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**URBAN INFRASTRUCTURE
AND POVERTY ALLEVIATION
IN INDONESIA**

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EXECUTIVE SUMMARY

PURPOSE

Over the past decade, the Government of Indonesia (GOI) has made great strides in improving the adequacy and efficiency of its urban infrastructure services, particularly of late through its locally-based Integrated Urban Infrastructure Development Program (IUIDP), but it recognizes the need for further improvement in these efforts. In particular, as the nation prepares for Repelita VI, government officials are concerned about enhancing the contribution of local infrastructure investment to poverty alleviation.

This report has two purposes in response to this theme. First, we examine the relationships between urban infrastructure and poverty in the broader program, and consider means of furthering the program's benefits to the poor.

Second, we look more closely at the role of USAID Housing Guaranty Loan (HGL) support for the program in this regard. The HGL for Indonesia has been implemented in the past through the Municipal Finance Project (MFP), which entailed the disbursement of US\$120 million in loan funds from 1988 through 1993, and HGL assistance is planned to continue under the Municipal Finance for Environmental Infrastructure Project (MFEI) which is scheduled to provide an additional US\$125 million loan from 1993 through 1998. The HGL program requires that the local currency equivalent of all loan funds disbursed be spent on improvements suitable for households whose incomes are below the national urban median income. The question addressed here is how best to assure that this requirement is being met.

MAIN FINDINGS AND CONCLUSIONS

Poverty Alleviation and Urban Infrastructure Investment

Indonesia's basic urban infrastructure program was substantially expanded during the 1980s and was responsible for marked improvements in the living and working conditions in the key urban centers of all Provinces. Reviews on this mission determined that the data needed to reliably quantify the benefits of the program to the poor are not yet available. Nonetheless, given the program's basic structure and design strategy, and the types of

investments that have been made, it is clear that the program has made a major contribution to improving living conditions for lower-income families.

Even so, there are indications that the program needs to do much more in this regard. We offer three recommendations for further enhancing the program's contribution to poverty alleviation:

1. *Require analysis of household survey data (on demand and perceived infrastructure needs), explicit planning for poverty alleviation, and participation of the poor, in the preparation of local medium-term investment programs (PJMs).* It is expected that local officials will be more sensitive than central officials in designing infrastructure programs that address the particular needs and opportunities of their own communities. Nonetheless, their effectiveness in this regard will depend heavily on how well they are informed about how the local population actually sees the need for various types of infrastructure improvements and about their ability and willingness to pay for them. The first waves of PJM preparation were not based on actual household surveys along these lines, but it is heartening to find that some such surveys have been conducted recently and that IUIDP will now require them as a base for all future PJM planning (a standard questionnaire and handbook for these has been prepared).

To meet the new priority for urban poverty alleviation, however, three things should be required in addition. First, ways should be found to expand the direct participation of community leaders and other representatives of the poor in PJM planning (this has occurred in some parts of the program but should be required more extensively). Second, it should be required that all future PJMs present an explicit analysis of survey data on demand and perceived needs and refer to it as a basis for strategy formulation. Third, each PJM document should be required to contain a separate section explicitly identifying how the program will address the particular needs of the poor (this has not been required in the past). This should include a table showing explicitly how the subsidy component of each subsector expenditure target will be allocated by income group.

2. *Eliminate the constraints that are holding back the growth of the overall program.* After much expansion in the 1980s, real per capita investment in the program has declined over the past few years. Procedural bottlenecks are a partial cause in the short term, but more important long-term constraints are the lack of institutional capacity at the local level (in part to be addressed by increasing private participation in urban service provision) and, particularly, the lack of adequate resource mobilization for infrastructure. The latter implies the need for stronger actions in support of several objectives in the GOI's Policy Action Plan for the program (incorporated in the Policy Matrix for the MFEI project). These include giving more latitude to local governments in revenue generation and spending decisions, raising property tax yields, substantially increasing cost recovery for infrastructure services (particularly from businesses and higher-income groups), and fully establishing a self-sustaining market-oriented credit system for infrastructure finance. These steps, to

regain the momentum of the overall program, will probably do more for poverty alleviation than any action simply to shift more of the program's current internal resources toward the poor (although the latter is also likely to be warranted in many urban areas).

3. *Address the need for new land development on the urban fringe.* Our review of past PJMs, indicated an almost universal emphasis on making up for infrastructure deficits in already built-up areas. Yet one of the most serious problems in urban Indonesia at present is that an insufficient amount of new land is being opened up at the urban fringe to accommodate new population growth. When the quantity of land is tightly constrained, marked inflation in land prices is inevitable. High land and development costs make it harder to establish new businesses and expand existing ones, and the effect on housing affordability is disastrous. These outcomes harm the poor much more than any other group. Accordingly, the GOI should work with localities in PJM planning and give priority to defining new "area development" mechanisms for urban fringe expansion in a manner that will provide new land for economic activity (thus job creation), as well as residences, and accommodate the poor equitably. This should be one of the key themes of urban poverty alleviation.

We also emphasize, however, that any changes in the program to support poverty alleviation must be designed with care. Some simplistic methods intended to benefit the poor might actually have an adverse effect. For example, it appears that more emphasis should be given to providing low-cost water and sanitation to serve the poor in many cities. However, a rigid national standard requiring that all cities spend a dominant percentage of total investment in this way could cause problems in two ways. First, it would fail to recognize that the most important means of poverty alleviation is the expansion of high productivity job opportunities and that the improvement of infrastructure services for businesses is critical to this objective. It is true that services for businesses should generally not be subsidized--full cost-recovery should be expected--but the expansion of services for businesses (and higher-income families) that they are willing and able to pay for should not be constrained. It is only the subsidy portion of the budget that should be tightly targeted to benefit the poor.

This does not argue that the share of total infrastructure investment designed to benefit businesses rather than residential areas should be increased over what it is at present in Indonesia. In fact, the reverse may well be true. The point is only that the share should not be shifted totally in the other direction. The objective should be to achieve a reasonable balance. It should also be remembered that investment in "social infrastructure," like water supply, can also improve economic conditions. For example, an efficient public water supply system increases productivity (by reducing work hours lost due to illness) and increases disposable income (by reducing the price of water).

Second, trying to impose a fixed-share allocation to the poor would fail to recognize that uniform national standards almost always distort investment. Investments that will most benefit the poor at any time differ in different cities and in different locations within cities. A uniform standard will result in too much investment in some places and too little

in others. This understanding was the basis for Indonesia's decentralization of investment decision making in the mid-1980s through IUIDP. Programs are not likely to meet the true needs of the poor efficiently unless they are designed by locally accountable officials based on serious analysis of local conditions.

Certifying the Eligibility of HGL Expenditures

As noted earlier, the HGL program requires that the local currency equivalent of all loan funds disbursed be spent on residentially related improvements suitable for households whose incomes are below the national urban median. Under the MFP, the GOI determined the percentage of expenditures under each eligible program activity that could be attributed to below-median-income households. Currently the accepted shares are 100 percent for the Kampung Improvement Program, 50 percent for water supply, 40 percent for sanitation and drainage improvements, 30 percent for solid waste management and road improvements, and 10 percent for the costs of related planning and studies. A separate share (37.5 percent) is applied to expenditures made with loans from the Regional Development Account (RDA).

Before each tranche of HGL funds is disbursed, the GOI prepares a nationwide HGL Investment Plan showing planned expenditures (excluding funds supported by other donors) for each type of activity and, after the performance period, it submits a report on actual outlays in each category. Total expenditures multiplied by the accepted percentages yield amounts that are credited against the HGL tranche. USAID staff also makes site visits on a sample basis to check the eligibility of expenditures counted within these totals.

The first question to be addressed here is whether the percentages noted above remain reasonable. As we have mentioned, actual data to support reliable estimates of the allocation of program benefits to different income groups do not exist. However, our analysis of information from PJMs and other sources discussed in this report supports the following conclusions and recommendations.

1. The current percentages for water supply, sanitation, drainage, solid waste management, access roads, and planning are probably well below the shares of program expenditures that are actually benefiting below-median-income families. In some cases, since the rich are already adequately served, it is logical to assume that the bulk of new service provision is reaching those below with incomes below the median (if not below the poverty line). Also, where these services are priced, the prices generally appear affordable to households with incomes well below median. We do not recommend the percentages be

increased, however, until actual data on allocations to beneficiaries by income group are obtained.¹

2. The figure for the KIP program (100 percent) may well be reasonable. Clearly there are families above the median-income level who live in KIP areas and receive KIP benefits, but the HGL requirement is only that eligible expenditures be "suitable for" (and affordable to) below-median families and, given the nature of the KIP program, it is unlikely that expenditures have been made that do not meet this criterion. Still, with this share (unlike the percentages for the other categories above) there is no safety factor. Accordingly, we recommend that the percentage attribution for KIP be reduced to 90 percent under the MFEI.

3. The composition of RDA lending has changed over the past few years and may well change again in the future. Accordingly, rather than use one aggregate percentage for RDA as has been done in the past, we recommend that RDA report expenditures in the same categories defined above and that the same percentages as above be applied to each category.

We also recommend that USAID support further analysis of surveys to offer a better understanding of the how well existing infrastructure serves different income groups in urban areas, and the way the benefits of new infrastructure investments are being distributed by income group. Two efforts could be initiated at the outset for a very low cost: (1) a re-analysis of data collected in an important recent household survey (for Yogyakarta) to focus on these issues; and (2) analysis of 1992 *SUSENAS* survey data on infrastructure services provided to various income groups (the data was collected in the survey but, so far, it appears that Biro Pusat Statistik does not have the resources to prepare these cross-tabulations).

Based on the above analyses, the GOI and USAID could better determine how to focus some of the new technical assistance resources to be provided in association with MFEI on helping local (and central) program managers use household survey data in more effective investment planning. It would also be advisable at some point to encourage further sample surveys that would directly measure the distribution of benefits yielded by recent HGL-certified projects across income groups.

A second question is whether "urban renewal" and "area development" projects now being planned in several Indonesian cities should be added to the list of eligible activities for the MFEI. Such projects have a mixed record. On one hand, projects that have entailed land clearance and rebuilding highly-subsidized, finished housing for the poor tend to be both inefficient and inequitable. The GOI should generally discourage local governments from

¹It is important to note that the shares of program benefits actually reaching families below the poverty line, in at least some of these categories, are probably well below what they should be to make an adequate contribution to poverty alleviation. However, there are large numbers of families whose incomes fall between the poverty line and the median, and the case is strong that a sufficient number of these families are being served and that basic HGL eligibility requirements are being met.

spending their money on such schemes. On the other hand, it does appear that new and more creative approaches are being considered--generally in projects that involve partnerships with the private sector. Where urban renewal breaks even or makes a profit for the city, it may well be a cost-effective approach (e.g., clearing a medium density slum in a good location, selling some of the land to private developers at the market price, and using the proceeds to rehouse the original residents on the remainder of the site). Similarly, new area development schemes on vacant land also can use cross-subsidies to accommodate poor residents without requiring any net subsidies from the government.

In such projects, using HGL funds to support clearance and/or the construction of new buildings would be inconsistent with the basic requirements of the MFEI (as agreed in the Project Paper, approved HGL expenditures are confined solely to low-cost environmental infrastructure improvements). However, when economically efficient urban renewal and land development projects are contemplated (particularly when they address the priority noted earlier to expand the supply of urban land) our judgement is that it would be appropriate to apply HGL resources to support their environmental infrastructure components that benefit lower-income residents.

