

HOUSING DEVELOPMENT

REPUBLIC OF INDONESIA

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MARCH 1973

OVERSEAS TECHNICAL COOPERATION AGENCY
GOVERNMENT OF JAPAN

事務協同事業団	
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PREFACE

The Government of Japan, in response to the request of the Government of the Republic of Indonesia, has agreed to conduct a survey of Housing Development in Indonesia as a part of its technical co-operation program, and entrusted the Overseas Technical Cooperation Agency to perform the above survey.

In view of the great importance of this project in Housing Development in Indonesia, OTCA organized survey team composed by specialists in technical and legal field headed by Mr. Yoshizuki Mizukoshi, senior policy planning officer, Secretariat to the Minister, Ministry of Construction, and despatched it two times to Indonesia each for three weeks from December 4, 1972 and from February 4, 1973 respectively.

Thanks to the unlimited cooperation and support extended by the officials concerned of the Indonesian Government, the mission was able to carry out its field survey smoothly and accomplish its objective.

Upon return to Japan, the mission made a further study on the findings obtained in the field and compiled a report which is now ready for presentation.

This report contains the result of study of necessary policies or countermeasures which are to be taken by the Government of Indonesia now suffering from rapid increase of population, as well as of what types of expert are to be needed for solving these problem through the investigation of the general conditions of housing, building materials and related systems such as legal or financial system of the country

It would give us a great pleasure if the result of this survey will contribute to the housing development in Indonesia as well as further promotion of friendly relations between the two countries.

In conclusion, we wish to express our heartfelt gratitude to the officials of the Indonesian Government and many other people who rendered generous assistance and cooperation to the survey team in accomplishing the assigned task.

March 1973



Keiichi Tatsuke
Director General

Overseas Technical Cooperation Agency

SUMMARY AND RECOMMENDATION

It is the purpose of our mission of the Government of Japan to make a preliminary survey for the future international technical assistance on housing development and building material development, proposed by the Government of Indonesia.

Our first group, consisted of five specialists of housing planning, urban planning and housing production, stayed in Indonesia from 4th to 24th December, 1972, and visited Djakarta, Surabaya, Bandung and the auxiliary regions.

The second group, consisted of three building material specialists, stayed from 4th to 24th January, 1973, and visited the above three cities.

Owing to the sufficient advice and cooperation of the Government of Indonesia and the Governments of provinces and municipalities concerned, we could obtain a fruitful achievement for our task within quite a short term.

Upon the departure from Indonesia, each of the two groups submitted briefings of the survey (q. v. Attached No. 1 and 2 to this report) to Ir. Rachmat, Director General of Housing, Building, Planning and Urban Development, Ministry of Public Works and Power.

For the promotion of housing development, there are so many overall and complicated problems to be solved at the same time: e. g. steep population increase, rapid urbanization and squatters growth, low income level, dual structure of economy and society, shortage of socio-economic-techno capacity, etc.

In order to develop socio-economic-techno potential and policy and system formulations, we keenly felt a sort of experimental-pilot projects of large scale housing development should be undertaken by the Government.

In other words, it seems to us that it is best at this moment to let this sort of projects function as catalyst or detonator in order to develop the great potential of Indonesian people, sufficiently.

Our views and expectations are produced by the following considerations.

1. A problem of housing development is neither an isolated political target nor a simple part of social welfare. It is closely linked with the development of the general economy of a country and has a social, political and technological issue.

It is very important to recognize that promotion of housing development stimulate

effectively a nation's economic growth and in addition provide many more employment opportunities.

2. From social viewpoint, an adequate housing as well as food and clothes, is a basic human need, and its absence causes inevitably a steady deterioration in national health, the collective will to progress, the maintenance of political stability and the preservation of law and social order.
3. From physical viewpoint, mass production of housing increases industrial potential through providing rationalized factories, transportation facilities, etc. and producing well-trained engineers, laborers and the other professional people.
4. Housing shortage is in fact a product of extreme population increase and rapid urbanization. Especially, in major cities like Djakarta, Surabaya, etc., the supply of housing has not kept pace with the growth of cities and added to this is the shortage of services and amenities leading to the lowering of standards of environment. Generally speaking, the consumer price and rent of housing has been rising steadily. While income of majority of urban inhabitants remains at a low level, the cost of housing is going higher and higher. The low income group always have to find that the house which was within their reach several years ago is now far beyond their reach. This situation obviously leads to the production of squatters where overcrowding, substandard living, hovel, shanty structure and all resultant ills, are seen.
5. The present squatters in Indonesia, apparently in Djakarta, has already reached unmanageable proportions. It is said the squatters' inhabitants in Djakarta has been estimated more than 800,000.
The effective solution is neither the removal of squatters from urban areas, the legal prohibition of further growth of squatters, the isolated promotion of kampong improvement programs, nor the simple supply of housing.
The solution must be a program of comprehensive complex of the above and new approach, planned and undertaken by an unified governmental organ.
6. As a sort of physical measure, it may be considered to supply a large quantity of proper and rationalized materials into the market for the improvement of urban and housing conditions. But the rationalized factories for this purpose must not be run in full operation, because of shortage of consuming capacity and low-cost-incentive (even when bad quality) of contractors and people.

From this viewpoint, it is effective for creation of future marketability to provide a governmental demand by means of construction of the large scale housing projects. The similar situation as the above is being found in improving the traditional and locally available materials and in smoothing their circulation.

7. Considering rent paying capacity (at highest, up to 20% of family income) of the majority of population, it is necessary for the Government to subsidize their housing, substantially. Even when they are given lots through the sites and services program, they are able to build only shanty houses and undoubtedly their quarter will turn to the new slums in quite a near future.

The importance is not only to provide building land to people, but to let them build proper housing on the land and/or to supply large number of multiple dwellings by the need to effectuate the future urban transportation and public services. Unfortunately, investment into these housing field can not be expected at present, because of high rate of interest and low intent of saving.

8. From economic viewpoint, promotion of housing development and building industry have much greater repercussions in the national economic growth, than those of the other manufacturing industries. This fact must attach importance to enlargement of employment opportunity.

It is understandable that the Pelita I think much of housing development but allocated small funds because of urgency of agricultural development and infrastructure rehabilitation. But it is keenly desired Pelita II takes long strides in the housing and related fields.

9. For a great leap of the national housing policy in Pelita II and future, it is essential to establish an unified and centralized government organ, which should play comprehensive and united roles in housing policy as follows;
 - 1) Planning, implementation and management of large scale pilot housing projects in the major cities, proposed in Chapter IV,
 - 2) Kampong improvement program,
 - 3) Site and service program,
 - 4) Housing loan, mortgage insurance service, etc. ,
 - 5) The other housing measures taken by the Government.
 - 6) Maintenance and enforcement of laws related urban development and building regulation.

The funds of the organ is to be allocated by the National Government. She would be able to expect international economic cooperation, especially in types of grant and concessional loan, as the developed countries are intending to cooperate with these programs in future.

10. Large scale housing development projects, proposed in Chapter IV, can be also expected to play roles of experimental-pilot projects, for the purpose of formulation of the related legislation and systems, accumulation of technical practice, provisions of building materials factories and circulation, and more-over, the projects must play demonstrations which produce people's progressive desire and march on to tomorrow. It is desirable that this sort of projects in major cities are successively implemented in the other big and minor cities. Those projects would leave benefit-able bequests to each of those cities.

Finally, we have reached to recognition; it is proper, adaptable and necessary as the international technical cooperation program, (1) to send the following experts in order to cooperate with the Indonesian Government for a long term (e. g. three-five years), (2) to supply them the necessary instruments and equipments, (3) to defray the concerned local cost, and (4) to establish scholarship for training the Government officials in the experienced countries.

- 1) One expert of urban and housing planning, to cooperate in comprehensive housing policy and development, as a senior advisor to Director General, Housing, Building, Planning and Urban Development, Ministry of Public Works and Power.
- 2) Three experts of housing development projects, to cooperate with the Government officials and the related personnel; in establishment of master plan and workable program, in cost and material estimate and in implementation of construction, etc. for the large scale housing projects.
- 3) Two experts of building material production, to cooperate with the Government officials and the related personnel; in planning production, supply and transport of building materials for the large scale housing projects, and in development of building material industry. And also market analysis and planning is to be expected for supply and transport of building materials after completion of the large scale housing projects.

- 4) Two-three experts of technical research and training, to cooperate with the Government officials and the related personnel; in improvement of locally available materials, in development of prefabricated technique and mass-production, and in reform and improvement of construction work.
- 5) One expert of legislation(lawyer), to cooperate with the Government officials; in formulation and arrangement of the concerned legislation and social systems.

We tried to prove worthy of the expectation which Indonesian people have placed us and we believe that our proposal shall be able to contribute to the development of Indonesian people and the prosperity of the nation.

Therefore, we sincerely ask the great Government of Republic of Indonesia to understand the directives and proposals in this report and to adopt this international cooperation program.

The following Diagram No. 1 and 2 might be of great help to understand the philosophy and structure of our proposal.

DIAGRAM No. 1 Philosophy & Structure of the Proposal of Large-Scale-Housing Projects

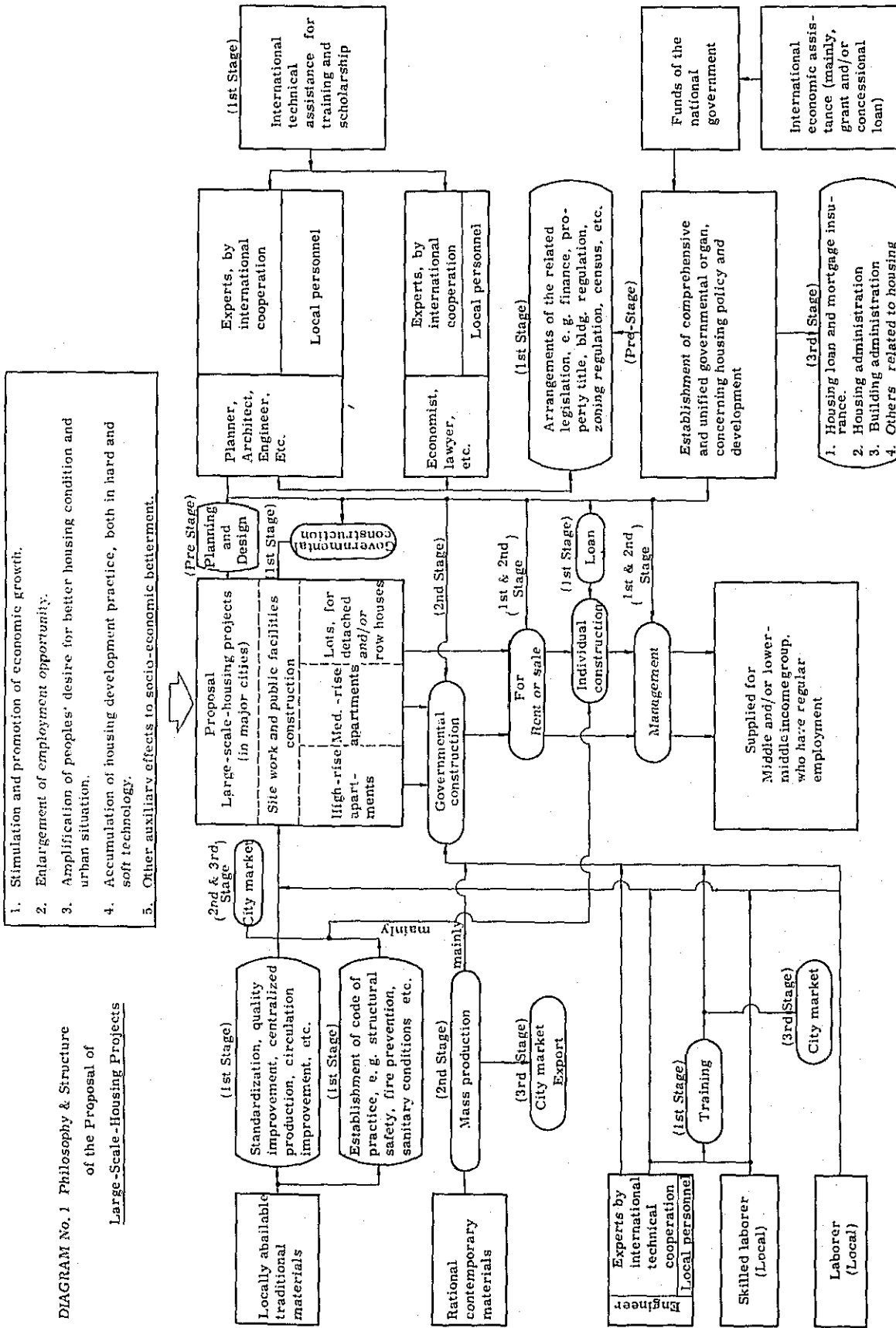
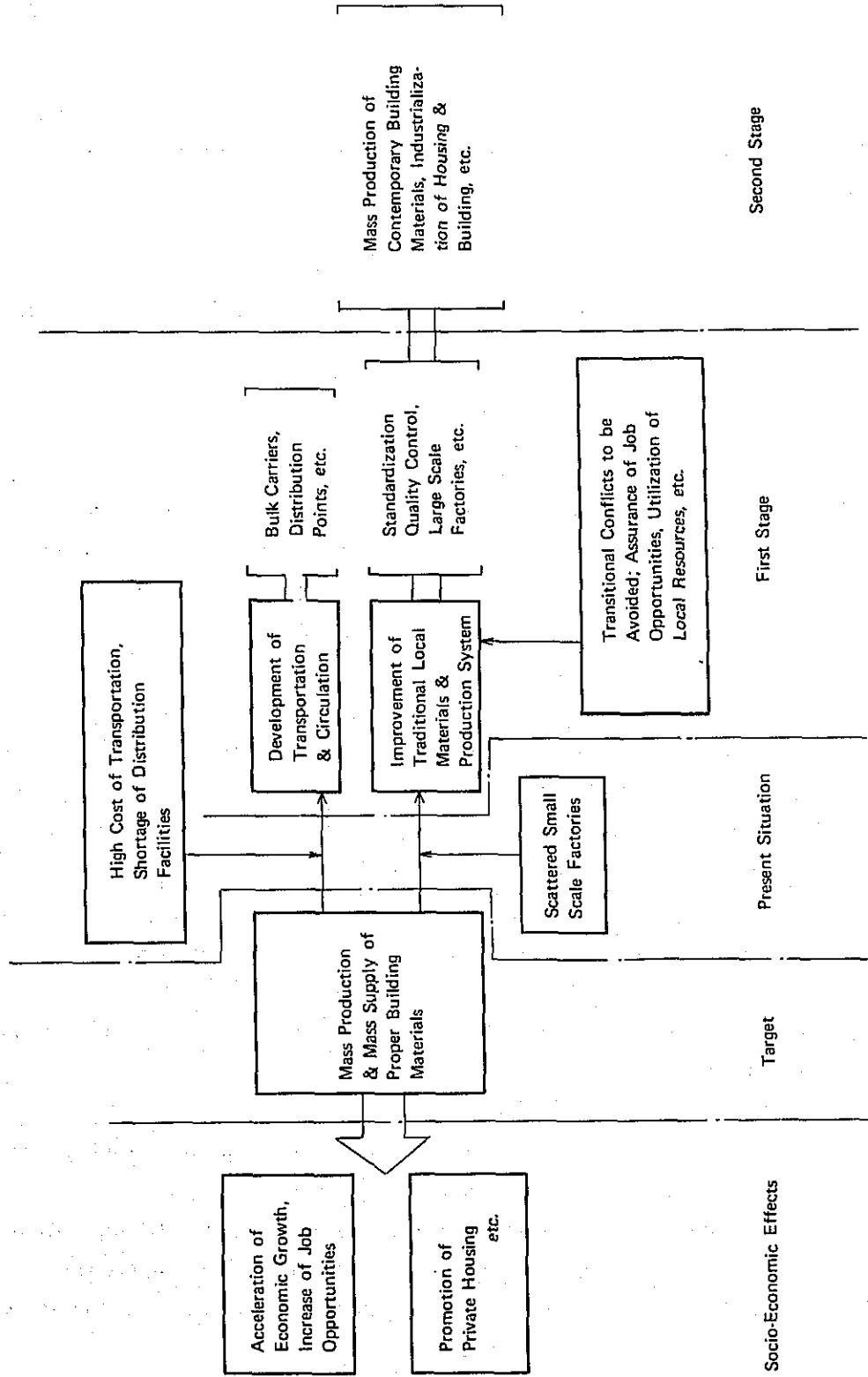


DIAGRAM No. 2 MACHINERY OF DEVELOPMENT OF BUILDING MATERIALS



ACKNOWLEDGEMENT

The survey team expresses its profound gratitude to the Government of the Republic of Indonesia for the assistance and cooperation extended through the Ministry of Public Works and Powers.

It is only through the assistance of the Indonesian Government and the people of Indonesia that the survey team was able to effectively survey large areas in a limited period of stay in a foreign country.

The team appreciate highly the help of Ir. Rachmat Wiradisuria, Director General of Housing, Building, Planning and Urban Development, and also the staff's of Ministry of Public Works and Powers, Ir. Sardiono, Directorate for People's Housing, Ir. Radinal Mochtar, Directorate for Planning and Urban Development, and especially Ir. Ars, W. Soebagio who has served the term with upmost care as a counterpart of the survey, Ir. A. Kartahardja, Director of the Building Research Institute gave the team efficient and extensive assistance in Bandung.

The team also wish to express it's gratitude to Ir. Prajogo, Vice Governor of D. K. I, Djakarta and Kol. Soekotje, the Mayor of the city of Surabaya who spared their precious time for the team in order to explain the general conditions of the cities and their policies thereon.

The member's of the team wish to record their gratitude.

The team is greatly indebted to the assistance and cooperation of the following Indonesian personnel.

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CHAPTER I

INTRODUCTION

CHAPTER I INTRODUCTION

1.1 Purpose and Circumstances of the Survey

The Indonesian Government requested the Japanese Government to send a preliminary survey mission to Indonesia, with the letter dated July 10, 1972 of Director General of Housing, Building, Planning and Urban Development, Ministry of Public Works and Powers, in order to identify and formulate an international technical assistance as regards housing field, based on the so-called KTA I and II projects which are of parts of technical assistance projects being offered by the Indonesian Government to the developed countries group.

The KTA projects, concerned with housing and building, are composed of the following outlined three;

KTA-I Research on Building Materials:

Technical assistance for housing promotion as regards; Research and development of building material and component, their standardization, modular coordination system, mass production system like prefabrication, construction tool, equipment and machine, etc.

KTA-II Survey and Study on Housing Development Project:

Technical assistance for feasibility study both from techno and economic aspects, on public housing development in connection with comprehensive regional development, in the area of fast-growing region like Djakarta, Bandung, Surabaya, Medan, Ujung Pandang; etc.

ITA-III Housing Development Policy:

Technical assistance for over-all housing policy formulation, legislation related to housing development, housing situation survey, housing finance, etc.

As it seemed difficult for our mission to reach to the conclusion without taking the KTA-III objectives into our consideration, we tried to make survey partially on KTA-III project.

Besides, another technical assistance project (LTA-8, implemented from August '72 to March '73) had been undertaken by sponsorship of the World Bank, which objectives were planning and design in Djakarta region, of site and service program, low cost housing project of 10,000 units, urban renewal program including kampong improvement program; legislation drafts of housing finance, property title, housing industry pro-

motion; revaluation of Djakarta's master plan and land use control.

According to the authorities of the Indonesian Government, the conclusion of LTA-VIII project would play a role as a prototype to be applied to the other-major cities and regions. We found this fact hard to understand.

We were afraid that if KTA-I and II, or III projects would be determined within the conclusion of LTA-VIII project, our preliminary survey itself had better be done after LTA-VIII project completion. Or we should understand KTA-I and II projects may be strictly limited within hard technology matters.

During our stay in Indonesia, we could obtain ideas of the consultants engaging LTA-VIII project, only regarding revaluation of Djakarta's master plan, housing finance institution with mortgage insurance system and the related. But the other directives were not clear for us.

1.2 Indonesia in General

We will give a short description about the Republic of Indonesia, especially about the Island of Java, concerning climatic, demographic, economic and industrial, as well as administrative aspects which give basic conditions for housing and urban development.

(1) Geological and climatic conditions

The Republic of Indonesia is composed of several thousands of island, large and small, which are situated at from latitude 6° North to lat. 11° South and from longitude 95° to long. 141° East, stretching 1,900 km north to south and 5,100 km east to west. Sumatra, Java and Minor Sundanes Islands belong to Alpes-Himalayan Ranges and Kalimantan, Sulawesi and West Irian to Pacific Mountain Ring with frequent volcanic activities. About 85% of total world earthquakes occur in those isles. (Table 1.2-1) From the climatic point of view, the Republic is divided into two zones; equatorial and monsoon. The Java Island is located in the monsoon area with clearly different two seasons, wet and dry, wet season covering from May to November, dry from December to April. Temperature is quite high throughout a year, annual average around 28°C and its seasonal variance quite small; averagely 1° C degree.

Although with much rain and high temperature, insular topography makes climate inhabitable and together with fertile, volcanic soil, physical setting for human environment is quite favorable.

