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REPUBLIC OF INDONESIA
MINISTRY OF PUBLIC WORKS
DIRECTORATE GENERAL OF HOUSING BUILDING
PLANNING AND URBAN DEVELOPMENT (CIPTA KARYA)

MEDAN URBAN DEVELOPMENT, HOUSING, WATER SUPPLY AND SANITATION PROJECT

46p

TECHNICAL MEMORANDUM NO. 39

BACKGROUND NOTES ON MEDAN'S HOUSING STRATEGY

NOVEMBER 1979

ENGINEERING - SCIENCE, INC • SINOTECH ENGINEERING CONSULTANTS, INC

A JOINT VENTURE

in association with

PADCO and P.T. DACREA

MEDAN URBAN DEVELOPMENT, HOUSING, WATER SUPPLY AND SANITATION PROJECT

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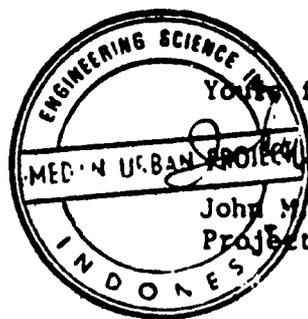
12 November 1979

Director General Cipta Karya
Ministry of Public Works
Jalan Pattimura 20
Kebayoran Baru
Jakarta Selatan

Subject: Technical Memorandum No. 39, Background
Notes on Medan's Housing Strategy

Dear Sir:

Attached are 20 copies of the subject Technical Memorandum
for your information and review.



Yours faithfully,

John M. McGill
Project Representative

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DACREA - Jakarta

JM/1

LIST OF TECHNICAL MEMORANDA PREVIOUSLY SUBMITTED

Report No.	T i t l e	Date Submitted
1.	Preliminary Site Selection Criteria for Perumnas Medan III, SSCH/LCH Project	March, 1979
2.	Work Plan for Water Supply and Sanitation Master Plans and Feasibility Studies	April, 1979
3.	Policy Issues for Project Guidance	March, 1979
4.	Drainage - Principal Rivers and Rainfall Analysis	May, 1979
5.	Preliminary Evaluation of Sunggal Water Treatment Plant	May, 1979
6.	Public Health Considerations	July, 1979
7.	The Present Drainage System	August, 1979
8.	Recommended Drilling Program	August, 1979
9.	Medan Household Income/Expenditures	August, 1979
10.	Existing Land Use in Medan	August, 1979
11.	The Regional Functions of Medan	August, 1979
12.	Existing Solid Wastes Systems and Projected Solid Wastes Characteristics	August, 1979
13.	Evaluation of Medan Master Plan	August, 1979
14.	Physical Constraints to Urbanization	August, 1979
15.	Development in Health Care in Medan	September, 1979
16.	Existing Water Supply Systems	September, 1979
17.	Developments in Education	October, 1979
18.	Existing Water Supply and Sanitation Systems	October, 1979
19.	Public Health and Environmental Aspects	October, 1979
20.	Alternative Solid Wastes Management Systems	October, 1979

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LIST OF TECHNICAL MEMORANDA PREVIOUSLY SUBMITTED (CONTINUED)

Report No.	T i t l e	Date Submitted
21	The Distributed Investment Strategy Plan (DISP)	October, 1979
22	Recommended Solid Wastes Management System	October, 1979
23	Recommended Drainage Management System	October, 1979
24	Alternative Water Supply Management Systems	November, 1979
25	Water, Wastewater, Stormwater and Solid Wastes Systems	November, 1979
26	Alternative Wastewater Management Systems	November, 1979
27	Design Criteria and Bases for Cost Estimates	November, 1979
28	Recommended Water Supply Management System	November, 1979
29	Recommended Wastewater Management System	November, 1979
30	Environmental Assessment	November, 1979
31	Finance	November, 1979
32	Groundwater Resources	November, 1979
33	The Existing Urban Situation	November, 1979
34	Sibolangit Springs	November, 1979
35	Distribution System Analysis	November, 1979
36	Surface Water Hydrology	November, 1979
37	Detailed Projections of Water and Waste Quantities	November, 1979
38	Organization for Water Supply and Sanitation	November, 1979

SECTION 3

BACKGROUND NOTES ON MEDAN'S HOUSING STRATEGY

3.1. INTRODUCTION

This Technical Memorandum presents background material on Medan's Housing Strategy as developed in Section 3 of the Interim Strategic Plan and Feasibility Report (July 1979). Based on subsequent analysis and discussions held with Cipta Karya officials, it also updates and revises some of the previously presented material.

3.1.1 Definition of Housing

Along with food and clothing, housing is one of the basic necessities of man. Housing is a diversified good which consists of much more than simply floor space, density, building materials and design. It provides access to employment, educational opportunities, health facilities and markets. A complete definition of housing should also include basic services such as water supply, sanitation, drainage and solid waste collection. An effective city-wide housing development strategy for Medan's low-income community should be concerned with progressively improving the consumption of these shelter services for the appropriate target group.

3.1.2 Background Situation

The discussion of the following topics establishes the base for the following sections on a general housing development strategy, kampung improvement and sites and services/low-cost housing.

Population. In 1978, Kotamadya Medan's population was estimated to be 1.12 million. The 1973 annexation of over 200 km² (including the port of Belawan) increased the city's land area five-fold and the population by over 300,000 persons. During the last intercensal period, 1961-1971, the population grew at an annual growth rate of 2.87 percent. Since 1971, the population has grown at a rate of over 3%. Only in the last 2-3 years has the growth rate slowed to approximately 2.5%. Based on an anticipated population growth rate of 2.6% until 1989 and 2.5% thereafter, Medan's population is projected to reach 1.95 million by the year 2000.

Household size will hold steady at 5.8-6.0 persons/household over the planning period. There are approximately 1.1-1.2 households per dwelling unit.

Household Expenditures and the Affordability of Housing.

The present discussion of household expenditures is intended to estimate the capacity of Medan's households to afford housing and its related components such as water, sanitary facilities, etc.. A discussion of affordability should include the expenditure for housing by Medan's different income groups, as well as the available financial terms of credit. Since information on household income is not available for Medan, data on consumption expenditures are used as a proxy.

Based on the Biro Pusat Statistik's monthly cost of living indices and the expenditure data contained in the feasibility study for the PERUMNAS Medan I project, an updated monthly household expenditure distribution was estimated for October 1978. The median monthly household expenditure is approximately Rp.37,300. Figure 3.1 shows this monthly distribution.

There presently exists in Indonesia much uncertainty surrounding the percentage of household expenditures which the family will be prepared to spend on housing services. Various surveys report housing expenditures (excluding fuel, light and water) ranging from 6.6 to 25.0 percent of total household budget. Apparently, a family will spend more on housing than it presently does if the alternatives offered are substantially more attractive than those enjoyed in the past. What families are willing to spend on housing depends therefore, on the product, price and alternatives as much as on past performances.

For the purposes of affordability of housing in this study, we will use 10 percent of monthly expenditure. This figure does not include expenditures for water, electricity, maintenance, etc.. Combining this assumption with the information from the household expenditure distribution, a rough estimate can be made of the cost of housing that could be afforded by households in

FIGURE 3.1

DISTRIBUTION OF MEDAN'S HOUSEHOLDS BY MONTHLY
CONSUMPTION EXPENDITURE, OCTOBER 1978

Household Expenditure Category (Rp/month)	Percent of Total Households	Cumulative percent of Total Households
Less than 10,000	2.4	2.4
10,001 - 20,000	12.6	15.0
20,001 - 30,000	18.5	33.5
30,001 - 40,000	18.9	52.4
40,001 - 50,000	14.5	66.9
50,001 - 75,000	18.3	85.2
75,000	14.8	100.0
	<hr/> 100.0	

SOURCE: Feasibility Report, Project Helvetia, Medan, Perumnas/PADCO, May 1977, and, Biro Pusat Statistik, Economic Indicator, Cost of Living Index in Selected Cities, October 1978.

different expenditure categories up to the level of the 70th percentile based on different assumptions concerning the terms of financing available.

The Issue of Subsidy. The role to be played by subsidies in the city-wide housing development strategy should be identified. What types of subsidies, if any, will be made available for what target groups? Different types of subsidies (direct capital, interest, land provision, rental subsidies, etc.) have different aspects which should be considered for specific situations. However, all of them place a burden of some sort on limited government resources. Cross subsidies of the sale of larger units at market prices could reduce the total subsidy amount substantially but not completely. Indonesia, like most developing countries, does not possess the necessary subsidy resources to alone make a significant impact on housing problems.