It is also worth making a broader point about HGL support. By design (consistent with U.S. law), only a limited class of investments are eligible under HGL: i.e., residentially related environmental infrastructure improvements for below-median-income households. As such, many other types of public investments (e.g., markets, terminals, main roads serving industrial or commercial areas) are categorically excluded. This does not imply that such non-HGL-eligible investments are not worthwhile. To the contrary, we have argued that they are vital to the employment generation that will be the most central means of poverty alleviation. But that does not mean that HGL eligibility should be extended to them.

The restrictions in the HGL program have an important purpose in serving as a constant reminder that direct investment in the living environments of the poor must receive adequate priority. The existence of this program does, however, indirectly benefit other investment categories that focus on economic development. By taking some of the financial pressure off in one area it should make it easier to raise funds from other sources for the others.

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Section 1

**POVERTY ALLEVIATION AND URBAN INFRASTRUCTURE INVESTMENT:
THE OVERALL PROGRAM**

In this section, we summarize the status and accomplishments of Indonesia's basic urban infrastructure program (now being operated through IUIDP), review what is known about the program's benefits to the poor at present, and then consider how the program's contributions to poverty alleviation might be strengthened.

PROGRAM ACCOMPLISHMENTS AND STATUS

Urban infrastructure investment in Indonesia increased markedly in the 1980s. Between 1980 and 1990, the share of the urban population receiving infrastructure services went up in all categories: from 26 percent to 33 percent for piped water supply, from 29 percent to 44 percent for basic sanitation (private toilet with septic tank), and from 49 percent to 85 percent for electric lighting (data from 1990 Census of Population). This is particularly impressive since the country's urban population grew massively over the decade: from 32.8 million--22 percent of the total--to 55.4 million--31 percent of the total.

The government's basic urban infrastructure program is reviewed in more detail in Annex A. Overall, it accounted for the expenditure of Rp. 4.15 trillion from 1986/87 through 1991/92 (45 percent for water supply, 17 percent for environmental sanitation and drainage, 7 percent for Kampung improvement, 26 percent for road improvement, and the remaining 5 percent for planning and studies). This period also saw a major institutional change as progress was made in decentralizing program design through IUIDP: through March 1993, IUIDP multi-sectoral Medium Term Investment Programs (Program Jangka Menengah or PJMs) have been prepared by 246 local governments accounting for 73 percent of the nation's urban population.

Problems have been evidenced over the past few years, however, as the overall program has not continued to expand its annual output to keep pace with urban population growth. Since 1988/89, real expenditures per capita have, in fact, declined fairly sharply. By one estimate they have declined from a peak of Rp. 12,000 in 1988/89 to Rp. 8,000 in 1991/92, in constant 1983/84 rupiah (Municipal Finance Project, 1993).

ASSESSING THE PROGRAM'S CONTRIBUTION TO POVERTY ALLEVIATION

The phenomenal economic development that occurred in Indonesia over the past two decades has dramatically reduced the extent of poverty nationwide. The World Bank (1993) estimates that the percent of the population in poverty in rural areas declined from 58 percent in 1970 to 14 percent in 1990. They estimate that urban poverty declined from 73 percent to 17 percent over the same period. This is an important accomplishment but, poverty--still clearly unacceptably high--remains the nation's most serious societal problem.

The change in the location of poverty is especially noteworthy for our purposes. In 1970, only 20 percent of the nation's poor lived in its cities and towns, but by 1990 the urban fraction reached 35 percent. International research has shown that urban poverty is substantially harsher than rural poverty, partially because the lack of basic public services such as water supply and sanitation has a much greater impact on the quality of life for those who live in the cities. It is understandable, therefore, that the role of urban infrastructure services in poverty alleviation commands an extremely high priority for policy as Indonesia prepares for Repelita VI.

A starting point for enhancing the role of infrastructure must be some assessment of how the program benefits the poor at present. Unfortunately, the data needed to reliably quantify direct benefits to the poor from the investment program are not yet available in Indonesia. The only potential central source of information on this topic is the PJMs prepared under IUIDP. We reviewed a sample of 16 PJMs (including appraisal documents where they had been prepared)² and found that none of them contained (1) any explicit statement relating estimated program benefits, aggregate expenditures, or subsidies to the income levels of the intended beneficiaries; or (2) sufficiently detailed data on the geographic distribution of expenditures, or of poor households, within the city to permit us to approximate beneficiary relationships. More detailed spatial data (e.g., showing precise locations of planned house connections, standpipes, etc.) no doubt exist at the local level, but fine grained locational data on incomes are available in only one city so far (Yogyakarta, see Yayasan Dian Desa, 1991). Furthermore, given the locational mix of incomes typical throughout much of urban Indonesia, this approach would be only partially useful even if full data for small areas did exist.

Nonetheless, although precise quantification may not be possible, it is clear on the surface that this program makes a major contribution toward improving the living conditions of the poor. First, Kampung improvement (KIP--a key component of the overall program from the start) substantially ameliorates living environments in areas where poor families are

²For Banda Aceh, Tanjung Balai, Pekanbaru, Jambi, Kab. Muara Enim, Pekalongan, Kab. Klaten, Kab. Sragen, Yogyakarta, Jember, Kediri, Sidoarjo, Kendari, Palu, and Gorontalo.

concentrated. Drainage programs also have particularly high impact, since the poor are also relatively more concentrated in flood prone areas within cities. Considerable evidence, along with statements in planning documents, also suggests that large portions of other program components (water supply, sanitation, and access roads) have been designed to benefit low-income families directly. (Additional support for these conclusions is provided in Section 2.)

Moreover, international research indicates that basic low-cost urban infrastructure programs like this one, in general, are among the most cost-effective public sector contributions to the urban development process. Cost-benefit ratios for such programs generally by far exceed those for public housing and many subsidized government job generation initiatives. They address poverty alleviation by improving the conditions needed for private job generation benefiting the poor, as well as by reducing health hazards and improving convenience in their living environments (see, for example, Peterson, et al., 1991b and Fox, 1992).

Although its achievements are noteworthy, there are indications that the program's contribution to poverty alleviation still needs to be considerably expanded. One study (Urban Institute and P.T. Hasfarm Dian Konsultan, 1989) found that while 53 percent of nonpoor families (with incomes above Rp. 100,000 per month) in urban Indonesia had access to water from piped systems or pumped wells, only 29 percent of the poor had such services; 75 percent of nonpoor families used flush water toilets, compared to 55 percent of the poor. In larger cities, the poor have been confined to reliance on shallow ground water that is increasingly polluted. In many of these areas, poor families can obtain clean water only from monopolistic water vendors who charge prices many times higher than the normal tariff for piped water (as much as 30 times higher according to the World Bank, 1993b).

Public water enterprises (PDAMs and BPAMs) have often favored the provision of individual house connections over public standpipes in poor areas, because the latter are harder to manage and cost recovery is harder to achieve. In large cities in 1988, only 26 percent of the population had access to piped water and the number of house connections being provided was three times the number of standpipes (World Bank, 1993b). Similarly, the quantity of low-cost shared toilet facilities provided to poor areas has been constrained because of a number of difficulties, including problems of finding sufficient space in *Kampungs*, the lack of good institutional solutions for handling ongoing maintenance, and the belief that shared-facilities are not culturally acceptable (even though recent evidence indicates they can operate quite effectively).

The GOI has recognized that more emphasis on such low-cost improvements for the poor is warranted and is increasing support for them under *Repelita V*, however, much remains to be done. Solutions entail much more stress on extending piped water systems into (or at least near) poorer areas, providing more standpipes as well as house connections in these areas, providing more shared-toilet facilities (with septic tanks), and further deregulation (which would, for example, allow people with house connections and others to

sell water, thereby breaking down the monopolies of the current vendors). Also important is implementing schemes that allow households to amortize connections fees over a reasonable period of time, thus making connection to public systems affordable to a much larger number of moderate- and low-income households.

ENHANCING THE PROGRAM'S CONTRIBUTION: APPROACH

How can the GOI and local governments have greater impact on poverty alleviation through their urban infrastructure programs? The problem warrants very careful consideration because the mix of direct and indirect impacts resulting from such programs is complicated. Some simplistic methods intended to benefit the poor might actually have an adverse effect.

Inevitable Distortions of National Standards

Assuring that urban infrastructure investments sufficiently contribute to poverty alleviation is an important objective, but setting national formula-based standards in this regard is generally the wrong way to go about it. Investments that will most benefit the poor at any time differ in different cities and in different locations within cities. Uniform national standards inevitably result in too much investment in some places and too little in others. For example:

a. *Problems with targeting by type of investment.* In some locations, the poor desperately need an extension of the water distribution network within their own neighborhoods. In others, the network exists, but the quantity and/or quality of water being supplied to it is inadequate (i.e., the priority is for improvements in production and/or primary distribution facilities). In yet others, local ground water is adequate so piped water is not a priority, but there is an urgent requirement for drainage to prevent frequent flooding or improved roads so the poor can access employment opportunities more easily.

b. *Problems with targeting by location.* Some of the poor in Indonesia's cities live in relative spatial isolation from higher-income groups (i.e., in the *Kampung*s, flood prone areas) but they are not in the majority. Most live in mixed-income neighborhoods. A recent study for the greater Yogyakarta area (Yayasan Dian Desa, 1991), for example, found a mix of low-, middle-, and higher-income groups in all of the area's 74 *Kelurahan* and even in each of 824 smaller "settlement areas" within them (even those with the highest population densities).

c. *Problems with direct targeting of aggregate investment.* A vast expansion of infrastructure is required to directly support the economic growth in cities and it is this, of course, that creates the new jobs that are the primary basis for poverty alleviation. Targeting too high a percentage of aggregate infrastructure investment to directly address residential infrastructure needs of the poor could interfere with this priority. Cost recovery programs

should, indeed, be designed to cover virtually all of the costs of infrastructure programs directly benefitting businesses and higher-income groups. It is only the subsidy component of the program that should be closely targeted to benefit poor families directly, but even here there is no way to set across-the-board targets sensibly at the national level (because of the problems discussed under a and b above).

More Sensitive Local Investment Programming as the Only Viable Approach

Distortions that arise in setting national formulas for urban infrastructure investment are what led Indonesia in the mid-1980s to shift to a more decentralized approach to program design (i.e., IUIDP). For similar reasons, the only effective alternative for enhancing the program's contribution to poverty alleviation in a sensible way is through local planning processes that set priorities across sectors realistically based on analysis of local problems, opportunities, and demand patterns (such as is already underway in the PJM preparation process of IUIDP).

Our review of PJM documents and discussions with a number of the consultants and officials that prepared them, indicated that the program's operating philosophy already gives much weight to improving conditions for the poor. In many cases, PJM designers have been extremely skillful in gaining information about problems and needs from physical observation and interviews with community leaders and in synthesizing this information in responsive design solutions.

An important problem, however, is that without reliable surveys (on income, perceived infrastructure needs, and willingness to pay for improvements), some bias is inevitable and there is the potential for serious mistakes (e.g., providing a service for which there are few customers, or benefits intended for the poor being usurped by the rich). Without surveys, it is extremely difficult to gain the right amount of cost-recovery from upper-income families, target subsidies to the poor efficiently, or monitor the progress that is being achieved. But in the first waves of PJM preparation, such surveys were not conducted.

