THE REPUBLIC OF INDONESIA

FEASIBILITY STUDY

FOR

INDUSTRIAL ESTATE PROJECT IN UJUNG PANDANG

MARCH 1977

Japan International Cooperation Agency

[redacted]

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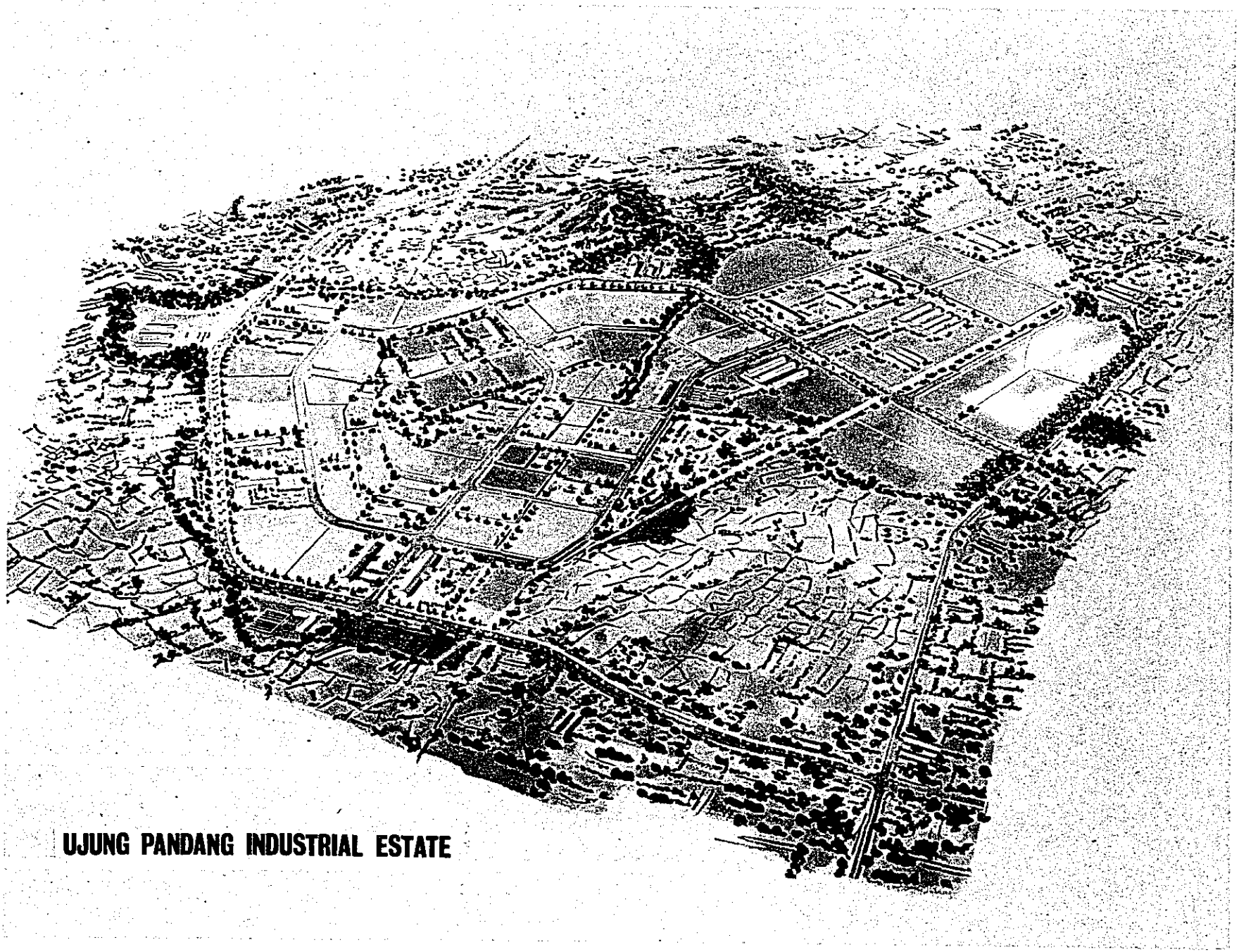


UJUNG PANDANG INDUSTRIAL ESTATE

Preface

The Government of Japan, at the request of the Government of the Republic of Indonesia, had previously carried out a pre-feasibility study to promote an industrial estate development plan in the City of Ujung Pandang in South Sulawesi Province. In order to put into a more concrete plan the result of the said pre-feasibility study, it has decided to undertake a feasibility study and entrusted its execution to the Japan International Cooperation Agency.

The Agency organized a survey team consisting of eleven experts, headed by Mr. Mikio ABE, Director of Nomura Research Institute Co., Ltd., and dispatched it to Indonesia for the period from October 3rd to November 25th, 1976.

The survey team visited the existing industrial estates in Jakarta City and Surabaya City for data collection, site reviews and interviews with related authorities. The team carried out detailed studies and field surveys of industries in the City of Ujung Pandang and the peripheral areas, economic and business situation of the region and other subjects. With regard to the site of the industrial estate, the selection of candidate sites made in the pre-feasibility study was further narrowed and site surveys and studies for making a master plan and basic design were carried out.

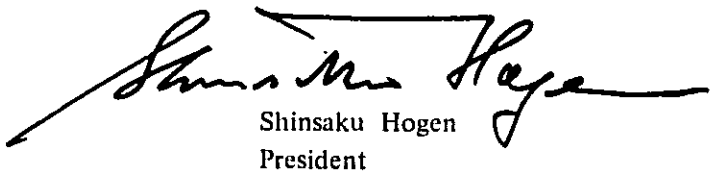
After returning to Japan, the survey team undertook analytical and design work based on the data collected in Indonesia and completed this report.

This report presents a master plan and a basic dedign for the site, an analysis on the kind of industries to be introduced in the estate, an economic and financial analysis of the project and additional comments for promotion of the project.

We would like to express our sincere gratitude to the Indonesian officials for extending hospitality to the survey team and providing cooperation to expedite its research work. Our particular appreciation goes to the Indonesian counterpart team members of the central and local governments.

In presenting this report, we hope that it will contribute to the economic development of the Republic of Indonesia as well as that of South Sulawesi Province, thus promoting the friendship between the two countries.

March 1977



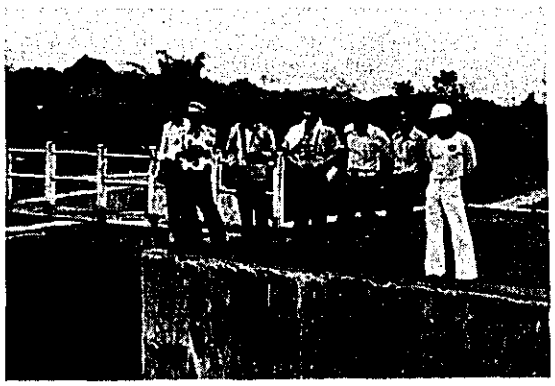
Shinsaku Hogen
President
Japan International Cooperation Agency

Birds eye view of the site.

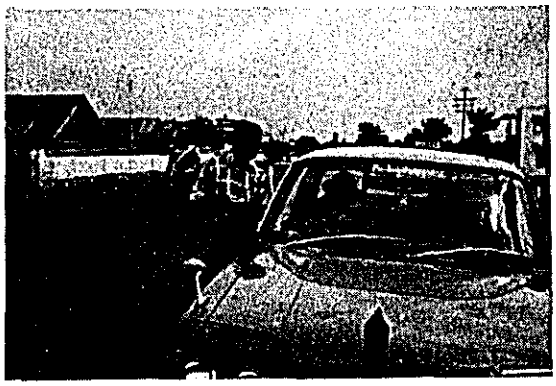
Landscape of the area adjacent to the site.

Site selection staff meeting (in the site).

Land measuring.

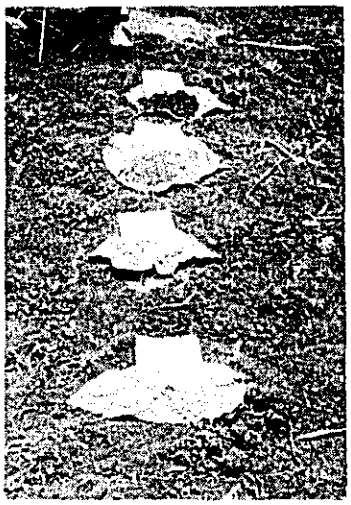


Investigation of water source.



Transportation survey.

Map making.



Soil sample collection.