Target Groups. The point of departure in the determination of the specific components for a KIP or SSCH/LCH program is to identify the broad target groups of concern. During the team's field visits, it has become evident that while all Medan's low-income kampungs tend to be experiencing certain common deficiencies, there are substantial specific differences between their physical, social and economic characteristics. These differences tend to focus the allocation of scarce financial and technical resources available, for example, for kampung improvement and what types of improvements are required. Each target group will need to have a different emphasis placed on the kind of housing programs which will be most appropriate.

3.1.3 National Objectives and Priorities for Repelita III

The broad general goals established for Repelita III are the following :

1. To increase the standard of living, educational levels and welfare of the entire population.
2. To provide a strong basis for subsequent development.

Based on these two broad goals and Government Policy Guidelines, Repelita III establishes three objectives for development :

1. Equity in order to create social justice for the entire population;

2. High economic growth; and

3. National stability.

The eight components of equity are the following :

1. Equity in fulfilling the basic needs of the people, especially food, clothing and shelter;

2. Equity in obtaining educational opportunities and health services;

3. Equity in the distribution of income;

4. Equity in employment opportunities;

5. Equity in business opportunities;

6. Equity for the participants in development, especially the younger generation and women;

7. Equity in the distribution of development throughout the country;

8. Equity in obtaining social justice.

3.2 TYPOLOGY OF MEDAN'S LOW-INCOME KAMPUNGS

The selection of types of low-income kampungs (potential target groups for KIP and SSCH/LCH) is undertaken on the 1972 aerial photographs for Kotamadya Medan and completed through field work. The criteria used to define the five types of kampung are those which best serve to focus the common physical and socio-economic characteristics and problems associated with each type of kampung. The criteria used in the present analysis are gross residential density; vehicular/pedestrian access, configuration of circulation system, and other land use parameters (lot size, percent coverage of lot by dwelling unit, etc.); and, location with respect to the central commercial and peripheral areas of the Kotamadya.

.In general, most of Medan's kampungs are homogeneous with respect to type. However, certain kampungs especially those contiguous to the central commercial district (for example, Kampung Mesjid and Pandau Hilir), are composed of more than one type. The five types identified for Medan can briefly be defined in the following manner :

Kp. Lama (Old). The Kp. Lama surround the city's central commercial area on the east, south and north. They are also found along the Belawan, Binjai and Singamangaraja Roads, the major arteries radiating from the commercial area. These kampungs have medium to high residential densities (250-650 persons/hectare), with little raw land available for future population growth. Residential land use patterns are characterized by ROW 6-8 m secondary roads at 150-200 m between center lines. An adequate coverage of public services presently exists along these principal secondary roads. However, due to the large amount of land available between secondary roads, much infill of a lower quality housing has occurred in the interior of these super blocks over the development life of this type of kampung. These interior areas generally have pedestrian access only, and are deficient in the full range of public services. The Kotamatsums are a good example of this type of kampung.

Kp. Pinggiran (Peripheral). The peripheral kampungs are found in a broad band surrounding the old kampungs and the middle-and upper-income residential areas of Kecamatan Medan Baru. They are found on the fringe of the Kotamadya's built-up area. Their residential densities are considerably lower than those encountered in the old kampungs (100-200 person/hectare). Within the peripheral kampungs, much raw land is still available to absorb future population growth. However, due mainly to the advantageous location of certain kampungs with respect to the center city employment market and land at relatively low prices, the peripheral kampungs have experienced varied growth rates. Several of these kampungs -- Sidorejo, Bantan, Tegal Sari, Sei Agul and Sei Putih Barat -- are presently experiencing population growth rates approximately double the rate for the entire Kotamadya (6 percent) while others have actually lost population over the last ten years.

With the exception of larger lot sizes and lower percentage of lot coverage by the dwelling unit, residential land use patterns are similar to those of the old kampungs. However, it is only over the last ten years that the area located off the principal secondary roads has begun to densify. This densification has been stimulated by the improved planning and construction of secondary roads of 4-5 m ROW linking the major secondary roads.

Kp. Darurat (Temporary). The temporary residential areas of the city which are located along the Babura and Deli Rivers, along the rights-of-way of railways, and in close proximity to many of the city's markets exhibit the worst physical and socio-economic conditions found in the Kotamadya. In most of these areas adequate sources of drinking water, suitable toilet facilities and public refuse collection do not exist. Many areas are also subject to periodic flooding. Compared to the rest of Medan, residential densities are very high, reaching approximately 700 persons/hectare along the abandoned rail line in Kp. Mesjid. Access to the areas is primarily by poorly constructed and poorly drained footpaths. Individual lots are poorly defined and very small, with almost the entire area covered by the dwelling unit. Open space and recreational areas are almost non-existent.

Institutional Kampung. For the purpose of this study, the institutional kampung is composed of those low-income residential areas provided by the military, railroad and other large organizations to their members/employees. The housing provided is usually in the form of 10-15 unit barracks with each family occupying approximately 50 m². Most of these areas are served by public water taps and pit latrines. Residential densities range from 250-450 persons/hectare. Access is usually by foot-path. While obviously suffering many of the same physical and socio-economic problems of the previously defined kampung types, this type of kampung, due to its special characteristics, must bear the added burden of not being served by many of the city's, albeit limited, maintenance and health programs.

Semi-rural Kampung. The semi-rural type of kampung contains the low-income residential areas found outside of the built up areas of Medan and Belawan. They generally take the form of agricultural compounds composed of from 30-50 dwelling units or scattered houses found along the main roads radiating from the built up areas. Residential densities are very low, being below 50 persons/hectare. Public services, with the possible exception of electricity, do not exist. The household water supply comes from open, shallow wells. Pit latrines serve the purpose of human waste disposal. In comparison to the peripheral, and especially the old kampung, larger lot sizes provide the semi-rural family with a clean, attractive environment. Sufficient area exists for the proper spacing of latrine and well. The household also has the opportunity to cultivate a small piece of land for its own foods supply. Solid wastes are well managed by burning, composting and feeding to animals.

The following Table (Figure 3.2) summarizes how Medan's low-income population is distributed among the five types of Kampung. It can be seen that as of 1978 78.6% of Medan's 1.12 million population resides within the five types of low-income Kampung. Location of Kampung by type is illustrated graphically in Figure 3.3.

3.3 GENERAL HOUSING DEVELOPMENT STRATEGY

3.3.1 Objectives

A distinction needs to be made between planning for a given KIP or sites and services project on one hand and planning for an ongoing city-wide program on the other hand. In Medan approximately 40 percent of the households in Medan can be considered to be clearly below any definition of absolute poverty while another 30 to 35 percent can be considered to be among the urban poor and suffering under various physical, social, and economic constraints on their capacity for self-improvement. Given the urban population growth rates of about 2.6 percent, and even higher rates for the lowest income groups, it is clear that Medan's poor represent a massive population in urgent need of assistance.