ORIENTING PJM PLANNING MORE SENSITIVELY TO POVERTY ALLEVIATION

With the understanding given above, the MFEI project (USAID/Indonesia, 1993) gave a high priority to furthering the analysis of consumer demand in future IUIDP program design. A conclusion of this mission is that considerable progress is now being made in this area. Several "real demand studies" have been conducted of late (most notably the one completed for Yogyakarta--see Annex B). In addition, some innovations have appeared in joint work with Kampung leaders and residents in more sensitively determining infrastructure needs and priorities (Collier and Santoso, 1992). More important, it has been decided that such surveys will be required in all future IUIDP planning and the Directorate

Bina Program in Cipta Karya has developed a guide (including a survey instrument and survey implementation procedures--Directorate Bina Program, 1993).

We advocate that three more steps be taken to further this approach in general and, in particular, the poverty alleviation objective which supports it.

1. First is that, in addition to surveys, some direct participation of the poor should be required in the process of preparing PJMs. The newer wave of KIP projects have increasingly involved local residents in the planning process and the outcomes have been regarded as highly successful. The participation of the poor in the PJM process should begin by gaining their involvement and assistance in the survey phase and then giving their leaders and representatives a chance to review and help interpret the results. They should then have some role in assessing strategic alternatives. This process can be a two-way street. Representatives of the poor will contribute ideas as to how to meet the needs of their constituents most effectively, but they should also learn, in turn, about the need for financial realism and about the true costs and benefits of alternative technical approaches. If their participation has been meaningful, they are likely to come out of the process as strong supporters of the program itself and more willing to share in providing their labor and other resources in implementing it.

2. Next, it should be required that all future PJM documents contain an explicit analysis of demand/need survey data and refer to it as a basis for strategy formulation. There have been PJM planning experiences in the past where surveys were conducted, but the planners did not have time to analyze them effectively; i.e., they had no impact on program design decisions. With the new demand surveys to be conducted for the next wave of PJMs, it is vital that such outcomes be avoided. This can be done by (1) designing the surveys efficiently (including focusing survey instruments on critical questions only, and employing tight management controls to expedite interviews and data processing); and (2) developing simple and standardized tabular formats and analytic techniques (automated where possible). (USAID technical resources could be helpful here--see further discussion in Section 2.)

3. Finally, it should be a requirement that each PJM document contain a separate section explicitly identifying how the program will address the particular needs of the poor (this has not been required in the past). This should include a table showing explicitly how the subsidy component of each subsector expenditure target will be allocated by income group.

REGAINING MOMENTUM IN THE OVERALL PROGRAM

It is obvious that one means of increasing the contribution of Indonesia's urban infrastructure program to poverty alleviation would be to shift more of the program's

resources into improvements that benefit the poor directly. This, however, is not the only, or necessarily the most important, way to accomplish that end. We have argued above that the overall program substantially benefits the poor indirectly, and we suspect that the indirect benefits may be even more important than the direct ones. One way to understand this is to recognize that if local infrastructure investment was confined solely infrastructure for poor families (1) there would be no infrastructure support for business expansion as needed to provide more jobs for low-wage workers; (it is well known that inadequate public infrastructure has its greatest impact in deterring the creation and growth of small businesses and these offer the greatest hope of providing job opportunities for the poor) and (2) the lack of infrastructure provision for higher-income groups would reduce the economies of scale that permit efficient systems development and eliminate the stream of cost recovery payments from the rich that are needed for the program's financial stability.

Thus, healthy expansion of the overall program is actually a primary requirement for poverty alleviation and, as mentioned earlier, the impressive momentum of this program achieved in the mid-1980s has stalled somewhat over the past few years. It is vital, therefore, to address those problems that are now constraining the program's growth in general.

The means of doing so have already largely been designed and are presented in the GOI's Policy Action Plan for the sector (incorporated as a basis for performance monitoring under the MFEI--see USAID/Indonesia, 1993). It is not necessary to review them all here, but it is worth noting some key elements. Procedural bottlenecks are a partial cause in the short term, but two factors are more important constraints over the long term:

The first factor is the lack of institutional capacity at the local level. This needs to be developed through a substantial expansion of training in urban management, continued vigilance in pursuing basic procedural reforms, and increased private and community participation in urban service provision.

The second factor, is the lack of adequate resource mobilization for urban infrastructure. Addressing this will require stronger actions in support of several objectives in the Policy Action Plan, including (1) giving more latitude to local governments in revenue generation and spending decisions; (2) raising property tax yields; (3) substantially increasing cost recovery for infrastructure services (particularly from businesses and higher-income groups); and (4) fully establishing a self-sustaining market-oriented credit system for infrastructure finance. These steps, to regain the momentum of the overall program, are central themes of the Policy Matrix and technical assistance components under MFEI. They will probably do more for poverty alleviation than any action simply to shift more of the program's current internal resources toward the poor.

EXPANDING LAND DEVELOPMENT ON THE URBAN FRINGE

The infrastructure deficits in the already built-up areas of Indonesia's cities are substantial. Our review of selected examples from the first wave of PJM preparation indicated that these plans focused almost solely on such deficits. The resources devoted, alternatively, to expanding urban land development at the fringe of the city were negligible. This is to some extent understandable. There are good economic arguments for not extending expensive infrastructure systems much ahead of evidenced demand for them--systems may be underutilized for long periods and this outcome is very hard to justify when such pressing needs for new capital investment exist elsewhere. Also, much of the land development now occurring at the fringe of Indonesia's larger cities takes the form of estates being built exclusively for the rich, and there is little justification for using scarce IUIDP resources to support that trend. Nonetheless, our judgement is that too little is being done at present to expand urban land use overall, and that this also has extremely negative consequences for low-income groups.

One of the most serious problems in urban Indonesia at present is that an insufficient amount of new land is being opened up at the urban fringe to accommodate new population growth. When the quantity of land is tightly constrained, marked inflation in land prices is inevitable. High land and development costs make it harder to establish new businesses and expand existing ones, and the effect on housing affordability is disastrous. These outcomes harm the poor much more than any other group. Accordingly, the GOI should work with localities in PJM planning and give priority to defining new "area development" mechanisms for urban fringe expansion in a manner that will provide new land for economic activity (thus job creation), as well as residences, and accommodate the poor equitably. This should be one of the key themes of urban poverty alleviation.

Section 2

**ASSURING THAT HOUSING GUARANTY LOAN INVESTMENTS
ARE SUITABLE FOR BELOW-MEDIAN-INCOME FAMILIES**

As noted earlier, USAID Housing Guaranty Loans (HGL) for Indonesia require that the local currency equivalent of all loan funds disbursed be spent on improvements suitable for families whose incomes are below the national urban median income. The main purpose of this section is to examine methods of assuring that this requirement is being met and to offer recommendations in this regard. We open, however, with background information on the HGL program and the process followed to date to assure compliance with the below-median-income requirement.

THE HOUSING GUARANTY LOAN PROGRAM (HGL)

The HGL program began in Indonesia when the USAID Municipal Finance Project (MFP, Project 497-0365, 497-HG-001) was initiated in 1988. Under their joint agreement for this Project, USAID has provided \$120 million in HGL funds for capital investment and \$5 million in Development Assistance (DA) grants for technical assistance and training, and the GOI has implemented a Policy Action Plan whose goal was to "improve the shelter conditions of the urban poor by developing the means by which municipal governments can finance shelter-related urban services and infrastructure at a pace sufficient to overcome present deficits and match the pace of urban population growth" (USAID/Indonesia, 1988).

The full \$120 in HGL funds has been authorized in a series of tranches since 1988. The most recent evaluation of performance under the Policy Action Plan (Kingsley and Peterson, 1992) concluded that the "GOI has made, and continues to make substantial progress toward the program's basic objectives" and recommended that USAID assistance to the overall program be continued under a new HGL Project that would give emphasis to new priorities identified in an assessment by the National Planning Agency (Bappenas, 1992)--particularly urban environmental quality management.

The GOI and USAID have since developed the new initiative: the Municipal Finance for Environmental Infrastructure Project (MFEI, Project 477-HG-006), which will be

implemented over the 1993-1998 period. The basic framework of this project is similar to that of the MFP. The GOI is to implement an updated and expanded Policy Action Plan and USAID will provide new HGL funds (up to \$125 million) and additional resources for technical assistance and training through related Projects (USAID/Indonesia, 1993).

REQUIREMENTS AND PROCESS

Basic requirements pertaining to HGL eligible expenditures in general, and "below-median-income" certification, in particular, are presented in the Project Papers for the two HGL Projects (USAID/Indonesia, 1983--Section 11.3 and Annex 11--and USAID/Indonesia, 1993--Section 4).

Under these requirements, the GOI must expend the local currency equivalent of all loan funds disbursed on eligible investments. These must be shelter-related improvements that are suitable for households whose incomes are below the national urban median. A set list of program activities has been accepted as eligible: Kampung improvement (KIP), water supply, sanitation, drainage, solid waste management, access roads, and urban planning (including the cost of basic infrastructure planning studies and environmental impact assessments).

Under the MFP, the GOI determined the percentage of expenditures under each eligible program activity that could be attributed to below-median-income households. Currently the accepted shares are 100 percent for KIP, 50 percent for water supply, 40 percent for sanitation and drainage improvements, 30 percent for solid waste management and road improvements, and 10 percent for costs of related planning and studies. A separate share (37.5 percent) is applied to eligible types of investments financed with loans from the Regional Development Account (RDA).

The determination of the applicable urban median-income level has been made and updated several times based on a reliable national sample survey conducted by the Biro Pusat Statistik: *SUSENAS*. The original estimate for the MFP (median annual urban household income as of June 1988) was Rp. 1,598,000 (US\$954). The initial estimate for the MFEI is Rp. 2,720,000 (US \$1,350) as of June 1992 (this estimate was made by taking the most recent figure available from *SUSENAS*--for 1990--and applying reasonable inflation factors--see USAID/Indonesia, 1993).

The process of developing the annual HGL investment program and monitoring its performance is described thoroughly by Taylor (1993). In summary, it has worked as follows:

1. Prior to AID authorization of a loan guaranty, the GOI agrees to make rupiah expenditures on eligible categories of investment in amounts equivalent to the dollar loan,

through the submission of an Investment Plan, which is basically a menu of programs and projects that qualify as shelter-related investments.

2. Following disbursement of the loan, the GOI certifies to AID that it has expended the rupiah equivalent of the HG loan in accordance with the approved Investment Plan, and submits a report on actual expenditures.

3. AID undertakes spot checks of the certified report of expenditures by making periodic visits to a small percentage of the sites specified in the reports to verify that the investments selected have actually been made, that they do represent an eligible category of investment, and that they are suitable for below-median-income families, as required.

REASONABLENESS OF CURRENT ELIGIBILITY SHARES

We now address the question as to whether the percentages noted above remain reasonable. As we have mentioned, actual data do not exist to support reliable estimates of the allocation of program benefits to different income groups. However, our analysis of information from PJMs and other sources supports the following conclusions and recommendations.

Kampung Improvement Program

The KIP program is probably the GOI's greatest success story in poverty alleviation. KIP provides a range of infrastructure improvements (at minimal standards) in dense, low-income settlements in Indonesia's cities. These include local roads, footpaths, drainage, water supply, public sanitation facilities, and solid waste collection. While many countries have undertaken pilot slum improvement programs of this kind, Indonesia has been the unquestionable leader in broad-scale implementation. KIP programs have been implemented in over 300 cities, directly benefitting around six million urban residents (World Bank, 1993b).