(2) Population

The Republic's population is 98 million in 1961 and 120 million in 1972, growing rapidly by the annual rate of 2.7%. 65% of the total population live in Java-Madura area with 130,000 sq. km, thus creating one of the world highest population density of 570 per sq. km(1970). Except Djakarta area, population is denser in the middle and east part of the island, especially around Jogjakarta and Surabaya. (Table 1.2-1, Figure 1.2-1 and 1.2-2)

Annual growth rate of 2.7% implies annual population growth of 2.5 to 3 million and it is beyond doubt that that much growth of population is endangering economic growth and improvement of people's welfare of this developing country.

According to 1971 census, a national average house accommodates 8 persons, twice as many as Japan's average.

Urbanization is going on and by 1971 19% of the total population live in urban areas. Concentration of the population is most remarkable in Java Island, having 6 of the major 10 cities with population more than 300,000. But for all that, as long as we rely upon census, urbanization has not yet clearly taken off for only three of the major cities,

Djakarta, Surabaya and Medan grow more than national average. (Table 1.2-2)

(3) Economy and Industry

Table 1.2-3 shows comparative economic levels of Southeast Asian countries. Indonesian level of economy is quite low with Burma. However, after a short observation, we come to conclude that it might be quite misleading to believe the figure as it is, for at least in Java island, people's life, way of living and social order are much higher than we can expect from the figures. Moreover, as table 1.2-4 suggests, Java's average per capita income is nearly half that of Sumatra because of its high population density.

Rice production occupies central role in Indonesian agriculture. But increase of its production can not keep pace with rapid population growth and it is necessary to import food stuff too. Plantation products such as rubber, tobacco and tea occupies important share in export items together with petroleum. Sumatra possesses rich and good oil well and national corporation Purtauina monopolizes its distribution.

Food, textile, machine and transport apparatus are the major import items and most of the building materials except lumber, bamboo and concrete block are also imported. Recently, foreign enterprises come to invest in manufacturing, forestry and mining. From 1967 to 1971, 360 enterprises have landed. Domestic investment concentrates in Java (2/3 of total) and most of them are for manufacturing.

(4) Administration

The Republic of Indonesia is consisted of 26 Provinces, 228 Kabupaten areas, 3,063 Districts and 101 special Districts in West Irian which have higher administrative status than other Districts. The Capital, Djakarta composed of 5 cities, has special status as a Province and there are other 54 cities. According to the recent survey carried by the Ministry of Interior, there are 40,316 villages, autonomous with elected chief under the jurisdiction of District. In West Irian, tribes are put under the direct control of District without village in between.

Most of the administrative works in those local governments are delegated by central government, and are financially heavily relied upon the subsidies and grants from the central government. Notwithstanding assumed pyramidal system of management in public works, actual construction and management of the public facilities are carried largely by the central government.

The Ministry of Public Works and Electric Power is consisted with Office of General Affairs, Directorate of Supervision and 4 Directorate Generals, ; Water Resources, Housing, Planning and Urban Development, Road and Bridges, and Electricity, and Provincial Offices in each Province. Directorate General of Housing, Planning and Urban Development has Bureaus of People's Housing, of Public Buildings of Urban and

Regional Planning, of Sanitary Engineering and Building Research Institute (where Regional Housing Center of the United Nations is also located) under its jurisdiction. It also has affiliated bodies such as National Gas Corporation, Electricity Corporation, Asphalt Corporation.

Table 1.2-1 Population and Population Density by region (1961)

	Area	Population density (per km ²)	% of total	
			Area	Population
Java Madura	132,174	477	6.94	64.93
Sumatra	473,606	33	24.87	16.22
Kalimantan	539,460	76	28.33	4.23
Sulawesi	189,035	37	9.93	7.30
Bali, Nusa Tenggara	93,614	76	3.86	5.73
Maluku	74,005	11	3.91	0.81
West Irian	521,951	1.8	22.16	0.78
Total	1,904,345	51	100.00	100.00

Source, Sensus Penduduk, 1961

Fig. 1.2-1 Population Density

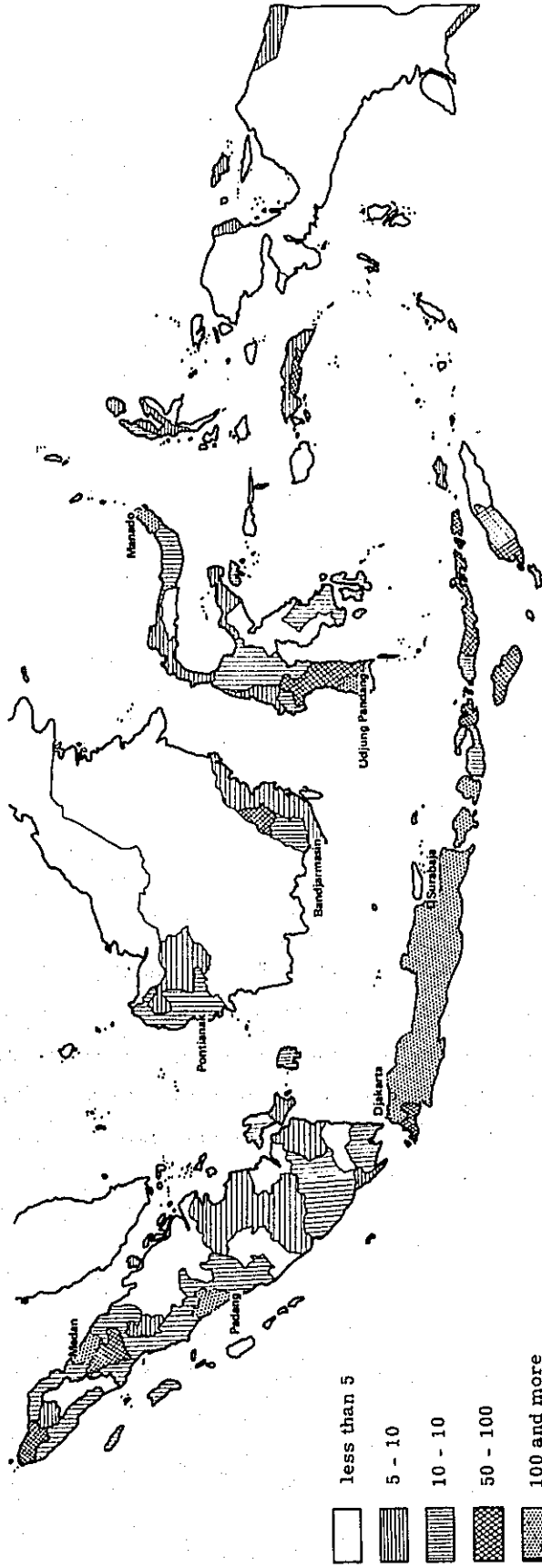


Fig. 1.2-2 Population Density in Java Island(km2)

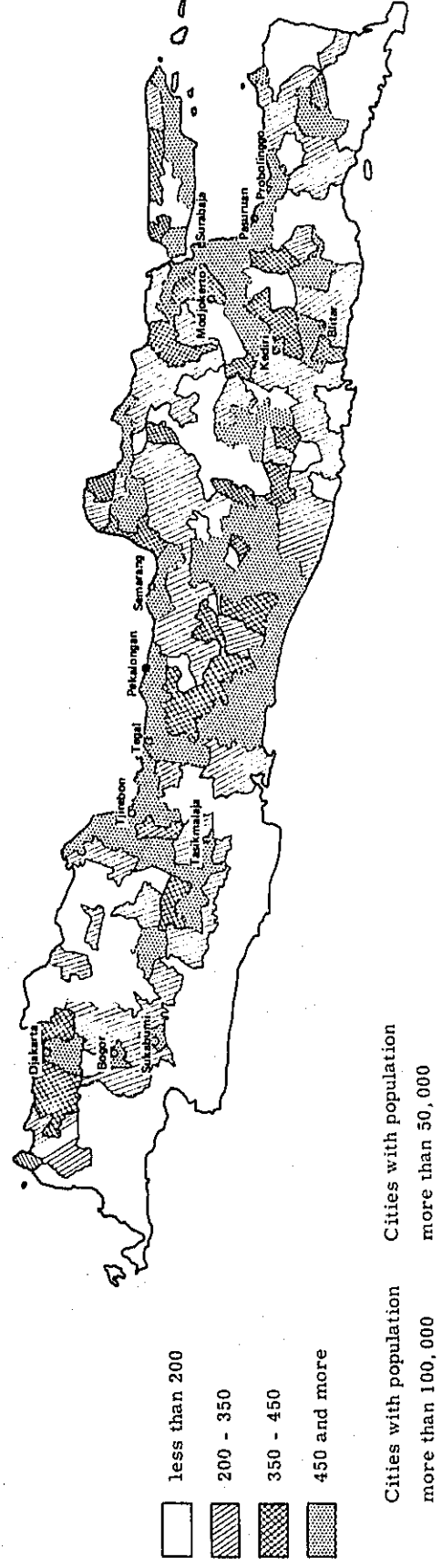


Table 1.2-2 Growth of cities in Indonesia

Name of cities	A. Population 1961 (thousand)	B. Population 1971 (thousand)	B/A	Annual growth rate (compound) (percentage)
Jakarta	2,971.1	4,576.0	1.54	4.2
Surabaya	1,007.9	1,556.3	1.54	4.2
Bandung	972.8	1,201.7	1.25	2.1
Medan	479.1	635.6	1.33	3.0
Semerang	503.1	646.6	1.28	2.5
Palembang	474.9	582.9	1.23	2.0
Ujung Pandang	384.2	434.8	1.13	1.7
Surakarta	367.6	414.3	1.12	1.6
Yoqyakarta	312.6	342.3	1.10	1.5

(Source; Population Census)

Note; According to certain officials in the Ministry of Public Works and Electric Power, census data is not so much reliable as registration data. Actually, there often happen to hear different population figures among Indonesian experts from figures on census base. But because we can not find persuasive reason for that and because we can get exact registration data, we use census figures as they are, and with which we calculate various rates.

Table 1.2-3 Major Economic Indicators of Southeast Asian Countries (1965)

	Population (1,000)	GNP (\$100 million)	Per Capita (\$)	Employed population (1,000)	Employed population in Agriculture and Fishing	Employed population in other than Agriculture and Fishing	(1,000)	Note
Philippines	32,345	85.9	266	10,544 (32.6)	6,080 ((57.63))	4,464	10,997 (34)	1) () % in total, population
South Vietnam	16,124	21.7	135	U 7,256 (4.5)	U 5,224 ((72))	2,032	4,031 (25)	2) (()) % in total, employed population
Laos	2,635	2.8	111	U 1,186 (45)	U 890 ((75))	296	501 (19)	
Cambodia	6,142	8.1	132	2,686 (43.7)	2,008 ((74.8))	678	1,474 (24)	
Thailand	30,744	9.4	129	14,111 (45.9)	10,280 ((72.8))	3,831	6,149 (20)	
Burma	24,732	16.4	70	U 11,129 (45)	U 8,347 ((75))	2,782	3,710 (15)	
Malasia	8,039	28.5	355	3,235 (40.2)	1,795 ((55.5))	1,440	3,055 (38)	
Singapore	1,865	10.6	567	727 (39.0)	36 ((5.0))	691	1,585 (85)	
Indonesia	104,900	107.8	103	37,659 (35.9)	24,600 ((65.3))	13,059	17,833 (17)	
Bornei	101	2.5	-	U 51 (50)	U 35 ((69))	16	51 (50)	
Total	227,627	323.7	142	88,584 (38.9)	59,295 ((66.9))	29,289	49,386 (21.7)	

Table 1.2-4 Population and GNP per capita by region

Region	Population		per capita	
	(million)	(%)	(U. S. \$)	(%)
Java	75.0	65	75.0	55
Sumatra	18.6	16	140.0	25
Kalimantan	4.9	4	90.0	4
Sulawesi	8.4	7	100.0	8
Others	9.1	8	90.0	8
Total	116.0	100	89.0	100

1.3 Current Policy of National Development of Indonesia

1. As the Republic is formed by more than 3,000 isles, the people speak 100 different languages and its social organization has large regional variances (patriarchy or matriarchy), national unity is one of the major objectives of regional development policy. At the same time, because of excessive concentration of population and industries, in Java Island, it is the main target of regional development that the regional disparity should be leveled so that national unity should be tightly maintained. Thus, such cities have been taken up as growth poles in corresponding regions as Medan in north Sumatra, Palembang in south Sumatra, Surabaya in east Java, Manado in north Sulawesi, Ujung Pandang in south Sulawesi. (Maccasal has been renamed as it absorbed surrounding towns.)

In regional development policies, it is our impression that substancial achievements have been done only in the planning shere, leaving the actual development of water resources, road building, port improvement etc. somewhat in sporadic or unorganized way.

2. The First Five-Year Development Plan (Pelita I, 1969/70-1973/74)

The First Five-Year Development Plan aims at rehabilitation of the economy and social capital that had been destroyed and used up in the period of loose management of national economy after the Independence. Although it covers quite a comprehensive scope of planning, it wisely puts focuses upon several major national targets; "Fully conscious of all this, it is necessary that we do not expect too much in a very short time....."

The development targets we hope to achieve are very simple, namely; food, clothing, infrastructure improvements, housing, expansion of employment oppotunities and spiritual welfare."

The agricultural sector recieves the main emphasis in the implementation of development plan. Plantation products are the major strategic products. Next comes mining and then manufacturing among which textile industry is considered as main strategic industry.

As for the social capital, as "deterioration in almost all infrastructure facilities is evident, rehabilitation of roads, railways, ports and so on demand paramount importance." "In planning industrial growth the main emphasis should be placed on employment opportunities". and "pattern of manpower requirements" is conceived in terms of industrial sector as well as geographic distribution. Thsu, old transmigration policy has been remodeled into new redistribution of employments. Also, family planning, educational planning, fiscal policies especially concerning foreign aids

are taken up as important field of planning.

As a result of these planning, (not as a target) growth rate of GNP is expected to attain to annual 5%. However, as population grows annually by 2.5%, substantial growth rate of economy per capita remains at the level of 2.5%.

CHAPTER II
STUDIES AND SURVEYS
ON
THE PRESENT CONDITIONS

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2.1 Urban Condition and Urban Development

1. Urbanization

Indonesian population amounts to 120 million (1971) in which urban population shares only 18.8%. National growth rate of population is 2.68% per annum while its urban counterpart reaches 3.89%. Thus, urbanization is certainly proceeding. (Table 1.2-2)

Especially, two largest cities, Djakarta and Surabaya are gaining its population faster than other cities. But if we rely upon the census returns of 1971, as the table 1.2-2 shows, urbanization has not yet been taken off as is widely observed in developing countries.

As natural growth rate is so high, net social increase that might be roughly estimated by deducing natural growth rate from total growth rate can be observed only in Djakarta, Surabaya, Medan and Malang, while in Bandung and Palembang total growth rate is almost the same level as natural growth rate.

However, this does not mean that the urbanization problems are less critical than elsewhere by any means. As population increase by natural growth is so high, total population in 1981 is estimated between 149.4 to 154.0 million(*1) and if we extrapolate the current growth rates of each city, between 1961 to 1971 upto 1981, Djakarta's population will reach 7 million, Surabaya 2.4 million, Bandung 1.5 million. This implies the population gain of each city as 2.5 million for Djakarta, 840 thousand for Surabaya and 150 thousand for Bandung. This heavy pressure will certainly give tremendous burden upon the improvement of urban environment not to mention to improvement of existing urban assets. Moreover, it is most probable that as economy grows and industrialization proceeds urbanization will be accelerated, making urban problems more and more serious.

2. Present condition of cities and their planning

Old cities such as Djakarta and Surabaya that have grown around pre-industrial, colonial towns now have quite large urbanized, colonial residential areas and outside these more or less planned areas extend so called kampung areas which have been developed after the Independence without any urban setting such as roads, water, drainage etc.

*1 Widjojo Nitisastro "Population Trends in Indonesia" P. 206

Bandung has followed different course of development and as its expansion of kampung area is less remarkable its level of urban facilities and environment seems to be considerably higher than other cities.

Improvement and rehabilitation of streets, water and drainage are carried by central government and its maintenance is delegated to local government. As for housing, except some experimental trial as Rumah Murah (low cost housing) public supply of housing is quite limited except for some housing for public official.

At present, almost no additional development or improvement of infrastructure of new urban residential areas can be observed, so except some piecemeal, small scale private housing development, urban growth are accomodated in sprawling, kampung development. Thus, urban development is supported by natural cycle of water by unilizing small rivers as basic living facilities for taking water, drainage and bathing. But natural ecosystem is becoming disturbed and ruined as density of population increases.

Concerning basic planning legislation, still Dutch, colonial ordinances adopted in 1930's are effective although draft of basic planning law has been prepared in 1970 it has not yet been officially adopted.

During the period of Pelita I, master plans of 7 cities and pilot plan of 32 cities have been prepared including Djakarta, Surabaya and Bandung's plans. (Fig. 2, 3 and 4) Local government's budget is heavily dependent upon the central government and without mentioning to predominant share of investment of central government in the improvement and rehabilitation of local urban facilities, municipalities and dasas (villages) receive subsidy on per capita and per dasa base from the Ministry of Interiors. Also, it seems that expenditure for employing civil servants are covered by subsidy from the central government through provinces.

" The achievements during the Pelita I is descrided as follows;

- 1) Project for City and Regional Planning
 - a. City planning: Completion of master plans for seven procincial capitals cities, outline plans for 19 provincial capital cities and 13 other major cities, and detail plans for five cities.
 - b. Regional Planning: Completion of master plans for four provinces, outline plans for five provinces, and surveys for five provincial areas.
- 2) Project for Establishment of Regional Planning Units

Regional Planning Units have been established in six provinces, and seven other provinces are under preparation.
- 3) Project for Preparation of Planning Legislation and Standards

The following draft of regulation and standards have been completed:

- Basic City Planning Law
 - National Urban Land Policy
 - Zoning Regulations for Bali
 - Standards of Physical requirements for industrial estate
- 4) Within the foreign technical assistance program efforts are under way for the establishment of a Prototype Planning Unit in Bali (Belgian Assistance) and in West Java (Netherlands Assistance). The experience acquired in these projects shall also be applied to other provinces.
- 5) To assist the upgrading of knowledge and knowhow for local regional planning officers, courses and training programs have been conducted in Bali (for the Eastern part of Indonesia) and in Djakarta (for the Western part of Indonesia).
- 6) To transfer planning knowledge to all the regional planning units, efforts were made for a regular dissemination of information through publications and consultations with appropriate local government officers through seminars, workshops and other meetings. " (*2)

In the period of Pelita II, for meeting with the increasing demand of local planners, effective training of local planners is put a stress and following measures are proposed;

"

- 1) Consolidation of the existing and will be established Regional Planning Units
- 2) Intensification of training and upgrading activities at the regional center
- 3) Stimulating the participation of private consultants in physical planning and related research activities
- 4) Strengthening the Planning Information and Documentation Centre in Djakarta for effective dissemination of planning knowledge and knowhow to the local governments.

*2 Department of Public Works and Electric Power

"A Short Note on Problems and Policies for urban and Regional Development in Indonesia"

- 5) Further improvements of planning tools to ensure the effectuation of adapted plans.
- 6) Upgrading of technical skill for evaluation of city and regional planning and development.
- 7) Promotion of interdisciplinary approach among central and local government administrators, in the preparation and evaluation of development projects. " (* 2)

(for further detailed information obtained mostly by hearing from planners of local government about the present condition and planning of the largest 3 cities, see Japanese edition.)

2.2 Housing Situation and Housing Development

1. Housing Situation

For clarifying housing situation statistically, housing census of 1961 and 1971 are available. However, qualitative as well as quantitative, detailed information is quite scarce as their tabulation is quite limited. (*3)

According to the 1961 census, 5.8% of total housing stock is built by permanent structure (concrete or brick construction) 59.8% semi-permanent (durable materials plus bamboo or timber), and 34.4% temporary (roof made of non-durable material such as coconut leaves).

Rural housing construction is carried by on self-help base on Gotong Royong principle and their qualitative general condition is as follows;

- 68% without water laid on
- 88% without private WC
- 77% without bathroom
- 13% with roof made of organic material
- 87% with wall made of organic material.

Some of the quantitative aspects of urban housing is as follows;

- 55% with only 1 room
- 26% with 2 rooms
- 11% with 3 rooms.

The data of total housing stock in 1961 is not available but total number of household in 1961 is 20,928,187 with average household size 4.4, number of rooms per household 1.5 and average number of resident per room 3.0.

In urban housing stock, 52% of them are occupied by one household, that is to say, 48% of houses are occupied by 2 or more families. On the contrary in rural area, 94% of houses are occupied by one household.

For 1971, household data is not available, but available housing stock data is as follows;

Housing Stock (1971)	(dwelling unit)	(%)
(urban) exclusively residential	2,877,109	13.4
residential plus other uses	131,717	
sub-total	3,008,826	
(rural) exclusively residential	19,162,108	86.6
residential plus other uses	300,293	
sub-total	19,462,401	
Total	22,471,227	100.0

*3. The following data are mostly derived from Building Research Institute "Housing and Urban Development in Indonesia A country monograph"

Even from the above general information we can imagine rough structure of housing situation.