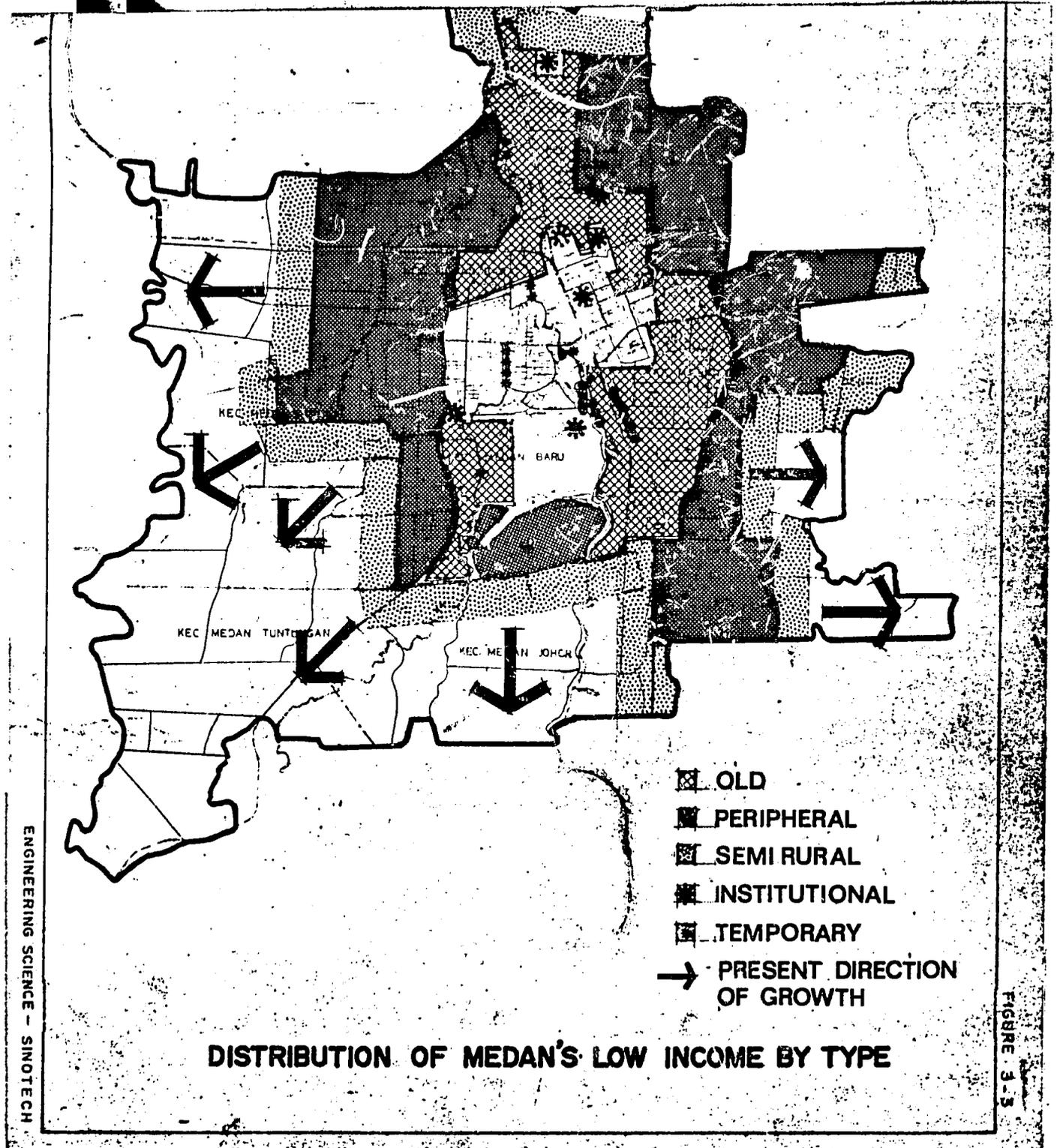
FIGURE 3.2

DISTRIBUTION OF MEDAN'S LOW-INCOME POPULATION BY TYPE
1978

Type	1978 Population (persons)	Residential Density (persons/ha)	% of Total Kotamadya Population
Old	344,600	250 - 650	30.0
Peripheral	279,500	100 - 200	25.0
Temporary	58,300	250 - 799 ^b	5.2
Institutional	34,800	250 - 450	3.1
Semi-rural	160,400 ^a	50 ^c	14.4
Total	877,600		78.6 %

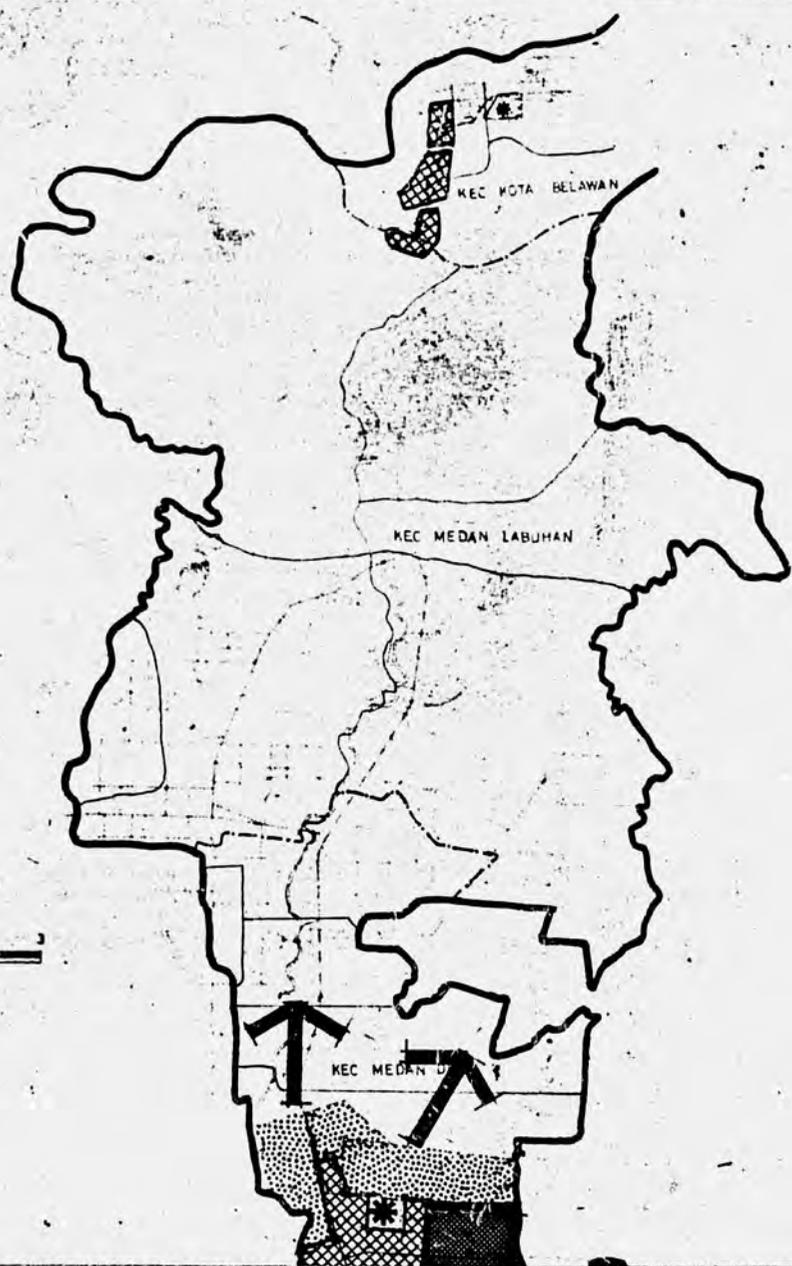
- Note: a. Based on the assumption that 75% of the population of Kotamadya Medan that lives in non-built up areas is low-income.
- b. Based on a sampling of kampungs contained in this type.
- c. Based on an estimate of occupied areas.

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Therefore, it is important for Medan to move as rapidly as possible away from a project by project approach to implementation of a program approach on a city-wide scale as a basic instrument of urban development policy. Such a program approach needs to recognize three fundamental objectives in planning :

1. Existing housing stock, even if substandard, needs to be preserved and improved (at least environmentally) with minimum dislocation to existing residents.
2. Sufficient land must be urbanized with minimum public services to accomodate existing deficits and the increments of new urban population expected annually.
3. The fundamental social and economic requirements in terms of jobs and income, health, and education must be given priority for the entire low-income population.

A well worked out city-wide program to deal with these overall objectives will allow forward planning for project implementation on a planned annual basis. It will allow the selection of project areas to be integrated into the overall development strategy of the city. It will permit the more efficient use of capital and management resources. It will provide a framework to allow the city to respond quickly to unforeseen opportunities by having a planned backlog of projects available for accelerated implementation if additional funds are available from national or international sources. Finally, but importantly, it will allow operation of an overall monitoring and evaluation system to allow for steady improvements of methods and techniques to be fed back into the project development process.

As important as the city-wide program approach is, it will take several years to be fully organized. Clearly, immediate action projects need not wait for the program planning process to be completed. In fact, early project experience can contribute to the overall city-wide planning program.

The planning for a sites and services city-wide program would related directly to the KIP program in that both are designed to serve target groups with similar physical and socio-economic characteristics.

In planning a sites and services program, the standards used should be relevant to the desired standards applicable to the settlement upgrading project. The mix of supplemental social and economic program components would generally be those relevant for the kampung target groups who will be the main groups of concern.

The planning of a city-wide sites and services program is also based on an estimate of future populations increases to be expected, approximately 25,900 households by 1983/84 and about 100,000 more by the year 2000. Even though the households moving to a sites and services project will most likely already be resident in the city, the idea is to balance new urban growth with population growth in order to prevent densities within existing low-income settlement areas from rising too high. The site selection process for sites and services projects will be of the utmost importance, and any effective and continuous city-wide program will need to have a workable land acquisition plan.

The city-wide housing strategy should be designed so that it clearly responds to the real needs of all income groups. In addition to recognising the importance of achieving better living conditions for lower-income groups, the high level of unsatisfied demand from upper and middle-income groups must be taken into consideration. Otherwise, these groups will tend to preempt and buy out the improved housing or sites and services projects developed for low-income groups. One way of relieving this pressure that will be investigated is to encourage private developers to build for lower and lower-middle income groups. For this to happen, the role of BTN becomes quite important, along with the whole question of land tenure and land security.