In our review of PJMs, we found no indication that the basic program design is being altered: areas being selected are still predominantly concentrations of low-income families and the services being provided are suitable for them. To date, spot check verifications performed by AID confirm this conclusion. Accordingly, the above percentage for the KIP program (100 percent) is probably reasonable. Undoubtedly there are families above the median-income level who live in KIP areas and receive KIP benefits. One study (Taylor, 1983) in the early 1980s found that 13 percent of the households in areas selected for KIP improvement in Jakarta at the time had incomes above the Jakarta median. However, the HGL requirement is only that eligible expenditures be "suitable for" (and affordable to) below-median-income families and, given the nature of the KIP program, it is unlikely that expenditures have been made that do not meet this criterion. Still, with this share (unlike

the percentages for the other categories discussed below) there is no safety factor. Accordingly, we recommend that the percentage attribution for KIP be reduced to 90 percent under the MFEI.

Water Supply

As discussed in Section 1, public water supply programs are probably not emphasizing the poor enough. However, there are large numbers of families whose incomes fall between the poverty line and the median, and the question here is whether stipulated share (in this case 50 percent) of program expenditures is suitable for families below the median. While actual data on allocations for this group are not available, we believe there is a strong logical case that the 50 percent level is actually conservative.

A number of studies (including Urban Institute and P.T. Hasfarm Dian Konsultan, 1989) have shown, as would be expected, that households above the median are already reasonably well served with water. Even at this level, service via public piped systems is not predominant, but the rich have the resources to assure higher quality water from protected pump sources (either serving individual houses or higher-income residential developments collectively).

Our review of PJMs indicated that new funding is being devoted overwhelmingly to extending service in already built-up areas (rather than in new development areas, such as high-income housing estates), thus, it is reasonable to assume that the predominant share of new service is going to below-median-income households (i.e., those not already adequately served). The tariff for piped water supply in most Indonesian cities is now affordable to households with incomes even below the poverty line (as mentioned in Section 1, many of the poor now pay much higher prices to purchase water from vendors). It is the connection fee that makes individual house connections unaffordable to most of the poor. But virtually everywhere the connection fee is affordable to families with incomes well below the median, if not below the poverty line. For example, the one-time connection fee in Yogyakarta is Rp. 122,500 (EWI/Electrowatt and Hasfarm Dian Konsultan, 1992), clearly affordable to households considerably below the Rp. 2.72 million annual median income.

It appears likely, therefore, that the 50 percent attribution actually understates the share of new water supply investment that is suitable for below-median-income families. Nonetheless, without better data there is no way to establish a new figure reliably. Therefore, we recommend no change in the current figure until further studies have been completed and analyzed.

Sanitation

Here, there is an even stronger case that the share accepted for HGL certification (40 percent) is too low. If Indonesia was spending much money on piped sewage systems, there

would be more of a question--such systems would probably serve denser, older sections of Indonesia's larger cities and a substantial share of higher-income households would no doubt be among the beneficiaries. However, our review of PJMs indicated that the share of IUIDP expenditures being applied to piped sewerage is negligible (only one city, Yogyakarta, had any funding for this purpose and, even there, the share was small).

The PJM analysis, then, indicated that programs in this subsector are overwhelmingly providing improvements suitable for below-median-income families: the provision of shared-toilet facilities with septic tanks (MCKs) and related desludging equipment. Again, however, we would not recommend any formal change in the accepted 40 percent share until actual data are available to set a definite level more reliably.

In relation to the GOI's interest in more focus on poverty alleviation, it is worth pointing out that the main problem with this subsector may be that so little is being spent on it. An analysis of 45 secondary city PJMs (see Annex A) shows only 6 percent of total expenditures is being devoted to sanitation in these programs. Clearly, the question of how to expand investment in this subsector (including the most efficient mix of investments in MCKs and other system elements) warrants a high priority for policy analysis.

Drainage

Our review of PJMs indicated that a wide variety of drainage improvements have been planned. It appears that locational priorities are assigned based primarily on the extent of flooding in different areas and the importance of this flooding to health hazards and general disruption of urban activity. These improvements clearly benefit businesses, as well as households and, among households, all ranges of the income spectrum. To the extent that locational segregation by income exists, however, drainage improvements are likely to be of most benefit to low-income groups. In traditional settlement patterns, richer families have generally commanded areas that do not have major problems of standing water. It is the poor that have been forced to locate in flood prone lands. Therefore, it is likely that the share of all drainage investment that benefits below-median-income households is considerably larger than the 40 percent currently accepted for HGL certification. Once again, however, we do not recommend a change in this factor at this time.

Solid Waste Management

PJM expenditures in solid waste management cover purchasing garbage containers, building transfer stations, buying trucks and disposal equipment, and developing sanitary landfill sites, as well as maintaining and repairing current facilities and equipment. In this case, without actual data on the incidence of benefits, it is difficult to make as strong a case that the majority of the beneficiaries are below-median-income families. The arguments, however, are similar to those given above for water supply: (1) PJM documents generally state that provision of better solid waste collection and disposal for low-income areas is their

priority, and (2) most wealthier households already have adequate solid waste collection services, thus most new investment must be serving those in the moderate- and lower-income groups. But, in this case, the argument does not have to be as strong--the share certifiable for HGL is 30 percent, and we believe it should remain at that level until conclusive direct evidence on the incidence of benefits is available.

Access Roads

PJM budgets provide funds for building, repairing, and maintaining urban roads of all classes, ranging from major thoroughfares to small access roads within residential areas. PJMs generally note a priority for service to low-income settlements in this subsector, as well, but we cannot be sure that the incidence bends in this direction. If these funds were distributed randomly, below-median-income families (which account for just half of all families) would receive just half of the benefits. However, in this case the accepted share for HGL certification is also only 30 percent, so it seems reasonable that this share does provide a sizeable safety factor with respect to compliance with program eligibility requirements. Again, no change in this level is recommended at this time.

Plans and Studies

Even when substantial data are available, it would be extremely difficult to demonstrate that any one income group benefits more than any other from improved studies and planning based on those studies. It would probably be most reasonable to assume that all residents share equally in the benefits; i.e., below-median-income families would receive just half. Here, however, the figure accepted for HGL certification is lowest of all--just 10 percent. No change is recommended at present, although on the surface an increase does appear warranted.

The Regional Development Account

The composition of RDA lending has changed over the past few years and may well change again in the future. Through the end of July 1993, the RDA had made loans totaling Rp. 436.6 billion--loans to PDAMs for water supply accounted 75 percent of this total, and water sector loans to provincial and local governments directly accounted for another 9 percent. In addition, the RDA has received requests for new loans totaling Rp. 344.7 billion, but water supply projects account for only 58 percent of this amount. Much larger shares of the funds in the new portfolio are being lent for terminals and markets.

Given this changing composition, it is difficult to justify continuing the aggregate 37.5 percent HGL certifiable share for RDA investments that has been applied in the past. Accordingly, rather than using one aggregate percentage, we recommend that, under the MFEI, RDA report expenditures in the same basic environmental infrastructure categories defined for the regular program and that the same percentages as above be applied to each

category. In other words, 50 percent would be applied for RDA water supply projects, 40 percent for RDA drainage projects, etc.

It is worth pointing out again that projects such as terminals and markets are definitionally ineligible for any HGL support under the MFEI (HGL certification is given only for residentially related environmental infrastructure in a definitely specified list of categories). It is also worth pointing out again, however, that because they are not HGL-eligible does not mean terminals and markets are not socially desirable investments. Clearly, such investments (if well conceived) can spur economic development and can be extremely important to poverty alleviation. HGL priorities are only intended to serve a subset of national priorities and by supporting that subset, they should realign pressures so that funds from other sources will be more readily available for non-HGL-eligible investments that are cost-effective.

RECOMMENDATIONS FOR ADDITIONAL RESEARCH

While Indonesia's decennial census and other sources do provide rough information on the total availability of urban infrastructures, it is surprising how little data exist on the way these services are distributed among various income groups. Such information, however, is critical to improving the design of local investment programs to better address the issue of poverty alleviation.

Such information is also critical to the strategy and objectives of the MFEI. One purpose is to improve data on the incidence of benefits to below-median-income households so that the HGL certification percentages just discussed can be improved. More important, however, is the value of such information in helping the GOI and local governments improve program performance. The MFEI Project Paper (USAID/Indonesia, 1993) emphasized a point made earlier in this report: that without information in household incomes and the use of such data to assess the true effective demand for various services, it is extremely difficult to design programs that are either effective or equitable.

We have also noted, therefore, that the decision by DG Cipta Karya to require demand surveys for future PJM preparation is a very heartening development. Their design of a basic survey instrument and survey procedures (Directorate Bina Program, 1993) is an important step toward implementation (although the questionnaire at present is probably too elaborate and thought should be given to how it can be streamlined). These surveys will be expensive, but it can be expected that they will save amounts vastly greater than their costs through improving program targeting and efficiency.

Consistent with MFEI objectives, it is recommended that USAID support additional research in the short term to further the effective application of infrastructure demand/needs

studies in the design process and to gain a better understanding of the incidence of program benefits. Two steps are suggested in the short term:

1. The *Real Demand Study* for Yogyakarta (reviewed in Annex B) has presented substantial information on incomes and on the way the sampled population as a whole sees its needs and ability to pay for service improvements. The two sides of this question, however, are not brought together in the report; i.e., although the information was collected, there are no presentations of data showing how current service levels, and perceived needs and willingness to pay, vary by income groups. In other words, we do not know from the study how well the poor are served at present, how they feel about priorities for service improvements, and how much they would be willing and able to pay for them--and how all of this contrasts with responses for other groups, such as the below-median-income nonpoor and the rich. All that is needed to provide such information is to run new cross-tabulations from the original database, so the task should not be expensive.

2. For the first time, the 1992 *SUSENAS* collected information on both the expenditure class of respondents (a reasonable surrogate for income level) and on their access to water supply, sanitary facilities, and other services. The sample sizes are sufficient to support cross-tabulations for the total urban populations of each Province. Information provided in the Yogyakarta study on perceived needs and willingness to pay is not available, from *SUSENAS* but just knowing how well the urban poor are served at present in contrast to other urban income groups (nationwide and for each province) will be a fundamental improvement over what we know now. At present, the budget of the Biro Pusat Statistik does not allow for the preparation of these cross-tabs. Again, for a fairly low cost, USAID could assist in providing this valuable information. This opportunity was pointed out and discussed in Gardiner and Oey-Gardiner (1993).

While technical assistance support associated with the MFEI is limited, improving the management of IUIDP is one of its objectives. The work specified above should not be very costly and its results should help those advisors who are working on IUIDP management to focus their guidance more efficiently. Work in this area should also serve as a base for another key element in the MFEI technical assistance agenda: developing an adequate indigenous training program in urban management. Clearly, the topic "using demand surveys in urban infrastructure planning" needs to be a part of the planned courses in any such program if today's best practices are to be conveyed.

At some point, the broader program should also support research on beneficiary impacts (whether funded by USAID and/or others). The steps above will tell us much about the relationships between urban infrastructure and poverty in general, but they will not address the question discussed in the previous section: what are the real percentages of current investment levels in each sub-sector that benefit below-median-income (and below-poverty line) households. The only way to obtain information is through new surveys.