Firstly, considering distinctly different character of urban housing problems from rural ones, especially because rural housing is surrounded by favoured natural environment in ecosystem and because they are built mostly on self-help base, it seems wiser to treat each problem in different manner. A set of the policies addressed to rural housing problems must be completely different ones from that for urban housing.

Secondly, although exact quantitative data of urban kampung housing is not available, taking annual issues of building permits into account, its share in the urban housing stock must be quite large. As it is reasonable to assume that permanent houses provide more than 2 rooms, the fact that 81% of urban houses provide 1 or 2 rooms suggests the magnitude of kampung housing problems.

So this aspect must be one of the major problem areas.

Thirdly, comparing the proportions of urban population and urban housing stock with the national totals, i. e. 18.8% urban population in total as against 13.4% urban housing stock in total, average size of residents per dwelling unit in urban area is considerably larger than in rural area. As urban population amounts to 22.4 million, averagely speaking, 7.5 persons live in a dwelling unit. This implies either that the average family size in urban area is larger than in rural area or that in urban area more houses are occupied 2 or more households. 48% of urban housing, in fact, are occupied by 2 or more families. This suggests that application of housing standards in developed countries which is constructed around the concept of core family is quite likely improper here in Indonesia.

The data upon housing flow is almost non-existent and especially data on housing replace is unavailable. So the estimation must be very rough. According to Building Research Institute, total housing units in 1961 is estimated as 19.71 million in which urban housing stock is about 2.25 and rural 17.46 million dwelling units, therefore, during 10 years between 1961 to 1971, 2.5 million dwelling units were added to the stock. (Naturally this figure suggests only net addition without taking replace into account.)

2. Planning and Policies on Housing

There is no official, quantitative planning. However, the Ministry of Public Works and Electric Power gives very general estimate on housing demand and the following figures appear in various governmental reports with minor variances.

(Housing shortage)	(million d. u.)
Necessary dwelling units for giving a dwelling unit to every family	27.1
Actual housing stock	22.0
Housing shortage	5.1
(Annual demand of housing construction)	(thousand d. u.)
For natural increase of population	600
For improvement of unsound houses (improving within 20 years)	250
For replace (3% per annum)	660
Total	1,510
	(13 d. u. per 1,000 people)

In Pelita I annual urban housing demand is estimated as 300,000 while actual building capacity is considered to remain at the level of 40,000 per annum.

Considering the above condition, Pelita I states urban housing policies and measures as follows;

"Present facts show that the materials as well as the funds for housing development are very limited. Therefore, solving the housing problem will be carried out in phases after determining a scale of priorities. Measures will be taken to prevent, or at least to minimize, the worsening of conditions. Physical facilities will be made available to stimulate house building in such a way that the greater part of it will be build by the people themselves."

Basically, Pelita I stage is considered as preparatory one large scale application of housing policies waiting until Pelita II stage.

In Pelita II, it tries to advance in this field so that various efforts have been made in the identification of problem areas and in the formulation of necessary policies. Overall policy frame in this field has been discussed in the so-called Workshop Group which are consisted of responsible government officials and related private and semi-public organs. (*4)

At the same time, pioneering implementation programs have been carried on in the following fields;

- (1) low cost housing development (Rumah Murah)
- (2) Kampung improvement program
- (3) site and service program
- (4) prototype housing project 1969-1971
- (5) rural housing and environment development
- (6) dissemination and public information of house building and construction

Although these projects remain in the experimental scale the achievements are impressive in terms of future policy formulation.

For Pelita II which begins at 1974, the Ministry of Public Works and Electric Power has already made following propositions;

"

(1) Housing in Urban Areas

- (a) Action will be aimed at the supply of housing for the economically productive low income group of the population, among others civil servants and industrial workers;
- (b) Efforts are to be made to find reasonable financing and credit systems for housing, with government's assistance by providing the necessary facilities;
- (c) Improved technical and technological methods shall be propagated through pilot housing projects;
- (d) Information and technical guidance will be given through increased activities of the Building Information Centres (B. I. C.).

*4 Workshop was held for 3 days in May, 1972 and reached to some propositions including creation of National Housing Board, Regional Housing Authority and Housing Bank. (Basic Paper 5 Team Research Project, PEMBIAJAN PEMBANGUNAN PERUMAHAN/BAPPENAS "KEBIDJAKSANAAN PEMBIAJAN PEMBANGUNAN PERUMAHAN")

(2) Housing in Rural Areas

- (a) Action shall be aimed at solving the housing problems in the high density villages and in strategic areas, such as transmigration and resettlement areas,
- (b) The development program in rural areas will consist of providing information and technical guidance on a massive scale on the principle of housing development based of limited financing, inter alia, rehabilitation of existing units;
- (c) Promoting the activities of pilot housing projects, and development of small scale and home building material industries.

(3) Supporting Activities

- (a) Promote surveys, research and studies on the sociocultural and socio-economic aspects of housing.
- (b) Development of production units with the purpose of improving the standards of local building materials and inviting participation of the private sector.

(* 5)

*5 Department of Public Works and Electric Power

"Basic Strategy for Housing and Urban Development in the Second Five-Year Development Plan (1974-1979)"

(4) Housing Problems; their Dimension and Nature

Considering above described present situation of housing and urban development, the magnitude of the problems is so big that from the conceptual frame of reference developed in the already developed countries any comprehensive proposition for solving the problems seems unrealistic.

The mere improvement of the existing stock of temporary nature, i. e. urban kampung, will demand tremendous efforts. But major part of the problems lie not in the improvement of the stock but in how to accept overwhelming demands created by natural increase of population and accelerated population influx from rural areas. For example, taking up 3 metropolitan cities, Djakarta, Surabaya and Bandung, net annual increase of 56,000, 19,000 and 6,800 dwelling units (* 6) are necessitated while there are very fragile economic and administrative bases for meeting these demands. In this situation, we have to look the problems through different approach from the modern conceptual frame of reference concerning urban housing problems.

Observable housing and urban crisis may, fundamentally, be attributable to the following causes;

- a) low level of economic affluence which may be represented by per capita GNP (less than 100 US\$)
- b) so-called push type urbanization which arises from low standard of living in rural areas. This means increase of unemployment and under employment in urban areas.
- c) lack of legal, administrative and financial system of improvement of urban infrastructure. (In a larger sense, short experience in modern administration)
- d) lack of modern institution for housing development and housing production (in public as well as private sectors)
- e) for the housing supply for middle income group with permanent job, lack of long-term instalment payment system of housing purchase and extremely high interest money. (18-30% private and 12 for government)

*6 The figures are derived by the following formula;

$$\text{Population of 1971} \times \frac{\text{Population of 1971}}{\text{Population of 1961}}$$

4.4 (average household size in 1961) x 10 (years)

According to vice-governor of Djakarta DKI Mr. Prajogo, annual demand of houses is estimated as 60,000, while actual supply falls short only to 12,000. Mr. C. J. G Becht estimates corresponding figure as 40,000. "Report concerning Housing Development Policy and Administration"

If we think these causes, housing problems should not be treated as one problem in which all housing supply and demand is taken into consideration and the problem area is understood as more or less independent field. Instead, we have to segmentalize housing problems into hygienic, educational, socio-administrative and economic problems and set of policies should be constructed in such a way that overall development process in economy, administration and educational will be accelerated.

At the same time dynamically, changing developing situation, comprehensive planning approach which starts from extensive data collection and proceeding on the refined planning process is improper to this particular situation.

We believe that in such a developing country as Indonesia, extensive and detailed survey directed to general public may not yield a fruitful results.

The modern investigation, social organization and a certain educational level which give prerequisite condition for such survey is non-existent. Besides, the socio-economic balance is so subtle to change that a small governmental action may cause a drastic change in a sector of economy. For example, if government tries to supply housing for certain income group, that would induce the structural change in the housing market. On the other hand, hypothetical need, to our opinion, should not be used for policy target. Applying a certain standard (most probably exotic) which is economically out of place as well as socially irrelevant to this country and estimating hypothetical need in housing is not only misleading but also harmful for the set-by step constructive proposals to improve the situation.

In such kind of a situation, the only way to prove into the reality is to try to act upon reality. Thus actually constructing housing development, we can find out the acting supply demand balance in the housing market.

We believe that here overall strategy for housing and urban development should be project-oriented, although providing general framework for policy formulation is indispensable in order to obtain common-understanding of the situation among experts and decision makers. Accumulation of unorganized, piecemeal achievements may lead to inefficient and often misguided investment. However, this frame may not necessarily be refined one.

2.3 Technological Situation of Housing

(Note: This section is skipped from English edition.)

For the detailed observation and analysis, refer to Japanese edition in which the followings are contained:

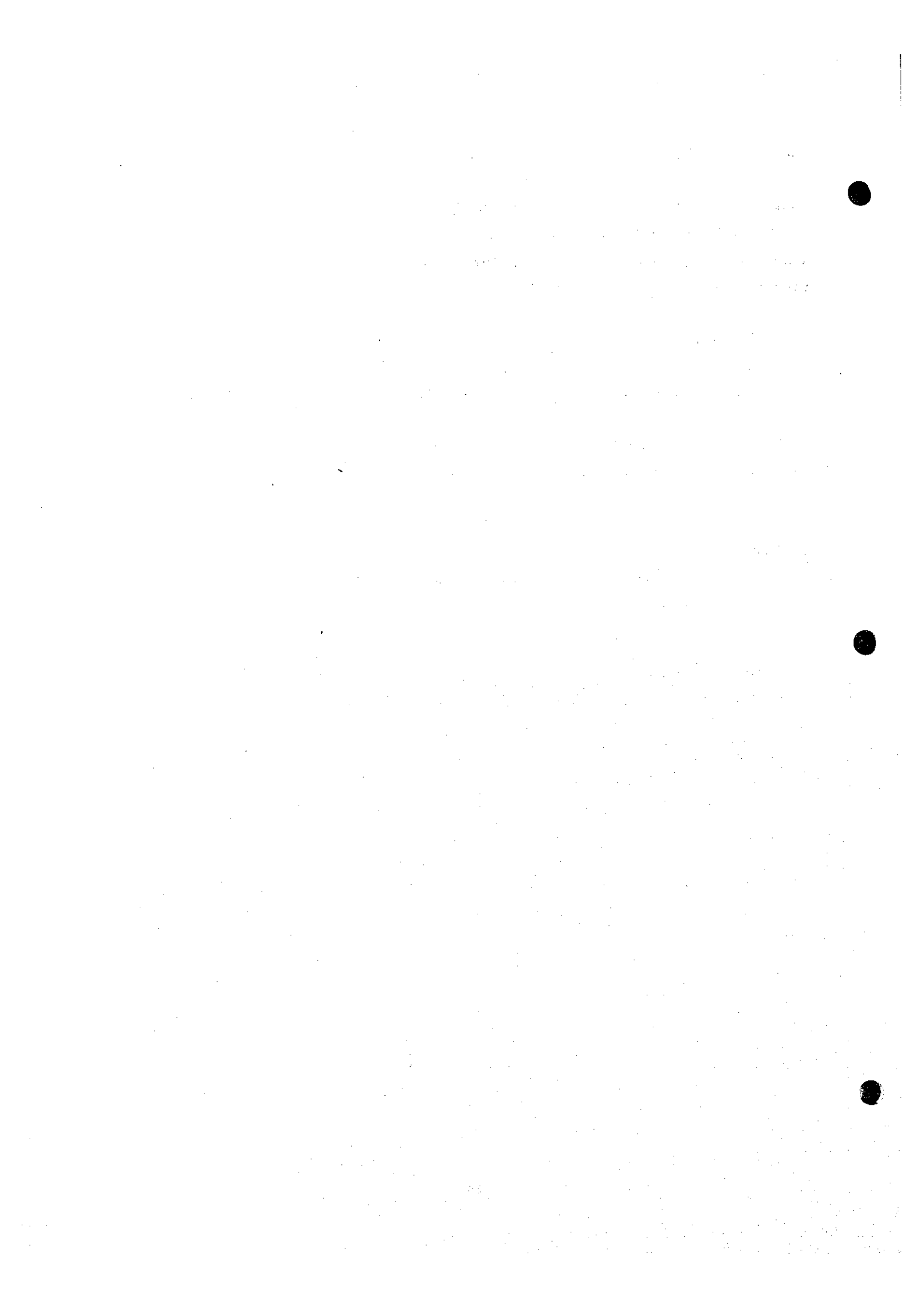
1. Construction and structure of Indonesian houses, (Indonesia has a good heritage of her own bamboo houses which composes the majority of her housing stock. Because of the abundant resources, bamboo should play an important role in rural housing, especially of self-help type.
Wooden framed houses are also popular and can be deemed as the advanced type of bamboo houses. Houses of trass-lime block or concrete block made are superior but not within reach of the average people.)
2. Housing cost, (Cost of building and land, and aspect related to income level)
3. Rumah Murah (Low Cost Housing), and (The governmental program and its observation)
4. Contractor and construction buisness.
(Activities of P. P., P. T. Djaja, and the other several semi-governmental contractors for urban building, and self-help housing activities supported by Gotong Rojong)

2.4 Building Materials and Housing Components

(Note: This section is skipped from English edition.)

For the detailed observation and analysis, refer to the Summary and Observation by the First and the Second Preliminary Survey Groups, and to Japanese edition in which the followings are contained;

1. Plan to survey,
(Local characteristics of resources, labor cost, difficulties of overall study on production and circulation because of lack of basic statistics, etc.)
2. Species, particularities, resources, etc. of the current building materials, and
(The present condition, desirable directions improving quality, etc. of the various materials)
3. General impressions.
(Systems and legislations, required for standardization, job-site-inspection, waste utilization, etc.)



CHAPTER III

FEASIBLE FUTURE DIRECTIONS

CHAPTER III FEASIBLE FUTURE DIRECTIONS

3.1 Housing Development

Based upon the approach described in chapter 2, here, we give a general frame of reference for housing policy formulation upon which we identify the problem areas, policy criteria and upon which we try to evaluate current Indonesian housing policies and necessary fields for technical assistance.

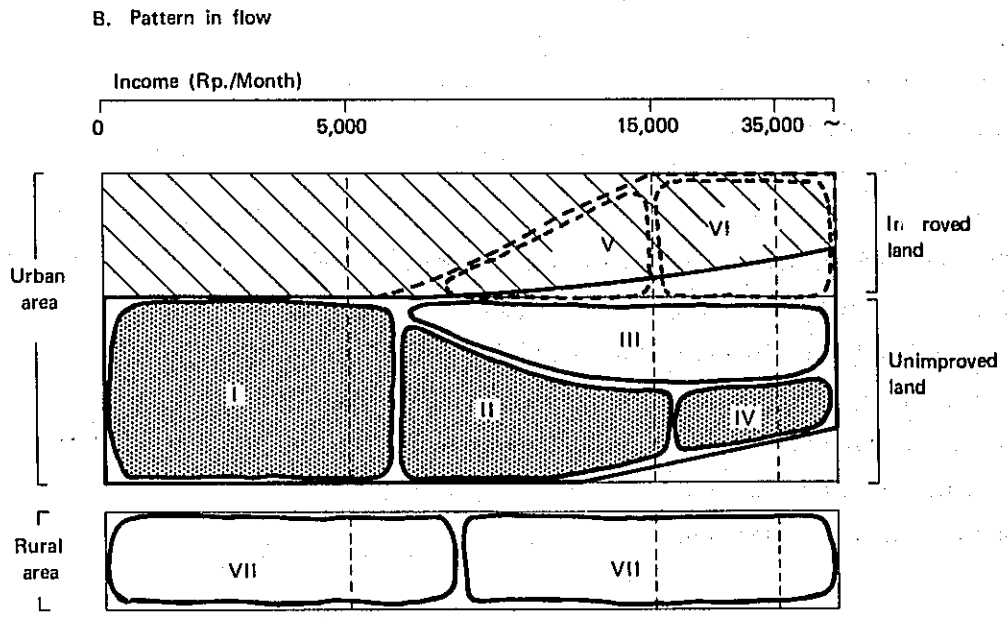
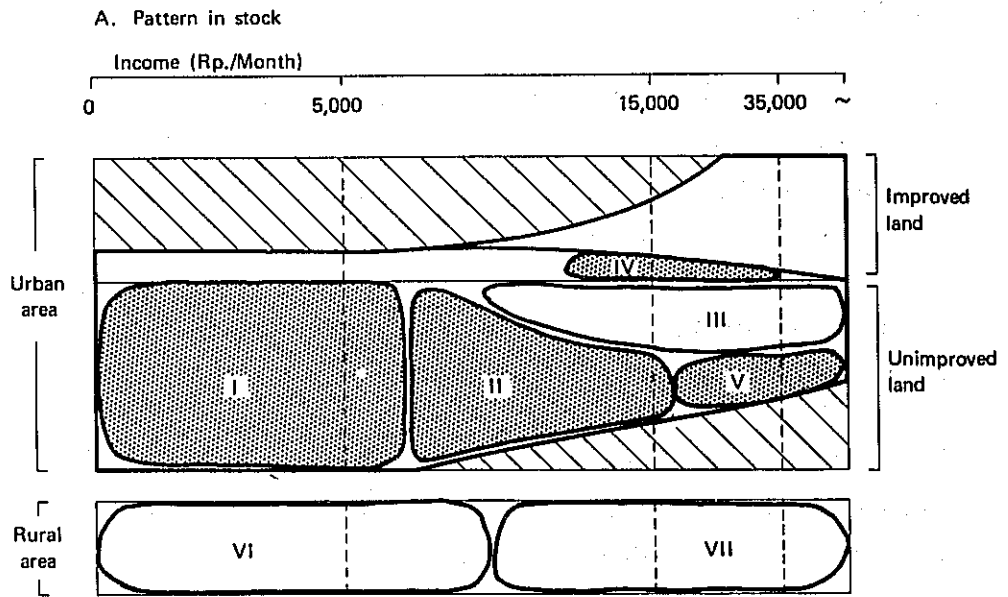
Our tentative general framework (navigation chart) for discussing housing policies is shown in the following table. (Table 3.1-1)





By this frame work we segmentalize the problem areas as follows;

- (a) The problem of rural housing should not be taken as more or less independent problem area nor level of dwelling unit should be taken as one of the major policy concern, for current living standard of rural area may be better represented by hygenic and educational level. Moreover, its production is safely maintained by traditional self-help system and there is little need for reorganizing such system into modern one and even if level of each dwelling unit is unsatisfactory, natural and communal environment may compensate enough if basic needs for sanitation, health and education are fulfilled.
- (b) The problem of urban, low income sector again should be tackled with more comprehensive approach than housing because they are likely in the position of unemployment or underemployment and considering their bare minimum income and their way of living quite similar to rural areas, it is quite likely that their major concern is not so much housing as expanded opportunity for employment, that is, increase of income, minimum sanitary facilities for maintaining their health and expanded opportunity for education.
- (c) The problem of improvement of urban infrastructure may be better treated if it is dealt differently from the system of housing construction. The system for improvement of land should be emphasized because actually many sound housing supply could often be observed on unimproved land. This is quite inefficient way of investment if we think of very scarce current supply of sound housing.

Other than the above mentioned problem areas, we identify the major problem areas in urban housing and urban development as follows;

Table 3.1-1 General Frame for Housing Analysis



-  unsound dwelling units
-  unprobable sphere
-  problem area
-  area that might be created by proper measures.

Note to Table 3.1-1

- (1) The proportion of income groups is adjusted to the following Table 3.1-2 from Studi Rumah Murah Di Djakarta by Institute Technoligi Bandung.

If we assume that the income data in the Table 3.1-2 is correct, proportion of income groups in this chart is rather distored towards unproportionaly larger higher income groups.

Housing volume data arranged as in the Table is not available.

We hope that the further survey clarify the comparative magnitude of each problem area.

Again problem here is how much we can rely upon such income data. From what we have heard, it is quite dangerous for policy formulation to rely upon such data. Instead, certain multiplier should be put on it. But we do not know how much should be the multiplier. Perhaps the best way to find out actual income level is through market mechanism, that is, to supply various housing types with various financial burden and see the people's reaction, if people can freely apply to whatever types they like without being distrubed by artificial factors.

