nations (ASEAN)) region, and were published by FAO.

Following a review of its initial objectives and scope and a number of staffing changes in midstream, the project was basically restructured to allow for the participation of outside researchers on an informal basis and for staff researchers to direct the research effort, only marginally financed by the Bank, toward topics of relevance to the Bank. Grouped as “Analytical Studies of Market Behavior,” a number of research papers on the welfare implications of price stabilization schemes were made available to the Bank as part of this coordinated endeavor. In order to assess the medium-term impact of alternative stabilization policies, simulation models of the jute and copper industries were added to the program. Devised in the context of the Integrated Commodities Program of the United Nations Conference on Trade and Development (UNCTAD), the models introduced stochastic elements, and results were calculated for a series of alternative scenarios. The expected rates of return to hypothetical buffer-stock operations were estimated endogenously; unfortunately, the models did not specify continued private speculation in the commodity following the formation of a buffer-stock agency.

In general, the research effort on energy yielded only tentative results. Initially, it focused on improvements in the estimation of demand and supply parameters underlying the world oil model formulated for the World Bank’s Energy Task Force. The overly ambitious econometric framework and methodology confined data collection to groups of developed countries, and the results did not benefit from theoretically consistent demand functions. On the other hand, in a separate initiative, an optimal time path of exploration-type investment for producers, competitive or monopolistic, of nonrenewable natural resources was developed. Qualitative results were derived for a simple
control-theory model of maximization of profit, followed by a numerically simulated application to the oil industry. Despite the novel application of the technique of optimal control, the behavioral assumptions regarding the handling of competitive supply and the avoidance of risk diminished its applicability.

The project, somewhat diffuse in execution due to staff changes over a decade, provided scope for a number of independent researchers to pursue interrelated avenues of inquiry and yield workshop discussions and papers and external publications, for which the project can hardly take credit, that advanced the Bank's analysis of investment in the exploration, development, and marketing of natural resources.

The research was conducted for the World Bank's Development Research Department by Ardy J. Stoutjesdijk, with the assistance of Alfredo J. Dammert and David Newbery, and in collaboration with Hans Bergendorff, Partha Dasgupta, Geoffrey Heal, Ethan Hochman, David Kendrick, Robert Pindyck, Joseph Stiglitz, Martin Weitzman, and Pinhas Zusman (consultants). The Food and Agriculture Organization (FAO) of the United Nations and the United Nations Development Programme (UNDP) collaborated on aspects of the project.

Reports


Analytics of Change in Rural Communities

Ref. No. 671–17

In developing areas with large and successful rural development projects, casual observation of the bustle and energy in local markets and enterprises suggests that, in addition to generating output and incomes directly, such projects may have powerful effects on the surrounding regions. Whatever the hazards of predicting them, the direct effects of a rural development project are usually not too difficult to identify and measure. Each result will normally cause an increase in economic activity in the rest of the economy, and this increase may, in turn, produce a further impulse of its own. The total cumulative effect of such a project on incomes and the net demands for goods and services in the economy is of special interest to the institutions that finance the project and to development practitioners who evaluate it. Yet, there have not been many attempts to provide quantitative estimates of the downstream effects of particular projects in rural areas. Based on a case study of the Muda Irrigation Project, completed in the mid-1970s in a relatively poor agricultural region of Malaysia, the main theme of this research—with its strong emphasis on methods—was the analysis of indirect or downstream effects as part of an overall evaluation of the project.

The Muda irrigation scheme, one of the largest agricultural projects ever undertaken in Malaysia, was designed to bring 255,000 acres of monoculture rice-growing land, farmed by some 51,000 families, under double cropping where previously only a single rain-fed crop was possible. Construction began in 1966, and the first release of irrigation
water took place in 1970. By 1974, the scheme was fully operational. Total capital outlays by 1974 had reached Malaysian $270 million, of which M$100 million was financed by a loan from the World Bank to cover the project's direct foreign exchange costs. The Muda Agricultural Development Authority (MADA), representing an interesting initiative that combined the authority of government with the flexibility of private enterprise, was established as a statutory corporation by the government to administer the project.

Between 1967 and 1974, the gross cropped area within the irrigation scheme's command almost doubled, while the level of rice production increased 141 percent. Rice production grew at a faster rate than the cropped area because crop yields were increasing with the introduction of improved rice varieties and the greater use of fertilizers and pesticides. The new high-yielding rice varieties were accompanied by changes in the methods of land preparation, traditionally done using buffaloes. In 1967, it was estimated that only 5.2 percent of the cultivated area was prepared exclusively by tractors. By the mid-1970s, the stock of tractors had increased almost tenfold and virtually all tillage was done by machine.