Gardiner and Oey-Gardiner (1993) point out the inevitable complexity entailed in beneficiary surveys but conclude they are feasible (although quite expensive) and offer helpful guidelines on how they could be prepared. They did not have the resources to develop precise estimates of resource requirements but suggest, as a rough guide, that a survey covering around 200-300 projects (around 4,000-6,000 household respondents in 6 or 7 provinces with about a one-year implementation period) might provide reliable estimates. Such a survey would cost at least \$250,000.

This, obviously, would be a substantial expense. In our view, however, a survey that produces fully reliable estimates for the national program as a whole may not be necessary, at least not initially. Because of the complexity of the design issues involved, starting on a smaller scale might be a more sensible strategy at any rate. Conducting a study of beneficiaries in a much smaller number of projects in, say, four cities might be done at the outset, and decisions about whether and how further surveys might be conducted should be postponed until the results of this exploratory research have been analyzed.

THE QUESTION OF ELIGIBILITY FOR URBAN RENEWAL AND LAND DEVELOPMENT PROJECTS

USAID has been asked how, and whether, HGL resources might be used to support various new "urban renewal" and "land development" projects being sponsored of late by entrepreneurial local governments in Indonesia.

Our review indicates that such projects vary substantially in composition and quality. Some of them are not based on sound economic or equity principles and do not warrant support in the overall program, but others exhibit considerable creativity in efficiently meeting real urban problems and opportunities.

In the former group are "showcase" projects that involve clearing present slums and replacing them with costly new housing for low-income groups. An example is the Rumah Susun project in Semarang (Directorate Perumahan and City of Semarang, 1992). In this project, a low-income Kampung (located just behind the office of the Walikota) was cleared and replaced by new housing in four-story apartment blocks (88 new apartments in all). Concern for the poor in this project is commendable. Care was taken to assure that the original residents of the area (whose employment opportunities and life styles would have been devastated if they had been relocated to an outlying site) would be accommodated in the new flats, and an attractive environment and services were provided for them. The incomes of the beneficiaries were generally well below the national median (the highest annual income reported was Rp. 450,000, but most fell in a much lower range). The problem with this project is in its economics. The total development cost averaged Rp.27 million per apartment, but for 73 of the units, the beneficiaries will be asked to pay only Rp.9 million, the rest being covered by a subsidy from the local government. (Given incomes as low as those reported, it

is in fact very difficult to see how most of the beneficiaries will be able to afford even the Rp.9 million payment).

Plainly, this method does not offer a sustainable way to house the poor given constraints on government budgets. If this approach were applied broadly, the total subsidy funds could support only a small fraction of the poor families in need, while the vast majority would receive no benefits at all. The approach is not consistent with the lesson learned earlier by Indonesia in its widescale implementation of KIP: low-cost environmental infrastructure improvements in *Kampungs* are a much more cost-effective way to address priority needs of poor families on a broad scale within current resource constraints. Other low-income apartment construction projects developed recently (see City of Surabaya, 1993) apparently suffer from the same problems. It is likely that leaders in other cities will promote such projects at times, and it is probably not critical that all of them be stopped. However, GOI officials should continue education campaigns to show local officials and the public how such projects turn out to be both inefficient and inequitable. Clearly, such projects are inconsistent with requirements of the MFEI for HGL support.

On the other hand, local governments are experimenting with more creative and economically sustainable land development schemes that offer promise in addressing the priority for land supply expansion, we noted in Section 1. One example is the Bandar Hardjo project in Semarang (Directorate Perumahan, 1993). This project entails the development of underutilized low-lying, city-owned land between the central business district and the port. The Port wants to expand into lands it owns just adjacent to its current facilities, but squatters occupy much of it. The 20 hectare Bandar Hardjo site is located next to this area. The plan calls for the relocation of the squatters into the new area, but this is only a small part of the scheme. The broader area will be developed for commercial and office activity, as well as for residential accommodations for a substantial number of middle- and higher-income families. Most important, business and higher-income residential buyers will pay more than an equal share of development costs--cross-subsidies will support the accommodation of low-income groups and no net subsidy will be required from the city. In some projects designed along these lines (using vacant or underutilized lands in good locations), it should be possible for the local government to make a substantial profit while still providing substantial benefits to the poor.

Similarly, it would be possible to design urban renewal projects that are economically viable; i.e., so that they can provide benefits to the poor in central city areas without deep subsidies. It is recognized that relocating low-wage workers from such areas to distant sites could well destroy their employment opportunities, as well as the social cohesion of their existing neighborhoods. In some central areas there are slums in locations that would be very attractive retail and office expansion. In many of these cases (at least where existing residential densities are not extremely high), it should be possible to clear the sites for mixed-use redevelopment so as to generate a profit even after including costs for rehousing the original residents; i.e., after clearance, the authority would sell the land on prime street

frontages at market prices to private developers and leave enough land inside the block to re-house the original residents in multi-unit apartment structures.

In either new land development or urban renewal projects, using HGL funds to support clearance and/or the construction of new buildings clearly would be inconsistent with the basic purposes and requirements of the MFEI (as agreed in the Project Paper, approved HGL expenditures under MFEI are confined solely to low-cost environmental infrastructure improvements). However, when such projects support economically efficient land development (particularly where they address the priority noted earlier of new "area development" approaches to expand the supply of urban land), our judgement is that it would be appropriate to apply HGL resources to support the environmental infrastructure requirements for the lower-income residential components of such projects.

Annex A

INDONESIA'S URBAN INFRASTRUCTURE INVESTMENT PROGRAM

THE IUIDP PROGRAM

Through the mid-1980s, virtually all urban infrastructure in Indonesia was planned by central government agencies in Jakarta (primarily by the Ministry of Public Works--MPW) and implemented by their field offices in the provinces. The programs of one central office (e.g., water supply) were seldom coordinated with those of another (e.g., drainage), either spatially or temporally, and local officials had little chance to influence them.

As cities and towns began to grow much more rapidly, there was recognition that this approach could not be sustained logistically, let alone respond sensitively to the varying needs of different urban areas. Many central officials came to believe that the only satisfactory long-term solution would be for local governments to assume full responsibility for providing (and largely financing) their own urban services. However, it was also clear that few of Indonesia's local governments then had the capacity to assume this role effectively.

The Integrated Urban Infrastructure Development Program (IUIDP) was developed in response to this dilemma. It is a phased approach to decentralization in which the central government supports local capacity building at the same time that it works with existing local staff in planning and implementing investment programs. In its idealized form, the process entails the following steps: (1) meetings are held with provincial governments to review urban analyses and prioritize cities for attention; (2) project teams in the selected cities (local staff with technical assistance provided from the center) review and update local master plans or develop a new "structure plan" where none is available; (3) teams then use those plans as a guide in developing a proposed local multi-year investment program (Program Jangka Menengah or PJM) integrated across several sectors; (4) the teams are required to prepare a complete financing plan (RIAP) that covers the enhancement of local revenues and borrowing, as well as support from the central budget and/or external donors; (5) plans (IUIDAP) are also prepared for building the capacity of local government to assume ever increasing responsibility for infrastructure development, operation, and maintenance; and (6) individual city programs so defined are reviewed at the province and central levels, and decisions are made about the allocation of central loan and grant funds.

To date, IUIDP has been limited to functions that traditionally had been the responsibility of Ministry of Public Works (MPW) Directorate General Cipta Karya (water supply, sanitation, drainage, kampung improvement) and Bina Marga (urban roads). It was reasoned that trying to cover more functions at the start might add complexity and threaten program viability. Other functions could be added later after the IUIDP had proved itself.

IUIDP has been implemented nationwide under guidelines issued in 1987 (TKPP, 1987b). Progress is detailed in Directorate Bina Program, 1990, and cogently summarized in Budhi Tjahjati, 1990. PJMs have been prepared (or are in preparation) for urban areas in all 27 provinces. Partly because initial targets were so ambitious, there have been many problems in IUIDP implementation (see UNDP, 1989, and Tjahjati, 1990). Particularly in the early years, consultants often dominated PJM preparation without providing adequate opportunity for meaningful local involvement. Still, today, many local governments have not yet internalized the process or developed the capacity to operate it effectively. It also became clear that the initial guidelines were too cumbersome and did not permit enough flexibility to adapt to varying local needs and priorities.

Nonetheless, IUIDP has generally been regarded as a major accomplishment. Its basic characteristics (integrated planning across sectors based on city-specific conditions, the linkage to financial discipline through the RIAPs and to capacity building through the LIDAPs) in and of themselves have been seen as a dramatic improvement over the approach of the past. Also, efforts continue to be made to rectify problems as they are identified: e.g., by revising IUIDP guidelines.

THE INVESTMENT PROGRAM

Tables A1 and A2 present data on the core of the urban investment program from 1986/87 through 1991/92. The data include investment programmed by central agencies, as well as funds flowing through the PJM process.³ Data for the fiscal year 1991-92 (ends March 31, 1992) are preliminary and subject to revision.

Urban sector total investment increased substantially between 1986/87 and 1987/88, due primarily to the influx of funding from the World Bank's Urban Sector Loan. Since that time (and over the lifetime of MFP), sector investment has increased at an annual compound rate of about 4.5 percent, which is well below the rate of inflation. As a result, real investment per capita has fallen significantly. Investment has fallen even farther behind the estimates of needs that underlie the sectoral program. It also has trailed budget targets. For

³The data on these tables include O&M expenditures, as well as capital investments for the basic needs subsectors covered under IUIDP. Similar data (isolating expenditure directly in urban areas) are not available for other subsectors such as energy, telecommunications, and port and market development.

Table A1
THE URBAN INVESTMENT PROGRAM, 1986/87-1991/92
 (Current Rp. in billions)

	Total	1986/87	1987/88	1988/89	1989/90	1990/91	1991/92
USE OF FUNDS							
Water Supply	1,582.2	188.6	250.6	260.7	198.9	332.1	351.3
Flood Prevention	451.3	28.6	103.7	119.5	105.3	41.5	52.7
Env. San. & Drainage	468.5	42.1	72.0	103.4	66.9	96.0	83.1
Kampung Improvement	283.8	23.4	38.8	59.4	52.0	58.4	51.8
Roads	1,116.0	115.6	146.7	204.3	255.8	186.4	207.2
Planning	248.0	30.2	47.3	41.2	48.8	36.3	44.2
Total	4,149.8	428.5	659.1	793.5	727.7	750.7	790.3
SOURCE OF FUNDS							
National							
Cipta Karya	1,345.4	133.8	215.5	235.8	202.0	239.7	318.6
Other	917.2	53.1	183.7	215.0	206.0	136.7	122.7
Subtotal	2,262.6	186.9	399.2	450.7	408.7	376.4	441.3
Local							
Domestic Loans	221.7	12.1	27.2	64.8	8.5	55.4	53.8
INPRES	447.0	60.5	70.5	72.0	106.8	71.9	65.4
SDO	34.2	4.8	4.2	19.7	2.0	1.2	2.3
APBD I & III	585.6	65.7	75.3	138.8	131.1	85.0	89.8
PDAM	598.6	98.5	82.8	47.6	71.3	160.8	137.7
Subtotal	1,887.1	241.6	259.9	342.8	319.6	374.3	349.0
Total	4,149.7	428.5	659.1	793.5	727.7	750.7	790.3

SOURCE: TKFP, unpublished records.