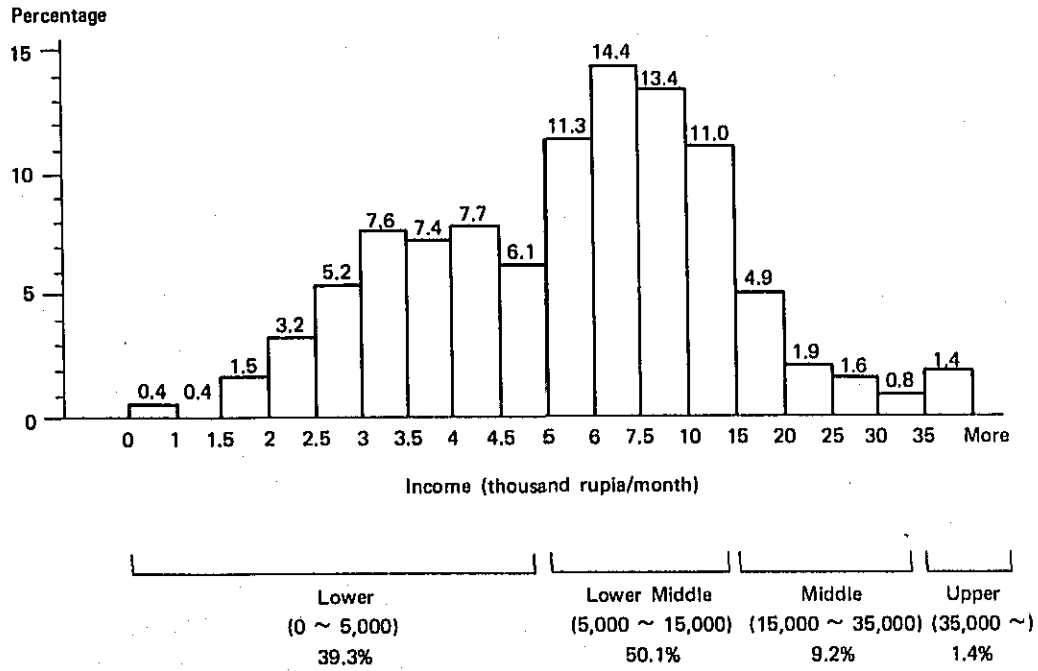
- (2) The housing volume on the vertical axis does not reflect reality. Rural housing occuppies about 80% in stock, as this chart is prepared for the sake of urban housing analysis.
- (3) Pattern in stock shows, following problem areas.

	land	house	probable measures
I.	unimproved	unsound	kampung improvement
II.	unimproved	unsound	site & service + self - help
III.	unimproved	sound	land improvement
IV.	improved	unsound	housing financing
V.	unimproved	unsound	financial assistance
VI.	Rural problems should be dealt differently, perhaps,		
VII.	some technical and financial help will be useful.		

- (4) Pattern in flow shows, following problem areas.
 (This pattern shows, probable outcome if no policy measures are taken, But here, if some policies will be put into effect, the areas in chained line may come out.)

	land	house	probable measures
I.	unimproved	unsound	reception area
II.	unimproved	unsound	site & service + self - help
III.	unimproved	sound	land improvement
IV.	unimproved	unsound	land improvement + housing financing
V.	improved	sound	"
VI.	improved	sound	"

Table 3.1-2 Income Distribution in Djakarta



(Source: Studi Rumah Murah di Djakarta, Institut Teknologi Bandung)

- (a) as for growth elements, that is, housing flow aspects,
 - (i) how to cope with encroaching and expanding kampung areas,
 - (ii) how to secure the sound housing supply for low-middle to middle income families with permanent jobs,
 - (iii) how to induce housing investment from middle to high income families.

- (b) as for adjustment elements, that is, housing stock aspects,
 - (i) how to improve already urbanized kampung areas above a certain level of density.
 - (ii) how to improve already urbanized areas with fairly sound dwelling units but without minimum urban setting,
 - (iii) how to improve unsound dwelling units on improved land.

To prepare comprehensive set of policies for all of these problem areas seems hardly to be possible, considering very limited available funds and institutions. Therefore, we establish a set of policy criteria for the formulation of policies.

- (a) To give minimum standard of sanitary conditions to every urban resident.

- (b) To give hope for lower-middle to middle income people for future fulfilment of their desire to be accommodated in sound housing.

- (c) To provide the system of controlled urbanization with minimum fiscal burden for those who can afford to live in such areas.

- (d) To induce money for housing development from household savings and from private capital sources.

Considering the major problems and policy criteria described above, we deem the following measures should be taken;

- (a) To provide reception areas for immigrating families as well as for the relocated families from urban kampung areas.

- (b) To improve the existing kampung with minimum, alleys, drainage and water system.

For the implementation of both (a) and (b) policies, the above mentioned comprehensive set of policies concerning employment, education, medical and sanitary

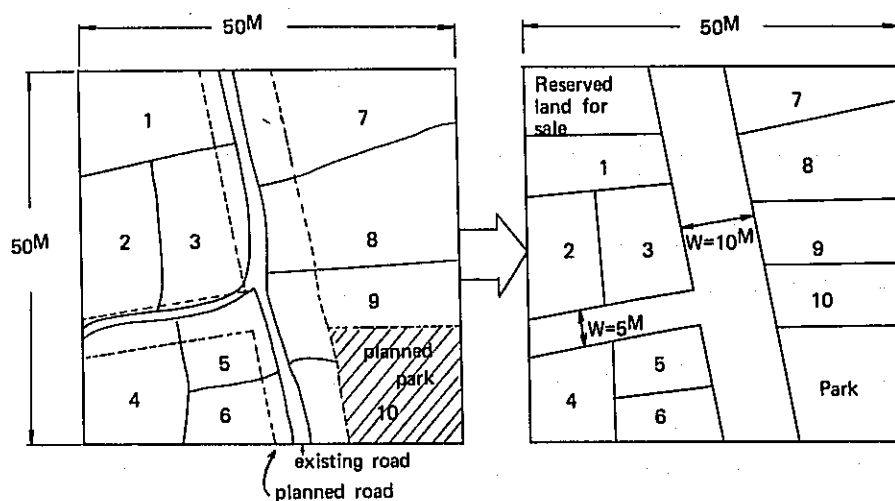
measures (possible including family planning) are demanded.

- (c) To provide the legal and fiscal system of improvement of urban land, such as land readjustment system and development permit system. This should include the system of improvement in the already urbanized areas with poor street and drainage system. (Table 3.1-3)
- (d) To try to build large scale housing development for the sake of demonstrating that the government has started long range program for lower-middle to middle income people who will share in the future the responsibility of the national development. This project also has a role for the test field of the financial system described below.
- (e) As for the inducement of the money to housing investment two separate systems may be demanded;
 - (i) For those who can bear the interest rate in private money market, to open up the way for publicly guaranteed instalment payment system.
 - (ii) For those who can not bear the interest rate in the private money market, to establish public financing body which extend loans with low interest rate to those who wish to build their own houses and who can pay the necessary expenditure if the loan terms are soft enough. This body may also function as money lending organization for those municipalities who wish to carry on the program of land improvement as described above.

Table 3.1-3 Concept of Land Readjustment

Land readjustment system has served one of the basic instruments for the ordinary urban development in Japan. As this system demands communal type of social organization. Indonesian society might fit for application of such system.

The general concept of the system is shown in Table 4. We do hope that the Indonesian Government has serious interest in this system and takes further study on it.



Kinds of Land	Before		After	
	m ²	%	m ²	%
a. Public Land	150	6.0	800	32.0
Road	(150)	(6.0)	(600)	(24.0)
Park	—	—	(100)	(4.0)
Reserved Land for Sale	—	—	(100)	(4.0)
b. Private Land	2,350	94.0	1,700	68.0
1	(200)	(8.0)	(145)	(5.8)
2	(200)	(8.0)	(145)	(5.8)
.
.
.
10
Total	2,500	100.0	2,500	100.0

- Total improvement cost for land readjustment such as construction of roads, removing of the buildings, is covered by sale of the reserved land.
- Total value of the improved land shared by the former owners is assumed to be equal to the total value of the land before improvement, on the ground that the betterment of land after improvement offsets partial contribution of land for public use.

Some more comments on technical matters for implementing the above policies;

- (a) Considering current land and transportation situation in Djakarta and Surabaya, the day will come soon when Indonesian urban people are requested to live in a planned, more densely inhabited housing estates. This implies necessity of introduction of row houses and multi-storied apartment houses. (*1)

Therefore, in the next model housing projects, experimental construction of those types of urban houses is recommended.

- (b) Because of convenience or of bureaucratic structure, housing financing policy tends to be separately dealt with urban development policy, leaving results of financing for sound dwelling units upon unimproved land. It is highly recommended that housing financing system should be tightly linked with urban development policies.

*1 How large the scale of housing development is in question. We do not know at present that 10,000 dwelling unit is from the planning point of view, reasonable or not. We have to study further upon the proper structure of a certain urban unit, social as well as physical (facility-wise). Important thing here is that the development unit should have more or less complete set of urban facilities. It should serve as a showpiece if we take up each of such facility.

Experiences obtained by prototype housing in Bandung and Rarawany should be fully assessed in this context. But next time, experimentation should be more on socio-economic sides rather than on technical sides.

In Japan, in 1955, we have virtually almost no multi-storied apartments. Mass introduction of multi-storied housing by Japan Housing Cooperation, naturally, encountered with severe criticism for a while. But now, around 1.5 million public or semi-public multi-storied apartments have been stocked.

In the process of rapid industrialization, people's preference and propensity for living environment quickly changes.

In the development of 10,000 housing, transportation especially commuting of the residents will become one of the key issues. Perhaps, here again trial and error approach is necessary in the introduction of existing individually operated "public transport" such as betjak, helitjak, bemo, taxi and bus.

- (c) Urban land policy, including land use control, land development program and land taxation must be one of the major constraints in planned development. However, if land policy is formulated independently from planning, implementation and administrative conditions and if land policy should be discussed irrelevantly with land improvement system and housing development system, then the tendency is likely that political as well as other socio-economic disturbing elements will necessarily encroach in the discussion, making the conclusions very much inert and ineffective. Consequently we think that urban land policies should be constructed so as to strengthen operational system of land improvement and housing development.
- (d) Considering general shortage of investment funds and extremely high interest rate, it is safer not to expect too much upon private investment on housing except household savings even if publicly guaranteed system of easy payment be established. Therefore, public subsidy of interest rate in some way or other is indispensable. Perhaps the best way is to provide independent, special housing fund in foreign aid account and without watering down the aided money (3% interest rate) the above mentioned public financing organ extends loans directly to housing purchaser.

Evaluation of Housing Policies and Technical Assistance Programs

Looking from the above described policy frame of reference, Indonesian governments, within quite a limited resources, has attained considerable success in various fields;

Although not too large scale as might be expected, kampung improvement and site and service programs have been realized in various cities. As for model housing estates, only very small experimental ones have been realized. However, in those project stress is put upon technical aspect of housing rather than socio-economic or administrative ones. Besides, they are too small in their scale.

In both of those policy areas, more intensive and extensive efforts are demanded in the period of Pelita II.

Housing financing policies have long been discussed within the related bodies centering around the Ministry of Public Works and Electric Power. But its proper setting within existing governmental structure and within overall money market requires further detailed study and experimentation.

As we have pointed out before, these policy measures should be build upon concrete, urban development projects and through the actual development process, constant review, assistant and evaluation is indispensable, which may lead to the adjustment of the newly created systems to the reality.

If the above described policy structure proposals are acceptable, then the proposed KTA-2 and KTA-3 project will become main pillars of the entire structure. Thus it is our mission's conclusion that the proposed KTA-2 and KTA-3 projects would certainly accelerate the progress in housing and urban development in Indonesia.

We would like to add some coumments on the basic guidelines for the future technical assistance concerning those projects;

- (a) While the above policies are in the process of development with constant feed back system, it is advisable for the Director General of Housing, Building, Planning and Urban Development to have an adviser who will grasp the overall process of policy development and give advise to the Director General from the strategic point of view of the development of housing and urban policies, naturally, he will assist upon the formulation of housing financing system.
- (b) Technical assistance should also be project-oriented so that, a team of experts who have had experiences in large scale housing development should be sent. The team should include not only senior planners but also building and public works supervisors on site. This would ensure the real assistance on the stage of actual development and through the cooperation the indigenious process of development will evolve.

3.2 Building Materials and Industry

1. Rationalization of Building Materials and Housing Components

Now, mass production and supply of proper and reasonable "building materials and housing components" (hereinafter, referred as "building materials") is one of the most urgency, as there is, actively and latently, a huge housing shortage and building demand. And turning to the present state in Indonesia, most of popular building materials except some, such as portland cement of mass-produced here and steel, etc. of imported, are being produced by small domestic-scale factories scattered all over the country. They depend strictly on the locally available raw materials and agricultural waste, and the limited local circulation.

The lack of circulation facility makes a portion of transportation cost in market price of building materials bigger and disturbs rationalized intensive factories of large scale.

On the other hand, it must be considered that the scattered factories of manual industry type are tendering employment opportunities to the local people.

As far as we understand, almost of all building materials supplied in the market have no common material standard, especially in terms of quality.

In addition, the low-cost-intensive of users and the absence of legislation related building regulation and its enforcement produces a vicious circle of "Bad money drives out good money".

Under the above mentioned basic situation, a way of rationalization of building materials should not be an intensive industrialization or mass-production of simple-minded and -directed according to example in the advanced countries. We conclude the best way is the transitional step-by-step rationalization, accompanied with creation of an effective demand. Then it may be expected the products shall permeate the city market, finally.

In the first period of the rationalization program of building materials (which may take first five years, at least), the targets must be the followings;

- 1) Basic consideration of effective utilization of the locally available resources,
- 2) Quality improvement and intensification of production (including arrangement and

integration of existing small factories and the employee), of selected building materials of traditional type such as trass, lime, bamboo, timber, second-products of agricultural waste, etc.,

- 3) Establishment of a good number of distribution stores (including their demonstration and transportation facilities), and
- 4) Provision for national standard of materials, legislation for building code and diffusion of them.

The actions shall be originated and backed-up with the large-scale-housing projects proposed in Chapter IV.

In the second period of the following five years, the targets shown below shall be pushed forward, owing to the socio-economic-techno stock obtained during the first period ;

- 1) Much more intensive mass-production of materials, both of the improved traditional and the contemporary, and
- 2) Establishment of distribution and circulation facilities.

In this period, the large-scale-housing projects of Chapter IV must contribute as an effective demand a field of experience accumulation, too.

Concerning philosophy and strategy of building materials development, refer to Diagram No. I in "Summary and Recommendation" of this report. And for the details, we would like to get Summary Report of the first group, the Preliminary Survey Mission referred.

2. Furtherance and Encouragement of Building Industry

Rational and effective establishment of building industry contributes greatly to the economic growth of the nation, and also goes a long way toward enlarging employment opportunity, improving living standard, and promoting related industry.

What support mainly the rational building industry, are considered as follows;

- 1) Building material industry,
- 2) Building contractor (Building production industry),
- 3) Architect and planner,
- 4) Stock of technical capacity (Engineer, skill-labor, etc.),
- 5) Legislation and social system related to building production, especially to quality control, such as building code, building regulation, code of practice, building material standard, etc.,
- 6) Legislation and social system related to contract for building production,
- 7) Financing market, and
- 8) Overall research and study organization.

Especially, establishment of national measures and legislation for architect, planner, engineer, contractor, etc. by means of qualification, licencing, monopolistic profession system, etc. produces social confidence on them and is very effective to bring-up, promote and guide them.

A nationally unified enactment of building code (structural, sanitary, fire-prevention, etc.), code of practice, material standard, etc., increases benefit of popularity and uniformity of building production. If wayward and capricious choice by governmental organ and other client is allowed, rationalization and efficiency of building industry must be extremely interrupted.

Building permit system is also essential in order to prevent illegal activity, to maintain the purpose and the rule of the law, and to take the statistics of production and ensuring employment opportunity.

For research and study organization, there are so many problems awaiting to be studied and solved, such as relationship of housing policy to overall national development policy, analysis of socio-economic problem between basic situation of the nation and housing development, draft-making of necessary legislations, many subjects of hard-technology, etc. At this moment, emphasis of research and study would be placed on projects as regards building material development and establishment of related legislations to housing.

3. A Role of the Building Research Institute

In driving the housing development forward in Indonesia, the Building Research Institute in Bandung shall undoubtedly play a major role such as the General Staff Office for Housing. Its task should cover not only technical fields but also the related administrative matters such as guidance and control of factories, inspection of material usage and other job execution on the site, etc.

The Institute should develop the proper and durable building materials including drafting quality standards, producing methods, structural code of practice, etc. according to the existing socio-economic conditions and the future prospect. The pressing task for the Institute is research, study and planning on quality standards, suggested producing methods, factory arrangements (including setting-up the governmental factories for the public large scale housing projects and assisting private factories by ways of governmental subsidy or loan), on the essential building materials such as:

Clay tile, glazed, which is good in durability, infiltration, partial repair, incombustibility, sound and heat insulation, etc.

Trass-lime block and concrete block, for wall, which are much better than bamboo mat, in terms of rigidity, durability, sound and heat insulation, etc.

Timber, for truss and other skeleton members and furnishings, which is good in proper light- and strongness, easy treatment, etc.

(Note: Bamboo is rather projected as raw material for the industrialized building materials such as fiber board, combination panel, etc.)

The Institute should also work on portland cement and steel as the major materials for the advanced stage of housing development, especially the public large scale housing projects. As concrete aggregate, artificial light weight aggregate is to be developed in Indonesia for the future high rise buildings.

As a basic matter, the Institute is also requested to make surveys and to grasp the present status of production and supply of the current building materials, their quality, their production standards, etc.

In order to come up the expectation, it is urgently requested to increase budget allocation and reliable staffs including ones of socio-economic fields, of the Institute.

3.3 Legislations, related to Housing Development

1. In General

It is said that the main principles are legislated but gaps between a principle of a law and the practical application are sometimes found, in Indonesia. That is why occasionally criticized as "there are no rules without exceptions but some of rules consist of exceptions".

On both sides of law enactment and its application, collisions between the national and local government are seen and so are seen conflicts between the existing and the newly enforced law, such as the tax exemption.

In order to push housing development forward, we believe it is urgent to enact the subsidiary rules for comprehensive and organic law enforcement.

2. Laws, related to land

Undang² Pokok Agraria (Basic Agrarian Law, Law No.5/1960), based on Article 33, Constitution of Republic of Indonesia, has some superior principles, which cannot be seen in the developed laissez faire countries, in terms of common land ownership. But it is a problem that the law authorized many of customary laws regarding land use and surface rights, most of which were not written and their legal entitles were not clear. And moreover, the abolished land law, effectiated transitionally, is producing many confusions.

At this moment in Indonesia, it is one of the urgencies is to make the circumstance- and fact-finding and arrangement of registration of land rights.

3. Legislation, related to urban planning, land use control, building regulation, housing code, etc.

In order to induce and determine the future urbanization, land use and density, structural safety-sanitary condition-fire prevention of building and amenity standard of dwelling, only poor legislations are existing in Indonesia. Some of guidelines for the above, being provided by the National Housing Center in Bandung and local governments, have no legal force nor overall coverage.

For the purpose to eliminate substandard stock dwelling, kampong expansion and chaotic urbanization, it is required at least, to establish contemporary zoning-, building- and housing- codes and their enforcing organs.

And also, for a comprehensive national housing policy, it is urged to set up active governmental systems for data collection and analysis, such as grand census, housing (situation) census, building permit sistem, income-, saving- and consumption-intent surveys, etc.

4. Legislations, related to qualification and practice of professionals

The exclusive job possession, given to the qualified professionals, increases reliability to quality of their achievements, produces confidence by clients and protects the benefits of the people.

It is keenly requested to legislate for qualification, code of practice, penalty for violation, etc for architect, planner, engineer, consultant, etc., as the basic conditions to promote physical development.

Some of codes of practice concerning the relationship between client and professional are provided in forms of general regulation by the Indonesian Council for Engineering and Construction. But as these are on the basis of civil affairs and not on the public law, these seem not so popular.

5. Legislation, related to contract and contractor

There is no legislation in connection with contract and contractor, except some provisions concerning contract of the Civil Law. Its concept of contract accepts a job of labor supply or one of materials supply, unlikely to the common situation of the other countries. And a concept and difinition is not firm in Indonesia.