Estimates of what happened to farm incomes over this period are plagued by the frailty of evidence for the earlier years of the project. Calculations from three separate estimates of farm household income between the preproject and postproject periods indicate that the gross value of rice output rose by 380 percent and the incomes from rice farming by 360 percent, both in nominal terms. Earnings from employment in rice cultivation doubled.

The project was large enough to affect the levels of wage rates and rents, as well as farmers' techniques of production. Since the distribution of incomes among the direct beneficiaries might also have changed, it was necessary to estimate its direct effects with some care, not only because the distribution of direct benefits is central to the evaluation of the project's social profitability, but also because the size and composition of the downstream effects could depend on the character of that distribution. Hence, a linear programming model of the farming sector was built to analyze the project's direct effects in some detail. The downstream effects were later integrated into a formal scheme for social cost-benefit analysis.

The indirect effects of a project may take many forms, such as increased output or new investments by firms, expenditure and savings by households, and revenues (or losses) by government. To trace these repercussions, a framework was needed within which all the transactions could be ordered and accounted for in a consistent way.

A social accounting matrix (SAM), a system of accounts in which (by convention) the various incomings of each and every account are represented by an ordered row and the corresponding outgoings by a similarly ordered column, was used. The whole is a square tableau, each cell of which contains the transaction between a particular pair of accounts in the form of an outlay of one and an income of the other. This array provides a picture of all the transactions in the economy at a given moment in time, and in so doing, it also reveals something of the structure of the economy. Moreover, as the distribution of income was of keen interest, several classes of households were defined—agricultural households with different sizes of farms and nonagricultural households, both within and outside the command of the irrigation scheme. Firms and government were also accommodated. Production activities were defined with enough detail to distinguish between sectors producing goods that are readily tradable and those producing mainly or wholly to satisfy domestic demand; and sectors using very different technologies or employing factors owned mostly by one class of institution.

The result was a regional social accounting matrix with 45 accounts. This snapshot picture of the regional economy in 1972 provided some valuable insights for the subsequent analysis. Two findings stand out. First, the linkages connecting production activities appeared to be weak, whereas households spent a large fraction of their incomes on locally produced goods. Second, the outflow of private capital from the region was very large, which suggested that the chances of self-sustaining growth were poor.

Although valuable, this picture said rather little about how the regional economy actually worked, and still less about how it responded to changes from the outside, such as the construction of the irrigation system or movements in the prices of traded goods. To explain such responses, a model of the economy was needed, and that, inevitably, entailed making specific assumptions about individual and institu-
ional behavior. In this case, the social accounting matrix provided a basis for estimating the parameters of a quantitative model.

The Muda region is a small, open economy, which is heavily dependent on primary commodities. Goods can be traded with the rest of the world at given prices and, though labor has only limited mobility, capital can flow freely in or out, depending on the opportunities for profitable investment. Apart from short-term adjustments, under these conditions the output of tradable goods will be determined not by the level of domestic demand, but by the level of installed capacity in the sectors producing them. Conversely, the output of non-traded goods will be determined by the level of domestic demand from industries and households alike. Similarly, if the prices of tradable goods should change, the prices of nontradables are likely to change too, and with them the level and distribution of both nominal incomes and domestic demand. In all this, the downstream effects of a project are likely to make themselves felt largely as changes in the output of nontradables.

These salient features can be captured in a relatively simple semi-input-output model, and two variants of such a model were developed. One of them featured prices of nontradables that were endogenously determined, given the prices of tradables; the other was a special case of the first in which all prices were fixed. With certain not especially strong assumptions, most of their parameters could be estimated directly from the regional matrix. Moreover, both models were computationally tractable.

The models were used to disentangle the contributions of the various sources of change that were at work in Malaysia between 1967 and 1974. Apart from the Muda project, there were autonomous changes in production and expenditures, as well as changes in the prices of tradable goods. The autonomous changes took two forms: first, growth in the output of traded goods other than rice, such as rubber, fish, and sawmilling products; and second, an increase in investment and current outlays by the government, the latter being especially large. For such an economy, the sectors producing traded goods and the government's expenditure decisions will normally act as the engines of growth. As it happened, the prices of tradables changed markedly over the period: the prices of primary commodities, which the region exports, were relatively high in 1967 and 1974, and relatively low in 1972. This, too, was taken into account.

To evaluate these effects, solutions from both the regional and rice-farming sector models were required. For each set of circumstances of the regional economy, whether hypothetical or actual, a particular configuration of the rice-farming economy corresponds. For example, in simulating the regional economy in 1974 in the hypothetical absence of the project and the presence of the prices of tradables that ruled in 1972, there was a set of results from the rice-farming sector model that had to be spliced into the semi-input-output models.