3.3.2 The Role of the Public Sector

The role of the public sector is divided into two major components kampung improvement and site and services core housing/low-cost housing. The existing poor population residing within the built-up area of the Kotamadya will be served through the city-wide KIP program. The KIP target population contains approximately 682,400 persons (117,650 households) in old, peripheral and temporary kampungs. The other low-income households of the institutional and semi-rural kampungs are to be served by other public and private actions outside of the scope of Medan KIP.

Based on an estimated annual growth rate of 2.6 percent over the period 1979-1989 and 2.5 percent during 1990-2000, the increase in the existing target population until the year 2000 will be dealt with through SSCH/LCH projects, through the densification/expansion of the already existing target kampungs, or through private sector non-profit housing groups.

The selection of the compined Domestic and Expanded Domestic/ External programs for kampung improvement (see Section 3.4.2 KIP Feasibility Analysis) yields the following results :

Year	Coverage of Population by Repelita	Percent of Target Group
1979 - 1984	140,000	20
1984 - 1989	210,000	30
1989 - 1994	245,000	35
1994 - 2000	245,000	35*

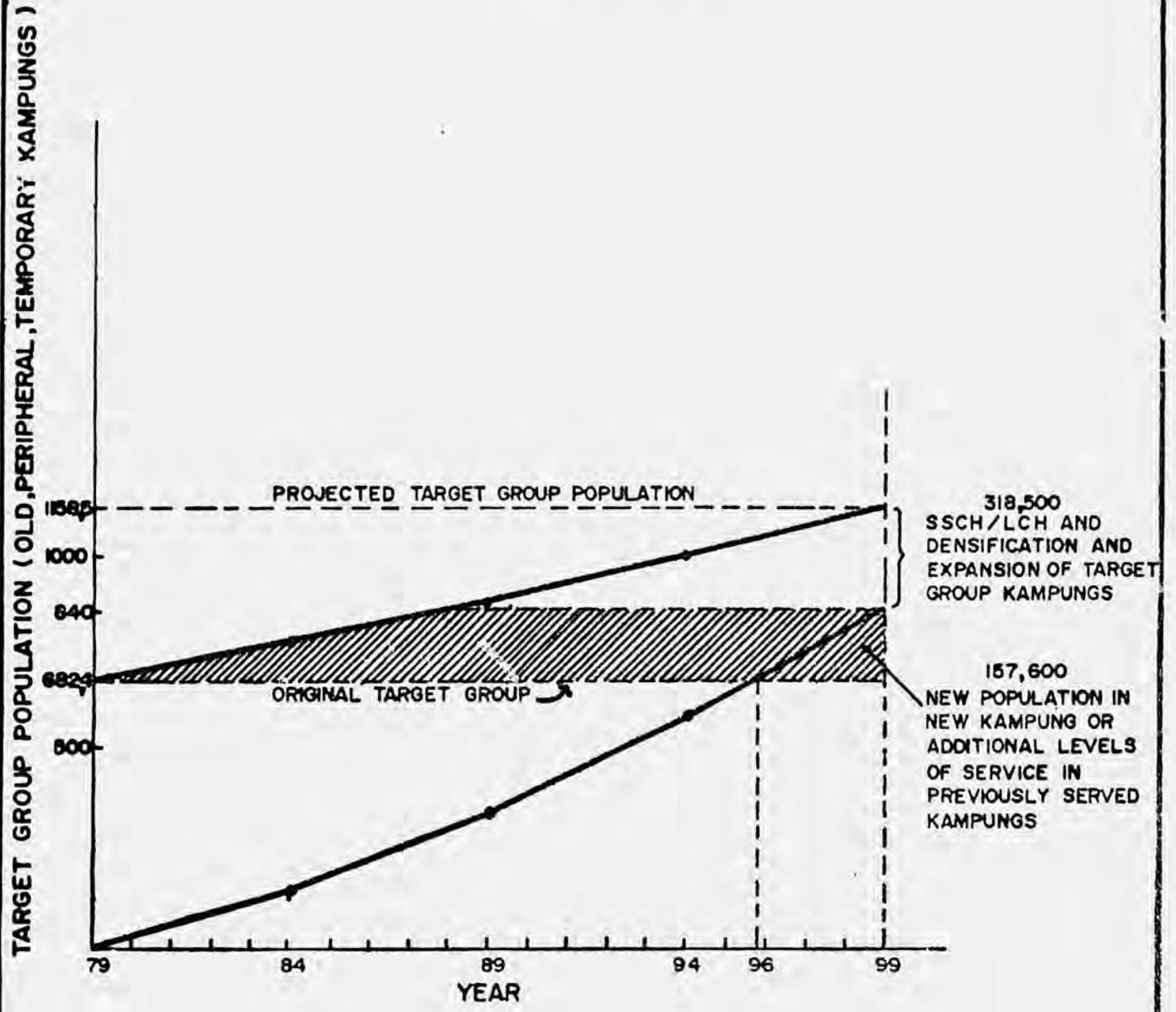
* Percentages based on a total target population of 700,000 persons.

Kampung improvement will serve approximately 840,000 persons by the year 2000. The original target population will be served by the year 1996, and an additional 158,000 persons may be served in new kampungs or in previously served kampungs (with increased levels of service). The remainder of the increase in the target population will be absorbed in PERUMNAS' SSCH/LCH projects and/or private sector non-profit housing groups. Figure 3.4 summarizes graphycally the housing strategy presented for the public sector in this section.

3.3.3 The Role of the Private Sector

The private sector (profit and non-profit) presently produces very few housing solutions for those households with monthly expenditures below the 50th percentile (Rp.37,000/month). The several small contractors who do construct "low cost" housing work almost exclusively for PERUMNAS. Their capacity to produce minimal housing solutions outside of PERUMNAS is severely restricted by their inability to obtain construction and mortgage financing from Bank Tabungan Negara (BTN).

HOUSING DEVELOPMENT FEASIBILITY ANALYSIS MEDAN 1979



The non-profit construction contractor Koperasi Serba Guna (Koserma) has fared better than the small private contracting firms in its ability to attract BTN financing. It is provided with financing during the construction stage and mortgage financing at 9 percent for 15 years. Over the past few years, Koserma has built on its own approximately 600 units ranging in size from 36 to 72 square metres on plots from 200 to 250 square metres. While Koserma's primary goal is to build inexpensive housing for retired army personnel, and in fact, with the exception of PERUMNAS, is producing housing at a lower cost than has been produced in the past, BTN financing restrictions have required applicants to possess at least a GOL III salary of Rp.60,000 per month, well above the median expenditure level for Medan, placing these units out of reach of the great majority of Medan's poor population. Presently, in an attempt to expand its base of operations, Koserma has begun to construct houses as a sub-contractor to PERUMNAS. It has already constructed 1300 units in Medan I and II.

3.3.4 The Role of Bank Tabungan Negara (BTN) and Housing Finance

Bank Tabungan Negara (BTN), organized as the national housing mortgage bank in 1974, began small scale finance operations in late 1976. As of old-1978, it had made only 1100 loans and commitments for another 7,650. Its target for FY1978/79 was 10,000 additional loans. All of these past loans have been made to members of the civil service and the Military. Significantly the average borrower still has quite a high income of approximately Rp.65,000 per month. The average loan per unit has been about Rp. 2 million with terms of 12 percent interest per year for 20 years.

BTN is just beginning to make a successful transition to becoming a housing finance agency and major administrative and coordination problems still need to be solved. BTN has not made any loans to residents of PERUMNAS projects though financing for PERUMNAS was one of the major reasons for establishing the institution. A number of other issues remain to be solved :

1. Development of a uniform mortgage instrument;
2. Development of an effective method for repossessing property delinquent in mortgage payment; and

3. Generation of sources of monies for housing finance.

In order to become an effective participant in the solving of the Nation's housing problems during Repelita III, BTN must move towards resolution of these issues.

3.3.5 The Role of the Construction Industry

The formal production of low and lower-middle income housing in Medan on PERUMNAS' Medan I and II projects has been done by small contractors. The several small firms used on these projects use almost exclusively labor intensive methods and operate without the architectural/engineering capabilities found in most larger Jakarta firms. Most of the project tasks from excavation to the mixing of concrete and mortar are done by hand. PERUMNAS' use of small contractors, while necessarily implying certain management, manpower and financial problems, has provided them the opportunity to build capacity and experience. An accelerated program of technical assistance and credit to these firms is required.