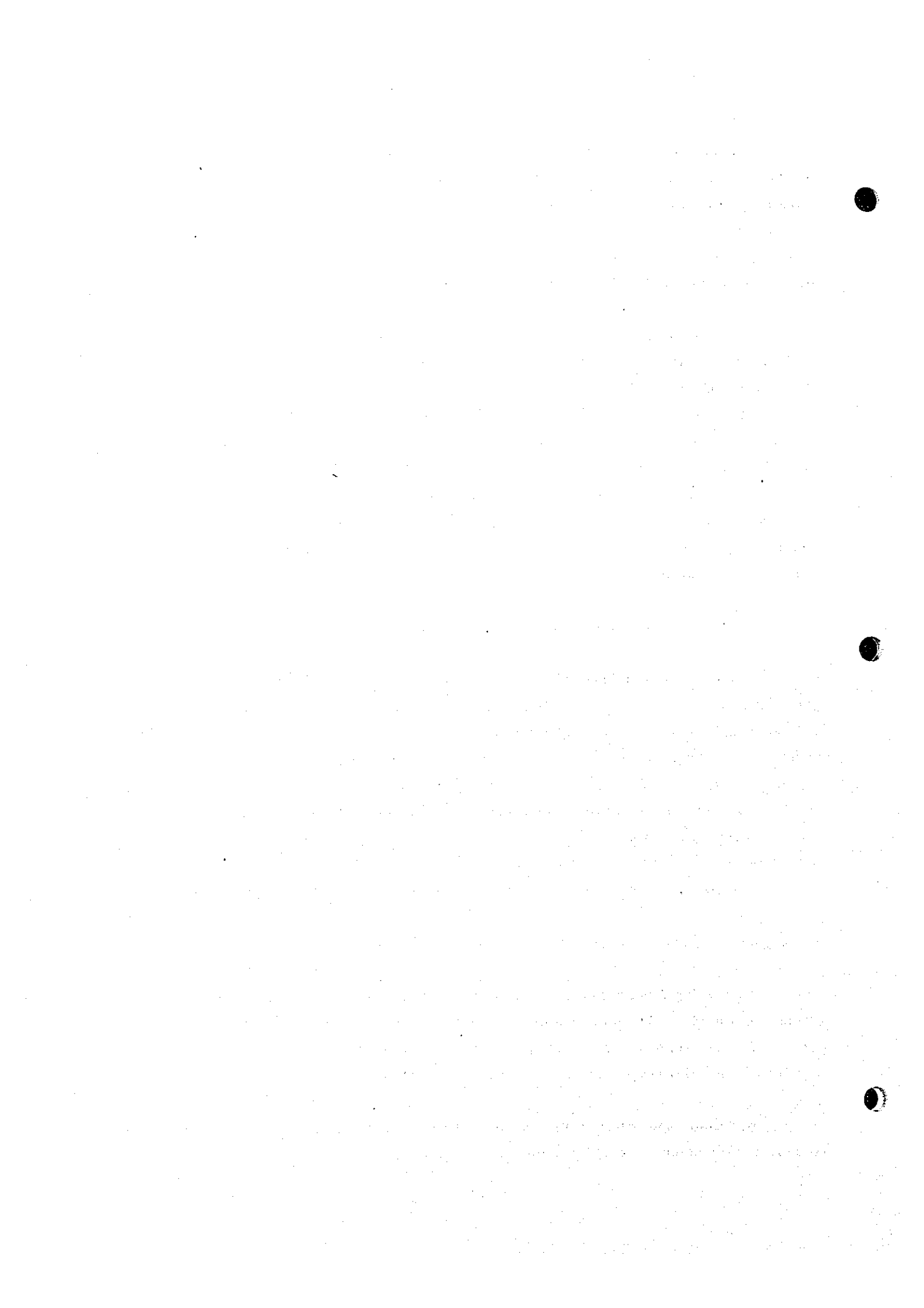
In order to make clear rights and duties, and claims and obligations in construction buisness, the above mentioned situation should be improved and a law for registration or licence of contractor shall be established in quite a near future.

The similar general regulations as in the above 4. by ICEC are also available.

6. Legislation, related to finance and taxation

For taking foreign funds and domestic hoarded money into housing sector, and lubricating liquidity of funds in the money market, it is necessary to establish reliable systems for long term credit, mortgage on real property and its assuarance, and to legislate for special tax exemption on housing investment.

And also, special exemption of income tax, real property tax and the like should be provided for home ownership and saving for it.



CHAPTER IV

PROJECTS PROPOSAL



CHAPTER IV PROJECTS PROPOSAL

4.1 Evaluation of KTA Projects

1. Outline of KTA-I Project

The objectives of KTA-I Project (Research on Building Materials) are as follows;

Research and development of building materials, building components and building elements, in particular those made of locally available raw-and waste-materials (with the emphasis on cement - clay - and timber products), to be used in the construction of single and multi-storied houses and buildings; with the ultimate aim of arriving at rational and efficient construction methods in order to enable the acceleration of house construction in Indonesia.

The project cost is estimated at U.S. \$ 1,000,000. and the required time is 5 years.

In the budget of the fiscal year 1972, the Government of Indonesia allocated funds for the construction 1,000 low-cost houses to be built in eight townships on Java (Djakarta 300, Bandung 200, Surabaya 150, Semarang 150, Kurawan 50, Jogjakarta 50, Keratan 50 and Djamburu 50; units).

To implement this purpose, 5 production units was to be set up, each of which consists of a block-making unit, a timber and/or bamboo shop, a wood-processing shop, and necessary machines and equipments for them. Also, experts for the operations are expected as a part of technical assistance.

2. Outline of KTA-II Project

The objectives of KTA-II Project (Survey and Study on Housing Development Project) are as follows;

To draw a scheme for the development of public housing in Djakarta region and other rapid growing areas such as Surabaya, Medan, Ujung Pandung, etc., taking into consideration of the development of the region as a whole.

And to study the feasibility which examines all the problems of housing development from an economic aspect and a technical one, to study the problems of organization and/or institution necessary for planning, implementation and management of the projects, and to examine the problems of land acquisition and its development.

The project cost is estimated at US\$ 600,000. and the required time is 2 years.

In the fiscal year of 1973, construction of 1,000 low-cost houses as a trial started in Java. The other 5,000 houses are planned for the fiscal year of 1973.

3. Outline of KTA-III Project

The objectives of KTA-III Project (Housing Development Policy) are as follows; Establishment of housing development organizations and housing financing. Institutions to provide long-term credit and guarantee system for large scale low-cost housing schemes for urban and rural areas.

The project cost is estimated at US \$ 200,000. and the required time is 1 year.

4. Outline of LTA-VIII Project

Technical assistance program based on this project is under implementation stage which term is from July 1972 to March 1973. The project is sponsored by the World Bank and is implemented by a consulting team named Planning Community Development Consultant from U. S. A. , for the area of Djakarta.

The outline of the works is as follows;

In general;

Formulation of an urban development program including master planning, urban rehabilitation, urbanization and use of land, housing programs, land and building credit facilities, and the development of the institutional frame work.

In itemized;

- 1) Preparation of action programs suitable for foreign assistance, of a site and service project for housing, a low-cost and moderate housing program of 10,000. units, and a urban renewal program including a Kampong Improvement Program.
- 2) Improvement of the legal framework of the housing industry and housing finance.
- 3) Adoption of laws, regulations, policies and institutional changes for the promotion of mortgage lending and investment into the housing sector.
- 4) Review and revision of the Masterplan of the City of Djakarta, and preparation of the Masterplan of Greater Djakarta Metropolitan Area.

5. Evaluation of KTA Projects

There is no wonder for that the each of the KTA projects are urgent and indispensable to the improvement of the situation in Indonesia.

What comes into question for us was the interrelation between LTA-VIII Project and KTA projects. According to the authorities concerned, the achievement of LTA-VII Project is expected to function as a prototype for the major cities other than Djakarta. Then, as a matter of fact, LTA-III achievement shall compose a basic frame for the implementation of KTA projects. Taking this into note, it seemed that the making a physical framework for KTA projects had better be done after the World Bank team completed the task and the Government of Indonesia approved it.

As to the interrelations among KTA projects, their objectives and scope of work are more or less fragmentary and have a poor organic connection or relation, although it is often pointed out by the proper authorities that the housing problem is a socio-economic-techno-political complex. Putting it strongly, it seems the persons or the sectors are insisting on their respective issues from viewpoints of their own standings and circumstances.

Some of objectives are wanting in the reality of the situation. For instance, projection of housing need and demand is really a tough work and requires so many basic surveys and data analysis related to the overall social fabric and system, such as Grand Census, Housing (Situation) Census, Building-Start Statistics, Building-Permit System, Consumption Survey, Saving-Intent Survey, Income Survey, Residence Registration System, Building-Cost and Land-Price Statistics, etc. Unfortunately, these are not completely undertaken in Indonesia. Sticking to the formalism, a comprehensive and complete system building might be begun with, in order to formulate the national housing policy. According to the present situation, a different approach should be taken, such as the project-oriented, the demonstration-initiated, etc. of housing development.

As to the housing financing, the directives are towards U.S.-style institution, such as the mortgage lending system, the mortgage insurance machine, formation of secondary market like the FNMA or GNMA, etc. Its feasibility which depends upon possibility taking private money into housing sector, possibility constituting financing market and the absolute amount of funds, seems pessimistic, because of high interest of money, low intent of saving and low level of income.

And taking the "Rent Paying Capacity (or Repaying Capacity)" into consideration,

the houses supplied through the above system, must be for the high income group. (q. v. the following trial balance.)

Note. A trial balance on the prototype house of 45 M²

(Data source: The Government of Indonesia)

Construction cost of a house: Rp. 300,000. /unit

Interest of funds: 12% (Market interest is more than two times of this)

Term of repayment: 10 years (Average market term is 2-3 years)

Total repayment : Approx. Rp. 830,000. (2.75 times of construction cost)

Annuaam repayment: Rp. 80,000. /Year, on the basis of equal sum.

If the Rent Paying Capacity is supposed as 10% of the household income, only those of which annual income are more than Rp. 800,000. can afford it. Taking 20% of income as the Rent Paying Capacity, those more than Rp. 400,000/Year can afford it.

And in addition, the land cost should be paid. (It is said land price is approx. Rp. 2,000/M² in the Central Djakarta and Rp. 1,000/M² in her vicinity, and land arrangement costs ab. Rp. 600/M².)

At this moment, one of the most urgent measure for the promotion of housing development is the establishment and operation of a unified governmental organ such as a national housing agency, which is responsible for all of the housing policy and its operation, and which intensively covers the large scale housing projects operation consisting of;

- 1) Land aquisition and arrangement, including provision of public and community facilities such as roads, water supply, sewerage, schools, hospitals, market, community buildings, etc.,
- 2) Sale or rent of housing land,
- 3) Loan of long term and low interest, for house construction by owner-occupants,
- 4) Construction of multiple dwellings for sale or rent, and
- 5) Management of the projects.

As to the funds of the agency, the governmental funds mainly from low-cost money of foreign aid should be allocated for some period.

Technological matters concerned with KTA-I and II, especially rationalization of building materials and promotion of building and the related industries, can not be expected without providing an effective demand which is produced by the large scale housing projects undertaken by the governmental organ.

It is recognized that in general for taking the purposes of KTA projects concrete, the achievement gained through the large housing projects will have a great repercussions.

4.2 High-Ranked Projects

1. Considerable Objectives (Teleological Consciousness)

1) From socio-economic aspects;

Stimulation and contribution to the nation's economic growth,

Enlargement of employment opportunities,

Promotion of people's desire and progressive will (for the better tomorrow), and

2) From physical aspects;

Improvement of urban situation and housing situation.

2. Difinite Objectives

1) Establishment of an unified and intensive governmental organ, responsible for the national housing policy and its implementation,

2) Establishment of comprehensive long-range housing program as a national policy,

3) Setting-up of promotion measure for technology development,

4) Setting-up of promotion measure for the rationalized building industry,

5) In order to accumulate socio-economic-techno experiences for the above, development of large scale public housing projects to be supplied to the middle and lower-middle income group who have regular employment, in Djakarta, Bandung and Surabaya within ten years, each of which has 10,000 dwelling units and the related facilities.

(As to the details of the projects, refer to the attachment of this chapter.)

3. Forms of Technical Assistance required

Technical assistance for the above mentioned should be;

to send experts,

to supply the related equipments and machines,

to defray the necessary part of the local cost, and

to offer scholarship for local people (including for studying in the concerned countries),

as regards the following items;

1) Preparation of establishment of the unified governmental organ for housing,

2) Preparation of a national housing policy and a long-range housing program (including arrangement and improvement for the necessary surveys and data analysis),

3) Planning and design of the large scale housing projects and the arrangement for the implementation and management system,

- 4) Planning for setting-up building materials factories and for the circulation system, in order to back up the large scale housing projects,
- 5) Planning for bringing-up building industries by ways of training, guidance and assistance to contractors, architects, engineers, skill laborers, etc., in order to back up the large scale housing projects,
- 6) Preparation of establishment of the related legislations to building and housing projects,
- 7) Arrangement for improvement and promotion of building research in order to develop and utilize the locally available resources and technique.

4.3 Prospect and Large Scale Housing Projects' Estimate

Foreign assistance to the developing countries has been, more or less, inclined to be an economic aid to an isolated physical project. Now, there is no wonder to make a share of technical assistance bigger and to make effort in order to organize and formulate various economic assistance up to a comprehensive level from socio-economic viewpoint of a nation as a whole.

We believe, the future economic assistance shall lay emphasis on projects which highly contribute to the social development such as urban and housing development.

In order to avoid that the sufficient effect of the assistance like the above mentioned is reduced by obstacles existing in the developing countries such as lack of socio-economic-techno capacity, the technical assistance is emphasized on the improvement of those obstacles.

From this viewpoint, the above kind of basic technical assistance should be a premise for the following related economic assistance.

Anyhow, we believe our proposal is one of the best approach to improve urban and housing situation in Indonesia, who is now going to make great steps forward with her abundance of human capability and natural resources.

Finally, we attached herewith the outline of the large scale housing projects.

Attached: Outline of Large Scale Housing Projects

- 1) Site: Djakarta, Bandung & Surabaya
- 2) Time of Implementation: Approx. 5 years per one project
- 3) Size and Composition (per one project)

Classi- fication	No. of Dwelling Units	Land	Area of Housing Lots (NET)	Area of Land (MEDIUM GROSS)
		UNITS	M ²	M ²
Detached or Row-House (q. v. Note 2.)	5,000		750,000 (150 M ² /unit)	975,000 (NET x 1.3)
Medium or High Rise Appartment (q. v. Note 1.)	5,000		150,000 (30 M ² /unit)	270,000 (NET x 1.3)
Sub-Total	10,000		-	1,245,000(55%)
Public & Community Facilities				1,018,600(45%) (q. v. Note 4.)
Grand Total				2,263,600(100%)

Note 1.: Housing lots, for sale and rent.

Houses, to be constructed by owner-occupants.

Ave. floor area/unit, 45 M².

Note 2.: Housing lots, for rent.

Houses, for rent or sale, to be constructed by the governmental organ.

Ave. floor area/unit, 60M².

Note 3.: Population density (GROSS); 177/ha. (4 x 10,000/226 ha.)

Note 4.: Land Use Distribution, based on the precedents of large scale housing develop-
ments in Japan;

Streets,

12.9%

Small Streets & Alleys 2.7%
Neighborhood Main Streets 3.2%
Urban Major Streets &
Highways 7.0%

Parks & Green	12.9%	{ Playlots	2.7%
		{ Neighborhood Parks	3.2%
		{ Community Major Parks	2.2%
Drainage & Sewerage	1.9%	{ Sewerage	0.1%
		{ Rivers	1.8%
Schools & Kindergarten	9.5%	{ Kindergarten	1.6%
		{ Primary Schools	3.1%
		{ Secondary Schools	2.3%
		{ High Schools	2.5%
Community Facilities	5.0%	{ such as Assembly Hall, Shopping Center, Fire Station, Police Station, Management Office, Athletic Facilities, etc.	
Others (Miscellaneous)	3.0%		
Total	45.2%		

4) Action Program for Implementation

Job Classification	Fiscal Year										
	'73	'74	'75	'76	'77	'78	'79	'80	'81	'82	'83
Survey, Planning & Design											
Land Acquisition & Land Arrangement(*1)											
Sale or Rent of Lots(*1)											
Land Arrangement(*2)											
Construction of Houses(*2)											
Sale or Rent of Houses(*2)											
Construction of Public Facilities (*3)											
Construction of Schools, Community Facilities, etc.											

Note. ————— for Djakarta *1 ; of Detached or Row Houses
 ----- for Bandung *2 ; of Med. or High Rise Apartments
 - - - - - for Surabaya *3 ; such as Streets, Parks, Drainage, etc.

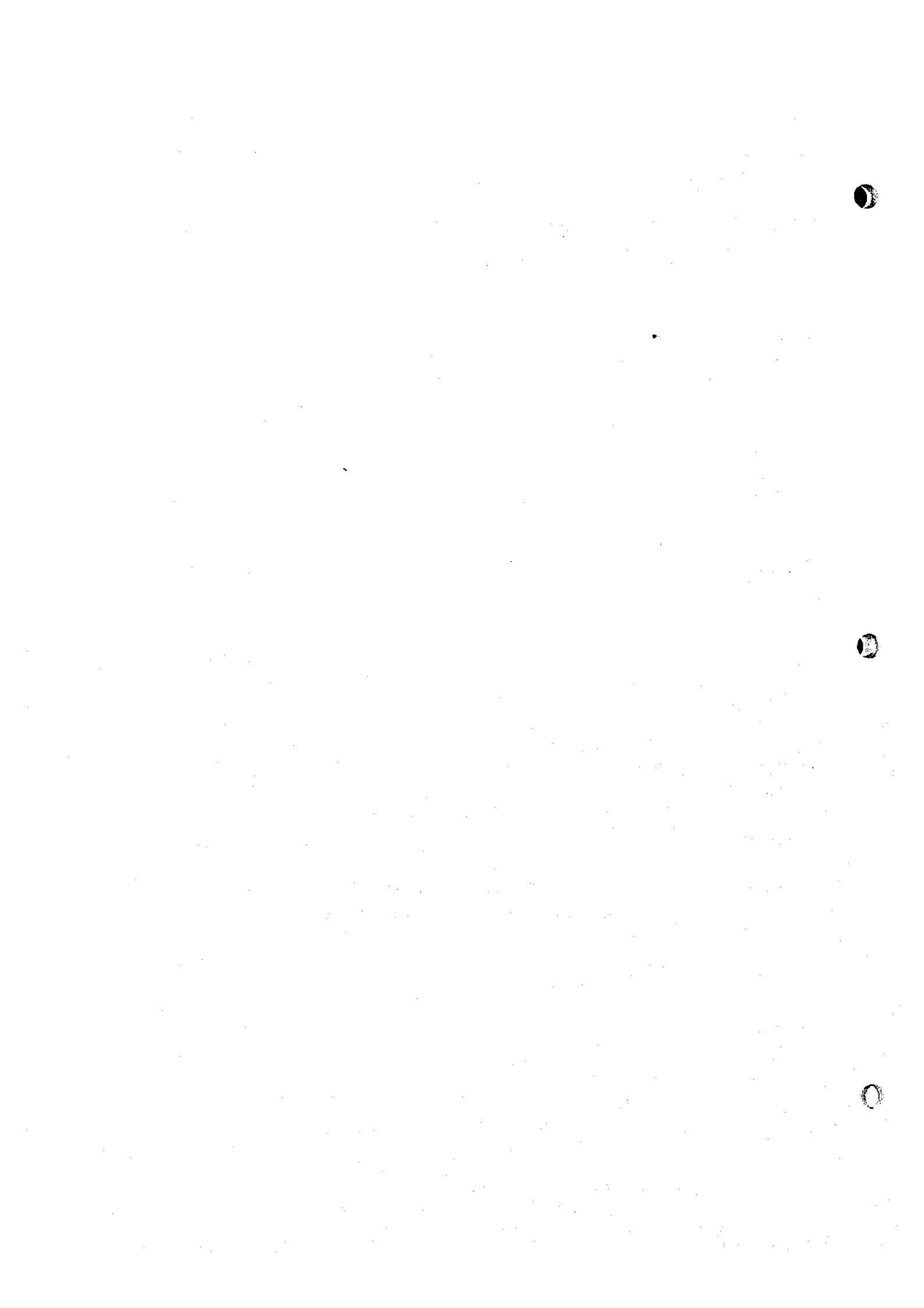
5) Estimate of Execution (per one project)

Note: Construction cost of schools, community facilities' buildings, etc. are excluded.

Cost is in 1972 price.

<u>Land Acquisition</u>	<u>2,264 million Rp.</u>
2,263,600M ² x 1,000 Rp. /M ²	
<u>Housing Land (M. G.) Arrangement</u>	<u>747 million Rp.</u>
1,245,000 M ² x 600 Rp. /M ²	
Paving neighborhood main streets and urban major streets, excluded.	
<u>Public & Community Facilities'</u>	<u>131 million Rp.</u>
<u>Land Arrangement</u>	
2,263,600M ² x 14.5% x 400 Rp.	
Paving neighborhood main streets and urban major streets, excluded.	
<u>Parks & Green Construction</u>	<u>292 million Rp.</u>
2,263,600 M ² x 12.9% x 1,000 Rp.	
<u>Construction of Medium & High Rise Apartments</u>	<u>180,000 million Rp.</u>
60M ² /unit x 5,000 units x 60,000 Rp. /M ²	
<u>Pavement of Neighborhood Main Streets & Urban Major Streets</u>	<u>1,155 million Rp.</u>
2,263,600M ² x 10.2% x 5,000 Rp. /M ²	
<u>Miscellaneous</u>	<u>1,000 million Rp.</u>
<u>SUB-TOTAL</u>	<u>185,589 million Rp.</u>
<u>Operation & Management</u>	<u>18,559 million Rp.</u>
Subtotal x 10%	
<u>GRAND TOTAL</u>	<u>204,148 million Rp.</u>

Reference: If this project is a 5,000 units development without medium of high rise apartments, the grand total could be approx. 3,000 million Rp.