It turned out that the downstream effects on the region were large: for every dollar of value added generated directly by the project, another 80 cents or so were generated downstream. Further, they originated primarily from household expenditure linkages. Most of the value added downstream accrued to nonfarm households. Yet, in the absence of the project, the distribution of income between rice-farming households in the irrigation command area and the other households in the region would have worsened considerably, for the autonomous changes overwhelmingly favored townspeople. As it was, aside from the changes in the region's terms of trade, rice-farming households were doing better in 1974 than in 1967—both relatively and absolutely. Moreover, the movements in the region's terms of trade proved to have a potent effect on the distribution of incomes between farm and nonfarm households. But sharp though these movements were, they had only a slight effect on regional output and value added in the aggregate. Of course, the additional 80 cents were not "free." Fewer workers migrated to other parts of Malaysia, and savings were diverted from other uses to finance the balancing investments needed to increase the region's output of nontraded goods.

It was then appropriate to ask how the downstream effects of the project could be incorporated into a full-blown social cost-benefit analysis. In order to do so, all the relevant effects of the project on the national economy had to be specified. First, there were goods traded between the region and the rest of Malaysia but not normally traded internationally, such as rice and electric power. These must come from elsewhere in the national economy with a
corresponding diversion of labor and capital from other activities. Second, there was the crucial matter of government income. Not only did the government construct and run the irrigation system, but it also levied taxes on incomes, expenditures, and international trade. Since the total effects of a project will normally include changes in the levels of exports and imports of tradable goods, as well as private incomes and outlays, the change in government income must be traced in full.

The project was then evaluated. For each year of the project’s life, the changes in the incomes of all the institutions in the economy brought about by the project were estimated. Then, by weighting these changes to reflect the social value of savings relative to private consumption and of extra consumption by the well-to-do relative to the poor, the change in the social value of national income was obtained. Finally, by discounting this stream of changes in the social value of national income at the appropriate rate of interest over the project’s entire lifetime, the project’s net present social value was calculated.

To do all this, the fixed-price semi-input-output model of the region was extended to include production activities affected elsewhere in Malaysia as well as a simple specification of the government’s fiscal system—in effect, a model of the entire economy, although only those elements affected by the project were specified. The evaluation indicated that the project yielded a handsome social profit irrespective of whether the premium on government income relative to private income was high or zero, or the government’s concern about the distribution of private incomes was strong or nonexistent.

How do these procedures for evaluating the project relate to standard methods? The literature provides rules for deriving shadow prices (that is, the social scarcities) of all goods and factors, which are applied solely to the direct inputs and outputs of a project. Do these shadow prices capture all downstream effects, too? In particular, what becomes of the 80 cents of indirect benefit per dollar of direct benefit mentioned above? If both methods are used correctly, the researchers suggest, the same results should be shown. But, since practitioners frequently use shortcuts, this issue is not quite closed.

The research evaluation project was conducted by Clive L. G. Bell, Peter B. R. Hazell, and Roger H. Slade for the World Bank’s Development Research Department, in collaboration with the Muda Agricultural Development Authority and other agencies of the Government of Malaysia and with the Food and Agriculture Organization (FAO) of the United Nations.

Reports


Traffic Restraint in Singapore

Ref. No. 671–20

The rapidly growing city-state of Singapore carefully examined its transport problems between 1967 and 1974 and decided to restrain the use of private automobiles in congested areas with a policy instrument called “area licensing.”

By 1974, seventy percent of Singapore’s inhabitants lived within a radius of about five miles (eight kilometers) of the central business district of the city. A similar proportion of the city’s jobs were located in the same area. There were over a quarter of a million registered motor vehicles, almost 150,000 of them private cars. It was estimated that population growth and rising incomes would lead to a more than threefold increase in the number of cars by 1992. Aware of the extreme levels of congestion implied by such growth, the Government of Singapore set out to develop a coordinated transport policy.

Two major transport studies concluded that limitations on the ownership and use of private motor vehicles would be required. In the meantime, several plans were put into action: Land-use plans attempted to coordinate the location of new housing, employment, and services in new industrial centers outside the City of Singapore to reduce the need for transport; bus services were improved; and a policy of restraining the rate of growth of car ownership by taxation was implemented. To raise public awareness of traffic problems, a campaign to promote staggered workhours and car pooling was launched. It involved an extensive publicity effort and government-business seminars.

The Singapore government, then, set the goal of designing a scheme to reduce peak-hour traffic by 25 percent to 30 percent. At the same time, several important points were recognized. First, accessibility and mobility within the central area were to be maintained to protect the economic vitality of the area. Second, the mobility of the private car was recognized as a benefit, and restrictions were to apply only when and where they were needed to combat local congestion. Third, the scheme was to be easily administered and enforced. Fourth, it should not require a subsidy.