Building Materials. To date most PERUMNAS projects have made use of building materials made by modern technologies. These include cement for concrete slabs, yumen and wood wool for partitions and corrugated zinc for roofs. PERUMNAS' use of materials produced by capital intensive methods has in part been dictated by the historic supply problems associated with materials produced by small, labor-intensive industry. These products have included clay tiles, bricks and bamboo mats. In the future, however, and in conjunction with reduced project standards, an attempt must be made to reduce the supply bottlenecks of these materials, and to incorporate them into PERUMNAS' projects where feasible. Improved distribution systems and quality control will also be required to make this possible.

3.4 KAMPUNG IMPROVEMENT PROGRAM (KIP)

3.4.1 The Role of KIP in Medan

Repelita III marks the clear recognition of the KIP Program as an integral element of national and local government strategy to meet the needs of the low-income urban poor.

For the City of Medan, the KIP program offers the potential to :

- 1) serve the lower 20% of the population in need of minimal services who cannot afford sites and services plots and low income housing units;
- 2) stimulate more development activities by kampung residents thereby mobilizing additional human resources; and 3) cover a large number of persons with minimal essential services.

While KIP programming will vary from kampung to kampung in order to fulfill its potential, the primary focus for Medan should be on the improvement of :

- The household's physical environment (roads and footpaths, drainage, water supply, etc)
- The household's access to educational, health and nutritional facilities and services
- The household's productivity through vocational training, credit to small-scale home industry, and employment generating activities.

Significantly, the implementation of KIP in Medan over the period of Repelita III must deal with two rather significant limitations.

These are :

1. Technical Constraints : Although the level of technical and professional resources available to the local government is comparable to similarly sized cities throughout Indonesia, the Kotamadya of Medan does not now have sufficient trained staff to carry out a greatly expanded development program. While, over the long run, this problem can be closely related to the city's finances, even large amounts of money during Repelita III would not remedy the basic problem of finding experienced competent technical persons in the magnitude required.

A total of 15 professionals staff the 5 most important KIP related agencies. A KIP program that attempted to increase the level of works quickly could spread these staff resources even thinner and negatively effect the ongoing development activities.

These technical limitations suggest the possible need for a separate KIP Unit. However, before such a recommendation is

made, the effectiveness of a separate unit in dealing with existing Kotamadya agencies must be considered. Coordination could be facilitated by adequate representation of such agencies at the policy, planning and implementation levels of the KIP program in accordance with their current capacities and responsibilities.

2. Financial Constraints : The point of departure for an analysis of Medan's financial capacity to pay for a city-wide kampung improvement program is the Kotamadya's present expenditures from all sources on KIP related programs. From the present trends in municipal KIP expenditures, projections can be made of estimated expenditure levels over REPELITA III. The following table details the City's expenditures, from all sources, on KIP related programs for the five year period 1974 to 1979. With the exception of the period between 1975/76 and 1976/77 these expenditures increased in real terms. (See Figure 3.6) The following four hypotheses will be used to determine the potential range of projected expenditures levels on KIP related programs during REPELITA III :

1. Continuation of present levels in real terms.
2. Continuation of previous yearly real growth in expenditures during the period 1974 to 1979.
3. Continuation of constant real per capita expenditures.
4. Continuation of constant real per hectare expenditures.

Based on the Kodamadya's KIP related expenditure level for 1978/79 and on the four possible projection hypotheses, Figure 3.7 estimates the funds that would be available at the City level for KIP related programs.

Given the trend towards decreasing yearly real percentage increases in KIP related expenditures since 1975 (including a real decrease between 1975/76 and 1976/77), it would be overly optimistic to suppose that the Kotamadya's available funds for KIP related programs over REPELITA III be based on the real increases experienced between 1974 and 1979.

FIGURES 3.5

KOTAMADYA MEDAN EXPENDITURES ON KIP RELATED PROGRAMS 1974-1979
(IN THOUSAND RUPIAHS)

Source of Spending	1974/75	1975/76	1976/77	1977/78	1978/79
Municipality ^a (own revenue)	236,837	411,150	362,467	435,791	468,860
INPRES ^b Infrastructure	100,825	222,744	247,762	271,348	270,590
Health	7,048	68,147	93,015	80,359	103,506
School	33,000	175,180	198,750	368,370	542,500
INGUB ^d	n.a.	n.a.	2,375	29,902	4,442
Desa Subsidies ^c	24,981	36,700	35,250	41,650	41,650
Total Spending	402,691	914,321	939,619	1,227,420	1,431,548

- a. Finance Dept. Realization of the Development Expenditures with Elaboration of MUDS.
 b. Finance Dept., Inpres Section with Elaboration of MUDS.
 c. Sub Directorate of PMD.
 d. Bappeda Municipality.

FIGURE 3.6

REAL INCREASES IN EXPENDITURES ON KIP RELATED PROGRAMS 1974-1979

Year	Total Absolute Expenditure (Rp. Thousand)	Cost of Living Index 1*	Annual Increase (%)	Total Real Expenditure (Rp. Thousand)	Yearly Real Increase In Expenditures (%)	Total Kota-madya Medan Population (Thousand)	Per Capita Real Expenditure (Rp)
1974/75	402,691	1.226	22.6	328,459	96.9	988	332
1975/76	914,321	1.414	15.3	646,620	-10.7	1032	627
1976/77	939,619	1.627	15.1	577,516	15.8	1079	535
1977/78	1,227,420	1.836	12.8	668,529		1091	613
1978/79	1,431,548	2.026	10.3	706,588	5.7	1123	629

* Based on 1973 = 1.00

SOURCE: Indikator Ekonomi, Biro Pusat Statistik, Jakarta, December 1978

FIGURE 3.7

ESTIMATED AVAILABILITY OF FUNDS FOR KIP RELATED PROGRAMS
DURING REPELITA III, MEDAN

Year	Continuation of Present Real Levels ^a (Rp Thousand)	Continuation of Previous Real Yearly Increases ^b (Rp Thousand)	Continuation of Constant Real per Ca- pita Expendi- tures ^c (Rp Thousand)	Continuation of Constant Real per Hec- tare Expendi- tures ^d (Rp Thousand)
1979/80	1,575,000	1,734,000	1,616,000	1,583,000
1980/81	1,732,000	2,099,000	1,825,000	1,751,000
1981/82	1,905,000	2,542,000	2,060,000	1,937,000
1982/83	2,096,000	3,079,000	2,326,000	2,142,000
1983/84	2,306,000	3,728,000	2,626,000	2,369,000

- a. Based on 1978/79 expenditures of Rp. 1,431,548 thousand and estimated increases in the cost of living of 10 percent per year over REPELITA III.
- b. Based on the 1978/79 expenditure level and yearly real increases of 21.1 percent (compound annual increase from 1974 to 1979).
- c. Based on the 1978/79 expenditure figure, an annual increase of 10 percent in the cost of living and an annual growth rate of 2.6 percent in Medan's population.
- d. Based on the 1976/77 expenditure figure, an annual increase of 10 percent in the cost of living, and an annual increase of 16 hectares in the residential area occupied by the population living in low-income kampungs. (Approximately 0.5 percent of existing built up, low-income Kampung residential area).

On the other hand, the results produced by the other methods give amounts only slightly larger than projections based solely on no real growth for the program. This view is probably overly pessimistic. The MUDS team is presently in the process of thoroughly analyzing the Kotamadya's financial status. Both expenditures and revenues out are being investigated. While a clear picture has not yet emerged as to how the Kotamadya's total expenditures on KIP related programs will increase in the future, it is not unreasonable to assume a real annual increase of 10 percent. Modifications to this estimate will be made based on the findings of this investigation and documented in a future report.* The following table (Figure 3.8) reflects this 10 percent real increase in KIP related expenditures during REPELITA III.

The current financial limitations of the Kotamadya when considered in the context of the current consumption levels of Medan's urban poor in the area of water supply and sanitation clearly suggest that the KIP program should give priority consideration to complementing the efforts of the existing public service agencies. This would be done by directly focusing and integrating KIP program development activities with the first stage program for water supply and sanitation, providing distribution networks, and environmental health services to complement major investments in trunk infrastructure provided through the principal entities in Medan responsible for water and sanitation.

3.4.2 Feasibility Analyses - Levels of Short and Long Term Programming

The primary group to be served by Medan's KIP Program (See Figure 34) contains approximately 682,400 person. This total 1978 population includes those households presently residing in old, peripheral and temporary kampungs.

* See Section 20 of the long term Urban Development Plan.

FIGURE 3.8

ANTICIPATED REAL INCREASE IN KIP RELATED EXPENDITURES
DURING REPELITA III

Year	Total Real Expenditure * (Rp. Thousand)
1979/80	1,718,000
1980/81	2,061,000
1981/82	2,474,000
1982/83	2,968,000
1983/84	3,562,000

* Total real expenditure based on a 10 percent increase in the cost of living and a 10 percent increase in the expenditure level of the program.