CHAPTER V

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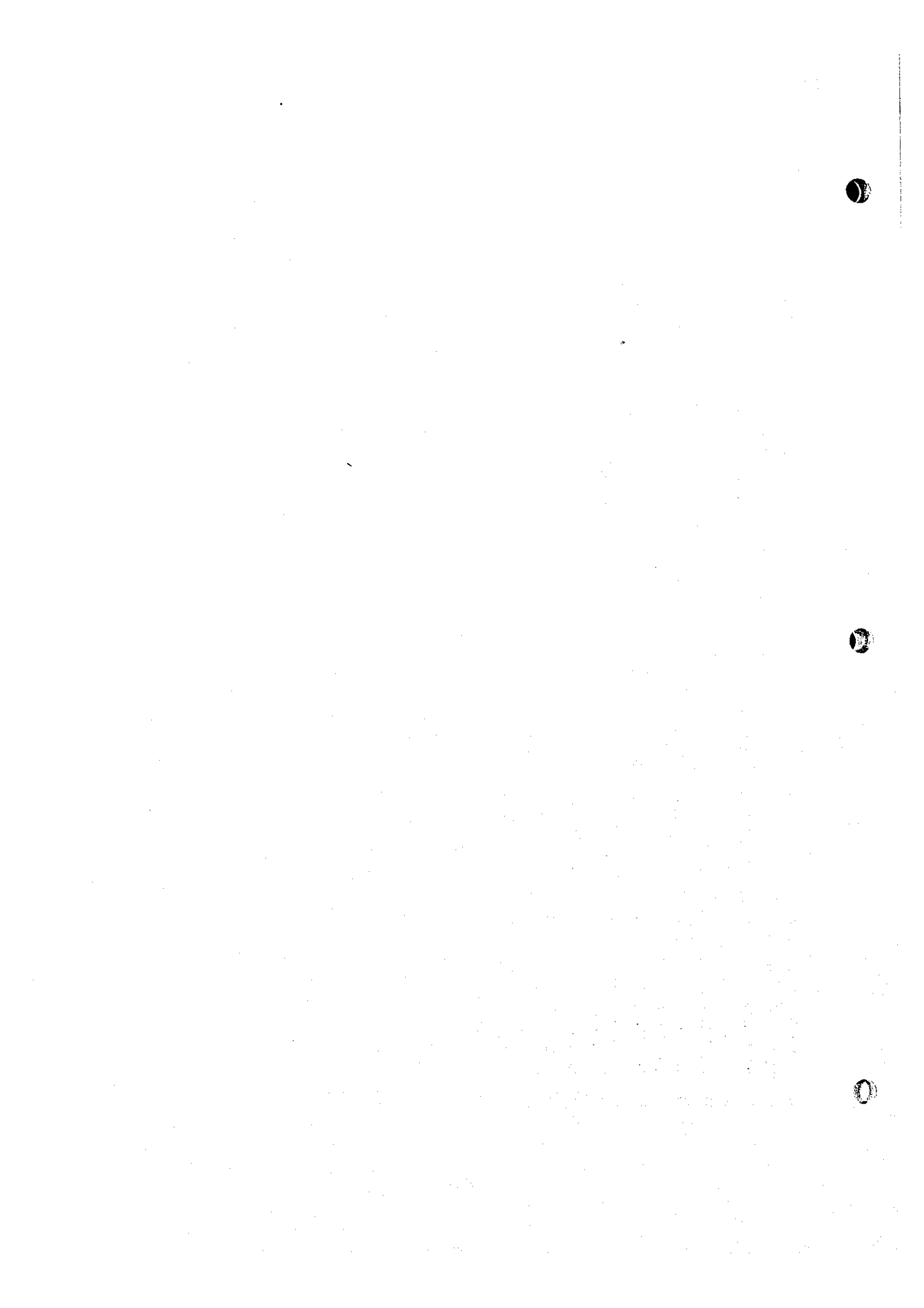


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- 26 BACKGROUND PAPER NO.7 THE FORMULATION OF A NATIONAL HOUSING POLICY FOR INDONESIA, SOME BASIC CONSIDERATION
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SURABAJA
(PRELIMINARY REPORT OF SURABAYA HOUSING DEVELOPMENT)
- 57 DJAKARTA its rehabilitation and development
- 58 PRISMA Nomor Khusus Urbanisasi & Pengembangan Kota
Des. No.7 1972
(PRISMA SPECIAL EDITION URBANISATION & CITY DEVELOPMENT
DECEMBER No.7 1972)
- 59 BAMBOO IN INDONESIA



SUMMARY OF OBSERVATION

December 22, 1972

**The Preliminary General Survey Group
JAPAN MISSION ON HOUSING SURVEY OF
THE REPUBLIC OF INDONESIA**



December 22, 1972

Ir. Rachmat,
Director General of Housing, Building, Planning and Urban Development,
Ministry of Public Works and Electric Power

Sir,

The Japan Mission on Housing Survey of the Republic of Indonesia, The Preliminary General Survey Group, has stayed three weeks in Indonesia from December 4th to December 23rd, 1972, visiting Djakarta, Surabaya, Bandung, investigating general aspect of housing, urban environment and building material problems of the country.

The mission's task is primarily to investigate general conditions of housing and urban development and institutional and policy aspect thereof, to confirm in identifying the problem areas which have been pointed out by you, and to set basic guidelines for the further technical assistance in future, so that the Preliminary Building Material Survey Group and the longer term experts who will visit and stay for technical assistance in the field of the proposed KTA-1 to KTA-3 projects can smoothly be guided into their task on the ground of the basic information collected and guidelines set by our group.

Within quite a little term, we could make intensive talk with the responsible persons in the Indonesian Government, and at the same time we could cover a considerable areas for observation with the help of the devoted personnels in the government, national, provincial and municipal.

Without doubt, the result of our observation, even if having been corrected by the personnels of the Indonesian Government, must be superficial and might not be well organized. However, we believe that we could make a fruitful general survey which will put an important stepping stone for the further survey and technical assistance in the field of housing and urban environment.

We hereby submit following summary of observation.

From paragraph 1 to 18, we discussed about housing and urban environment problems in general and paragraph 19 to 26, about building materials.

We appreciate highly of your help and your staff's, Ir. Sardiono, Ir. Mochter and especially Ir. Soebagio who has served us with utmost care as a counterpart of the survey. Ir. Kartaharja, Director of the Building Research Institute gave us efficient and extensive assistance while we stayed in Bandung.

We also wish to express our gratitude to Ir. Prajogo, Vice Governor of D.K.I. Djakarta and Kol, Soekotje, the mayor of the city of Surabaya, who spared their time for us in order to explain the general conditions of the cities and their policies thereon.

Yours sincerely,

Leader of the Mission,
Yoshiyuki Mizukoshi
Senior Policy Planning Officer,
Secretariat to the Minister,
Ministry of Construction

Kei Minohara
Deputy Chief
City Planning Division, City Bureau
Ministry of Construction

Kenji Hirai
Deputy Chief
International Cooperation Division,
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Toshio Suzuki
Deputy Chief
Housing Production Division,
Housing Bureau,
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Mikio Nakamura
Coordinator, 1st Training Division,
Overseas Technical Cooperation Agency

1. According to the Census returns 1961 and 1971, urban population is increasing annually at the rate of 3.89%, while total population increases at the annual rate of 2.68%. Thus, urbanization trend is remarkable. In the metropolitan cities such as Djakarta and Surabaya, corresponding rate of increase shows more than 4%.
2. Indonesian economy now stays at the rehabilitation stage. Most of the government investments are put into rehabilitation of social capital, leaving sound housing supply to the level of bare minimum even in the rapidly growing cities. This has created serious housing shortage and uncontrolled development.
3. Observable housing and urban crisis may be attributable to the following causes;
 - (1) low level of economic affluence which may be represented by per capita GNP. (less than 100 US\$)
 - (2) lack of legal as well as financial system of improvement of urban land,
 - (3) extremely high interest rate money. (18 ~ 30% private and 12 for government),
 - (4) lack of modern institution of housing production.
4. In the PELITA I, Indonesian government has dealt the housing problems as follows;

"The demand for (city) houses is approximately 300,000 per year, while the building capacity is only 40,000. Present facts show that the material as well as the funds for housing development are very limited. Therefore, solving the housing problems will be carried out in phases after determining a scale of priorities. Measures will be taken to prevent, or at least to minimize, the worsening of conditions. Physical facilities will be made available to stimulate housing building in such a way that the greatest part of it will be built by the people themselves."
5. In the PELITA II, it tries to advance in this field so that various efforts have been made in the identification of problem areas and in the formulation of necessary policies. Overall policy frame in this field has been discussed in the so-called Workshop Group which are consisted of responsible government officials and related private and semi-public organs.
6. At the same time, pioneering implementation programs have been carried on in the following fields;
 - (1) low cost housing development (Rumah Murah)
 - (2) Kampung improvement program
 - (3) site and service program
 - (4) prototype housing project 1969 ~ 1971
 - (5) rural housing and environment development
 - (6) dissemination and public information of house building and construction

Although these projects remain in the experimental scale the achievements are impressive in terms of future policy formulation.
7. Djakarta, Surabaya and Bandung have their masterplans, although they function as not so much legal measure as administrative guidepost.
8. Indonesian government seeks for better estimation of housing need as well as more refined comprehensive urban development plans. LTA-8 project financially supported by World Bank can be considered in this context.
9. At the same time, among related public officials, it is urgently felt that the concrete achievement in housing and urban development is necessary.

10. It is our mission's firm belief that in dynamically changing, developing situation, comprehensive planning approach which starts from extensive data collection and proceeding on the refined planning process is improper to this particular situation. On the other hand, accumulation of unorganized, piecemeal achievements may lead to inefficient and often misguided investments.
11. We believe that here overall strategy for housing and urban development should be project-oriented, although providing general framework for policy formulation is indispensable in order to obtain common-understanding of the situation among experts and decision makers. However, this frame may not necessarily be refined one.
12. Based upon a tentative general framework, we identify the major problem areas in urban housing and urban development as follows;
 - A. as for growth elements, that is, housing flow aspects,
 - (1) how to cope with encroaching and expanding Kampung areas,
 - (2) how to secure the sound housing supply for low-middle to middle income families with permanent jobs.
 - (3) how to induce housing investment from middle to high income families.
 - B. as for adjustment elements, that is, housing stock aspects,
 - (1) how to improve already urbanized Kampung areas above a certain level of density,
 - (2) how to improve already urbanized areas with fairly sound dwelling units but without minimum urban setting,
 - (3) how to improve unsound dwelling units on improved land.
13. For the sake of housing policy formulation, we consider that following criteria are relevant to the particular situation;
 - (1) to give minimum standard of sanitary conditions to every urban resident,
 - (2) to provide the system of controlled urbanization with minimum fiscal burden for those who can afford to live in such areas,
 - (3) to give hope for lower-middle to middle income people for future fulfilment of their desire to be accommodated in sound housing,
 - (4) to induce money for housing development from household savings and from private capital sources.
14. Considering the major problems and policy criteria described above, we deem the following measures should be taken;
 - (1) To provide reception areas for immigrating families as well as for the relocated families from urban Kampung areas.
 - (2) To improve the existing Kampung with minimum, alleys, drainage and water system.
 - (3) To provide the legal and fiscal system of improvement of urban land, such as land readjustment system and development permit system. This should include the system of improvement in the already urbanized areas with poor street and drainage system.
 - (4) As for the inducement of the money to housing investment two separate systems may be demanded;
 - 1) For those who can bear the interest rate in private money market, to open up the way for publicly guaranteed instalment payment system.
 - 2) For those who can not bear the interest rate in the private money market, to establish public financing body which extend loans with low interest rate to those who wish to built their own houses and who can pay the necessary expenditure if the loan terms are soft enough. This body may also function as money lending organization for those municipalities who wish to carry on the program of land improvement as described above. (14, (3))

- (5) Finally to try to build large scale housing development for the sake of demonstrating that the government has started long range program for lower-middle to middle income people who will share in the future the responsibility of the national development. This project also has a role for the test field of the financial system described above (14, (4) 1 and 2).
15. As we have pointed out in paragraph 11, these policy measures should be built upon concrete, urban development projects and through the actual development process, constant review, assessment and evaluation is indispensable, which may lead to the adjustment of the newly created systems to the reality.
16. If the above described policy structure proposals are acceptable, then the proposed KTA-2 and KTA-3 project will become main pillars of the entire structure. Thus it is our mission's conclusion that the proposed KTA-2 and KTA-3 projects would certainly accelerate the progress in housing and urban development in Indonesia.
17. We would like to add some comments on the basic guidelines for the future technical assistance concerning those projects;
- (1) While the above policies are in the process of development with constant feed back system, it is advisable for the Director General of Housing, Building, Planning and Urban Development to have an adviser who will grasp the overall process of policy development and give advise to the Director General from the strategic point of view of the development of housing and urban policies. Naturally, he will assist upon the formulation of housing financing system.
 - (2) Technical assistance should also be project-oriented so that, a team of experts who have had experiences in large scale housing development should be sent. The team should include not only senior planners but also building and public works supervisors on site. This would ensure the real assistance on the stage of actual development and at the same time they would be able to cooperate with the counterparts of various levels of development and through the cooperation the indigenous process of development will evolve.
18. Some more comments on technical matters;
- (1) Considering current land and transportation situation in Djakarta and Surabaya, the day will come soon when Indonesian urban people are requested to live in a planned, more densely inhabited housing estates. This implies necessity of introduction of row houses and multi-storied apartment houses. Therefore, in the next model housing projects, experimental construction of those types of urban houses is recommended.
 - (2) Because of convenience or of bureaucratic structure, housing financing policy tends to be separately dealt with urban development policy, leaving results of financing for sound dwelling units upon unimproved land. It is highly recommended that housing financing system should be tightly linked with urban development policies.
 - (3) Urban land policy, including land use control, land development program and land taxation must be one of the major constraints in planned development. However, if land policy is formulated independently from planning, implementation and administrative conditions and if land policy should be discussed irrelevantly with land improvement system and housing development system, then the tendency is likely that political as well as other socio-economic disturbing elements will necessarily encroach in the discussion, making the conclusions very much inert and ineffective. Consequently we think that urban land policies should be constructed so as to strengthen operational system of land improvement and housing development.

(Development of Building Materials and Element)

19. In order to meet huge housing demand both in urban and rural areas, it is urgently requested to find out proper "building materials and elements" (hereinafter as "building materials") which have enough durability, and to put them into mass production, in quite near future, together with to provide necessary systems of circulation and distribution.

It is considerable that mass production of building materials can simultaneously stimulate the growth of the national economy since a building industry is generally one of the largest in terms of G.N.P. share, both in the developed countries and the developing.

For this matter, it should be taken in note that in choosing and selecting the building materials as a target of mass production, there should be a fair adaption to the National Policy as regards her socio-economic development.

20. At present in Indonesia, almost of all building materials except some natural resources, for example, timber and bamboo, are being produced rather in small scale factories which are scattered all over the country, with a few exception in portland cement being produced in a rational way, etc.

For the reason, mass production of building materials will cause reduction of job opportunities and possibilities utilizing local resources.

While carrying out rationalization of production and provision of building materials, it is highly requested as social problems besides physical and economic problems, to give opportunities to join into the above revolutionary rationalization, to the people who are engaging in the sale and/or production of building materials.

21. Timber shortage in Jawa Island mainly depends on the lack of transportation facilities between Jawa and timber producing islands. Timber is still major building material everywhere in the world, because of its superior adaptability for housing and building.

In order to supply enough amount of timber, not only for the building material but for textile industry use, etc., it is seriously urged to provide an efficient transportation system for the purpose.

22. It is important that according to the local characteristic, the local resources, for example, trass, lime, bamboo, other agricultural wastes, are utilized efficiently, in order to reduce a burden of transportation.

On this viewpoint, new large scale factories on semi-governmental basis, are to be established at least in each province, and distribution points as stores and demonstration (in other words: Show Windows) are desirably to be provided in each District or Villages. It is hoped that those who are engaging in building material production are to have the priority to invest to the new factory and the new local store, and to join the management of them.

23. The above mentioned revolution will be divided to two or more stages in terms of target building materials.

In the first stage which is to be achieved in five ~ ten years, the task would be establishment of

- 1) The above mentioned large scale factories
- 2) Quality control system
- 3) The above mentioned points of sale and demonstration, and
- 4) Facility and/or capability of 3), for prompt delivery of building materials.

The target items of building materials to each region or province has to be studied by the experts concerned, but the considerable are rather the traditional ones which are improved, for example, roofing tile (possibly glazed), processed bamboo and timber, brick, trass and lime block, lime (with the specification for concrete), etc.

24. Concurrently with the above, it is necessary to accelerate the training program for engineers and laborers, by which they will be able to afford to build the better housing with the better materials.

Such organ as the above should be scattered all over the country.

25. The second stage (possibly in the following five years) is a gradual conversion from the traditional ones to the rational building materials which enough conformity with this country in terms of price, durability and better comfort.

The target items are, for example,

- 1) Asbestos cement board (both corrugated for roofing and board for wall),
- 2) Plywood (especially, type I is recommended, as regards termite/corrosion/water-proof),
- 3) Particle board (for wall, floor and furniture),
- 4) Wood wool cement board (for ceiling and wall),
- 5) Wood fiber board (for interior use), and desirably in the second stage, or the following stage,
- 6) Sheet glass (for window),
- 7) Prefabricated ventilation window, etc.,
- 8) Prefabricated gutter, sink, pipe, etc. (for drainage and sewerage system, made of concrete with wire reinforcement),
- 9) Materials for plumbing and electric supply,
- 10) Ready-mixed concrete, and
- 11) Steel or light gauge steel members (for multi-storied or large span structure).

In the second stage, the factories would be rather concentrated than those in the first stage.

26. Taking into account that multi-storied structure is required in the urban area, especially in high land-price district mass production system of precast concrete panel construction is to be developed and practised in near future.

It has a great advantage of reliability in terms of structural safety, because the site work of concrete making and casting are not needed.

27. For execution of the above mentioned (No. 19 ~ 26), the detailed survey and research by experts of corresponding fields, are to be required.

As far as building materials of today's concerned, the most urgencies for the low cost housing are arrangements of

- 1) Research experts, for example, as regards processing timber, bamboo, etc.,
- 2) The above processing plants and facilities,
- 3) Research laboratories' equipments and
- 4) The above related engineers.

MEMORANDUM

(This memorandum is prepared for the sake of memory and not to be considered as a part of Summary of Observation)

1 p. If we believe in the Census return rather than registration data, it seems that urbanization has not yet taken off in Indonesia. Following table shows that in City Djakarta, Surabaya and Medan, social increase can be observable while in the rest of the cities annual growth rate is nearly the same or a little below the national natural growth rate of 2.68%.

If this is true, as economy grows, the problem of housing and urban environment will surely be aggravated. (See table 1).

2 p. Although considerable amount of housing developed or purchased by the public organs for renting to public official with nominal charge could be observed, yet its volume was not known.

10~11 p. We believe that in such a developing country as Indonesia, extensive and detailed survey directed to general public may not yield a fruitful results.

The modern institution, social organization and a certain educational level which give prerequisite condition for such survey is non-existent. Besides, the socio-economic balance is so subtle to change that a small governmental action may cause a drastic change in a sector of economy. For example, if government tried to supply housing for certain income group, that would induce the structural change in the housing market. On the other hand, hypothetical need, to our opinion, should not be used for policy target. Applying a certain standard (most probably exotic) which is economically unaplicable as well as socially irrelevant to this country and estimating hypothetical need in housing is not only misleading but also harmful for the step-by-step constructive proposals to improve the situation.

In such kind of a situation, the only way to probe into the reality is to try to act upon reality. Thus by actually constructing housing development, we can find out the acting supply demand balance in the housing market.

12 p. Our tentative general framework is shown in Table 2.

The proportion of income groups is adjusted to the following Table 3 from Studi Rumah Murah Di Djakarta by Institut Teknologi Bandung, Housing volume data arranged as in the Table is not available.

We hope that the further survey clarify the comparative magnitude of each problem area.

Again problem here is how much we can rely upon such income data. From what we have heard, it is quite dangerous for policy formulation to rely upon such data. Instead, certain multiplier should be put on it. But we do not know how much should be the multiplier. Perhaps the best way to find out actual income level is through market mechanism, that is, to supply various housing types with various financial burden and see the people's reaction, if people can freely apply to whatever types they like without being disturbed by artificial factors.

14 p. (3) Land readjustment system has served one of the basic instruments for the ordinarily urban development in Japan. As this system demands communal type of social organization. Indonesian society might have advantage for application of such system.

The general concept of the system is shown in Table 4.

We highly recommended that the Indonesian Government takes serious interest in the system and make further study on it.

- 14 p. (4) (2) Considering extremely high money interest rate and scarcity in availability, private resources other than household budget may not be successfully introduced in the housing investment. Perhaps it is wiser to try to establish special independent fund for housing accepting foreign aid money and without watering down to use the money for direct loan to home purchaser.
- 14 p. (5) How large the scale of housing development is in question. We do not know at present that 10,000 dwelling unit is from the planning point of view, reasonable or not. We have to study further upon the proper structure of a certain urban unit, social as well as physical (facility-wise). Important thing here is that the development unit should have more or less complete set of urban facilities. It should serve as a showpiece if we take up each of such facility.
- 18 p. (1) Experience obtained by prototype housing in Bandung and Rarawany should be fully assessed in this context. But next time, experimentation should be more on socio-economic sides rather than on technical sides.

In Japan, in 1955, we have virtually almost no multi-storied apartments. Mass introduction of multi-storied housing by Japan Housing Cooperation, naturally, encountered with severe criticism for a while. But now, around 1.5 million public or semi-public multi-storied apartments have been stocked.