Farewell party (NO.1)

Farewell party (NO.2)

Brief Outline of

Ujung Pandang Industrial Estate

1. Location: Inland Part of Ujung Pandang City (about 14 kilometers from the Center of the City)

2. Area: Total 221 ha

3. Planning/Development/Management: P.T. Industrial Estate Ujung Pandang (Planned)

4. Number of Firms (Planned): about 150

5. Expected Value of Production in the Estate of Completion: about Rps. 100 Billion

6. Major Industries Promoted for Introduction: (Food and beverage, Textile, Wooden Products, Ceramics, Metal Products, Machinery, Electric machinery, Transportation equipment)

7. Expected Number of Employees at Completion: about 25,000

8. Development Schedule: 1987 - 1990

	Gross	Net
1st Stage ('78-'83)	82 ha	46 ha
2nd Stage ('84-'87)	82 ha	60 ha
3rd Stage ('88-'90)	57 ha	40 ha

9. Development Cost (Rps. mil.):

Total	6662.5
Land Acquisition	965.9
Development	5479.3
Building	217.3

10. Sales and Rental (Planned):

Cash	Rps. 6500/m^2
5 Year Installment	Rps. 1686/m^2P.A.
Lease	Rps. 860/m^2P.A.

11. Land Use Plan:

Total 221 ha	
Factory Site	64 %
Roads	12 %
Greens	9 %
Public Utilities	4 %
Others	11 %

12. Power Supply: 140,000 kWh/day

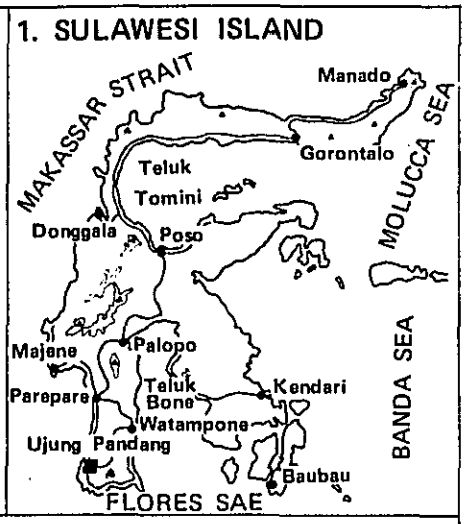
13. Water Supply: 10,800 m^3/day

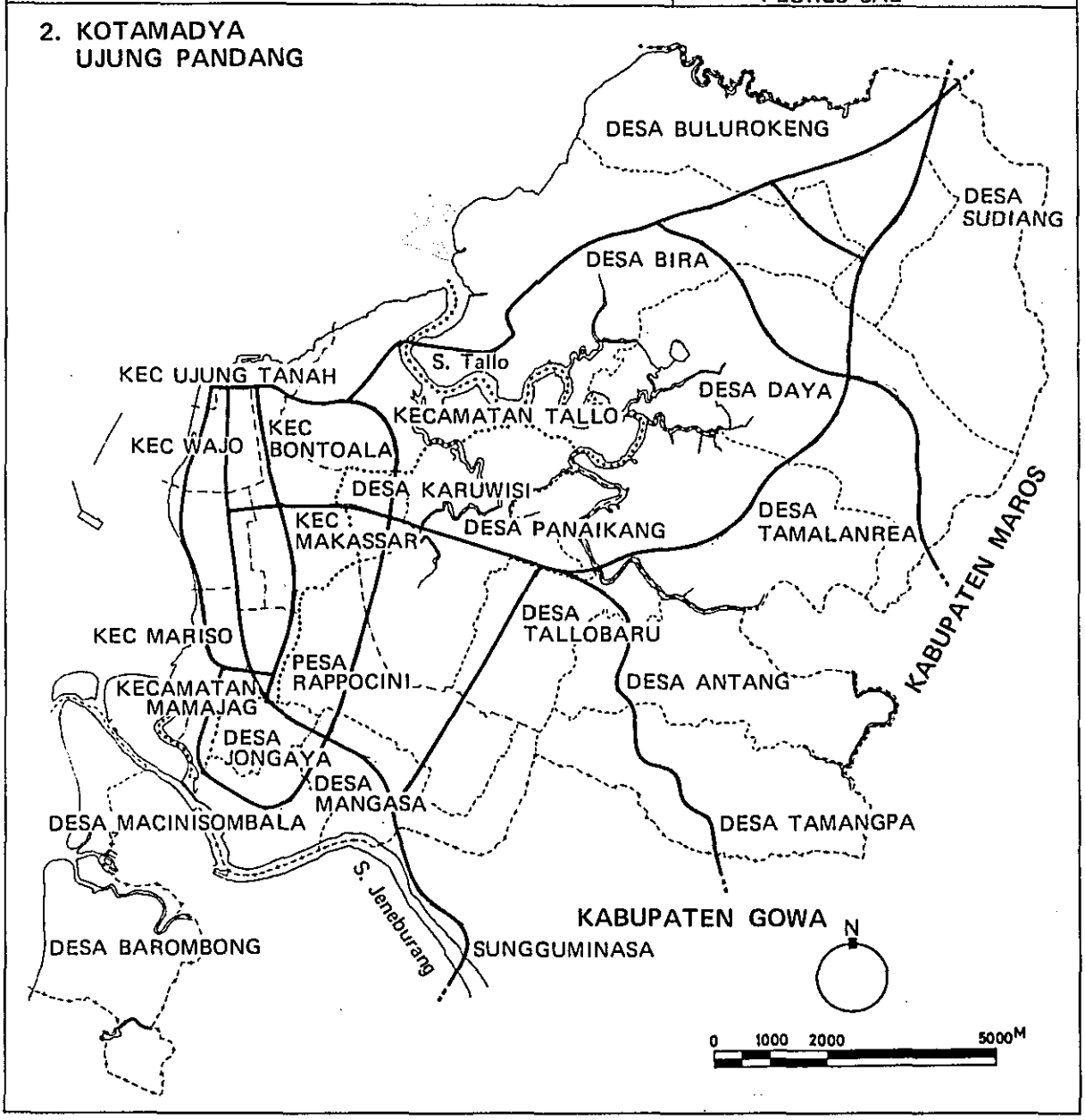
14. Other Services Available: Distribution Center, Truck Terminal Market, Workshop, Post & Telegram Office, Bank, Restaurant, Police & Fire Station, Athletic Ground, etc.

GENERAL MAP

OF

UJUNG PANDANG





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SUMMARY AND CONCLUSION

SUMMARY AND CONCLUSION

1. Conclusion

The Mission has studied the proposed industrial estate project, to be located in Ujung Pandang, Indonesia, in two stages: pre-feasibility and feasibility studies. The Mission believes that these two studies have generated sufficient data to evaluate the economic advantages of the project. On the basis of these data, the following conclusion may be presented:

A significant contribution should be made by constructing an industrial estate in the city of Ujung Pandang: it will increase the role of the city of Ujung Pandang as a "growth pole" for the development of East Indonesian Region in accordance with the basic national goals for promoting development and industrialization of regional economies.

Physically and technically, construction of an industrial estate in Ujung Pandang is feasible, and economic analyses of the project are good.

On the basis of these findings, the Mission would like to recommend to the Government of the Republic of Indonesia that the project should be carried out at the earliest date possible.

Principal items obtained from the feasibility study are summarized below.

2. Objectives of the Ujung Pandang Industrial Estate Development Project

The fundamental objectives of the development project are to further the industrialization of South Sulawesi Province, in order to make Ujung Pandang City a base for the development of Eastern Indonesia and to expedite the regional development of South Sulawesi. The industrialization should be achieved step by step over a long period of 50 to 60 years, and as its first step an industrial estate project should be worked our for building primary industrial foundation.

For this purpose, the industrial estate proposed in this project should be a medium-sized one covering an area of around 200 hectares and should be an inland type estate having a group of minor but modern enterprises as its nucleus.

The project requires 14 years from start to completion. Construction start is scheduled for 1978; enterprises will be able to move in the estate from 1980 and the estate will be filled to capacity by 1990. Needless to say, this schedule is subject to changes in conditions. Assessment of economic effects of the industrial estate covers a far longer period ahead.

3. Analysis of Investment Environment

(1) Ujung Pandang has been playing -- and continues to play -- a strategic role as a gateway of export, formerly of copra and now of ebony, lumber and fishery products. The city also serves as a major port of entry of foreign goods and commodities imported from the Island of Java. The port facilities are relatively well maintained and its network of distribution covers most of the areas of Eastern Indonesia. Factories established on the industrial estate will have an access to all markets existing in Eastern Indonesia for the distribution of their products through the network. The large pool of jobless workers will provide a source of labor at low wage level. These factors spell unique advantages to industries in Ujung Pandang.