One question that needs to be resolved is that given limited financial resources, should KIP be focused initially on a comprehensive multi-sectoral effort to be made in a small number of kampungs or should KIP be used as part of a city-wide development strategy that spreads resources more thinly.

The answer to this question is directly related to the size of program required to produce a meaningful impact in Medan over Repelita III and beyond. The success of KIP in providing basic essential urban infrastructure improvements depends on covering a large enough area in a short period of time to avoid "encroachment" or excessive movement of both lower and middle income households who have not received such improvements in their kampungs. Correspondingly, as suggested earlier, too large an initial KIP program in Medan could overburden both the Kotamadya's technical and financial resources.

Given the financial and technical limitations which the Kotamadya will encounter in the implementation of a city-wide KIP program in addition to the existence of an ongoing Pilot KIP program, it is recommended that, rather than present several alternatives which merely require a choice between greater or lesser levels of spending per capita/ per hectare and/or greater or lesser yearly coverage of the target population (in terms of hectares), a phased program based initially on national and local government's capacity to sustain the program from domestic funding sources and incorporating all Kotamadya KIP activities within one financing and administrative package be undertaken. In later phases the program could be expanded depending on the availability of additional national and local resources and/or financing from an international lending agency. The following sections briefly discuss a Domestic Program for KIP based on Cipta Karya guidelines found in REPELITA III and two possible options which include external financing.

Domestic KIP Program. The Domestic KIP Program is based largely on the guidelines for kampung improvement established in Cipta Karya's program for REPELITA III. For large cities like Medan, a minimum of approximately 200 hectares will be improved over REPELITA III.* Financing for this Domestic Program will be supplied from national and local levels.

* If additional national/local and/or international funds were available, the total number of hectares covered during REPELITA III could be increased.

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It is anticipated that the national government will supply Rp.3.1 million per hectare (for direct construction, planning, supervision, monitoring and training) for a minimum of Rp.620 million for Medan over REPELITA III. This amount should cover roughly 60-70 percent of the program, with the remainder being supplied from the Kotamadya's budget.

The Domestic KIP Program would make use of previously budgeted, readily available funds to initiate programs of immediate action in kampungs of greatest physical priority. These programs should include solid waste, water supply, drainage, etc. A program similar in concept to this is already underway in Medan under Cipta Karya's and the Kotamadya's pilot program for Kotamatsum I, II and III. This pilot program, already in the final design stage, involves a physical upgrading program for 1979/80 for approximately 75 hectares at a cost of Rp.475 million.* At 400 persons per hectare, the program will serve roughly 40,000 persons (6 percent of the total population targeted for KIP). The Rp.475 million are financed in the following manner :

Cipta Karya KIP Program

(From Cipta Karya funds budgeted for KIP over Repelita III)	Rp.2.8 million/ha x 75 ha = Rp.210 million (Physical program) Overhead	= " 15 "
		<u>Rp.225 million</u>

Urban Sanitation Program

(Used to fund off-site infrastructure - not from Cipta Karya's Repelita III KIP budget)

Kotamadya

PAM Tirtanadi

" 100 "
<u>Rp.325 million</u>
" 100 "
<u>" 50 "</u>
Rp.475 million

T O T A L :

* Even though the pilot KIP program for the Kotamatsums was financed on the basis of 75 ha, the scope of work for the final design specifies a corresponding kampung area of 118.3 ha. For the purpose of simplifying the calculations of this section, the Kotamatsum KIP area will be taken as ± 100 ha.

In this program, the combined financing of the Kotamadya and PAM Tirtanadi represent 32 percent of the total project budget.

Assuming a similar level of financing for the 100 hectare MUDS Domestic Program for REPELITA III -- Cipta Karya supplying Rp.395 million (60%) and the Kotamadya Rp.263 million (40%), a total of Rp.658 million would be generated which would benefit 40,000 persons, or 6 percent of the total KIP target group. Combining the Kotamatsum Pilot Program for Medan results in a total cost of Rp.1,033 million. This figure yields a per hectare cost of Rp.5.17 million and a per capita cost of Rp.12,900 (US\$20.80). While it is anticipated that this program would be financed jointly by Cipta Karya and the Kotamadya, it is obvious from Figures 3.8 and 3.11 that the Kotamadya alone could easily finance this Domestic KIP Program. At no time during REPELITA III does the total yearly budget for the Domestic Program exceed even 10 percent of the City's total funds that are projected to be available for KIP related programs.

Option #1 - Expanded Domestic/External Program. In the event that additional domestic (national and/or local) and external financing are available, the Expanded Domestic/External Program would supplement the on-going Domestic Program. While the on-going Domestic Program is focused mainly on improvements to the household's living environment, the Expanded Domestic/External Program, while still concentrating on the solution of more costly environmental problems, will also focus on the other two main components of kampung improvement. These two areas are the improvement in the family's access to educational, health and nutritional facilities and services and the improvement in the family's productivity through vocational training, credit to small-scale "home" industry, and employment generating activities. Due to the administrative and technical complexities involved in the design and implementation of programs in both of these areas, and the time required for negotiations with foreign donors, it is recommended that, in order not to delay the immediate implementation of priority physical improvements, the KIP programs focusing on the family and its improved productivity be developed in the second phase Expanded Domestic/External Program.

The availability of additional funds from both domestic and external sources would allow an increase in both the hectare coverage and per capita investment of the program over REPELITA III. The original 200 hectares of the Domestic Program would be expanded to cover an additional 150 hectares. This coverage would serve an additional 60,000 persons (9% of the total KIP target group) during REPELITA III. Based on previous programs partially financed from external sources, per capita investment could be increased to Rp.24,600 (US\$40.00) for the first three years of the program (1979/82). The cost per hectare for the combined program would be Rp.12.11 million. External sources would supply 66 percent of the supplementary Expanded Domestic/External Program or 50 percent of the total budget (including Domestic Program). The Kotamadya would be asked to supply the greatest share of the remaining required funds. However, referring again to Figures 3.8 which is based on a 10 percent real increase in the availability of City funds for KIP related programs over REPELITA III, it can be seen that the Kotamadya, over the five-year period, would be required to spend a maximum of slightly more than 12 percent of any year's projected KIP related budget on the program.

Option #2 - Maximum Coverage Domestic/External Program. Figure 3.9 shows that only by the year 1996 will the original target group of 682,000 persons be served by a combined Domestic and Expanded Domestic/External Program. Due to the severity of the physical existing and socio-economic conditions, it may not be feasible for Government to wait 17 years to complete a city-wide KIP program for Medan. In that case, Option#2, a Maximum Coverage Domestic/External Program is designed to serve the entire original target population by the end of REPELITA IV (1989). The Maximum Coverage Program is similar in concept to Option #1 in that it would contain components to improve the physical environment as well as programs to improve the family's access to various health and educational facilities and services and its productivity. However, this program would be much wider in scope. In stead of covering 350 hectares and a target population of 140,000 persons during REPELITA III, it would cover 750 hectares and a target population of 300,000. This population represents 43 percent of the designated KIP target group to be served by the city-wide program.

FIGURE 3.9

TARGET POPULATION SERVED BY CITY-WIDE KIP

Program	1979/80	84/89	89/94	94/2000	Total and Percentage of Target Group
Domestic Program	80,000 (11%)	80,000 (11%)	80,000 (11%)	80,000 (11%)	320,000 (44%)
Option # 1	140,000 (20%)	210,000 (30%)	245,000 (35%)	245,000 (35%)	840,000 (120%)
Option # 2	300,000 (43%)	400,000 (51%)	245,000 (35%)	245,000 (35%)	1,190,000 (170%)

* Percentages based on a total target population of 700,000 persons.

Per capita spending would be maintained at the same level as Option #1. External financing would have to provide at least 50 percent of the program's total budget, with the remainder being supplied by the Kotamadya and the national government.

Given current conditions, the Maximum Coverage Program would overload the financial and technical capabilities of the Kotamadya.* In addition, the financial contribution required at the national level would exceed by a factor of four the amount allocated for KIP in Medan during REPELITA III. Not only would a heavy reliance have to be placed on external financing, but also much of the technical expertise would have to be supplied by non-Kotamadya or Cipta Karya employees. For these reasons, a decision to select a KIP program based on the Maximum Coverage Option must be taken at the highest levels of Government.