Area licenses and parking fees were chosen as the basis of the Singapore traffic restraint scheme, together with a park-and-ride system to provide motorists with an alternative mode of transport. The area licensing scheme was instituted in 1975. The key concept underlying the scheme was, and remains, that a special, supplementary license must be obtained and displayed by a motorist in order to enter a designated restricted area of the central business district within which congestion was to be reduced. The zone covered 62 hectares and had 22 entry points. The government had no previous experience to guide it in setting the license fee, and a panel of experts convened by the World Bank was unable to find adequate empirical data on the response of motorists to large cost changes. Thus, it was necessary to set the fee by judgment.

The requirement to display an area license did not apply to buses or commercial vehicles, in order to favor public transport and maintain commercial activity. To encourage higher vehicle occupancy and more efficient use of road space, car pools (defined as cars carrying at least four persons) were exempted from the license requirements, as were motorcycles. Initially, taxis were also exempt but, after a few weeks of operation, this exemption was removed. The scheme was designed to operate from 7:30 a.m. to 9:30 a.m. After implementation, congestion developed after 9:30 a.m. and the time period was extended to 10:15 a.m. Ten thousand spaces in car parks around the periphery of the restricted zone were opened to commuters, and special shuttle buses were introduced to carry commuters from the fringe car parks to the central area.

The third element of the scheme was an almost one hundred percent increase in parking charges at public car parks within the restricted zone. The new rates were designed to reflect the geographical distribution of congestion and to favor short-term as opposed to all-day parking. The government also acquired powers to levy a surcharge on private car park operators, to induce them to raise their charges without permitting them simply to collect a rent reflecting the difference between public and private charges.

Singapore is the first city in the world to have introduced a scheme of this type, and it remains unique. The World Bank, in cooperation with the
The short-term evaluation indicated that, overall, the volume of traffic entering the restricted zone during the applicable hours of operation was reduced by 40 percent. The use of car pools increased 82 percent. In this respect, the area licensing scheme has been successful. Benefits have accrued to some car drivers and to bus riders, and the central area has been improved for pedestrians and vehicle users alike. It was initially thought that the morning restrictions would produce a mirror-image effect on the evening peak hours, assuming that people who stopped driving during the morning peak hours would not drive out of the city center in the evening. But, in fact, evening traffic volumes fell only slightly. And what of traffic outside the restricted zone? Following the introduction of the scheme, congestion was heavy on the ring road as motorists avoided the restricted zone. This problem was quickly solved as traffic light timing was modified to favor circumferential movements rather than radial in-bound traffic.

Problems encountered were underutilization of city streets and parking space due to the unexpected reduction of 40 percent in traffic, rather than the 25 percent to 30 percent reduction that was set as the target; the continuation of congestion during the evening peak period, contrary to expectations regarding the impact of a reduction in morning congestion on evening user patterns; and the overbuilding of parking space for the park-and-ride component which proved unpopular. The excess parking capacity and the ability to convert it rapidly to other uses illustrate the pragmatism and flexibility required by a government implementing such a scheme.

Administration and enforcement proved to be manageable, to a considerable extent, due to the care devoted by the Singapore government to the design and preplanning of the scheme, and to the gradual implementation of complementary transport policies and the publicity that preceded it.

Overall, the area licensing scheme clearly has promise as a component of an urban transport policy. It is flexible enough to be tailored to the needs of a wide variety of cities, creates revenues, and requires little capital to implement. In Singapore, it was used to break the spiral of increasing congestion and decreasing public transport service by creating a situation in which public transport could operate more efficiently and give better service. As Singapore government officials have pointed out, however, success required a fundamental restructuring of the public's attitudes to the ownership and use of the private car. It also was essential to have policymakers who were imaginative and innovative in developing urban transport strategies.

The project was carried out by Edward P. Holland and Peter L. Watson for the Urban Projects Department of the World Bank. Technical Memoranda Nos. 1-16 on the scheme are available from the Bank Research Documentation Center. A long-term evaluation of the area licensing scheme, in terms of its comparative structural impact on the business center and contiguous areas, is under consideration by the World Bank.