(2) On the other hand, there is no particularly serious problem in the area of land transportation, at least for the present. However, when the construction of the industrial estate will have been completed, the large volume of goods expected to be produced by the factories and the massive flow of people commuting to and from these factories are bound to cause chronic traffic congestion on the existing national highway which is the only link between the city and other parts of the country. And such a condition will make the access to the port difficult. Furthermore, the roads on Selaweshi Island are less than adequate, so that large trucks will have difficulty reaching their destination, hampering thereby the inflow of goods to the Island market and the transportation of raw materials. Therefore, construction or improvement of roads and bridges concurrently with the construction of the industrial estate will take on an equal importance.

(3) At present, due to the small number of large businesses operating in Ujung Pandang, the front office operation of the existing banks is conducted relatively smoothly. But when the number of their clients increases, the volume of their business will inevitably grow and an increase in the number of their service personnel and introduction of mechanized operation will be required. Similarly, a rapid increase in the volume and variety of goods produced by the factories sited on the estate may create a tendency to consolidate small and financially weak distributors and beef up the facilities of physical distribution in the way of increased number of trucks and so on.

4. *The Outlook of Industrial Development and Possible occupants for the Estate*

(1) Given the macro-frame of the regional economy, in which the population of South Selaweshi Province and its GNP are expected to grow at yearly rates of 2.3% and 7.5% respectively during the plan years, the region's industrial goods market is estimated to grow at about 10% and its industrial production at about 13%. In the course of such a dynamic industrialization, a large number of factories are expected to be lured into the area, and thanks to the favorable locational factors, factories which are built in areas outside the industrial estate will eventually account for about two thirds of the province's industrial production and value added. In other words, factories that will locate themselves within the industrial estate as a group will account for about one third of the region's industrialization.

(2) The kinds of industries which are expected to build their factories on the industrial estate may vary widely. In terms of siting requirements, the estate will be attractive to metals and machinery, ceramics and food industries. In terms of labor requirements, metals and machinery, textiles, wood-working and furniture, and food industries may find the estate attractive.

Upon completion of the estate, the net area available for factory locationing will be about 150 hectares. Timing-wise, the majority of industries desiring to establish their factories on the site are will seek opportunities at a comparatively early stage. This is because of the delay in the establishment of industrial zones and in the decision of planning for the construction of infrastructure,

which in turn delayed the investment decision by corporations and formalities for obtaining government permits.

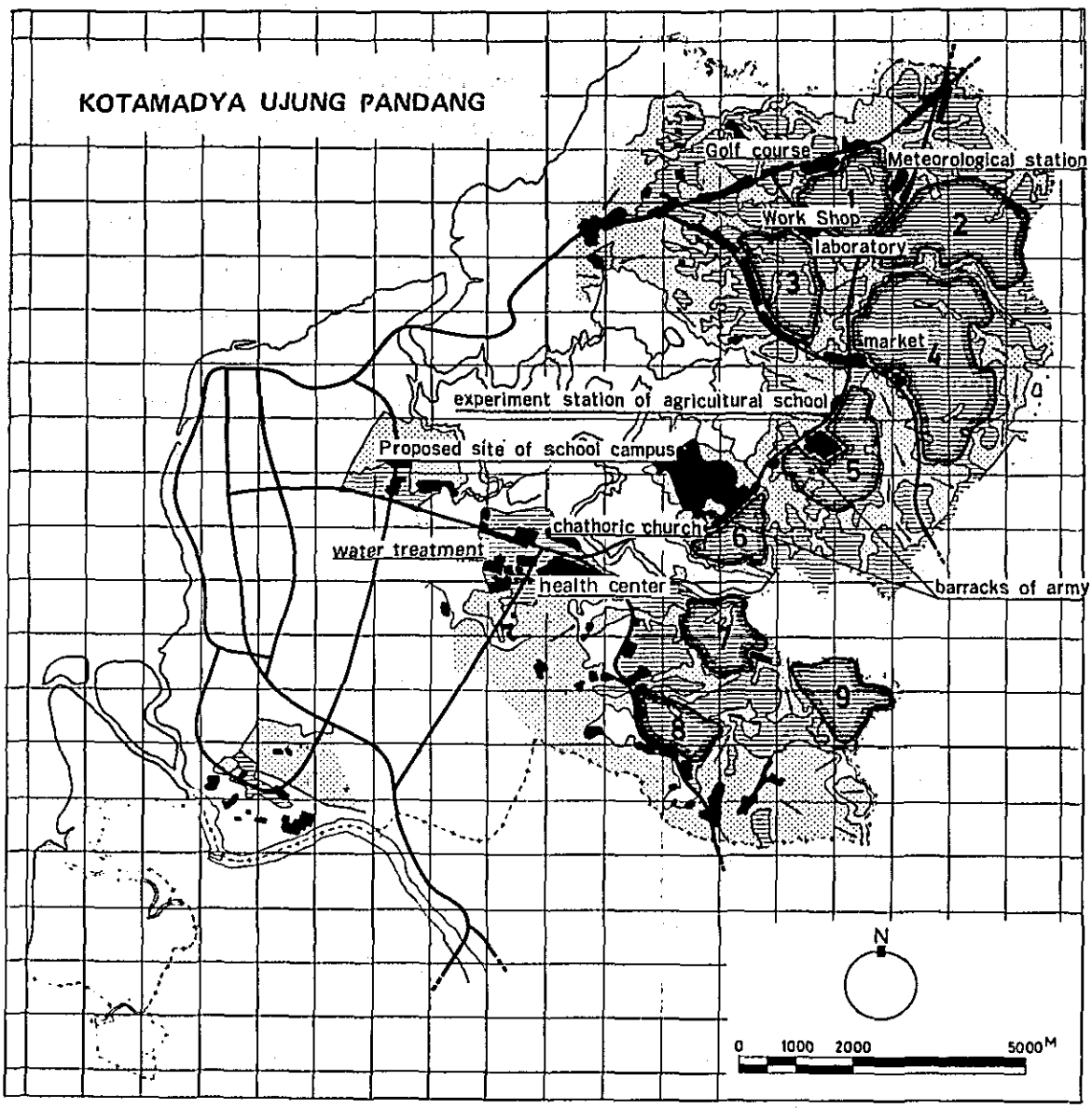
Estimated Land Requirements

	Immediate	0.5	1.0	2.0	3.0~	Medium-term	0.5	1.0	2.0	3.0~	Long-term	0.5	1.0	2.0	3.0~
Food	16.5	3.5	3.0	2.0	8.0	8.0	2.0	2.0	4.0	-	0.5	0.5	-	-	-
Textiles	4.0	1.0	3.0	-	-	2.0	1.0	1.0	-	-	3.0	-	-	-	3.0
Wood	9.0	-	1.0	2.0	6.0	2.5	0.5	-	2.0	-	3.5	0.5	-	-	3.0
Paper & pulp	3.0	1.0	2.0	-	-	1.5	0.5	1.0	-	-	-	-	-	-	-
Chemicals	3.5	2.5	1.0	-	-	1.0	1.0	-	-	-	-	-	-	-	-
Ceramics	17.0	-	6.5	4.5	6.0	7.5	0.5	2.0	2.0	3.0	2.5	-	-	2.5	-
Metals	5.5	3.5	2.0	-	-	9.5	0.5	1.0	-	8.0	2.5	0.5	-	2.0	-
Machinery	9.0	2.0	1.0	6.0	-	9.0	0.5	3.0	2.5	3.0	21.5	1.0	2.0	8.5	10.0
Others	3.5	2.5	1.0	-	-	3.5	3.5	-	-	-	-	-	-	-	-
Total	71.0	16.0	20.5	14.5	20.0	44.5	10.0	10.0	10.5	14.0	33.5	2.5	2.0	13.0	16.0

5. Selection of Site for the Industrial Estate

A total of nine sites are available within the city limits of Ujung Pandang for the construction of an industrial estate. These nine sites were critically screened on the basis of 17 evaluation criteria, such as topography, geology, land use, environment surrounding the site, location, availability of utilities, compatibility with superior plans and environment protection. As a result, Site 3, Site 4 and Site 8 were given high comprehensive marks. This is not to say that other sites are basically flawed; they may be suited for other industrial estates planned in the future, if any.

For the present project, Site 3, Site 4 and Site 8 were considered, but Site 8 was ruled out because it entailed the construction of extra roads. As a result, the Mission has decided on Site 3 and Site 4 for final selection.