For the purpose of the present analysis, the Domestic Program combined with Option #1 will be developed as a phased program that will provide minimal essential levels of basic infrastructure and services to approximately 20 percent of the target population during REPELITA III. Figures 3.10 and 3.11 summarize the basic Domestic Program and the two options presented in preceding sections.

* The Maximum Coverage Program would require a maximum yearly contribution by the Kotamadya of approximately 20 percent of KIP related funds during REPELITA III. The degree to which this contribution would place an excessive burden on the City would depend on the additional monies required for Kampung improvement in other low-income, non-KIP areas and non-low-income areas. This question is presently under investigation.

FIGURE 3.10

FEASIBILITY ANALYSIS - REPelita III 1979 - 1984
 APPROXIMATE COST & COVERAGE OF MEAN PHASED KIP PROGRAM COMPONENTS

Phase Level	Phase Level Component	Total Population/ Area Coverage		Yearly Cost of Program (Rp Million) (Note 2)					Total Cost Component Repelita III 1979-1984 (Rp. Million)	Financing Mechanisms			Notes:
		1979-1984 (Note 1)	% of Target Population (Note 1)	1979-1980	1980-1981	1981-1982	1982-1983	1983-1984		Amount (Rp. Million)	% of Total	Funding Source	
Domestic Program	Pilot Program	40,000	6	50	100	-	-	-	375	150	40	Local & Provincial	1. Based on an estimated target population of 682,400 persons living in the old, peripheral and temporary Kotamadya Kumpungs at densities of ± 400 persons/ha. 2. The yearly cost of the program is based on our estimates of when budgeted funds will actually be spent. 3. The Rp.225 million budgeted by Cipta Karya for the plot program does not include the Rp.100 million from the Urban Sanitation Program for off-site infrastructure improvements. 4. Based on per capita costs of Rp.24,600 (US\$ 40.00) over the period 1979-1982 and a per capita cost of Rp.35,977 (US\$ 58.50) during 1982-1984. The per capita cost is assumed to increase by an inflation rate of 10 percent per annum over the 5 year period to 1984.
	Kotamadya 1, II, III	100 ha.		75	150	-	-	-		225 (Note 2)	60	National	
Program	MUDS Program	40,000	6	-	100	100	63	-	658	263	40	Local & Provincial	
		100 Ha		-	150	150	95	-		395	60	National	
Option # 1 Expanded Domestic/External Program	MUDS Program	60,000 150 Ha	9	-	-	200	250	300	3207 (note 3)	750	23	Local & Provincial	
	Additional to Repelita III			-	-	100	115	122		337	11	National	
				-	-	600	700	820		2120	66	International	
Option # 2 Maximum Coverage Domestic/External Program	MUDS Program	220,000 550 Ha	32	-	-	400	500	675	8054 (Note 3)	1575	20	Local & Provincial	
	Additional to Repelita III			-	-	550	650	735		1935	24	National	
				-	-	1150	1500	1894		4544	56	International	

SOURCE : MUDS

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FIGURE 3.11

FEASIBILITY ANALYSIS - REPELITA III 1979 - 1984
 TOTALS FOR OPTIONAL MEDAN KIP COVERAGE LEVELS

Phase Level	Total Population/ Area Coverage		Combined Yearly Cost of Potional Program (Rp Million)					Total Cost of Program Repelita III 1979 - 1984 (Rp. Million)	Financing Mechanisms		
	1979- 1984	% of Target Population	1979- 1980	1980- 1981	1981- 1982	1982- 1983	1983- 1984		Amount (Rp Million)	% of Total	Funding Source
Domestic Program	80,000	12	50	200	100	63	-	1053	413	40	Local & Provincial
	200 Ha		75	300	150	95	-		620	60	National
Domestic Program + Option # 1 Expanded Domestic/Exter- nal Program	140,000	21	50	200	300	313	300	4240	1163	27	Local & Provincial
	350 Ha		75	300	250	210	122		957	23	National
			-	-	600	700	820		2120	50	Internatio nal
Domestic Prog- ram + Option # 2 Maximum Cove- rage Domestic/Exter- nal Program	300,000	44	50	200	500	563	675	9087	1988	22	Local & Provincial
	750 Ha		75	300	700	745	735		2555	28	National
			-	-	1150	1500	1894		4544	50	Internatio nal

SOURCE: MUDS

3.4.3 Selection Of Kampung To Be Improved

The following major criteria were used to focus the selection process on those kampungs which will be planned for improvement by the MUDS team as part of the Kotamadya's on-going, city-wide KIP program :

- High population density per hectare (in the range of 250 to 400 persons per hectare)
- Poor environmental quality with frequent flooding
- Severe public health problems with frequent outbreak of epidemic.

In addition to these criteria based primarily on kampung need, consideration should be given to a kampung's potential for benefiting from a KIP program providing minimal levels of basic infrastructure and services :

- Availability of educational social and religious facilities even though in poor condition
- Strategic location of kampung with respect to development trends of city
- Spirit of cooperation and interest in improvement program by kampung residents.

Based on these criteria and our analysis of Medan's low-income kampungs, on conversations held with key members of local government, and on discussions with Cipta Karya officials in Jakarta, we recommended the improvement of the following ± 250 hectares during Repelita III (see adjoining map) :

FIGURE 3.12

KOTAMADYA MEDAN AREAS SELECTED FOR KIP
1979

Kampung	Population 1979	Residential Area (ha)	Residential Density (persons/ha)	Major Physical Problems
1. Tegal Sari	9,100	39.1	230	Streets, Water, Sanitation
Tegal Sari I	20,600	31.8	650	Solid Waste
Tegal Sari II	5,100	26.8	190	
2. Sei Kera Hilir	14,400	41.4	350	Water, Sanitation Solid Waste
Sei Kera Hulu	6,400	22.3	290	
3. Sidorame Barat	11,600	42.8	270	Water, Street Flooding
Sidorame Timur	4,800	22.7	210	
4. Aur	3,700	7.7	480	Water, Streets, Sanitation
Hamdan	4,600	9.6	480	
Total	80,300	244.2	330	

3.4.4 Planning Standards For KIP

The following table presents the general Cipta Karya KIP standards which will be applied, and modified according, to actual field conditions found in the Kotamadya.

ALTERNATIVE PLANNING STANDARDS FOR KIP

<u>INFRASTRUCTURE</u>	<u>STANDARD</u>
STREETS & ROADS	Dwelling 100 meters from one way road - row 4-5 " 300 " " two " " - row 6-8
FOOTPATHS	20 meters from each house - row 3 meters.
DRAINAGE	Primary and secondary collector drains along roads one year frequency storm, mayor drainage channels five year storm.
WATER SUPPLY	Approximate or slightly improve on coverage of existing open well system with public taps - 35 liters/capita/day and/or deep wells 35-100 liters/capita/day.
SEWAGE FACILITIES	Upgrade existing coverage of pit latrine/ river disposal system to a water sealed latrine and/or MCK unit with septic tank (coverage to depend on existing conditions).
SOLID WASTE	Community solid waste disposal pool (1 or more gerobaks) serving a radius of 125 M. Gerobaks emptied daily to easily accessible 6 M wagons for off site disposal.
HEALTH FACILITIES	1 Puskesmas per ± 30.000 people.
SCHOOLS	1 Primary school per ± 6.000 people. Each student within 300-400 meters of school.
RELIGIOUS FACILITY	100 M ² facility for every 750-1750 persons.
OPEN SPACE AND RECREATION	100 M ² per 1000 persons.
RELATED PROGRAMS	Depending on needs of Kampung. Loans for home improvements, vocational training, small scale industry, nutrition programs etc.

3.4.5 KIP Administration

The administrative complexity and the professional staff requirements of a KIP program require that the program be organized and scheduled in order to minimize the dislocations to the agencies presently involved in KIP related activities. Existing entities should be utilized as fully as possible, rather than creating new special purpose ones. Modest changes in procedures should be emphasized. Established institutional roles and responsibilities as well as ongoing programs and projects should be built upon and strengthened during the implementation of KIP. For this reason it is recommended that the following agencies be involved in the three stages of KIP :

1. Pre-construction (planning, programming, detailed engineering and coordination) - Provincial Cipta Karya, Bappeda, City Planning Department, City Development Office, PMD, and;
2. Construction - Building Information Center (BIC), PAM Tirtanadi, PLN, Public Works, Health, Education and Cleaning Departments, and;
3. Post-construction (management and maintenance) - Kecamatan Head, representatives from kampung/lorong, Desa Social Institution (LSD), KORAMIL, KOSEKTA, City Revenue and Agraria Departments.