In the process of rapid industrialization, people's preference and propensity for living environment quickly changes.

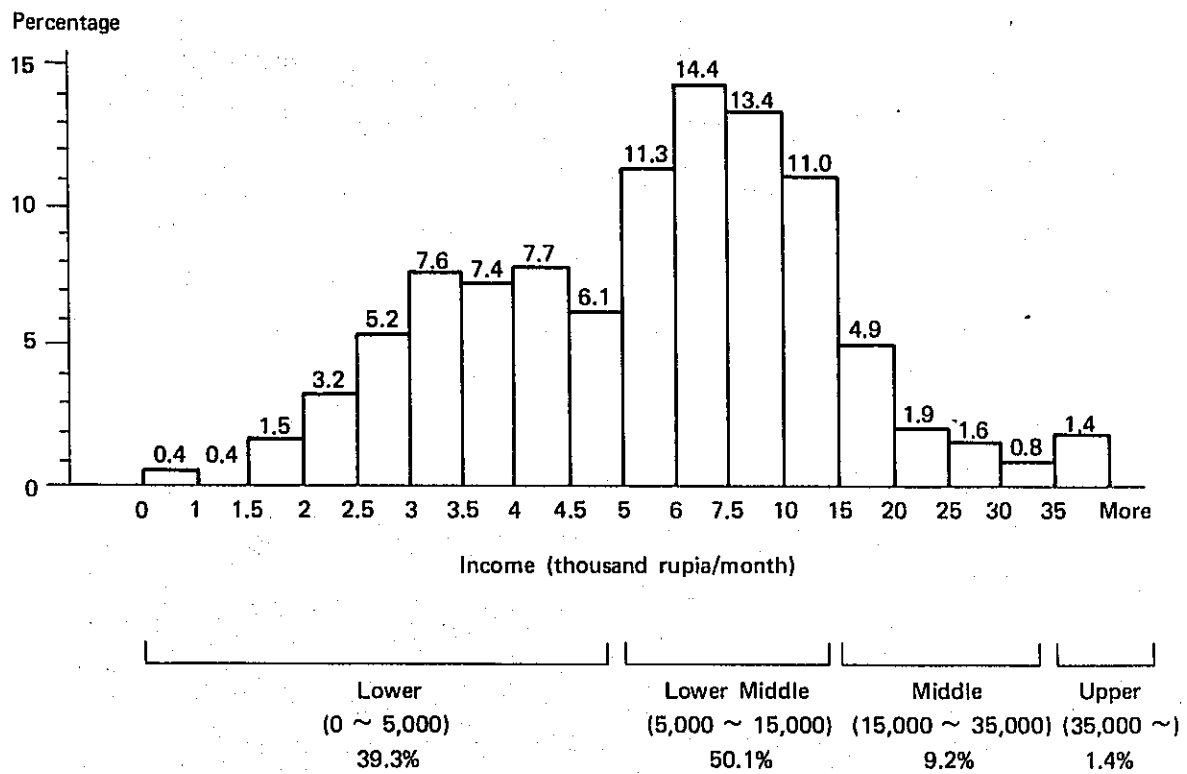
In the development of 10,000 housing, transportation especially commuting of the residents will become one of the key issues. Perhaps, here again trial and error approach is necessary in the improvement of existing individually operated "public transport" such as betjak, bemo, taxi and bus.

Table 1. Growth of cities in Indonesia

Name of cities	A. Population 1961 (thousand)	B. Population 1971 (thousand)	B/A	Annual growth rate (compound) (percentage)
Jakarta	2971.1	4576.0	1.54	4.2
Surabaya	1007.9	1556.3	1.54	4.2
Bandung	972.8	1201.7	1.25	2.1
Medan	479.1	635.6	1.33	3.0
Semerang	503.1	646.6	1.28	2.5
Palembang	474.9	582.9	1.23	2.0
Ujung Pandang	384.2	434.8	1.13	1.7
Surakarta	367.6	414.3	1.12	1.6
Jogjakarta	312.6	342.3	1.10	1.5

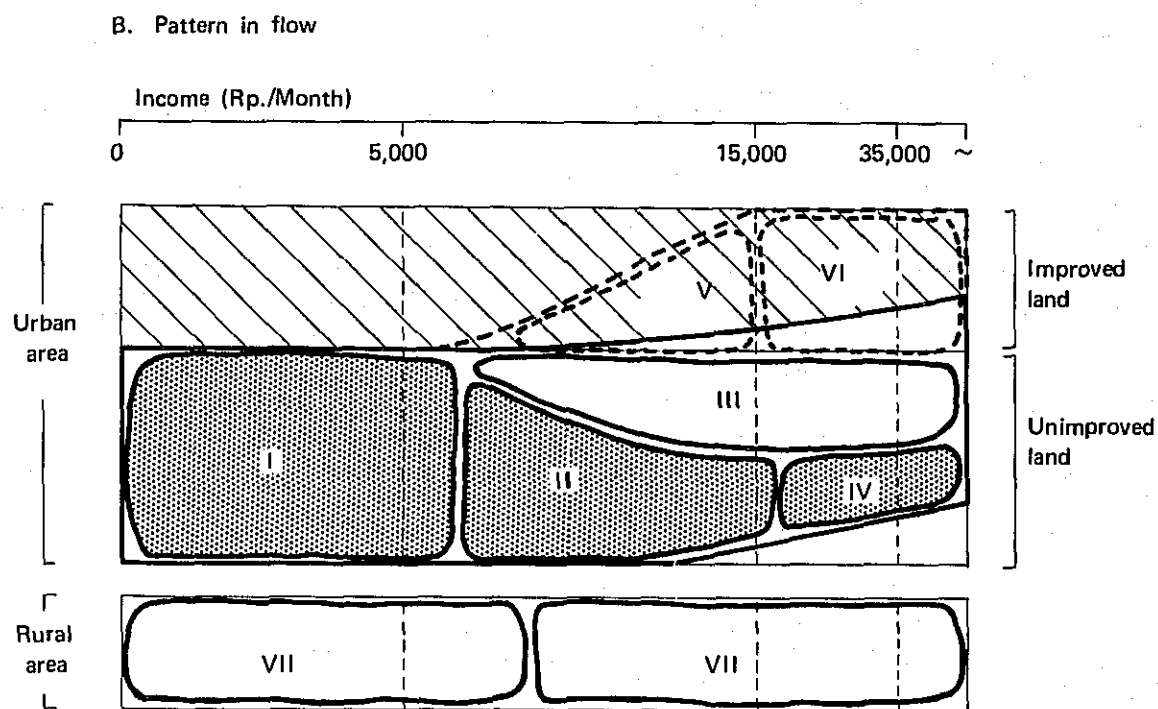
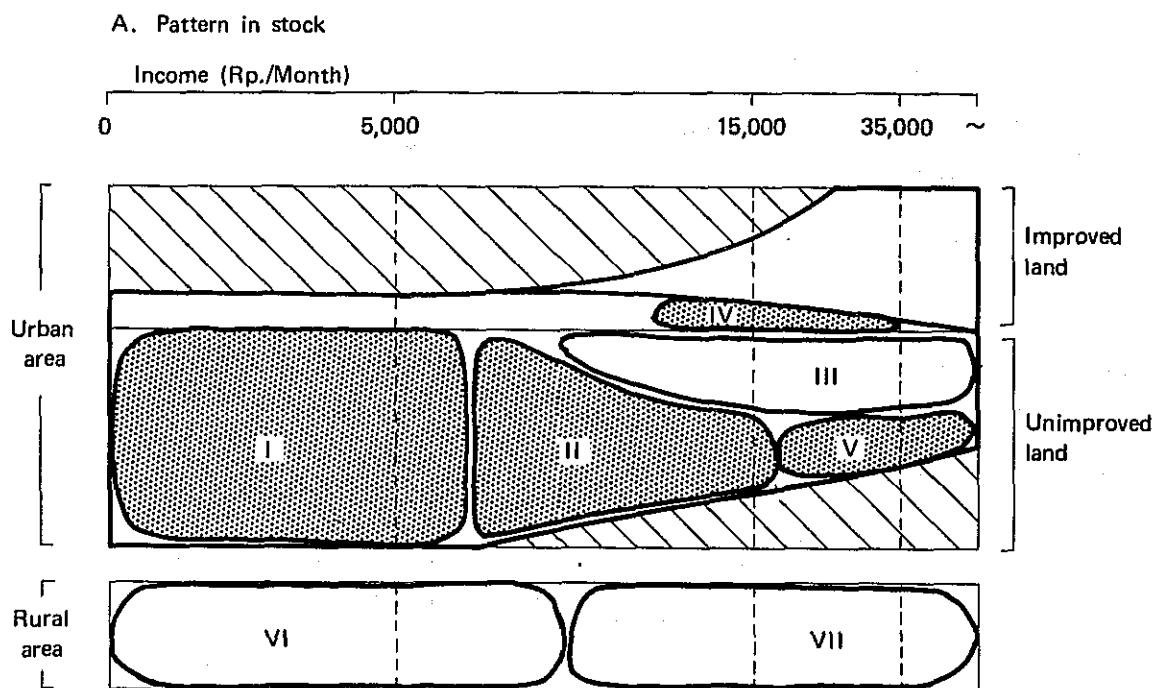
(Source; Population Census)




Table 2. Income Distribution



(Source: Studi Rumah Murah di Djakarta, Institut Teknologi Bandung)

Table 3. Hypothetical Housing Need



-  unsound dwelling units
-  unprobable sphere
-  problem area

Note to Table 3

- (1) If we assume that the income data in the Table 2 is correct. Proportion of income groups in this chart is rather distorted towards unproportionally larger higher income groups.
- (2) The housing volume on the vertical axis does not reflect reality. Rural housing occupies about 80% in stock, as this chart is prepared for the sake of urban housing analysis.
- (3) Pattern in stock shows, following problem areas.

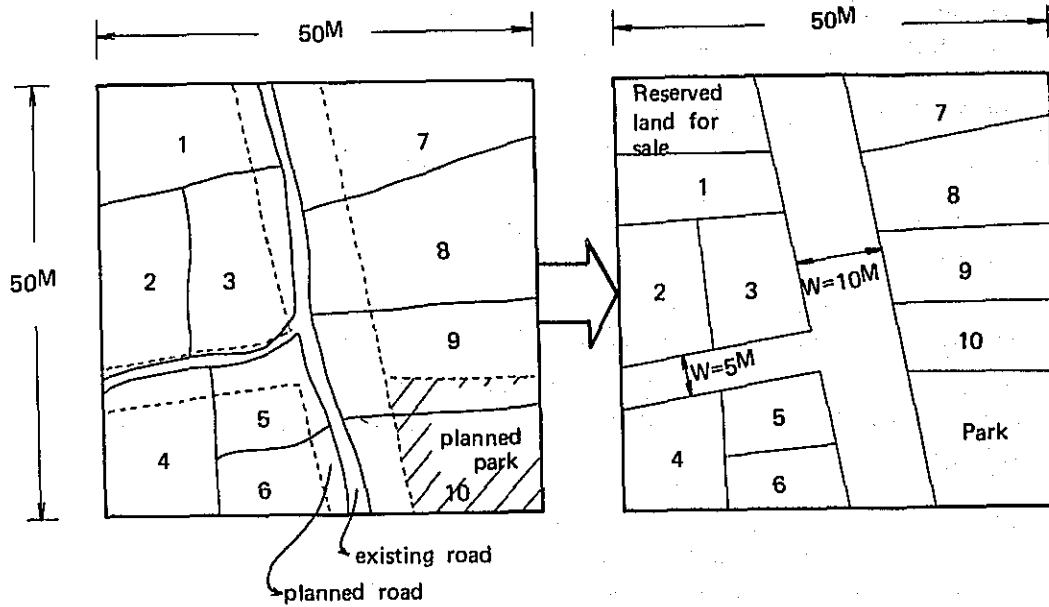
	land	house	probable measures
I.	unimproved	unsound	Kampung improvement
II.	unimproved	unsound	site & service + self - help
III.	unimproved	sound	land improvement
IV.	improved	unsound	housing financing
V.	unimproved	unsound	financial assistance for relocation
VI. } VII. }	Rural problems should be dealt differently, perhaps, 2 or 3 classes of technical and financial help will be demanded.		

- (4) Pattern in flow shows, following problem areas.

(This pattern shows, probable out come if no policy measures are taken. But here, if some policies will be put into effect, the areas in chained line may come out.)

	land	house	probable measures
I.	unimproved	unsound	reception area
II.	unimproved	unsound	site & service + self - help
III.	unimproved	sound	land improvement
IV.	unimproved	unsound	land improvement + housing financing
V.	improved	sound	land improvement + housing financing
VI.	improved	sound	land improvement + housing financing

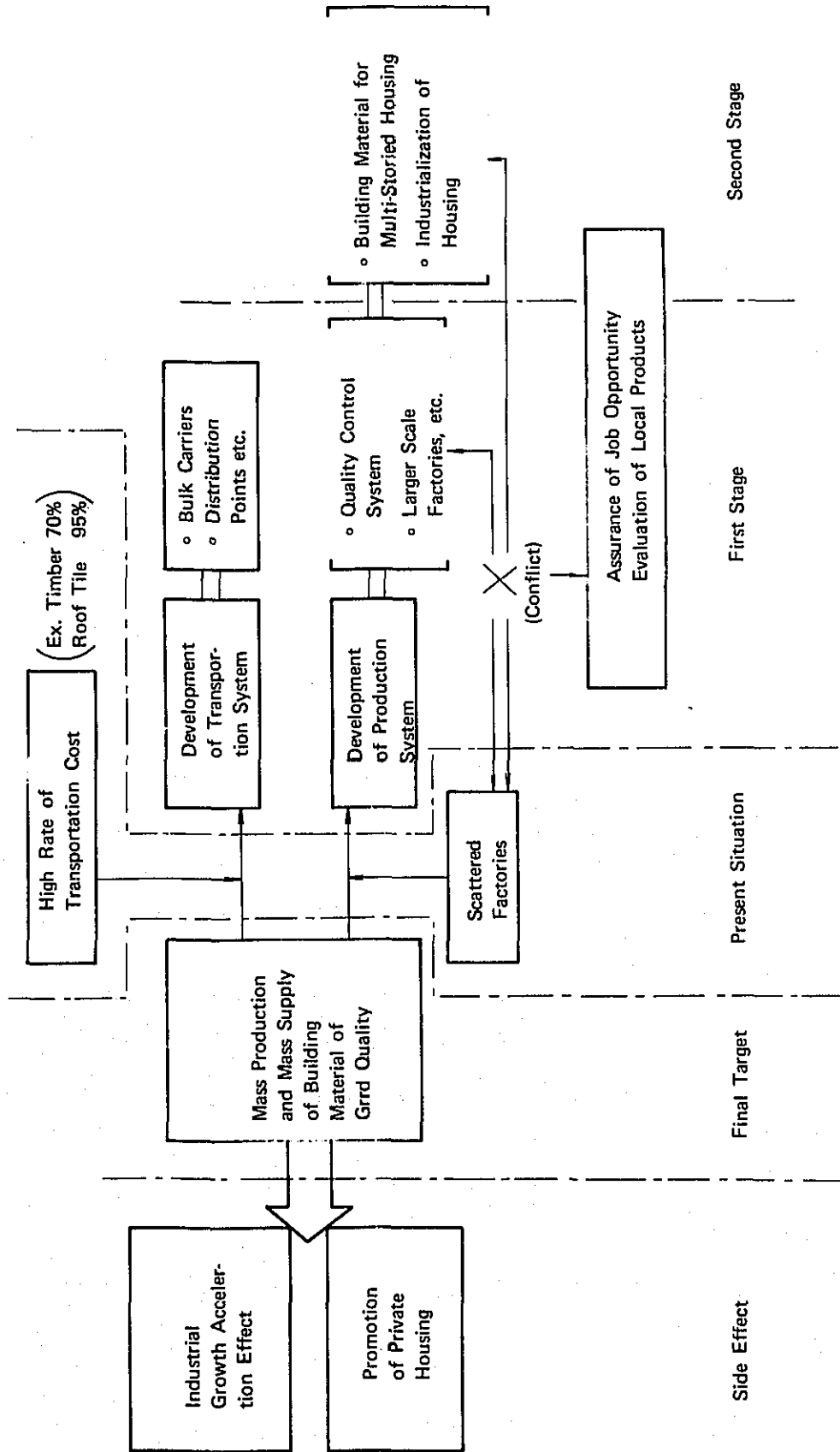
Table 4. Land Readjustment

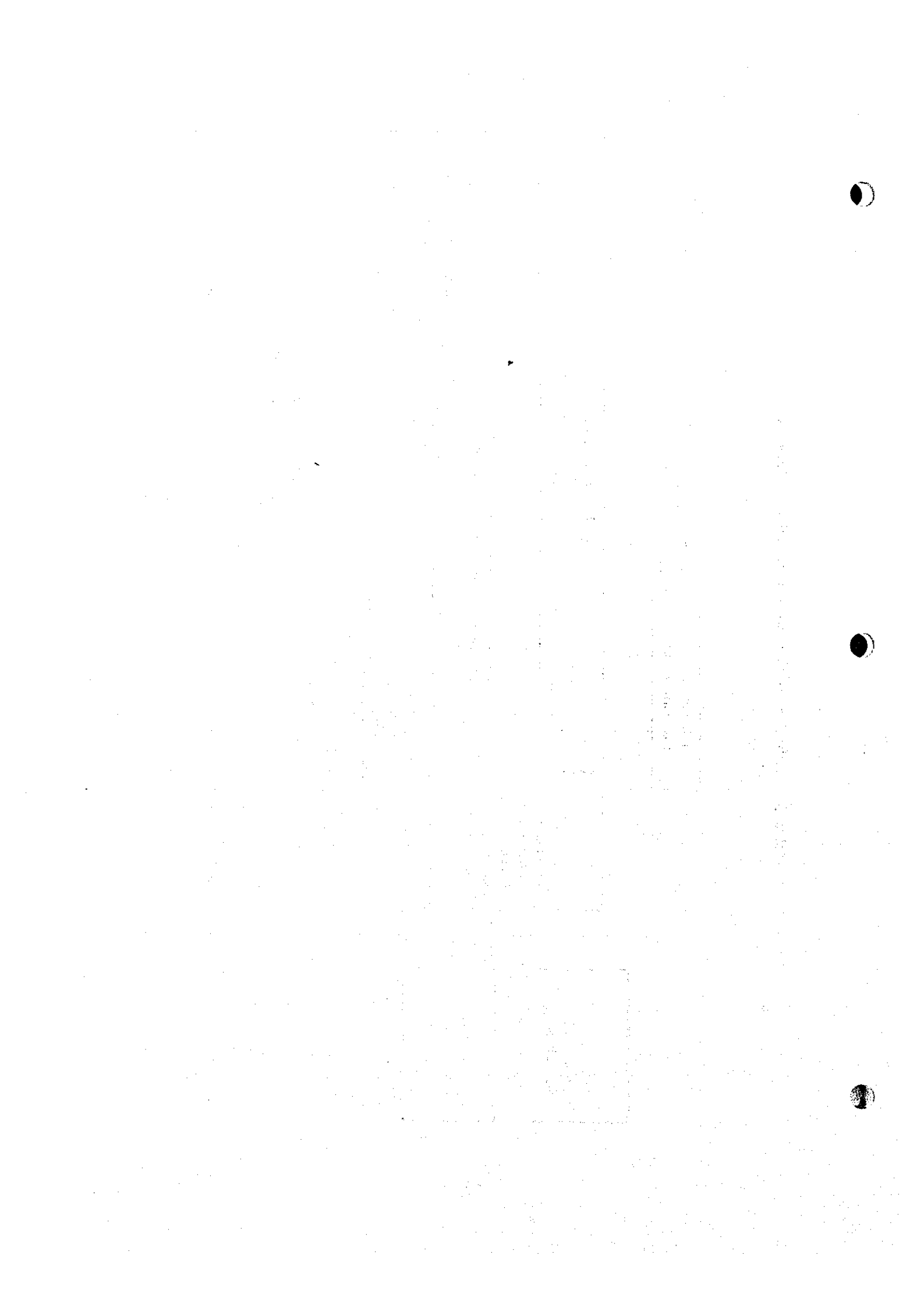


Kinds of Land	Before		After	
	m ²	%	m ²	%
a. Public Land	150	6.0	800	32.0
Road	(150)	(6.0)	(600)	(24.0)
Park	—	—	(100)	(4.0)
Reserved Land for Sale	—	—	(100)	(4.0)
b. Private Land	2,350	94.0	1,700	68.0
1	(200)	(8.0)	(145)	(5.8)
2	(200)	(8.0)	(145)	(5.8)
⋮	⋮	⋮	⋮	⋮
10	⋮	⋮	⋮	⋮
Total	2,500	100.0	2,500	100.0

- o Total improvement cost for land readjustment such as construction of roads, removing of the buildings, is covered by sale of the reserved land.
- o Total value of the improved land shared by the former owners is assumed to be equal to the total value of the land before improvement, on the ground that the betterment of land after improvement offset partial contribution of land for public use.