Candidate Sites for Industrial Development

LEGEND

	Villages and planned development area
	Paddyfields
	Candidate sites (primary selection)
	Candidate sites (secondary selection)
	Drainage rout of paddies

6. Design of the Industrial Estate (Master Plan and Basic Design)

(1) Purpose

Since this project is to be the very first industrial estate in Eastern Indonesia, it should be designed as the prototype of inland industrial estates to be projected in the future. At the same time, the development of the industrial estate is looked for as it will provide a means to rejuvenate and vitalize the industries and cities in Ujung Pandang Province. To meet these requirements and expectations, transportation, distribution, water supply and drainage, energy supply and other functions must be improved on the one hand, and on the other, the industrial estate must be designed in the fashion to stimulate workers by improving their working conditions.

(2) Alternatives and their Assessment

The following four alternatives for each of Sites 3 and 4 have been prepared and compared.

Alternative 1	(L-type)	The ridges in Site 3 are utilized.
Alternative 2	(Camel Type)	Fields in Site 4 are utilized.
Alternative 3	(Garuda Type)	The site is designed to face the national highway in part, using Site 3.
Alternative 4	(Combination Type)	Sites 3 and 4 are combined.

As the result of the study of these four alternatives in terms of difficulty in construction, reuse of paddyfields, availability of factory site, disposal of waste water and possible effects on the surrounding communities, Alternatives 1 and 3 proved to be more advantageous than others. Then, plans were worked out for land use and these two alternatives were compared further in terms of volume of various works involved in the plans. As a consequence, Alternative 3 (Garuda Type) has been selected.

(3) The Basic Design Policy

Designing is based on the following principles:

- To emphasize the balance between productive space and nonproductive space. (The rate of factory site to total area : 65 – 70%)

- To create an attractive amenity by establishing green zones along the national highway and trunk roads, a symbol zone in the highest place within the industrial estate and as many ponds and wooded areas as economically feasible.
- To plan a factory site in consideration of the type and size of industries which are to build their factories on the industrial estate.
- To set up such industries as commerce, service and transportation compatible with the size of the industrial estate.

(4) Land Use Plan

The land use plan has the following main points :

- To surround the industrial estate with green belts from the viewpoint of preserving the environment of its vicinity and particularly set up a 50 meter-wide green zone along the national highway for the sake of amenity.
- To establish the industrial estate center as a symbol of the estate on the 24 meter-high hill in the northwestern part of the estate and set up three subcenters.
- To arrange sites for big factories in the neighborhood of the national highway to highten the prestige of the industrial estate.
- To establish distribution facilities in the southwestern part of the industrial estate in expection that the Bulu Rokeng road running closer to the seaside than the national highway will become an industrial road in the future.
- To arrange a wilderness park around the industrial estate center and a sports ground in the southernmost part of the estate.

Land Use Areas for Each Stage

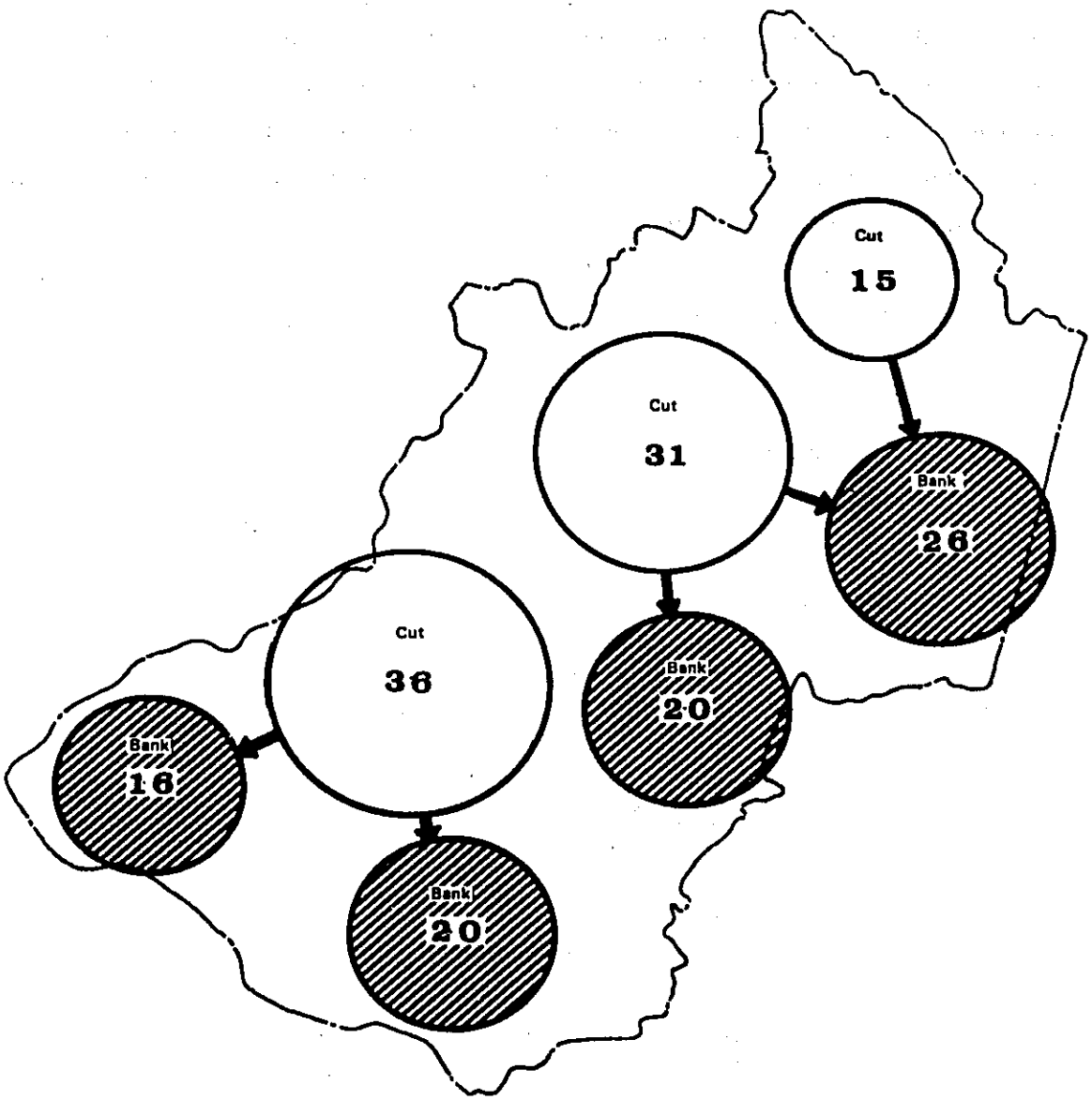
	A Stage		B Stage		C Stage		Total	
Site for Factories	458,750	% 56.1	597,225	% 73.0	356,200	% 62.3	1,412,175	% 63.9
Site for Administrative Center	16,000	2.0	4,200	0.5	5,000	0.9	25,200	1.1
Right of Way	132,050	16.1	76,580	9.4	25,200	4.4	233,830	10.6
Site for Distribution Center					41,750	7.3	41,750	1.9
Utility Facility site	19,500	2.4					19,500	0.9
Regulating Pondage	10,000	1.2	8,250	1.0			18,250	0.8
Water Way	420	0.1	12,730	1.6	12,540	2.2	25,690	1.2
Park	116,900	14.3	50,500	6.2			167,400	7.6
Buffer Green	19,750	2.4	7,660	0.9	7,200	1.3	34,430	1.6
Open Space	35,400	4.3	39,850	4.9	104,100	18.2	179,350	8.1
Foot Path	9,760	1.2	17,220	2.1	8,890	1.6	35,870	1.6
Area Preserved for High Voltage Cable			4,050	0.5	10,895	1.9	14,945	0.8
Total	818,350	100.0	818,265	100.0	571,775	100.0	2,208,390	100.0

(5) Levelling of Ground

The estate presents moderate undulations with a difference of about 20 meters in height above sea level. Since rocks lie beneath the ground surface, it is necessary to establish points of ground levelling to hold down the cost and minimize rocks excavation. Furthermore, these ground levellings should be set to assure a balance in the amounts of cutting and filling in each construction stage.