Reports


Audiovisuals


Income Distribution in Thailand

Ref. No. 671-36

This study of the incidence of poverty and characteristics of poor households in Thailand was based on data from the Socio-Economic Survey of Thailand 1971-73, conducted by the National Statistical Office, using separate samples for urban and rural areas in each of five regions of the country. The project was one of a group conducted by the World Bank in the 1970s using existing data sets to describe the patterns and anatomy of poverty and the distribution of income, and as material for more formal hypothesis testing concerning the causes of such patterns. Similar studies were carried out in 11 other countries in Asia and in several countries in Latin America (see Research News, Volume 4, Number 1, Spring 1983, for summaries of the findings of “Evaluation of Latin American Data on Income Distribution” (Ref. No. 670-83) and “Evaluation of Asian Data on Income Distribution” (Ref. No. 671-08)). The study also explored the relationship between the household’s life cycle and income, the earning power of individuals as determined by education and training, and the effects of earnings incentives and opportunity costs on labor participation.

The principal methods used for describing patterns of income distribution and the profiles of poverty were simple tabulations and cross-tabulations, with some decomposition of inequality measures (the Theil index and the variance of log income), and for estimating determinants of income, fairly standard earnings functions were used. On the whole, the investigation yielded no surprises: the poor were found to be more concentrated among younger, larger families, especially those dependent on farming as a livelihood.

Poor households were defined as those with incomes of approximately $62 or less at 1972 prices for each adult-equivalent member. Income included money payments and the value of goods and services acquired through barter, payments in kind, and production for household consumption, but excluded the rental value of owner-occupied dwellings. To adjust for the presence of children, adult-equivalency was used as a measure of household size, with children under 5 years and from 5 to 14 years having adult equivalencies of .46 and .63, respectively. In 1972, the average household size for Thailand as a whole was 5.86 members or 4.80 adult-equivalents. Adjustments in defining poverty were also made for regional differences in the consumer price index. Based on the cost of 2,353 food calories a day, including 59 grams of protein, at 1972 prices the poverty line derived for the research was quite close to estimates of the cost of subsistence living in Bangkok, the capital.

According to the study’s definition, 36 percent of all households in the country were poor, with 99 percent of this poverty in rural areas. The poverty was concentrated more in the northeastern and northern regions than in the southern and central regions; rural areas around Bangkok had comparatively little poverty.

To some extent, poverty was discernible as a life-cycle phenomenon, that is, a temporary condition which households with numerous children outgrow as children depart or join the work force. Three-quarters of all households in Thailand in 1972 were headed by men in the 30 to 49 years age group, which also constituted the bulk of poor households. Households headed by women in the same age group were even more likely to be poor.

When examining the determination of earnings, the level of education, work experience, gender, and occupation were found to be important indicators. Two-thirds of all household heads had some elementary schooling, and 28 percent had none. For every year of additional schooling, earnings increased by 7 percent in urban areas and by 5 percent in rural areas. No household head with a secondary education was found to be poor. The returns to secondary education were twice as great as for elementary education; university graduates earned 45 percent to 65 percent more than secondary graduates. Experience also had economic rewards in the wage sector which started to diminish after 36 years in the work force. The experience-earnings profile was half as great for women as for men, however.
In the rural sector, it was found that households deriving their incomes from farming as a primary or secondary occupation were three times as likely to be poor than nonfarm households. Commercial occupations in rural and urban sectors earned a 25 percent premium over production and service workers.

The study was conducted by Carmell Ullman Chiswick as a consultant to the World Bank's Development Research Department.

Reports


Industrial Statistics

Ref. No. 671-92

This project aimed at developing an industrial data base of internationally consistent data classified, whenever possible, at the 4-digit level of the International Standard Industrial Classification (ISIC), Rev. II, and capable of being updated regularly. The data cover the following indicators: gross output, value added, number of employees, wages, number of establishments, and gross fixed investment for about 80 countries for the period generally 1963–77. The objective was to overcome the difficulties posed by present inconsistencies in data due to differences in coverage by size of establishment and between surveys and sample data and national accounts statistics and estimates of total manufacturing in census years, as well as gaps in data collection over time. The objectives of producing a “clean” industrial data file, excluding data on fixed investment, have been accomplished. The information on fixed investment was not obtainable for many countries and, where available, was often unreliable.

In order to compile improved data or to reconcile conflicting data the project took the following steps: (1) it obtained industrial statistics from the United Nations and assembled information provided by individual countries, together with supplementary material from regional offices of the World Bank; (2) reviewed the underlying definitions and concepts, coverage, classifications, valuation, and sampling methods, and identified limitations in terms of missing data, internal consistency, and international comparability; and (3) filled gaps in the coverage of industrial activities, adjusted nonstandard industrial classifications and definitions into a standard format, and compiled subsectoral data on gross output, value added, number of employees, wages and salaries, and number of establishments to the 3-digit and 4-digit level. In addition, consistency was sought for sample and census coverage, because individual countries report manufacturing data according to a different minimum size of establishment. Based on the techniques developed, it was possible to adjust these data for 13 countries, using all establishments employing five or more persons as a base. Estimates for missing data were made where supporting data were available.