Table 5. Mechanism of Development of Building Materials





SUMMARY OF OBSERVATION

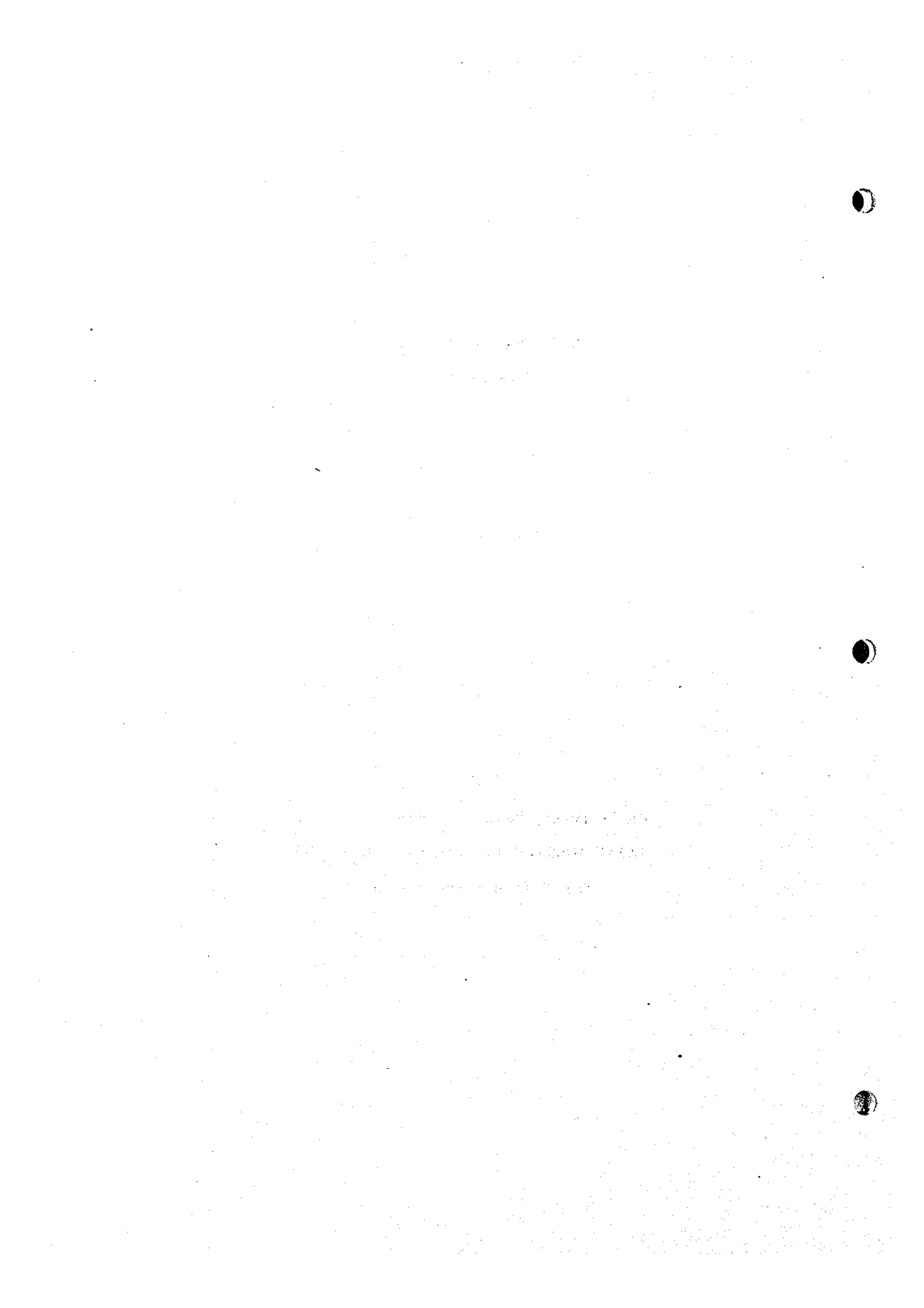
(Building Materials)

February 22, 1973

The Preliminary Building Materials Survey Group

JAPAN MISSION ON HOUSING SURVEY OF

THE REPUBLIC OF INDONESIA



February 22, 1973

Ir. Rachmat
Director General of Housing, Building, Planning and Urban Development,
Ministry of Public Works and Electric Power

Sir,

The Japan Mission of Housing Survey of the Republic of Indonesia, The Preliminary Building Materials Survey Group has stayed about three weeks in Indonesia, from February 4th to 22nd 1973, visiting Jakarta, Bandung and Surabaya, investigating the present conditions of Building Materials for housing construction.

The mission's task is to get the present informations of Building materials for housing, and to give some suggestions to solve the difficult problems for the using of building materials.

Final report of this mission should be sent to you until the end of March, 1973, as a jointed results cooperated with the Preliminary General Survey Group.

Interim report is the summary of the review of the building materiaks while the mission has stayed in Indonesia.

The mission appreciates deeply of your help and of your staff's Ir. Sardiono, Ir. NORE Saijidi, Ir. Soebagio, Ir. Z.A. Abbas, chief Research Division, Regional Housing Centre gave us the efficient and extensive assistances while the mission had stayed in Bandung. Also, the mission wishes to heartily express gratitude to Mr. Supranto, Secretary and Ir. F. Panjaitan, Assistant Director of DKI in Jakarta, and also Ir. S.S. Sumartaatmadja in Bogor.

The mission also expresses our appreciations to Mr. B.U. Kartohadiprodjo, Mr. S. Siswoko and Mr. S. Basari for their kind guidances in Bandung and Surabaya.

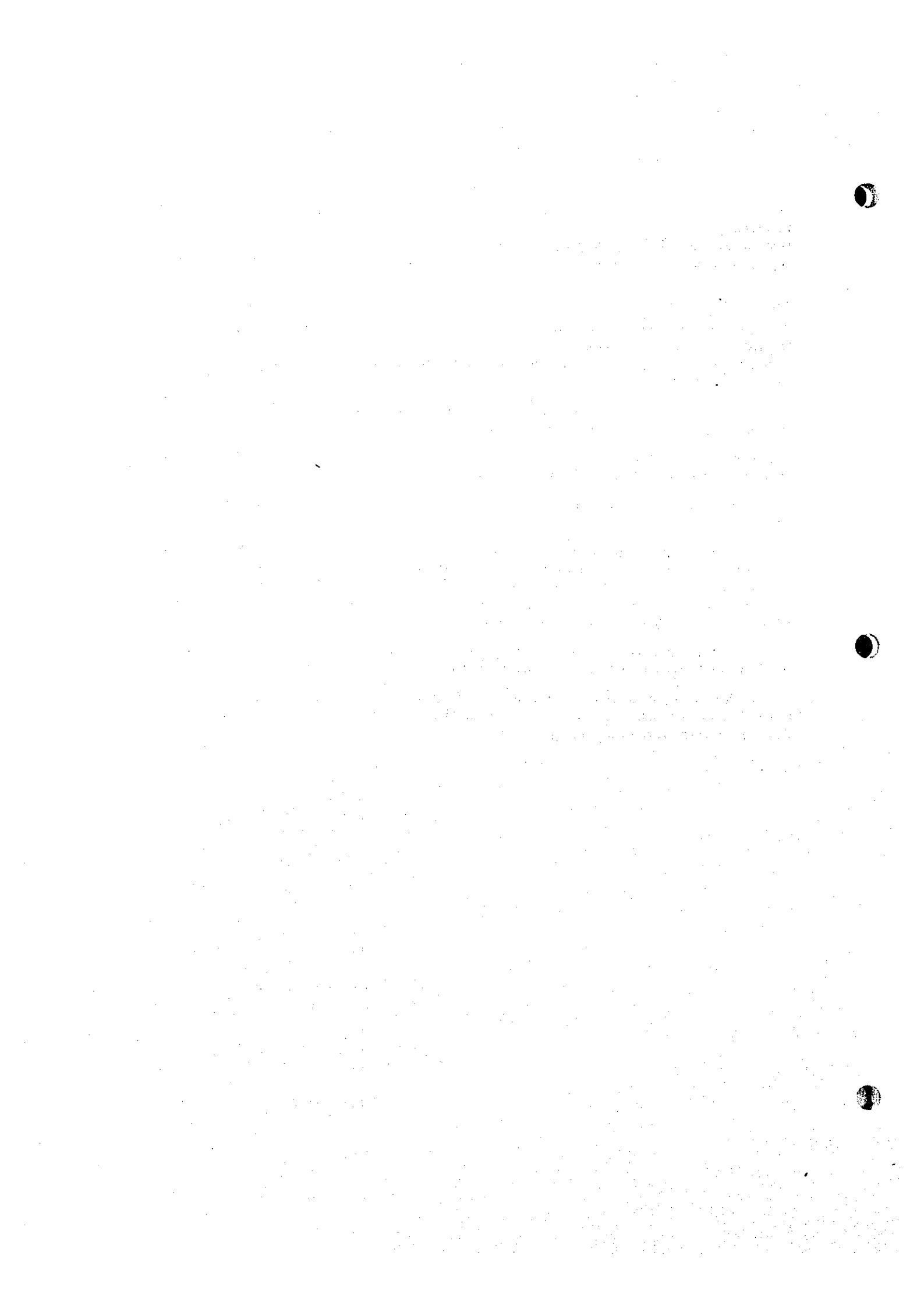
We have no words to express our gratefulness for good arrangements of Mr. Harun, Chief of the Public Relation Department, and Ir. S. Wirodihardjo, Manager of B.I.C. of Surabaya, while we investigated the building materials in Surabaya.

Yours sincerely,

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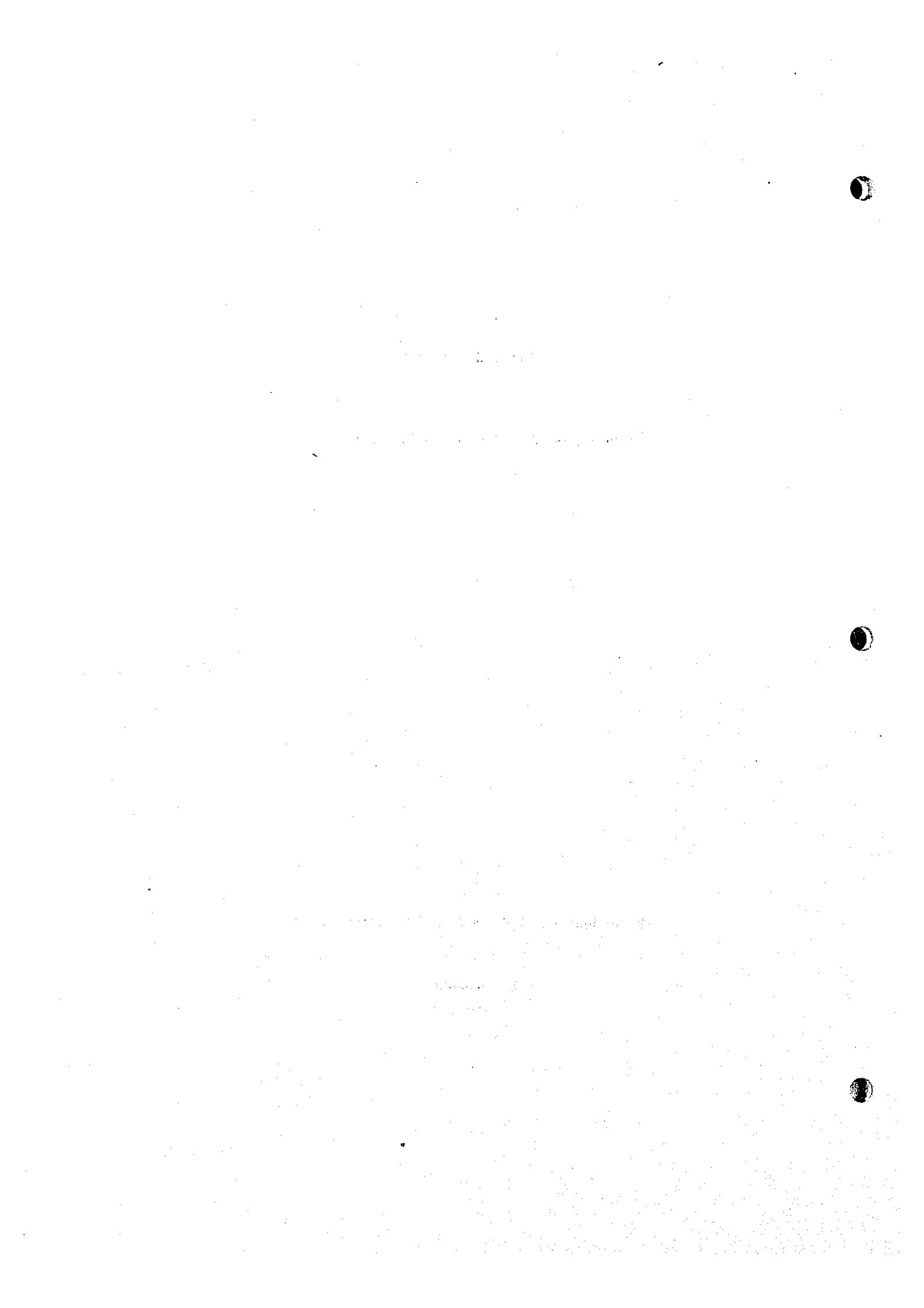
INTERIM REPORT

**Review of The Use of Building Materials
In Housing**

by

The Preliminary Building Materials Survey Group

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1. Timber

Timber is one of the most important organic materials for construction of housing. Because of the low density of Forest resources in Java, the use of timber in Java will always be limited. Java produces about 90% of all teak products in Indonesia, but this species is earmarked for export, furniture and railway sleepers, then the use of commercial lower grade non-teak hardwoods is commonly relied on the structural purposes in Java. Non-durable timber should be treated by preservation chemicals and by the method of dry kiln. Countermeasures should be taken to make maximum use of available timbers by lengthening the life of the use through drying and preservation against fungi and terminate.

Also, in order to preserve the natural forest resources, it is necessary to standardize the sawn timber and other timber products to reduce the waste. Timber sawing machinery should be introduced to produce correct dimension lumbers.

2. Bamboo

About 70% of all houses in Indonesia use bamboo, especially it is used in rural areas, and in cities for low cost housing and preliminary buildings, etc.

Bamboo is easy to obtain from any places, comparatively cheap, light weight materials which can be easily transported.

Bamboo mats for underlayer of plastering has been used in Indonesia for long time, disadvantage of plastered bamboo mats is the tendency to crack. Recent research results are found a good mixing ratio of plaster. This results should be developed into practice because of its good resistance against fire.

Relative low resistance to deterioration should be improved by using of rather cheap preservation chemicals. And also, new building materials using bamboo should be created by somewhat simple procedures. In order to create such new building materials, some Indonesian technical engineers should be stayed for studying in developed country for several months.

3. Cement

The total production of portland cement is estimated at about 600,000 ton per year now. And also about 500,000 ton a year of cement are imported from abroad. Total cement consumption of 1,100,000 ton per year in Indonesia.

It seems that there are a great amount of raw materials for the cement in Indonesia. All over the islands there are plenty of clay and limestone deposits that could be developed for making cement. It is advantage to locate the cement factories properly as near the limestone deposits area as possible, because of the transportation troubles, it seems to desirable that the small scale cement plants should be located in the adequate places separately.

Cement is, of cause, one of the most important building materials as well as timber, so that the cement should be more produced year by year in Indonesia.

At the same time, the ways should be studied to economize in the consumption of cement by developing many techniques for making mortar and concrete. Considering the near future demands for housing, precast concrete with light weight agregats and pre-stressed concrete techniques should be improved to not only for countermeasures of huge demands of housing also for considerable economics and improvements.

Another means to save cement could consider the replacement of cement with other binding materials such as trass-lime mixtures, red-brick powder-lime mixture and pozzolanic-lime mixture. The experts who knows the techniques of such mixtures could be found at the special field in developed countries. And also, the techniques for making artificial lightweight agregate would be obtained by the guidance of specialists in developed countries.

4. Lime

The lime stone which is the raw material for the lime is generally of good qualities and available almost in Java. Lime is produced in many small fieldkilns by means of wood fuel. The total amount of production of all kilns is not known, but the qualities of the lime seems to be somewhat lower, because of the lack of quality controls.

A great deal of efforts should be made to improve the qualities of the lime through better burning by oil-burners instead of tree-trunk fuel.

Good lime or lime cement for mortar for inside plastering in the house is definitely superior to cement.

5. Trass

Volcanic tuffs are extensively used for the manufacture of trass, occurring in homogeneous compact bed. The tuff deposits in Bogor, Bandung and other regions of West Java are extensively quarried.

Trass mixed with lime at the ratio of 6 : 1 respectively, gives a hydraulic cement, which is the slow setting and hardening as well as the high shrinkage.

This mixture is used as raw materials for making trass-lime solid or hollow blocks by the simple good machines or hand-made.

The trass-lime blocks will become one of the most important building materials of making walls and floors for not only low rise housings, but also high rise buildings. In order to get more using of this for housing, the standards for making and for qualities for this blocks should be established by the government concerned, and also the blocks which is more than the level decided by such standard should be used for making the houses sponsored by the government. It is much more difficult but much important to lighten the total weight of the trass-lime blocks.

Making pozzolamic-lime cement of trass is another possibility. The properties of the mixture should be carried out in laboratory to increase the strength and the setting properties. It should be alright for the Building Materials Development Laboratory in Bandung to investigate the properties of mixture, which could be saved the usage of portland cement from abroad.

6. Roofing tile and clay brick

Roofing tile and clay brick are produced small and insufficient kilns and operated by families or by village-cooperative groups.

These kilns make a variety of sizes and types of tiles and bricks which could not be classified of qualities in shape, dimension, physical properties, mechanical properties and usage.

Attempts for establishments of national standards for manufacturing should be made as soon as possible.

Roofing tile is the main inorganic roofing materials in Indonesia, especially in Java, not only for the lower class houses but also for the higher class houses. The roofing tiles are very useful for the tropical humid country, especially good protection against the tropical weather causes low maintenance cost.

The clay brick usually come out in the size of $5 \times 10 \times 20 \text{ cm}^3$ to $6 \times 12 \times 22 \text{ cm}^3$, but lackings of standardized manufacturing methods introduce a great deal of broken bricks during transportation or handlings.

The standards for manufacturing and for properties should be established by the special technical staffs and by the representatives in the field of construction side.

7. Nails

The capacity of the factories for the production of nail for building construction is sufficient provided the raw materials could be supplied in sufficient quantity.

8. Building hardware

Almost building hardware come from abroads, but small quantities of cast-iron brass fittings are made by hand, in Indonesia.

9. Glass panes

Quartzsand and quartzsand stone occur in many localities in Indonesia. Most of them, however, have not been properly investigated. In Sumatra quartzsand-stones occur in pretertiary formations. There are also scattered deposits of alluvial quartzsand derived from acid in the coastal regions of East Sumatra. Alluvial deposits of quartzsand also are found in the coastal strip area of East Java.

Although the quartzsand are available for the production of glass panes, there are no factory to manufacture them. For housing, normally 2 and 3 mm thick glass are imported from abroads.

10. Paints

The paints and laquer manufactures are well developed to meet the need of this country, but some difficulties were faced by paints enterprises lie in raw materials.

11. Corrugated Iron Sheets

This building materials is the imported products and it has limited its durability in such humid climate without high quality protection.

12. Asbestos Cement boards

There are two factories in Java, one is in Jakarta, another one is in Surabaya. Both factories produced corrugated roofing sheets and flat asbestos boards which are mostly used for ceiling and wall.

There are asbestos deposits of Wusia in Halmahera and other places, but low-grade chrysotile asbestos with fiber length averaging 3 ~ 4 millimeters are obtained in veins in the breccia part of the basic massives. Its practical value seems to very small due to lack of good transportation facilities.

The productions of the factories are limited as asbestos has to be imported. Considering the usage for the roofing, however, its weight is more lighten than that of the clay tile roofing. So it is more useful roofing materials to save the structural supported building elements and also to simplify the foundation system.

MEMORANDUM

(This is prepared for the sake of memory and not to be considered as part of Summary of Observation.)

1. Standards

Standards for manufacturing of traditional building materials, such as tiles, bricks, trass-lime products, bamboo mates and so on, should be enacted in order to stabilize and to improve the properties of building materials.

2. Inspections

Inspection standards for checking the performance of building materials before sending to building sites should be also established in order to obtain the reasonable building materials. The inspected building materials should be authorized by the government concerned, putting some visible marks or stumps on them.

3. Superior Factories

The factories which should be passed above mentioned inspection systems are also authorized by the government as superior factories in Indonesia. The houses financed by the government should be constructed by only such building materials produced by the superior factories.

4. Productivity

The present productivity could be raised by utilising the capacity in full by running the factories in more than one shift, by improving the quality of the materials in order to reduce waste and by organizing its transportation facilities.

5. Utilization of Wastes

Developmental works to find uses for the many local available forest and agricultural wastes, such as saw-mill wastes another wood wastes from timber factories, bamboo, coconut husk and pith, groundnut shell, rice husk, bagass etc., are very much useful not only for making of building materials, but also for saving of natural resources.