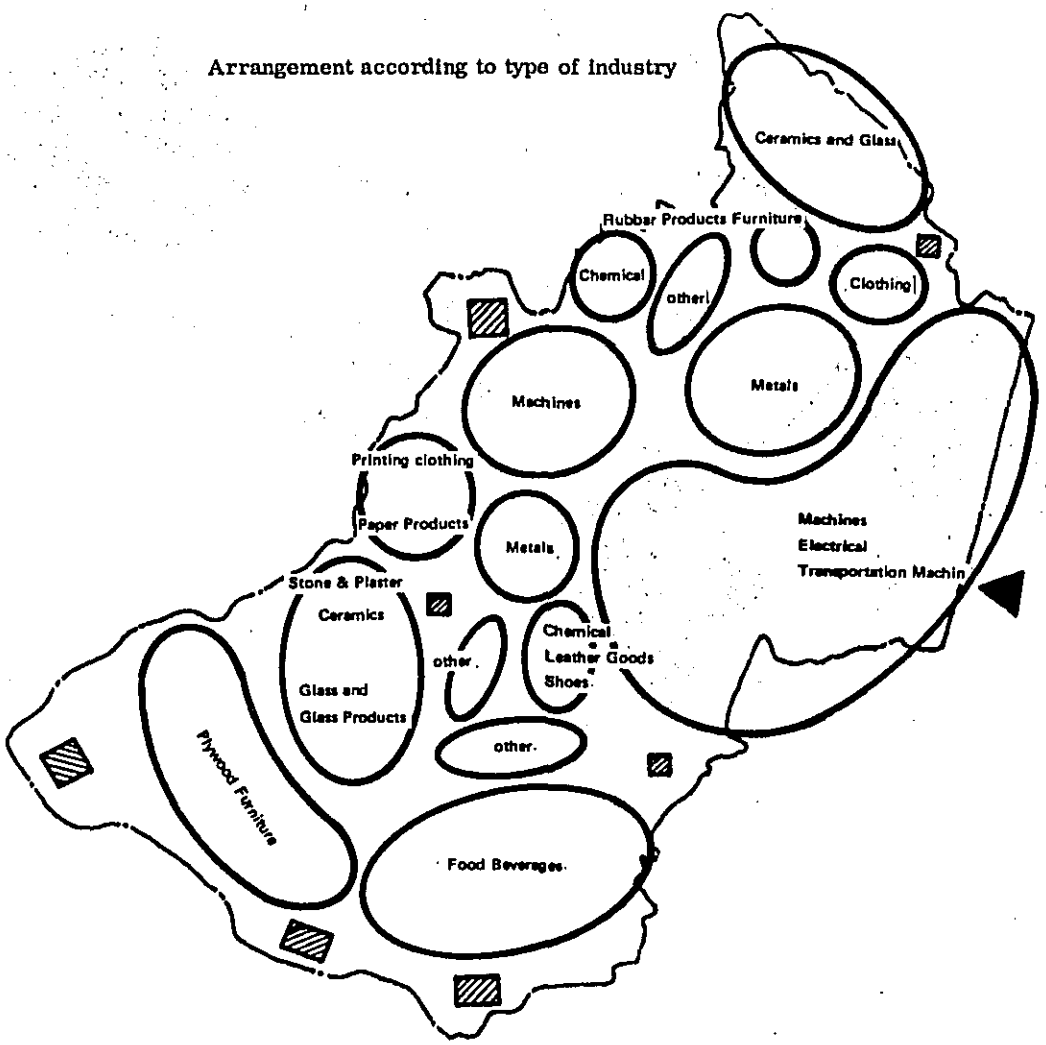
With these points in mind, the following levelling plans have been prepared in consideration of safety, convenience and economy.

Outline of land improvement (0,000 m^3)



(6) Factory Site Plan

Factories will be effectively arranged by classifying the industries to be established on the industrial estate by such factors as worker density, appearance of the estate, generation of noise and vibration, quantity and quality of factory effluents - waste water and solution, dust and odorous gas - and dependence on the distribution network. The size of parcels has been grouped into four according to the size of factories : under 0.5 ha, 1.0 ~ 1.5 ha, 2.0~ 2.5 ha and over 3 ha. For smaller factories, the standard factory site (total area : 1,000 m^2 ; building area: 500 m^2) has been prepared.



(7) Road Plan

The trunk road network surrounding the industrial estate will consist of such roads as Gowa Jaya (national highway) , Bira and Bira-Bulurokeng. A sub-trunk road connecting the national highway with the golf links will be added. The roads within the industrial estate will include the 30 meter-wide trunk road running from northeast to southwest in the estate and linking the national highway with Bira road, the 20 meter-wide sub-trunk road, 12 meter-wide lot roads and roads for bicycle riders and pedestrians. The number of cars going in and out the industrial estate is estimated at about 6,000 a day and that on the trunk roads within the estate at 3,000 a day.

Road Areas for Each Road Width

Road Width	A Stage	B Stage	C Stage	Total
30 m	2,545 m 76,350 m^2	740 m 22,200 m^2	340 m 10,200 m^2	3,625 m 108,750 m^2
20 m	2,065 m 41,300 m^2	2,035 m 40,700 m^2	750 m 15,000 m^2	4,850 m 97,000 m^2
12 m	1,200 m 14,400 m^2	1,140 m 13,680 m^2		2,340 m 28,080 m^2

(8) Drainage Plan

Rainwater drainage will be planned in accordance with the existing divide and in the process of development, a change in the direction of rainwater flow, if any, will be minimized. Drainage facilities should be large enough to handle the rainwater that flows into the industrial estate from outside. Since there are many rocks on the estate, open canals should be set up which are easy to maintain and control.

Probable rainfall intensity :		55mm/hr
Return period		10 yrs.
Coefficient of discharge :	prepared site	0.6
	unprepared site	0.3

Waste water consists of industrial waste water and sewage and service waste water which are estimated at 2,500 m^2/day and 3,500 m^3/day, respectively.

As a rule, harmful matters contained in industrial waste water will be

removed in each industry and heavily polluted waste water will be purified in the treatment facility to be set up in the southeastern corner of the industrial estate, to the quality level higher than that of the rivers where the waste water is discharged.

(9) Park Plan

Since parks and green zones play an important role in creating agreeable living environment and attractive appearance, a total of 17 hectares of parks and a total of 21 hectares of preserved green areas and buffer green zones will be established within the industrial estate. The zones of natural greenery should preserve the present conditions as much as possible for the reason of cost, while preserved green areas and buffer green zones should be planned and arranged so that they may function as buffer zones against vibrations, noises and odours which may arise within the estate and that they may present a pleasant amenity.

7. Assessment of Environment

(1) *SOx as an Air Pollutant*

The factories in this industrial estate will use 200 m^3/day of heavy oil which includes 0.1% of sulphur. Based on constant wind directions and wind velocity in Ujung Pandang, SOx concentration on the ground level is estimated at 0.002-0.022 ppm, a level harmless to human body.

(2) Water Pollution (BOD)

The factories will discharge 947.1 kg/day of BOD. Highly polluted industrial waste water and sewage and service waste water will be treated by combining activated sludges with the trickling filter process. This process will reduce the BOD level of the discharged waste water to 24.8 ppm. Considering that the present BOD level of the river into which the waste water will be discharged ranges from 30 ppm to 60 ppm, the discharged waste water from the industrial estate will pose little problem.

(3) Noise and Vibration

Although plant operations in the industrial estate will generate noises of nearly 100 phons, sound prevention measures such as proper plant location, the use of the attenuation effects of distance and forests and construction of dikes and

buildings around factories will help reduce noises to a degree that will have little adverse effects on the residents of the surrounding areas.

8. Construction Cost

The total cost of this project is estimated at Rps. 6,662.5 million or US$16.05 million in the price at the end of 1976. Of this total, Rps. 965.9 million is for purchase of land.