Two data bases resulted from the project, one with “raw” data collected from the national publications, and the other with adjusted data. A complete description is included in Volume I of the “User's Guide and Reference Manual,” cited under “Reports” below. Both sets of data are extensively documented in terms of sources, method of adjustment, and data peculiarities. The data will be updated as information from public sources becomes available. Communication has also been established with a number of countries in order to obtain industrial statistics directly; it is hoped that the remaining countries will be covered soon. The companion piece to the data sets is a set of computer programs suitable for the maintenance (update, correction, validation) and manipulation of the data bases. A detailed description of these programs is included in Volume II of the “User's Guide and Reference Manual.”

The data are particularly useful as shifts in the industrial product structure, market penetration, and the potential for industrial exports from developing countries become more important economically and politically, and existing margins of error implied by the previously available statistics become increasingly unacceptable. The data base makes it possible to determine shifts in the developing countries' share in global manufacturing
over time, in total and by subgroups. This analysis can reveal the penetration of developing countries' exports of manufactures into various markets, as well as the changing ratios of imports and exports to production in developing countries. Furthermore, the employment, wage, output, and value added data provide for studies of factor intensity (by various measures), comparative wage costs, and productivity changes. On a broader scale, the development of a consistent data base on industry is expected to provide the basis for a qualitative advance in economic research on industrial development, comparable to the impact of standardized United Nations trade statistics in the postwar era on international trade theory. Standardized data enable researchers to achieve a degree of concreteness and policy relevance not previously possible.

In addition to the World Bank, which uses industrial statistics in project-oriented work and in global analysis and research, the beneficiaries of the project are research institutes of newly industrializing client-member countries and international organizations: the European Economic Community (EEC), Organisation for Economic Co-operation and Development (OECD), United Nations Industrial Development Organization (UNIDO), and the United Nations Statistical Office (UNSO).

The project was conducted by Sang E. Lee and Vasilis Panoutsopoulos of the World Bank's Economic Analysis and Projections Department. Details of the problem-solving techniques are available in two papers prepared by Professor John Weeks, consultant to the project.

Reports


NEW RESEARCH

Analysis of the Tax Systems in Developing Countries: Applications to Pakistan and Mexico

Ref. No. 673-13

The prospect of acute constraints on the ability of the governments of developing countries to raise added revenues in the 1980s has highlighted the need for more analysis of the measures to increase public revenues and better to mobilize domestic resources. One of the major instruments for raising revenue is the tax system. The problem is to raise additional revenue in a manner consistent with a government's social objectives—with respect to the distribution of income, for example—and with desired levels of production and public expenditure.

The immediate objective of this research is to study the tax systems of Pakistan and Mexico to identify the direction tax reform should take and the most efficient and equitable ways of raising extra revenue, and to enhance the decision-making process with regard to tax reforms. The more fundamental objective is to develop a methodology of public finance so that similar studies can be undertaken in the future for a wider range of developing countries.

Only relatively recent developments in the theory of public finance have explicitly linked taxation, social objectives, production, and public expenditure. More recent still has been the systematic application of the theory to the analysis of the tax system of a developing country.

These developments in public economics provided an effective framework for a two-and-a-half year study of the tax system of India, conducted by Professor Nicholas H. Stern of Warwick University (United Kingdom) in collaboration with Dr. Ehtisham Ahmad, and financed largely by the British Social Science Research Council. The study addressed a standard and central question in public finance: How should a government best design its tax system to raise a given revenue, or, in its more operational form, how should a government change the present tax system to improve its structure and/or raise more revenue?
In extending this work to Pakistan and Mexico, each country’s tax structure will be described in a form useful for policy analysis, which is a major task of considerable interest to the countries and the World Bank, and areas for improvement will be identified, given some specification of each country’s objectives. The study will entail analyses of personal income tax reforms, the impact of indirect taxes on incomes, the implicit tax component in public enterprises, capital goods, tariffs, market structure, and labor market clearing. A number of other research projects currently under way within the Bank employ the same methodological framework, including “Book on Modern Tax Theory for Developing Countries” (Ref. No. 672-92) and “Pricing and Taxing Transport Fuels in Developing Countries” (Ref. No. 672-83) (see Research News, Volume 3, Number 3, Fall/Winter 1982).

The research is being conducted by David Newbery and Lyn Squire of the World Bank’s Development Research Department and Country Policy Department, respectively, in collaboration with Nicholas H. Stern, Ehtisham Ahmad, and J. Seade (consultants). The British Social Science Research Council is cofunding part of the study.

**Collaborative Research with China (Phase II)**

Ref. No. 673–14

The second phase of this project, being jointly conducted by the World Bank and the Institute of Economics of the Chinese Academy of Social Sciences, contains two components—the first dealing with enterprise management and the second with demand and production structures.