The major constraints to achieving effective involvement of the related agencies is that most agencies at the Municipality level do not have sufficient professional staff, especially in the areas of planning and programming. In addition, a serious lack of trained personnel exists at the middle, as well as the lower levels, of the executing agencies such as Public Works and the Cleaning Departments. Considering these limitations, it will presently be difficult for the Municipality to carry on a large scale city-wide, KIP projects.

The ongoing search by the MUDS team for a suitable organization for KIP, either standing alone or integrated within an overall urban development organization, must be focused within the bounds created by the limited technical capacity of the existing Kotamadya KIP related agencies

on the one hand, and the desire to utilize these very same agencies as fully as possible in KIP on the other.

The Role of Universitas Sumatra Utara (U.S.U.). The role of U.S.U. in KIP could be significant, especially in the areas of planning and programming. During the last few years, U.S.U. has coordinated and prepared planning studies at the regional and village levels (Repelita III for North Sumatra and a development study for some villages in collaboration with a Swedish university). Presently, U.S.U. is undertaking the detailed KIP engineering design for Kotamatsum I, II and III. Four organizations at the University which could be more fully involved in the KIP program include :

- U.S.U. Research Institute which coordinates all studies and research activities.
- U.S.U. Center for Population Studies.
- U.S.U. Center for Environmental Studies
- U.S.U. Fakultas Teknik.

Given the above mentioned activities, however, it still remains to be seen whether these various organizations have the time, technical disciplines and inclination required to make a significant contribution to Medan KIP.

3.5 SITES AND SERVICES/LOW COST HOUSING (SSCH/LCH)

3.5.1 Potential and Constraints

Objectives and Purpose

The following general objectives serve as the guiding principles for the PERUMNAS SSCH/LCH program :

1. To initially provide a minimum standard shelter which can be afforded by designated target groups, with in-built flexibility so that the units may be expanded and modified as families' financial capabilities change; and
2. To provide a secure living environment with appropriate health, educational and recreational facilities within a reasonable distance of employment opportunities.

Norms and Standards

Norms and standards for SSCH/LCH projects are only relevant when based upon the ability of low-income target groups' capacity to afford them. In the past, it has been estimated that the least expensive PERUMNAS house cost 40-50 percent more than a comparable house produced informally in the kampungs. This has partially been due to reliance on building materials produced with capital-intensive technologies, such as particle board. In the future, however, while a greater emphasis must be placed on the use of labor intensive, locally-produced building materials, greater flexibility must be shown with respect to project standards such as residential density, provision of minimal levels of public services, and core housing in order to enable households with total monthly expenditures of approximately Rp.20,000 to 25,000 to afford and be interested in SSCH/LCH houses.

Constraints of Land Cost and Acquisition

Land acquisition is presently the major problem facing PERUMNAS and the MUDS team with respect to SSCH/LCH. It is becoming extremely difficult to find anywhere within the boundaries of the Kotamadya large sites in the range of 100 to 200 hectares close to employment opportunities and health, educational and market facilities which may be easily acquired at a sufficiently low cost. The process is further complicated by stipulations that land acquisition must be coordinated between PERUMNAS and several local agencies. The experience of the short-term search for a large site for Medan III by the MUDS' team indicates that these constraints will undoubtedly result in potential locations being found beyond the perimeter of the present built-up area of the Kotamadya.

3.5.2. Repelita III PERUMNAS Program for Medan

Based on a population growth rate of 2.6 percent, it is estimated that Medan's population will increase by 150 thousand persons in the 1979-84 period. Assuming an average household size of 5.8, this estimate suggests an increase of 25,900 households. In addition to this estimate of future housing needs, an existing backlog of about 35,000 dwelling units --caused mainly by overcrowding--must also be considered.

Of the 150,000 - 200,000 new dwelling units to be produced by PERUMNAS during Repelita III, it has been estimated that approximately 10,000 will be allocated to Medan. Considering the 8972 units which are to be built on the recently - initiated Medan II site, it is evident that some 88 percent of PERUMNAS' estimate of housing production for Medan over Repelita III is to be constructed in Medan II. If present PERUMNAS' policies with respect to subsidies and target group (civil servants and military) are continued, PERUMNAS should encounter few problems in finding occupants for these units. If, on the other hand, an additional 12,000 units were produced in Medan III (200 hectares x 60 units/hectare) nearly 80 percent of the total demand of all new households in Medan over Repelita III would be met in Medan II and III. Since the total absorptive capacity generated by the increase in households over the period will be closely approached, site selection and market analysis must be carefully undertaken in order to avoid an unmarketable project.

3.5.3. Feasibility Analysis for Medan III

Site Selection Criteria

The following criteria are being used in the site selection process for the Medan III SSCH/LCH project :

1. Conformance to Medan's development plans;
2. Cost of raw land;
3. Facility of acquisition;
4. Topography of site;
5. Soil and erosion difficulties
6. Proximity to existing infrastructure network;
7. Proximity to socio-economic infrastructure;
8. Proximity to employment centers;
9. Site area sufficient for project; and
10. Site development costs.

While all these criteria have been taken into consideration, three criteria are being emphasized in order to locate a suitable site during the time frame of the MUDS project :

1. Cost of raw land must be kept to a minimum (Rp.500-1000/m²);
2. Facility of acquisition through the purchase of the site from one, or at most two, individuals or plantation estates; and
3. Topography of site must not be too wet or level so to present drainage and cost problems or too steep so as to place physical limitations on how structures can be fitted to the terrain without extensive grading costs.

Experience to Date

While a definite decision has not yet been made on a site for Medan III, three sites have been identified for further analysis by PERUMNAS and the Kotamadya. The three sites are the following :

1. Km 10 of Brastagi Road

A previous Memorandum gave a preliminary analysis of 160 hectares at km 10 of Brastagi Road. The site is currently used as a rubber plantation. It is traversed by one large stream and two smaller ones which flow in well-defined channels. The site is essentially located on three levels with varying degrees of developability :

1. Narrow streams and their floodplains which are unsuitable for development;
2. Terraces possibly suitable for housing development and small valley floors which could be drained for agriculture or public uses; and
3. Upland areas suitable for housing development.

Of the total 160 hectares, it is estimated that roughly 127 hectares or 79 percent of the site could be used for housing development.

Soil conditions over the site appear to be uniformly silty clay which is generally unsuitable for sub-surface disposal of wastewater. However, the site is ideally suited for the installation of gravity sewers to treatment sites (waste stabilization ponds) which could be located on the terrace levels.

The slope of the site on the upland and terrace areas provides excellent drainage. Water supply is available from the water distribution system, approximately 3 kms to the northeast along the Brastagi Road, or from deep wells drilled on site. Electricity could be supplied from planned secondary distribution feeders. The topography and configuration of the site will necessitate additional costs for channel improvements and for bridges and culverts.

The following costs are additional costs of site development attributable to the particular topography and configuration of the site :

Land

Assuming a unit land cost of Rp.750 per square metre with 79.3 percent of the site developable for housing the cost per developable square metre is Rp.946.

Drainage

Rp./m²

Channel improvements,	
Valley floor and lower terrace improvements	
Lump sum 8.8 million	= 6.9

Access

Bridges - 2 @ 5.3 million Rp. each	= 8.3
Culverts - 4 @ 2.0 million Rp. each	= 6.3
Additional main road costs - 7 metres/ hectare @ 8,000 Rp/m	= <u>5.6</u>

TOTAL

27.1 Rp/m²

2. Kp. Masyhur - Kec. Johor

Approximately 200 hectares are located between the Babura and Deli Rivers in Kp. Masyhur, Kec. Johor, south of Polonia Airport. At the request of PERUMNAS, a very preliminary analysis of this site was undertaken. No cost estimates of site development have as yet been made. Approximately 20 percent of the site is poorly drained and presently used for rice cultivation. It would be difficult to use the entire 200 hectares of this site without extensive filling and grading.

However, the site is divided into two fairly well-defined sections. The western section containing approximately 93 hectares is criss-crossed from north to south by rice paddies (27 percent of area) and would be extremely difficult to develop for SSCH/LCH. On the other hand, the eastern section, containing roughly 100 hectares is much more suited for SSCH/LCH development, with only 13 percent of the total area being poorly-drained. This 13 percent is found in two well-defined areas of the eastern section and could be partially filled depending on available funds and project requirements.

In summary, the site could be attractive to PERUMNAS in the event that approximately 100 hectares were needed. Further analysis will be required in order to determine more precisely the amount of usable land and the potential for the disposal of waste and surface water.

3. Site 10 kms to the Southwest of Pancur Batu

The first two sites are presently being discussed by PERUMNAS and local government. The third site was visited by the project team on June 23. Due to the roughly 30 kms that separate this site from downtown Medan, it should not be given further consideration for Medan III.