Cost of Developing the Industrial Estate

(Rps. 1,000)

Cost Item	Stage I	Stage II	Stage III	Total
1. Preliminary	75,000.0	31,350.0	19,950.0	127,000.0
2. Ground levelling	431,611.0	408,606.5	230,096.5	1,070,314.0
3. Roads	906,615.0	544,310.0	199,480.0	1,650,450.0
4. Paving	9,250.0	3,950.0	34,800.0	48,000.0
5. Drainage and sewerage	179,702.5	120,411.0	126,787.5	426,901.0
6. Water supply	162,410.0	44,770.0	28,550.0	235,680.0
7. Electrical supply	72,000.0	72,000.0	36,000.0	180,000.0
8. Slope protection, prevention of hazard	23,318.9	57,491.1	39,857.0	120,730.0
9. Parks	25,736.0	38,604.0	64,340.0	128,680.0
10. Buffer greenery and others	10,994.0	10,332.0	24,439.0	45,765.0
11. Sewerage treatment	310,000.0	20,000.0	20,000.0	350,000.0
12. Buildings	138,800.0	-	35,000.0	173,800.0
Sub-total	2,346,200.4	1,351,824.6	859,250.0	4,557,275.0
13. Overhead	586,550.1	337,956.1	214,812.5	1,139,318.7
Total	2,932,750.5	1,689,780.7	1,074,062.5	5,696,593.7
14. Land acquisition	965,856.8	-	-	965,856.8
Grand Total	3,898,607.3	1,689,780.7	1,074,062.5	6,662,450.5

Off-site development cost	(Rps. 1,000)
Water supply	285,750
Electrical supply (power station)	260,821
Total	546,751
Building 2 (profitable)	1,125,000

9. Organization and Management

It is necessary to establish P. T. Industrial Estate Ujung Pandang as an administrative and management company for this industrial estate.
The following points are proposed:

- A department which coordinates the activities of the Industrial Estate and governmental institutions and improves the infrastructure outside the Industrial Estate will be established within the local government.
- An advisoty team composed of outside experts will be formed in order to back up the functional activities of the management company.
- Prior to the official establishment of the management company, a preliminary organization called "Project Industrial Estate", will be established within the local government. This organization will then become independent as the management company after its financial base is established.

Marketing is the most important activities in the management of the Ujung Pandang Industrial Estate. The plan will have to be worked out most carefully and utmost efforts must be made for the marketing activities.

10. Financial and Economic Analyses

(1) In consideration of such factors as recovery of invested capital, market price of land, competition with industrial estates in other regions and financial position of occupants, the selling price of the factory site is set at Rps. 6,500/m^2 in 1976 price. This price is slightly high than Rps. 6,382/m^2, the minimum selling price that assures recovery of the total construction cost, maintenance and administrative costs and the interest excluding that on land cost, all by 1990. Depending on the financial conditions of the occupants, payment may be made in the lump or in five installments (Rps. 1,686/m^2 at a time for four years).
The site may also be leased at an annual rental of Rps. 860/m^2. The maximum amount of cash that is required in 1983 to purchase the site at the above-mentioned price and by the above-mentioned method will be Rps. 2,960 million.

(2) As against the maximum cash requirement of about Rps. 3 billion, possible occupants of the industrial estate will have Rps. 1 billion of capital which is almost equal to land cost, Rps. 1.5 billion of long term debt and Rps. 0.5 billion of short term debt. These funds are sufficient for occupants to continue operations, but since the margin included in the selling price is very low, profitability is not necessarily high. The operation will begin registering black figure and it will be in 1995 that the accumulated deficits will be eliminated. In the year 2000, there will be an accumulated retained surplus of Rps. 168 million, but the dividend will total no more than Rps. 400 million. In order to improve profitability without raising the selling price, and to use profits in fostering the traditional small-scale industries, the ratio of equity to total debt must be raised or the interest rates on debt (15%) must be lowered.

(3) As the most direct social and economic effects, the development of the industrial estate will help alleviate unemployment and decrease outflow of population. There will be an expected employment of about 25,000 at the time of completion of the industrial estate. This means that there will be new employment of about 15,000 in 1990 as compared with the employment that may arise even without the industrial estate project. Salary and wages that the 15,000 employees would have earned by the year 2,000 may be regarded as the most direct economic benefit. If the salary and wages are translated into the present price at the discount rate of 15% and then compared with the discounted development cost, the benefit-to-cost ratio will be 1.24 and the internal rate of return 18.8%. The economic feasibility of this project is thus established.

There will be other economic effects such as promotion of transportation, construction and banking, residents' increased income and the resultant expansion of market and prosperity of commerce and service industry, increased tax revenues, accumulation of basic industrial technology and systematic urban development. The effect on urban development is particularly significant. If a few hundreds of factories are set up in many places of the city, the city will lose much of its amenity and Ujung Pandang will become a unlivable.

(4) An increase in population due to increased employment will also help improve social capital significantly. For example, there will be new demands

for 140,000 houses and for a few hundreds of primary and secondary schools by early 1990. There will also be the need to construct and improve public facilities for service water, electricity, and garbage disposal as well as hospitals and parks. All this points to the need to develop an industrial estate project in the context of the regional social and economic development and to the need to develop the related businesses in many other fields in a comprehensive perspective.

I. OBJECTIVES OF THE INDUSTRIAL ESTATE DEVELOPMENT PROJECT

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1. Methods of Objectives Formulation

The character of an industrial estate and the framework of planning an industrial estate development project are determined by roles assigned to the estate, as well as by the objectives of the development. The type of industries to be introduced into the estate, for example, depends on its development objectives. In this sense, objectives formulation is an important work in the first stage of this study, as it was in the "Pre-feasibility study for industrial estate project in Ujung Pandang" conducted prior to this study. A process of the objectives formulation is shown in the figure. The basic points of the objectives are chiefly determined by "stakeholders' expectation" for the estate. Stakeholders are institutions or groups of people who have something at stake in the project;. in this case, administrative organs such as the Indonesian Government, Government of South Sulawesi Province and Ujung Pandang City authorities, local community and aid-providing bodies.

As a matter of course, expectations for the estate will be affected by changes in various conditions such as a rise in the nation's economic level or a progress in its industrialization for the future, which inevitably exert influence on the objectives of the nation's industrial development. On the other hand, the objectives of an industrial estate development project should be in accordance with constraints laid by such facts as laws in force or city planning now under way. These objectives should be modified if they are hardly feasible. Thus, the objectives of an industrial estate development project will be formulated through input and feedback of four great factors; stakeholders expectation, a change of conditions, constraint imposed by accomplished facts and feasibility.

Objectives formulation in this study was carried out by the following methods:

i) Repeated discussion meetings with Indonesian counterpart teams of both central and local governments through the whole process of the study.

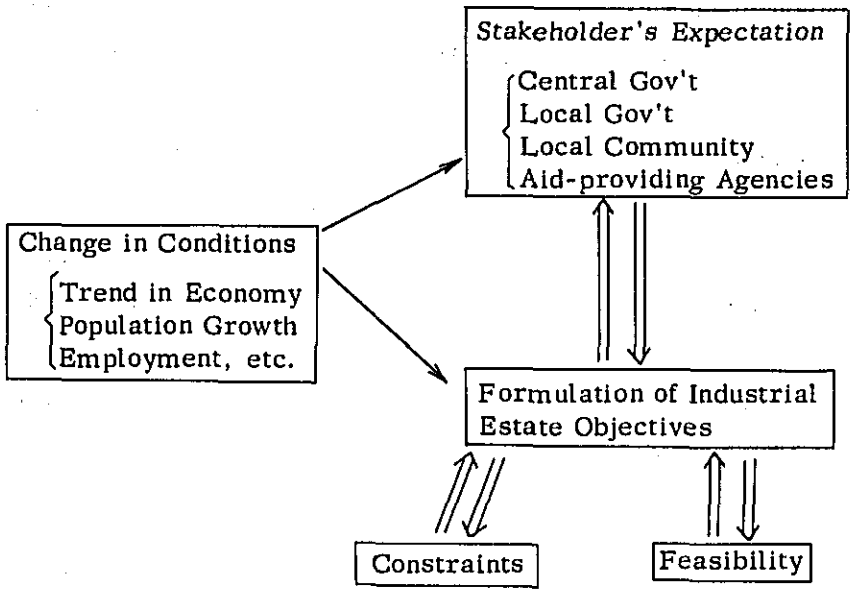
ii) Outlook for the Indonesian economy and the regional economy in the

pre-feasibility study.

iii) Participation of Indonesian counterpart team members in the working process of the study and joint discussions during their visit to Japan.

iv) Review of the study course at several steering committee meetings taking into account the result of the above-mentioned activities.

Process of Objectives Formulation



(Source) Prepared by the Mission

2. Basic Objectives

In its second five-year industrial development program, the Indonesian Government worked out a key-point development plan to attain an ambitious economic growth of 7 % a year and, at the same time, to make up regional disparity. The Government now pushes industrial estate development projects in various parts of the country as an effective means to attain those purposes.

Considering such a backdrop, we take up the following as the basic objectives of the present industrial estate development project:

i) To promote the industrialization of the Ujung Pandang Region with a view to making Ujung Pandang City a "Growth Pole" or nucleus for developing East Indonesia.

- Idea of a free trade zone designed to manufacture substitutes for imported goods and to promote export.
- Idea of CTS (Crude Transshipment Station) in view of importance of the Makassar Strait in ocean transportation.
- Idea of a large-scale coastal industrial estate centering on heavy and chemical industries.
- Idea of an industrial estate centering on mechanical industry as a comprehensive technology center.
- Idea of a large-scale industrial estate of international character centering on intermediate goods manufacturing industries.