The objective of the component on enterprise guidance is to analyze the system of managing Chinese enterprises: how it has worked in the past, what the effects of recent attempts at reform have been, and what the likely effects of proposed reforms will be. Enterprise guidance is defined broadly to include internal management issues, relations among enterprises, and relations between them and government authorities. The focus will be on how enterprises have responded to the set of incentives and directives issued by higher authorities.

The main source of information on this facet of the project will be in-depth interviews with key personnel in 20 enterprises and organizations that will permit exploration of frequently cited systemic problems and analysis of how closely the actual system of guidance conforms to the official model. The information gathered is expected to provide a basis for comparing the Chinese system with centrally planned economies in Eastern Europe and the Soviet Union and, to a lesser extent, with the public enterprises of market economies. Previous research in Eastern Europe will probably prove the most useful for comparative purposes, because reform policies evolved in a similar way.

For the second component of the project on demand and production structures, earlier Bank experience in analyzing the sources of growth in large industrializing economies will be tapped to develop a general framework pertinent to a country the size of China. In China, the transition to a more complex economic structure, which emphasizes industrial production, has necessitated better sectoral balance in production so that output meets intermediate needs and final demand. It has become increasingly important to accumulate the data base needed for analyzing structural change and to master the tools that will help in that analysis.

The immediate purpose of the study is to analyze the evolution of Chinese consumption patterns over time, to obtain a more detailed view of current consumption patterns through analysis of household surveys and comparison with international data, and to use this analysis to advance the methodology of consumption analysis in China. In the longer run, it is expected that a reasonable basis for estimating consumption patterns will be established, making it possible to forecast demand in the medium term and to create a better foundation for matching consumption and production.

Of particular interest to the descriptive analysis of household consumption and the economic analysis of consumption patterns generally is the fact that within the Chinese economy, in many cases, various prices exist for the same goods. The relevance of this feature of the economy in explaining consumption patterns will be assessed.

The project is supervised by Ardy J. Stoutjesdijk and Edwin Lim of the World Bank’s Development
Research Department and East Asia and Pacific Country Programs Department, respectively, in collaboration with the Chinese Academy of Social Sciences and with the assistance of staff members Gene Tidrick, Shujiro Urata, and Jacob Van Der Gaag, and of Benjamin King (consultant).

Supply Responses of Aggregate Crops Output

Ref. No. 673–15

The purpose of this project is to estimate the long-run price elasticity for aggregate agricultural supply. Assumptions regarding the responsiveness of aggregate agricultural output to prices are important in the analysis of agricultural pricing policies, particularly in many developing countries where domestic policies discriminate against agriculture. Discrimination takes the form of taxes on agricultural production or exports, or protection given to other sectors of the economy. Development institutions such as the World Bank, however, have urged governments of developing countries to move to more rational pricing policies as a means of spurring overall economic growth and improving income distribution. This position hinges on the assumption of a high elasticity for aggregate agricultural output; yet, most previous estimates have indicated a very low or negligible responsiveness to changes in prices.

The aim of the study is to follow up on earlier challenges to traditional estimates of the responsiveness of aggregate agricultural supply to prices, using state-of-the-art econometric techniques of pooling time-series and cross-section data and of variable coefficient estimation. Cross-country data (from about 90 countries) on aggregate crop output, producer prices, fertilizer prices, land use, expenditure on agricultural research and extension, agroclimatic variables, size of the agriculture sector, and human capital stock for the years 1966 to 1981 are being used in the analysis. Aggregate output indices will be constructed using purchasing-power-parity estimates of income and export unit values.

The project is being supervised by Ronald Duncan and Hans P. Binswanger of the World Bank’s Economic Analysis and Projections Department and Agriculture and Rural Development Depart-

Agricultural Mechanization in Africa: Review and Prospects

Ref. No. 673–16

A historical review of the evolution and extent of mechanization in more than 20 different areas of Eastern and Western Africa is part of this study focusing on the factors that determine the demand for various forms of farm mechanization. The driving forces of the mechanization process are fairly well understood for most regions of the world—scarce labor, abundance of land and capital, elastic demand for agricultural output, and innovation and invention by the private sector—yet, in Africa, mechanization has proceeded very slowly. Hoe cultivation is tenaciously maintained in areas where labor appears to be very scarce, and successful mechanization is restricted to sharply defined areas. While recent reviews of mechanization have looked at management factors and constraints to the supply of farm machinery, this project will center on issues affecting demand, particularly agroclimatic and soil conditions, seasonality of crops and peaks in the demand for labor, and the final demand for agricultural products. A better understanding of these interactions will provide more reliable predictions of future patterns of mechanization.