Table A2
THE URBAN INVESTMENT PROGRAM, 1986/87-1991/92
(Percent of Total)

	Total	1986/87	1987/88	1988/89	1989/90	1990/91	1991/92
USE OF FUNDS							
Water Supply	38.1	44.0	38.0	32.9	27.3	44.2	44.5
Flood Prevention	10.9	6.7	15.7	15.1	14.5	5.5	6.7
Env. San. & Drainage	11.3	9.8	10.9	13.7	9.2	12.8	10.5
Kampung Improvement	6.8	5.5	5.9	7.5	7.1	7.8	6.6
Roads	26.9	27.0	22.3	25.8	35.2	24.8	26.2
Planning	6.0	7.0	7.2	5.2	6.7	4.8	5.6
Total	100.0						
SOURCE OF FUNDS							
National							
Cipta Karya	32.4	31.2	32.7	29.7	27.8	31.9	40.3
Other	22.1	12.4	27.9	27.1	28.3	18.2	15.5
Subtotal	54.5	43.6	60.9	56.8	56.1	50.1	55.8
Local							
Domestic Loans	5.3	2.8	4.1	8.2	1.2	7.4	6.8
INPRES	10.8	14.1	10.7	9.1	14.7	9.6	8.3
SDO	0.8	1.1	0.6	2.5	0.3	0.2	0.3
APBD I & III	14.1	15.3	11.4	17.5	18.0	11.3	11.4
PDAM	14.4	23.5	12.6	6.0	9.8	21.4	17.4
Subtotal	45.5	56.4	39.4	43.2	43.9	49.9	44.2
Total	100.0						

Source: TKPP, unpublished records

example, the Rp. 750.7 billion actual investment total for 1990/91 compares with a budgeted total at the beginning of the year of Rp. 1,094.1 billion.

Both the World Bank (1991) and BAPPENAS (1992) recognize that investment levels are falling behind targets. Indeed, BAPPENAS estimates for 1990-91 show an even greater shortfall. Both reports judge that, in the short-term, institutional constraints probably have been more binding than financial constraints. The pipeline of high quality projects ready for appraisal has declined, and there are notable bottlenecks, stemming from both GOI and donor practices, in disbursement and implementation. These are important issues to be addressed in the next phase of the program.

For the six years shown, the largest share of funds was spent on water supply systems (more than one-third) and local road extensions and improvements (almost one-quarter). Sizeable shares also went to flood protection, environmental sanitation and drainage, and the Kampung Improvement Program (KIP). This allocation of resources conforms to the general priorities stated in Repelita V.

MORE RECENT TRENDS IN PROGRAM COMPOSITION

A comprehensive estimate of future expenditure is not available, but insights can be gained by reviewing data on planned expenditures over the period from 1990/91 through 1997/98, as compiled from the PJMs for 45 secondary cities by Huszar (1990).⁴ Data is reported only for very general categories because the IUIDP did not require a standardized accounting system that would permit aggregation of more detailed types of expenditures.

Results are summarized on Table A3. Together, these plans contemplate an average expenditure Rp.101,600 per capita over the period. Planned per capita expenditures are significantly higher for cities in Eastern Indonesia (Rp.164,800) than for the PJMs prepared for Java (Rp.65,900) and Sumatra (Rp.70,300). As would be expected, at Rp.114,900 per capita, planned expenditures for cities with high population growth rates (greater than 5 percent per annum) is much above that for those experiencing slower growth (Rp.91,100 per capita for cities with annual growth rates of less than 3 percent).

While there are some variations, the sectoral composition of planned investments in these PJMs is very similar to that of the overall program for the 1980s (which was shown in Table A2). The combined total for sanitation, drainage, and solid waste management (29 percent) is up from the 1980s figure (22 percent), the proportions for KIP and road building

⁴The report points out that comprehensive data for larger cities could not be assembled for the report because of the multiplicity of agencies preparing plans for those areas and the lack of a uniform accounting structure.

Table A3
SUMMARY OF EXPENDITURES—45 SECONDARY CITY PJMs

	Total	Water Supply	Drainage	Sanitation	Solid Waste	Kampung Roads	Market Improv.	Plans/Improv.	Studies
EXPENDITURES PER CAPITA (Rp. in thousands)									
Total	101.6	37.1	14.9	5.9	8.1	27.9	6.9	0.6	0.2
Sumatra 70.3	15.0	16.7	2.3	3.9	21.6	10.0	0.6	0.3	
Java	65.9	21.0	8.3	4.4	6.1	22.1	3.6	0.5	0.0
East Indonesia	164.8	72.1	17.5	11.4	15.8	41.4	5.5	0.7	0.4
Fast growth	114.9	45.0	15.6	6.5	10.3	30.8	6.1	0.6	0.1
Mod. growth	101.7	37.6	13.1	7.1	7.8	27.0	8.3	0.5	0.4
Slow growth	91.1	20.6	25.6	1.7	7.2	29.1	5.4	1.0	0.6
PERCENT OF EXPENDITURES									
Total	100	36	15	6	8	27	7	1	0
Sumatra 100	21	24	3	5	31	14	1	0	
Java	100	32	13	7	9	34	5	1	0
East Indonesia	100	44	11	7	10	25	3	0	0
Fast growth	100	39	14	6	9	27	5	0	0
Mod. growth	100	37	13	7	8	27	8	1	0
Slow growth	100	23	28	2	8	32	6	1	1
BY TYPE OF EXPENDITURE									
Rp. thousands per capita									
New construction	28.5	11.5	3.4	2.6	3.1	6.9	0.9	0.1	0.0
Rehabilitation	44.4	16.8	6.0	2.8	1.3	11.6	5.5	0.4	0.0
Equipment	1.7	0.6	0.4	0.1	0.2	0.1	0.0	0.0	0.2
Maintenance	26.9	9.2	4.2	0.3	3.5	9.2	0.4	0.1	0.0
Total	101.6	38.0	13.9	5.9	8.1	27.9	6.9	0.6	0.2
Percent									
New construction	28	30	24	44	38	25	14	20	0
Rehabilitation	44	44	43	48	16	42	80	63	0
Equipment	2	1	3	2	2	0	0	1	100
Maintenance	27	24	30	6	43	33	6	15	0
Total	100	100	100	100	100	100	100	100	100

Source: Huszar, 1990.

Table A4
COMPOSITION OF PLANNED EXPENDITURE PROGRAMS:
SELECTED SUMATRA PJMs

	Total	Tanj. Balai	Jambi	Pekan- baru	Banda Aceh	Muara Enim
EXPENDITURES (Constant 1988/89 Rupiah in millions)						
Total 5 Yr. Program	60,888	6,962	19,736	15,075	13,309	5,807
PERCENT OF EXPENDITURES						
WATER SUPPLY						
Treatment plants	5.3	14.4	8.5	0.0	3.7	0.9
Rehabilitation	0.5	0.0	0.2	0.0	2.0	0.0
Supply mains	3.1	2.5	2.8	0.5	7.5	1.2
Secondary distrib.	2.5	1.5	0.7	1.5	7.1	1.3
Tertiary distrib.	4.7	1.8	0.6	1.3	17.8	0.6
House connect.	2.1	0.0	1.0	7.3	0.0	0.0
Standpipes	0.0	0.0	0.0	0.2	0.0	0.0
Fire hydrants	0.0	0.0	0.0	0.0	0.0	0.3
Routine maintenance	13.1	2.0	32.4	4.0	5.3	2.6
Other	0.3	2.2	0.1	0.0	0.0	0.6
Total	31.7	24.3	46.4	14.8	43.4	7.4
DRAINAGE						
Primary drains	3.2	0.0	1.7	8.9	0.9	2.4
Secondary drains	7.7	12.2	4.4	15.3	0.2	11.3
Tertiary drains	1.4	0.0	0.0	0.0	0.0	14.6
Rehabilitation	0.2	0.0	0.2	0.0	0.0	1.6
Routine maintenance	1.2	4.1	0.0	0.4	1.7	2.8
Other (incl.pump stn.)	6.2	0.4	7.7	0.0	16.0	1.3
Total	19.9	16.7	14.1	24.6	18.7	34.0
SANITATION						
Construction MCK	0.4	0.0	0.0	1.1	0.2	1.0
Desludging trucks	0.6	0.8	0.1	0.0	0.3	3.8
Alt.san.systems	0.1	0.0	0.4	0.0	0.0	0.0
Rehabilitation	0.1	0.0	0.0	0.0	0.3	0.0
Routine maintenance	0.1	0.1	0.0	0.1	0.1	0.3
Other	0.0	0.0	0.0	0.0	0.0	0.0
Total	1.3	0.9	0.6	1.2	0.9	5.1
SOLID WASTE MANAGEMENT						
Beca sampah	1.1	0.5	1.1	1.4	0.8	2.1
Transfer stations	0.8	1.1	1.2	0.6	0.0	0.9
Trucks, disp.equip.	4.0	2.2	3.3	6.7	2.0	5.6
Prep.deposit areas	0.4	0.0	0.7	0.4	0.0	0.6
Routine maintenance	1.1	1.5	1.0	0.6	1.3	1.3
Other	0.3	0.0	0.1	1.1	0.0	0.0
Total	7.6	5.3	7.3	10.8	4.2	10.6

Table A4 (Continued)
COMPOSITION OF PLANNED EXPENDITURE PROGRAMS:
SELECTED SUMATRA PJMs

	Total	Tanj. Balai	Jambi	Pekan- baru	Banda Aceh	Muara Enim
ROADS						
Prov./state roads	4.5	27.4	3.8	0.0	0.0	0.9
Collector roads	5.1	0.0	6.9	0.0	7.5	12.7
Local roads	6.5	1.5	6.9	16.2	0.0	1.3
Footpaths	0.6	0.0	0.0	0.0	0.0	5.9
Routine maintenance	3.4	10.0	0.4	1.2	5.0	7.4
Other(incl.bridges)	2.9	6.9	6.4	0.0	0.0	0.0
Total	22.9	45.8	24.4	17.4	12.5	28.4
KAMPUNG IMPROV.PROGRAM						
KIP-Perentis	1.4	0.0	1.8	0.0	0.0	7.6
KIP plus	1.0	1.8	0.0	4.2	4.2	0.0
KIP plus 1	1.1	1.2	2.2	0.0	0.0	1.6
KIP plus 2	3.7	1.7	0.9	8.7	0.0	0.2
Routine maintenance	0.5	0.6	0.0	0.0	1.6	1.1
Total	7.7	5.3	4.9	12.9	5.8	10.5
RESIDENTIAL DEVELOPMENT						
Guided land devel.	0.5	0.0	0.0	1.5	0.0	1.5
GLD plus	0.0	0.0	0.0	0.0	0.0	0.0
Other land proj.	2.2	0.0	0.0	0.0	9.9	0.0
Total	2.7	0.0	0.0	1.5	9.9	1.5
MARKET IMPROVEMENT						
MIP (P2LPX)	1.4	0.0	0.0	4.4	1.4	0.8
MIP plus	0.5	0.9	0.0	0.0	0.0	0.0
Centr. area improv.	0.0	0.0	0.0	0.0	0.0	0.0
Urban renewal	0.0	0.0	0.0	0.0	0.0	0.0
Routine maintenance	0.5	0.4	2.4	0.0	0.0	0.7
Total	2.4	1.3	2.4	4.4	1.4	1.5
MASTER PLANS/TECH. ASSIST.						
Master plans,feas.study	2.2	0.4	0.0	5.3	3.3	0.9
Technical assist.	1.5	0.0	0.0	5.8	0.0	0.2
Other	0.3	0.0	0.0	1.3	0.0	0.0
Total	4.0	0.4	0.0	12.5	3.3	1.0
TOTAL	100.0	100.0	100.0	100.0	100.0	100.0

Source: Tabulated from Cipta Karya records.

remain the same (7 percent and 27 percent respectively), and the shares for water supply and planning decline somewhat.