Some of these ideas were dropped simply by reason of unfeasibility according to intuitive judgement, but many of them can be taken up to be incorporated in a certain phase of the long-term plan. It is desirable, therefore, that these ideas will be put under review in the choice of projects for Phase II and III, after Phase I is set on the right way. Of course, we duly considered this point when we have mapped out the present industrial estate development project.

However, industrialization as a key point of the development of East Indonesia or for contributing to regional development (the basic objectives of the project) should be carried out based on a cycle of indigenous and independent expansion of the regional economy. For this reason, in a strategy for industrial estate development, industrialization program should be worked out making both cycles of income raising (introduction of various industries into the estate → an increase in employment → an increase in income and in purchasing power → a progress of industrialization and introduction of new industries) and of technological improvement (introduction of various industries into the estate → transfer and accumulation of technology → a progress of industrialization) a basic pattern of the independent expansion cycle. The plan for Phase I of the industrial estate development project was drawn up with such a concept.

The industrial estate to be developed in Phase I, therefore, should be conceived taking account of various potential industrial resources in this region and setting the completion of its goal at 1990. Thus, as stated in the report of

ii) To contribute to the development of the Ujung Pandang Region and South Sulawesi Province through industrialization.

The first objective is nothing but furtherance of industrialization. To attain this objective, induction of larger industrial investment, expansion of the local market and transfer and accumulation of technology should be realized through the industrial estate development project.

The second objective is for social and economic development. For this purpose, the industrial estate development project should contribute to increases in employment and the income level of inhabitants of the region. The project also should be mapped out in line with the regional development program with a view to an orderly expansion of Ujung Pandang City contributing to effective city planning.

3. The Role of This Industrial Estate in a Long-term Industrial Development Strategy

In order to attain these purposes, varied and dynamic policies for regional industrialization, as well as a long span of time, will be required. As we have already stated in the report of the pre-feasibility study, supposedly the most part of regional industrialization will be performed by industrial estates. Regional industrialization will be divided into the following three phases, each of which will require a relatively long span of time of 15 to 20 years.

Phase I for building primary industrial foundation

Phase II for progressive accumulation of industrial technology

Phase III for industrial sophistication with advanced technology

A general concept of the industrial estate in each phase is shown in Table I-1 picked up from the pre-feasibility study report.

Within the whole plan which will last for 50 to 60 years, many independent plans for constructing industrial estates may be conceived. In fact, several ideas of different characters were proposed at the stage of working out a basic plan and reviewed by the steering committee. The following are some examples of these ideas:

Table I-1 A Long-term Plan for the Industrialization and Construction of Industrial Estates in the Ujung Pandang Region

	Factors determining character of the estate			Scale of industrial estate	Primary objectives of development/ characteristics to be possessed
	Market	Infrastructure	Manpower		
Phase 1	Small	Not developed adequately	Unskilled	Small	. Objectives: Promotion of employment, increase of income, saving of foreign currencies. . Type of industrial estate: Mixed-type comprising the labor-intensive industries, industries which promote the processing of agricultural products and some of the existing industries in Indonesia. . Location: Readily accessible even from the urban district.
Phase 2	Medium	Improved	Skilled	Medium	. Objectives: Improvement of productivity (improvement in the quality of employment), increase of income and saving of foreign currencies. . Type of industrial estate: One comprising the industries to employ more sophisticated production techniques. . Location: Adequately separated from the residential districts.
Phase 3	Large	Adequate	Skilled technical labor	Large	. Objectives: Establishment of the autonomous system for industries. . Type of industrial estate: One comprising capital-intensive industries. . Location: Seaside location adequately separated from the residential districts.

(Source) Prepared by the Mission (Pre-feasibility Study)

our pre-feasibility study, it will be a single industrial estate with an area of around 200 hectares, mainly gathering modernized medium-scale enterprises. The basic plan and design in the present report is for this type of industrial estate to be developed in Phase I.

4. Priority in Objectives and the Policy for Drawing up the Project

Considering the foregoing, the objectives of the industrial estate development project (those of the industrial estates to be developed in Phase I stated in the preceding section) should be ranked in the order of priority. We enumerate various objectives subordinated to the above-mentioned basic objectives in Table I-2 which will well serve to give us a rough idea of priority, though it is not very well arranged comprising the objectives of different conceptual levels.

In the list, the objectives are classified into the following three categories in the order of priority: economic development, technological development and social development. Each category is further divided into tow; the national level and local level (though they are overlapped in many cases).

We have taken into account this priority order in working out the project. For example, production of exportable goods, production of substitutes for imported goods, expansion of employment and income raising stand to one another in a relation of "trade-off" as explained in the pre-feasibility study. In selecting appropriate industries to be introduced in the industrial estate, we have given priority to the last two items. In addition, selection of appropriate sites for the construction of the industrial estate was made placing emphasis on effective promotion of urban and regional development projects, as well as on improvement of infrastructure bolstered by construction of the industrial estate. We also gave serious consideration to heighten prestige of Ujung Pandang City as much as possible and attach importance to local marketing, taking up, for example, encouragement of indiginous entrepreneurship.

Table I-2 Priority in the Objectives of the Industrial Estate Development Project

	National level	Local level
Economic development	*** Increase in employment, decrease in unemployment	*** Increase in employment, decrease in unemployment
	** Raise in gross income (national production and income)	*** Raise in income
	* Production of exportable goods	** Induction of industrial investment, raise in this type of investment
	* Production of substitutes for imported goods	*** Activation of local economic activity
	* Induction of industrial investment, raise in this type of investment	** Fostering of local industries
	*** Expansion of the local market	** Induction and fostering of local capital
	*** Induction of a desirable size of population influx	*** Reduction of population outflow
	* Promotion of resources development	
	** Accumulation of industrial capital	
Technological development	*** Transfer and accumulation of technology	*** Transfer of technology
	** Improvement of business management skill	** Improvement of business management skill
	** Fostering of talents	** Increase in skilled laborers and talents in the region
Social development	*** Making-up of regional disparity	** Encouragement of indiginous entrepreneurship
	** Effective urban and regional development projects	** Effective urban and regional development projects
	** Improvement of infrastructure bolstered by the industrial estate development project	** Improvement of infrastructure bolstered by the industrial estate development project
Other		** Publicity of Ujung Pandang City
		** Enhancement of the prestige of Ujung Pandang City
		** Cultivation of international character of Ujung Pandang City

(Note) *** the first priority
** the second priority
* the third priority

(Source) Prepared by the Mission

5. Setting of Development Goal

Let us express these objectives numerically as much as possible, for example, the objectives given high priority in Table I-2 to the following five: (1) employment index, (2) income index, (3) population outflow index, (4) technology transfer index and (5) regional disparity index.

It is almost impossible to set definitively development goal for all of them, but we will try to give the readers an outline as follows:

1) Employment index

Employment index shows an increase in employment, a decrease in unemployment including latent and faked unemployment, improvement of labor force ratio. An outlook for some figures related to the labor force in Ujung Pandang City is shown in the following table. According to the outlook, population of the productive age (from 10 to 64) cluster and effective labor force will increase by 157,000 and 84,000 respectively. Of an increase in labor force, at least 30,000 should be employed by the secondary industry including manufacturing and construction.

The industrial estate in Ujung Pandang is expected to employ 25,000, more than 80 % of the above-mentioned figure.

It is estimated that the total labor force will increase by 84,000 for ten years to come. The industrial estate development project will contribute to employment of this additional labor force in the two different fields. The one is a possible increase in employment in transportation for supporting construction and production in the industrial estate, and the other is that in the tertiary industry owing to an increase in direct employment there. According to trial calculation at this moment, the former is estimated at around 25,000 and the latter around 44,000. We may say, therefore, that the industrial estate in Ujung Pandang will be able to contribute greatly to an improvement of employment index.

It is difficult to determine a degree of its contribution to reduction of unemployment, but the industrial estate may absorb a fairly large part of latent unemployment in Ujung Pandang City which reached 10,395 in 1971, though other measures for absorbing the jobless are naturally required.