In the study, mechanization is defined as the replacement of human labor by animal or mechanical power. The slow progress of animal traction and motorization in sub-Saharan Africa is well documented. The project is aimed at identifying persistent forces that govern the profitability of mechanized investments and that remain relevant when shorter-run impediments, such as sociocultural or institutional factors, could be overcome. The review is intended to assist World Bank project departments in clarifying, on a region-by-region basis, what factors have limited mechanization and whether the main ones continue to be relevant or are about to be overcome.

The geographical areas selected for analysis include regions where animal traction has long been established, such as Lesotho and Botswana; where
animal traction spread shortly after World War II, such as the areas of groundnut cultivation in Senegal or of cotton cultivation in Mali; and regions where it has spread during the past 10 years, such as southwestern Upper Volta and the central Ivory Coast. A similar comparative approach will be used in the case of tractors, with reference to their successful introduction in selected areas of the Sudan and Kenya, and in rice-growing areas in the northern Ivory Coast.

Field visits by the researchers to the major agroclimatic zones of Niger, Upper Volta, and the Ivory Coast will complement the review of existing economic, agronomic, and technical studies upon which the project is based.

The project is being conducted by Hans P. Binswanger and Inderjit J. Singh of the World Bank's Agriculture and Rural Development Department, in collaboration with consultants of the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), India.

NEW BOOKS

Manpower and International Labor Migration in the Middle East and North Africa

Ismail Serageldin, James Socknat, Stace Birks, Bob Li, and Clive A. Sinclair


LC 82-20206
ISBN 0-19-520406-9 $27.50 hardcover

Without the international flow of migrant workers to the nine labor-importing countries of the Arab region, their current economic metamorphosis could not have been achieved. Nevertheless, these labor-importing states are becoming uneasy about the number of migrants who, in some of the smallest states, comprise 90 percent of the work force. Within the seven major labor-importing states, the expatriate population is expected to reach 10 million by 1985, up from 3 million in 1975. For the capital-poor states of the Arab region, which are the major suppliers of migrant labor, the outflow of workers has resulted in dramatic increases in remittances, yet has aggravated internal inflation rates and shortages of certain critical skills. The benefits of exporting labor are thus becoming increasingly equivocal.

This study of labor market trends in the Arab region from 1975 to 1985 analyzes the demand for and supply of manpower by country, sector, occupation, sex, educational level, and ethnic composition. The sources and destinations of workers are indicated, and the social and economic implications of migration, particularly for government policy and planning, are examined for both labor-importing and labor-exporting economies in the Middle East and North Africa.

NEW AND FORTHCOMING PUBLICATIONS

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Pricing Policy for Development Management

Edited by Gerald M. Meier


LC 82-7716  ISBN 0-8018-2803-1 $35.00 hardcover
ISBN 0-8018-2804-X $12.95 paperpack

Many economists believe that a major task of development policy is to "get the prices right." Policy prescriptions frequently emphasize the need for "more appropriate pricing systems" or a "sensible pricing system." But how does one know that prices are "right," "appropriate," or "sensible"? What exactly are the policy instruments that policymakers can use to get prices right? In exploring these questions, the book emphasizes that pricing has fundamental economic policy implications and is not merely an activity of accountants or financial analysts. The text is designed for the development practitioner, although it presupposes no formal training in economics.

To integrate the theoretical, applied, and policy dimensions of price analysis, commentary is combined with selected readings in the important fields of agriculture, industry, power, urban services, foreign trade, and employment to elucidate the basic principles of pricing and to illustrate their application to development problems. The aim is to provide the reader with as much substance as possible for the applied and policy dimensions of pricing analysis.

Urban Land Policy: Issues and Opportunities

Harold B. Dunkerley, coordinating editor, with the assistance of Christine M. E. Whitehead.


LC 82-20247  ISBN 0-19-520403-2 $22.50 hardcover

The use of urban land poses serious problems in all countries, simply because the supply of serviced land is limited and subject to competing claims. Dissatisfaction with emerging urban forms is almost universal. But in the developing countries, where towns and cities often double in area as well as population within a decade, land problems are most critical. Urban land problems are inherently complex due to the many interactions between land uses, location, and the deep roots of land rights in legal and social systems.

This volume, originating in the urban project work of the World Bank, provides a context, or perspective, for detailed consideration of the urban land issues that most clearly impinge on the preparation and implementation of urban projects and programs. Eight contributors with wide experience in their respective fields analyze the value of land, concepts of urban land tenure, and the rationale for and types of government intervention. The analyses refine and illuminate many of the urban problems that confront authorities of developing countries and provide practical guidance to suitable and adaptable approaches for dealing with them.

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