The distribution of planned expenditures by type of expenditure is also of interest. The PJMs are often talked about as if they concentrated primarily on the provision of new facilities, but that is obviously not the case. On average, 44 percent of all expenditures are for the rehabilitation of existing systems, and maintenance accounts for another 27 percent. Only 29 percent of the total is planned to be spent on new construction.

PROGRAM COMPOSITION IN MORE DETAIL

The above categories are too broad to convey much understanding about the technical nature of these programs but, as noted earlier, the lack of standard accounting systems prevents more detailed tabulations for the program as a whole. The first wave of PJMs prepared for Sumatra, however, did require uniform accounting at a more detailed level, and information from these plans are instructive. Table A4 shows the figures for five urban areas.

One overall conclusion is both positive and important. Even though the same consultants were employed in PJM preparation in each of these areas, there is certainly no uniformity in types of investments selected. It appears that each area was looked at on its own terms and priorities were set based on local conditions, which clearly varied across cities. In water supply, for example, the top priority in Tanjung Balai was expansion of water production and treatment capacity, and this was also important in Jambi. In Pekanbaru, however, the bulk of the funds in this sector was programmed for house connections and, in Banda Aceh, for extension of the tertiary distribution network. Funding for routine system maintenance also was given a high priority in Tanjung Balai and Jambi.

In the drainage program, there also were differences with the highest priorities varying between the construction of primary and secondary drains and maintenance in different cities. One important, but not surprising, finding for sanitation is that funds still are not being allocated to build piped sewerage systems. The bulk of the funding in this area is planned for the provision of MCKs and related desludging equipment. Thus it appears that virtually all of the investment in sanitation is to be spent on improvements intended for lower-income families, although it should be noted that only a very small share of the total planned investment--1.3 percent of the total across cities--is being allocated to this sector as a whole.

In solid waste management, priorities were more similar among the cities. The provision of new garbage trucks and related disposal equipment received the largest allocations in all cities, with facilities maintenance coming in as a fairly distant second. The proposed budgets for roads showed considerable variation again, with some urban areas concentrating more on major thoroughfares and others, on local access roads. KIP was a

still significant component of the overall programs in all cities accounting for shares of total planned investment ranging from 4.9 percent to 12.9 percent.

Only three of these urban areas programmed any funds for infrastructure to help expand land development at the urban fringe (Guided Land Development schemes).

Annex B

THE YOGYAKARTA REAL DEMAND SURVEY

The Yogyakarta Real Demand Study (RDS) (Yayasan Dian Desa, 1991) is the most comprehensive study of local demand patterns for infrastructure, and household perceptions of infrastructure problems and needs, thus far conducted in Indonesia. It was sponsored by the Swiss Development Corporation as a part of the Yogyakarta Urban Development Project (YUDP), for which EWI/Electrowatt and Hasfarm Dian Konsultan were the primary consultants. Its total cost was US\$500,000--obviously greatly above what can be expected to be spent for urban infrastructure demand studies in the future. But the additional resources allowed the researchers to probe many issues quite deeply and, therefore, it offers valuable lessons for the design of future and more streamlined studies on these topics.

The core of the study was a sample survey with 3,602 household respondents (2.5 percent of all households in the area) plus 1,290 student respondents. However, the researchers also collected many other direct measures of physical conditions and infrastructure service quality (e.g., land use distributions, trip speeds for public transport). They also obtained considerable information on social and cultural conditions.

In this Annex, we summarize selected results of this study. First, we review RDS data on the spatial distribution of incomes within the Yogyakarta Urban Area (YUA). Second, we summarize some of the findings pertaining to infrastructure services and how the local population views them.

THE SPATIAL PATTERN OF HOUSEHOLD INCOMES

The survey contained questions that probed the level and composition of both household expenditures and income, and the sample was such that results could be presented for small areas within the YUA--which includes the kotamadya, itself, and several kecamatan from kabupatens Sleman and Bantul. The area had a total of 74 kelurahan and the researchers divided each of these into subareas (824 in all) by density class. There were five classes, the highest being subareas with net densities above 400 persons per hectare and the lowest, below 50 persons per hectare.

Table B1 shows both densities and income data for all Kelurahan in the YUA (ordered from the highest density to the lowest). At the time of the survey (1990), a household income of Rp. 200,000 per month was slightly above the median (53 percent of all households had incomes below that level). The table shows that all kelurahan were "mixed-income" areas; i.e., none of these areas housed exclusively lower- or higher- income households, or even anything close to those extremes. In the kelurahan with the highest concentration, low-income households (defined as earning below Rp.200,000 per month) still represented only 83 percent of the total, while in the lowest they represented 30 percent. These data are plotted in Map 1. Clearly, there is no spatial concentration of either high- or low- income groups into distinct zones. The table also shows that there is very little correlation between income levels and gross density (population per total area).

The study researchers found that this conclusion also held with their more fine-grained settlement classes; i.e., no spatial concentration of the rich or the poor. They state, "even in settlement class I areas (the highest density), there are rich, medium, and poor families. . . . All economic strata are woven into a single social fabric, and this weave results in appropriate micro cross-subsidy and cohesiveness."

The results were similar when they looked only at households below the poverty line. The poor (defined as being unable to afford a basic intake of 2,100 calories per person per day) had monthly incomes of less than Rp. 17,500 per person and accounted for 10.8 percent of the total population. Those in poverty were also spread fairly evenly across the area; "poor families can be found in all kelurahan in the YUDP territory."

This has obvious implications for efforts to provide better infrastructure services to lower-income groups. Programs focusing only on high-density kampungs will not reach a very large share of the intended beneficiaries. On the other hand, programs that attempt to extend services throughout the urban area at least will bring them closer to all of the poor, and they offer potential benefits in cost reduction (due to economies of scale) and self-sustaining system operation.

SELECTED FINDINGS ON INFRASTRUCTURE SERVICE

As noted, the Yogyakarta survey covered a broad range of topics. Here, we summarize only a few that are particularly relevant for infrastructure planning.

Water Supply

The study found that 85.8 percent of all households in the YUA own and control their own water sources (90 percent of these rely on only one source and the rest use multiple sources). The remaining 14.2 percent obtain their water mostly from public taps, wells, or similar sources owned by neighbors. Only 0.4 percent rely directly on river water. Across

Table B1
KELURAHAN CHARACTERISTICS--YOGYAKARTA URBAN AREA

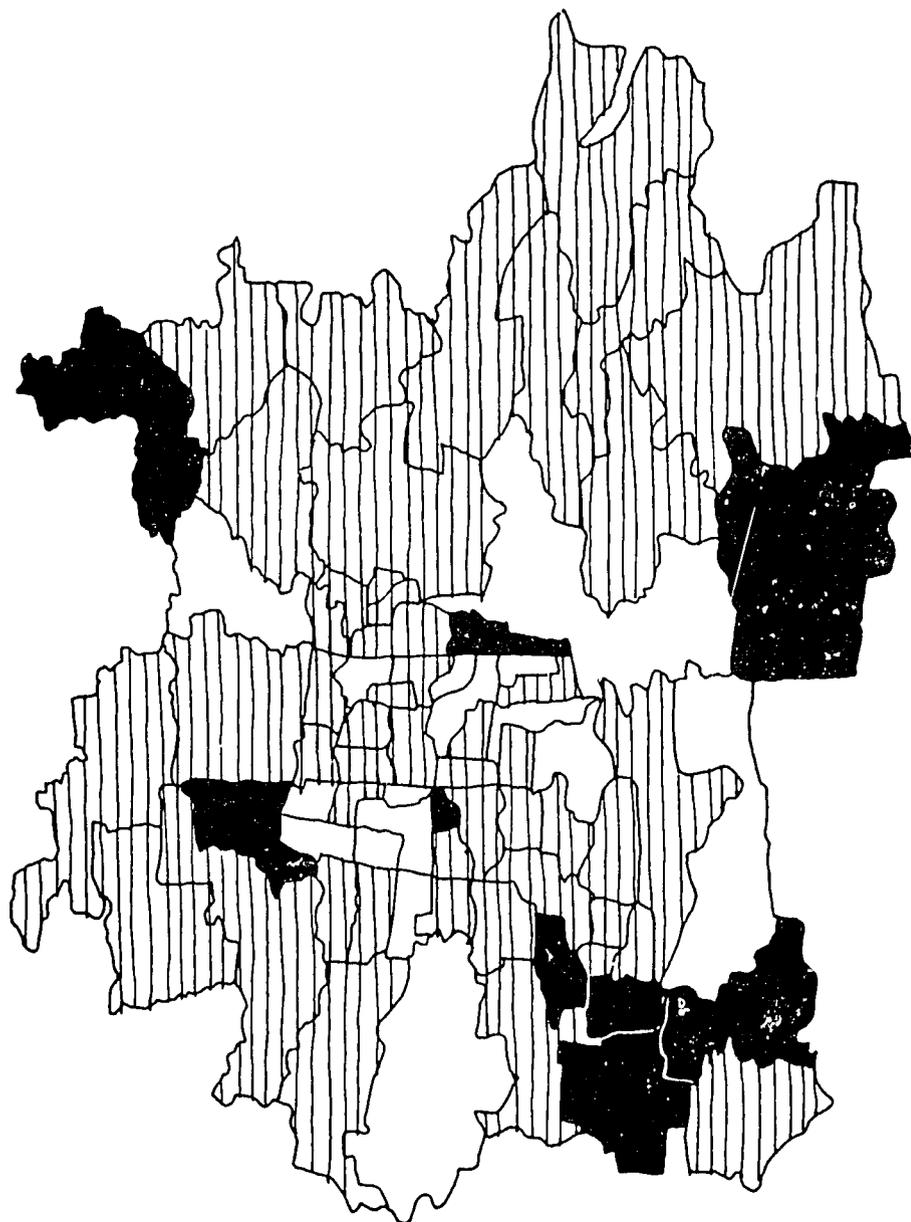
Code No.	Kelurahan	1990 Pop.	Area (hectares)			Family Low-Income	Percent Pop./ Total Area	Percent Built-Up
			Total	Built-Up	Resident.			
102	Pringgokusuman	14,486	45.5	44.5	37.0	58.8	318.3	97.8
113	Tegalpanggung	10,294	33.5	33.5	28.0	61.7	307.3	100.0
92	Ngampilan	13,243	48.0	48.0	40.0	53.5	275.9	100.0
91	Notoprajan	10,133	38.0	37.2	31.0	56.4	266.7	97.9
81	Prawirodirjan	11,439	43.0	40.9	30.0	82.7	266.0	95.2
71	Genungketur	6,813	26.9	26.9	16.0	44.4	253.3	100.0
124	Kiltren	16,053	64.5	62.0	42.0	13.7	248.8	96.1
72	Purwokinanti	8,250	34.0	31.8	28.0	62.0	242.6	93.5
131	Gowongan	11,128	46.5	42.1	28.0	58.0	239.3	90.5
112	Bausaaran	10,522	45.5	45.5	37.0	58.3	231.3	100.0
132	Bumijo	13,375	57.9	55.9	35.0	35.0	230.8	96.5
133	Cokrodiningratan	12,586	55.0	52.3	32.0	64.8	228.9	95.2
33	Kadipaten	8,287	38.2	38.2	24.0	36.4	217.0	100.0
13	Gedongklwo	14,598	70.4	61.8	44.0	45.9	207.4	87.7
21	Patangpuluhan	9,120	44.4	40.1	32.0	32.1	205.6	90.5
32	Panembahan	11,560	57.7	57.7	51.0	38.9	200.4	100.0
111	Suryatmajan	6,218	31.8	31.8	14.0	65.4	196.8	100.0
101	Sosromenduran	10,501	53.6	53.6	24.0	58.9	195.9	100.0
123	Demangan	14,400	74.0	72.2	56.0	42.5	194.7	97.6
23	Pakuncen	12,438	67.2	65.2	52.0	42.6	185.1	97.0
125	Terban	14,493	79.7	76.8	42.0	80.5	181.9	96.3
43	Wirogunan	15,037	85.2	79.1	68.0	42.3	176.6	92.8
31	Patehan	7,283	41.4	37.1	27.0	31.5	175.9	89.7
22	Wirobrajan	11,903	68.5	66.0	50.0	43.9	173.8	96.4
42	Keparakan	9,810	57.7	54.3	48.0	56.8	170.0	95.0
144	Karangwaru	10,330	69.9	61.4	48.0	55.9	147.7	87.8
143	Kricak	11,857	81.8	65.5	61.0	63.4	144.9	80.0
11	Suryodiningratan	11,936	85.1	79.6	70.0	34.6	140.3	93.5
57	Semaki	8,941	65.9	57.8	25.0	44.4	135.7	87.8
82	Ngupasan	9,102	67.5	65.0	27.0	16.7	134.8	96.3
55	Tahunan	10,357	77.5	64.0	52.0	44.0	133.6	82.5
122	Baciro	16,324	124.0	120.2	81.0	32.2	131.6	96.9
202	Jagalan	3,165	26.0	26.0	23.0	61.2	121.6	100.0
41	Brontokusuman	10,945	92.8	89.6	78.0	48.2	118.0	96.6
12	Mantrijeron	12,797	112.5	112.5	105.0	48.1	113.8	100.0
141	Tegalrejo	9,171	81.7	59.1	48.0	57.1	112.3	72.3
54	Warungboto	8,532	82.5	49.5	44.0	50.0	102.5	60.0
61	Pronggan	9,102	93.5	91.1	84.0	55.5	97.3	97.3
62	Purbayan	8,083	84.0	83.9	81.0	67.9	96.0	99.8
121	Kotabaru	6,101	71.0	67.1	23.0	36.8	85.9	94.4

Table B1 (Continued)
KELURAHAN CHARACTERISTICS—YOGYAKARTA URBAN AREA

Code No.	Kelurahan	1990 Pop.	Area (hectares)			Family Low-Income	Percent Pop./ Total Area	Percent Built-Up
			Total	Built-Up	Resident.			
53	Pandeyan	11,140	135.7	80.1	70.0	40.1	82.1	59.0
56	Mujamuju	12,455	152.0	91.9	64.0	30.0	81.9	60.4
142	Bener	4,414	57.5	50.0	41.0	42.8	76.7	86.9
63	Rejowinangun	8,295	122.8	76.6	62.0	54.5	67.5	62.6
192	Minomartani	10,149	153.0	114.1	92.0	64.9	66.3	74.6
52	Sorosutan	10,717	170.0	82.7	74.0	55.0	63.0	48.7
171	Caturtunggal	76,833	1,501.0	849.2	334.0	34.5	51.2	56.6
223	Ngestiharjo	24,094	510.0	226.0	198.0	81.7	47.2	44.3
51	Giwangan	5,254	121.7	40.8	25.0	79.0	43.2	33.3
161	Sinduadi	30,800	737.0	328.3	272.0	58.8	41.8	44.5
212	Panggunharjo	21,954	561.0	203.4	172.0	58.3	39.1	36.3
153	Nogotirto	13,280	349.0	106.3	54.0	39.6	38.1	30.5
207	Banguntapan	29,540	816.3	223.9	229.0	62.7	36.2	27.4
173	Condongcatur	34,316	950.0	738.5	567.0	65.1	36.1	77.7
203	Singosaren	2,185	66.8	40.8	38.0	74.9	32.7	61.1
221	Tirtomirmolo	16,336	513.0	190.5	156.0	57.1	31.8	37.1
152	Banyuraden	11,004	380.0	122.7	63.0	48.1	29.0	32.3
211	Bangunharjo	17,713	679.1	194.2	171.0	39.3	26.1	28.6
151	Ambarketawang	13,770	572.9	334.6	299.0	45.2	24.0	58.4
172	Maguwoharjo	23,653	1,104.0	837.1	560.0	71.1	21.4	75.8
206	Baturetno	8,018	375.0	99.4	91.0	29.6	21.4	26.5
204	Wirokerten	8,177	387.7	104.2	98.0	88.2	21.1	26.9
201	Tamanan	7,554	375.0	98.2	88.0	53.5	20.1	25.7
162	Sendangadi	10,738	536.7	205.6	138.0	65.0	20.0	38.3
222	Tamantirto	13,280	672.0	343.6	318.0	54.2	19.8	51.2
205	Potorono	7,450	385.7	101.0	95.0	81.0	19.3	26.2
154	Trihanggo	10,707	562.4	203.9	162.0	56.7	19.1	36.3
193	Sinduharjo	10,370	609.0	215.0	201.0	51.5	17.0	35.3
208	Jambidan	6,349	374.5	94.1	89.0	63.6	17.0	25.1
163	Togoadi	7,906	482.0	253.0	198.0	64.7	16.4	52.5
191	Sariharjo	10,845	689.0	290.7	237.0	63.2	15.7	42.2
164	Tirtoadi	7,044	497.0	240.6	220.0	80.0	14.2	48.4
194	Sardonoharjo	11,191	938.0	389.7	250.0	55.9	11.9	41.5
181	Wedomartani	14,132	1,245.0	347.7	313.0	60.0	11.4	27.9
Total	942,396	20,305.2	10,263.5	7,805.0	48.8	46.4	50.5	

SOURCE: Yayasan Lian Desa (1991)

NOTE: Low-income = Less than Rp. 200,000/month



□ Less than 40 percent

▨ 40 to 70 percent

■ More than 70 percent

Lower-income (less than Rp. 200,000 per month)
as percent of total households

Map 1
**SPATIAL DISTRIBUTION OF LOWER INCOME POPULATION
YOGYAKARTA URBAN AREA**

all categories, only 15.4 percent use piped water provided through public systems (PDAM and BPAM); shallow wells provide the water even for two-thirds of the households who control their own source.

Survey data on community attitudes about water provision can be extremely useful to the managers of public systems who want to improve their services. The relevant questions differ for different categories of respondents.

1. *Well owners who do not purchase piped water even though it is already available in their neighborhood.* This group comprised a surprising large share (40 percent) of all well owners. When asked to name the primary reason why they did not use piped water, 33 percent said the quality of such water was not good ("too smelly" was the most frequent response), 12 percent said supply through the piped system was unreliable, and 20 percent said they thought system water was too expensive. Actually, in this group overall there was considerable ignorance of the prices entailed in becoming a piped system customer--while 46 percent of them said they knew what the prices were, only 35 percent were later able to state them correctly.

2. *Well owners in neighborhoods that did not yet have piped water.* At the outset 69 percent of this group said they would not purchase piped water even when the system was extended into their area. The reason given by most of these respondents (86 percent) was the perception that the cost was too high (only 31 percent said they could not afford the monthly bill--for the rest, the initial cost of the house connection was the barrier).

When told what the actual prices would be, the number saying they would become customers went up from 31 percent to 43 percent (although 60 percent of the latter said they would be willing and able to pay the installation cost only if some type of credit scheme was provided).

3. *Those who do not have their own well.* Most of the households in this group (71 percent) also live in neighborhoods where piped water is not yet available. For the group as a whole, 64 percent said they would not be interested in their own connections to a piped system because they were *belum mampan* (not yet settled).

4. *Those who are already customers of the piped system.* A large share of this group (74 percent) had complaints about their water service (69 percent complain about water quality and the rest about quantity and reliability). Because of quality problems, 31 percent of these customers actually use water from another source for cooking and drinking.

Given these responses, the study authors note that the managers of the piped system clearly need to concentrate on improving the quality of the water they provide if they are to expand their customer base. However, they note that public information campaigns to explain prices and service goals also would win them more customers.

Sanitation

The survey showed that 79 percent of YUA households own a private latrine and the remaining 21 percent either rely on public (or shared) toilet facilities or have no toilet facilities. Of all private latrines, only 1.2 percent are connected to the piped sewage system, but another 48 percent are connected to septic tanks. The report also discusses traditional Javarese attitudes relating to sanitation that surfaced in the interviews. Yogyakarta households give high priority to obtaining a private toilet and maintaining their facilities in a manner that does not "make other people uncomfortable" (only 30 percent of private latrine owners said that health concerns were their primary motivations for obtaining them). There is a potential public health problem here, however: 41 percent of the families with private latrines depend on water from wells located less than 10 meters from the latrine's septic tank or soaking pit. This does imply priority for extending safe and higher-quality piped-water supply to many new customers, as well as the need for expanding piped sewerage in high density areas.

The problems that prevented other families who want them from obtaining their own toilets are largely the lack of finances and the lack of sufficient land. The authors advocate the provision of soft credit to support many more private latrines in economically weak communities and the development of a sustainable model for publicly-built latrine services in densely populated areas, where individual latrines may not be feasible. They also advocate an education program on the health effects of solid and liquid waste disposal and the promotion of proper use of facilities.

Solid Waste Disposal

The survey showed that only 33 percent of the 2,450 cubic meters of solid waste generated in the YUA each day is collected and disposed of by government agencies. Of all respondents, 51 percent (mostly in outlying *kelurahan*) dispose of waste in pits in their own houseyard, 18 percent take it themselves to a temporary disposal bin (where it is picked up by the government for final disposal), 21 percent have their waste picked up by garbage collection staff (public or private) directly from their house, and the remaining 10 percent either dump their wastes in rivers or canals or find other means of disposal.

Normally, when garbage is picked up at the house, the service has been organized by the community (rather than being a government-provided service), and a fee is charged. (The report provides considerable information on how different communities have organized their own collection services and the motivations behind these efforts.) The survey found that households in the YUA care deeply about garbage not accumulating in their own houseyard and almost always take steps to assure that this will not occur. They were generally willing to pay a reasonable fee for such removal but indicated little willingness to contribute money for government's transfer of the waste from the temporary bin to the final disposal site or for the operation of that site ("as long as the house is clean, they don't care").

The authors advocate a community education program to inform residents about the requirements of the full disposal system and the health effects of improper disposal practices. They also offer suggestions on improving the design of temporary disposal bins and on extension work to "re-educate" those who dump in rivers and canals (which they found to be focused geographically in just a few kelurahan).

Annex C

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