Table I-3 Future Labor Supply Situation in Ujung Pandang

(1,000 persons)

	1971	1991	Number of Increase
Population	550	870	320
Population of "Productive Age" Cluster *	383	540	157
Labor Force	140	224	84
Number of Employment Required in the Secondary Industry	17	47	30

(Note) * Population with age from 10 to 64

(Source) Prepared by the Mission (Pre-feasibility study)

2) Income index

Income index shows a degree of contribution to a raise in reagional gross domestic product (RGDP), the amount of value added, regional gross income and average family income. We have set a goal for a degree of contribution to a raise in RGDP based on the pre-feasibility study as follows:

As shown in the table below, an increase in the amount of value added in the industrial sector in South Sulawesi Province necessary for catching up with the national level of industrialization is expected to reach Rps. 33 billion in 1990. On the other hand, the value added coming out of production in the industrial estate in Ujung Pandang in 1990 is expected to amount to Rps. 25 billion. That is to say, the industrial estate will have to cover 75 % of the required amount of value added for industrialization of South Sulawesi Province.

As to a raise in income, a goal for RGDP per head in South Sulawesi Province in 1990 has been set at $248 against $95 in 1973. (See the pre-feasibility study report) The industrial estate in Ujung Pandang will exert a great influence both directly and indirectly on such an increase in personal income.

Table I-4 Regional GDP required from Manufacturing Industries in South Sulawesi

(Billion)

	1971 Actual	1991 Projection	Increase over 1971
Regional GDP	Rps. 125. 3	Rps. 301. 6	
Percentage of GDP Output from Manufacturing Industries	4. 86 %	13. 0 %	
Value of GDP	Rps. 6. 1	Rps. 39. 2	Rps. 33. 1

(Source) Prepared by the Mission (Pre-feasibility Study)

3) Population outflow index

We can not grasp correctly the movement of population in South Sulawesi Province, but population influx and outflow in the province for ten years from 1961 to 1971 have been estimated at about 130, 000 and 500, 000 respectively. That is to say, a population which is neary same as that of Ujung Pandang City flowed out probably to economically-advanced regions, especially to Jawa Island. This is mainly because sufficient employment was not offered in the Province. The industrial estate in Ujung Pandang should also contribute to prevention of such population outflow. According to the project, the industrial estate is expected to support the population of around 230, 000 in 1990 when the estate will be fully occupied. Assuming that population outflow continues at the same pace for twenty years from 1971 to 1991, the industrial estate will be able to detain more than 30 % of the outgoing population according to a mere calculation.

On the other hand, the population of Ujung Pandang City is expected to reach 870, 000 in 1991 increasing by 320, 000 from 550, 000 in 1971. In this case, the industrial estate is expected to absorb more than 70 % of the increased population. If it fails to do so, the city can not support the increased population and can not prevent inhabitants from going out of the city.

4) Technology transfer index

It is more practical to take the word "technology transfer" in broader sense as technological knowledge, knowhow and experiences newly imported in this region through the industrial estate. We wish to include in it not only invention, patent, knowhow concerning both production process and facilities, but control systems and technique, management skill and the like, because we think it is more pertinent to attain such objectives as "industrialization as a center of the development in East Indonesia and that for building up the regional economy." We cannot neglect management knowhow and experiences, as expansion of the local industry on its own will become possible through diffusion of technology only after all of the technology related to each industry introduced in the estate are learned and mastered completely.

Since methodology for putting the effects of technology transfer in figure has not been established, we can not set a goal concretely as to objectives of technology transfer. But conceptually, we can evaluate these effects by finding an answer to each of the following four questions.

- How many kinds of new technology are introduced?
- How widely they are transfered?
- How deeply they are rooted?
- How strongly they are diffused?

The answer to the first question depends on the variety of industries introduced in the industrial estate, as well as that of technology in each industry. (For example, the manufacture of heavy electric machines requires far greater variety of technology than sheet metal processing.)

The second question may be answered by giving the number not only of divices and facilities introduced in the estate but that of common workers, skilled workers, engineers, executives and entrepreneurs who learn new technology.

The third question is to know how far these people can master transfered technology. It is impossible to express this numerically but we think it is clear as a concept.

As to the fourth question, it is also impossible to reply it giving figures, as the intensity of diffusion depends on many factors such as growth potential of goods manufactured by the transferred technology on the market. But it is also not so difficult to set a goal for it conceptually.

In this sense, we may say that settlement of all industries earmarked for the industrial estate in this project and achievement of a goal for employment will be no other than objectives necessary for technology transfer.

5) Regional disparity index

Regional disparity can be shown by various indexes such as disparity in income, in a degree of industrialization, in employment and so on. In addition, these indexes explain indirect effects of construction of the industrial estate. We may regard them as a whole, therefore, as a goal for the regional development project. Nevertheless, the industrial estate will be able to contribute greatly to attainment of this goal.

We only show hereunder per capita GDP goals for this region.

Table I-5 Per Capita GDP Goals for the Region

(in US dollars)

Region \ Year	1973	1980	1990	2000
Indonesia	130	180	275	420
East Indonesia	96	135	234	420
South Sulawesi	95	144	248	420
Index of South Sulawesi, Total Indonesia as 100	73	80	90	100

(Source) Prepared by the Mission (Pre-feasibility Study)

II. ANALYSIS OF THE INVESTMENT ENVIRONMENT

II. ANALYSIS OF THE INVESTMENT ENVIRONMENT

Investors will have to have information on the following eight points when making investment in the Ujung Pandang industrial estate: 1) availability of the labor force; 2) the wage standard; 3) financing; 4) the interest rates; 5) distribution channels for finished products; 6) the scale of the market; 7) the state of the infrastructure -- water, power, roads and ports; 8) the quality of management in presently operating industries. This chapter will examine the conditions in Ujung Pandang that relate to the investment environment, specifically, labor, financing, distribution, infrastructure and case studies on local enterprises.

1. Labor Market

1) Labor force availability

In undertaking any business the first problem that must be solved is how to secure good quality workers. According to the 1971 census, 100,000 people were unemployed in South Sulawesi or 7.3 percent of the total labor force of 1,410,000 in the province. These are the figures for those completely unemployed and if the latent or partially unemployed in agriculture and service sectors are included, the figures from the provincial government show that 30 percent of the urban and 60-70 percent of the rural labor force fall into this category.

In the city of Ujung Pandang, there are more than ten thousand people out of work and it is urgent that they be given jobs. With this many unemployed people a labor force is readily obtainable in Ujung Pandang. However, since the labor force is by and large unskilled, there will be a shortage in absolute numbers of the technicians and skilled workers required by industry, and it will be necessary to train these people on the job. In most Ujung Pandang industries, unskilled day-labor is employed in addition to permanent workers. In those factories where it takes only a short time to learn simple tasks, unskilled daily workers are

indispensable because in most instances wages are low and the size of work force can be adjusted to production needs. One example of this is that a certain food processor employs eighty percent of his work force on a daily basis. This situation suffices for the company in terms of production volume, quality and returns. In most instances, the easiest and safest way to recruit these workers in through connections, but newspaper want-ads, schools and job-training centers are also used.

Due to the unemployment situation, there is a very high rate of workers and middle-management personnel who remain at the same company.

2) Labor productivity

Most of the past views of the Indonesian workers was quite critical, an enumeration of various negative elements such as low level of education, lack of experience and training and a deficiancy in the desire to really work. These ideas are rapidly changing as corporations gain more experience with the local manpower. Many people in management are beginning to see the positive advantages of investing in Indonesia and looking less at the negative aspects. One reason is that Indonesians are very skilled in working with their hands and if given the right type of on-the-job training, they have high productivity in simple, repetitive tasks. (They seem as yet unable to do jobs which require some originality or the application of acquired knowledge to a practical task.)

Among the Ujung Pandang corporations that were surveyed, there is a considerable difference in labor productivity depending upon the level of training that the employees have and their years of experience on the job. In the aggregate, however, productivity is about sixty to seventy percent of what it would be in the comparable enterprises of the industrialized countries.

3) Wage levels

Thirty companies in Ujung Pandang were surveyed and the results show that wages are determined by each company with marked difference in wage level according to enterprise and type of industry.

The table below shows comparisons of average wages for skilled and unskilled workers by industry. There are wage differences between industries with the lowest found in the textile, ceramic and metal product industries. The standard for skilled workers is Rps. 10,000 and that for skilled workers is Rps. 15,000 per month. The next highest group is that of the food and wood product industries where wages for unskilled workers were Rps. 12,500 and for skilled workers Rps. 25,000 per month. The highest wages are in machine manufacturing, particularly those for the knockdown production of automobiles and motorcycles. Wages here for unskilled workers were Rps. 15,000 and for skilled workers Rps. 30,000. Wages in the machine manufacturing industry are fifty to one hundred percent higher than those in textiles and ceramics (Table II-1).

Table II-1 Wage Level by Industry

(Rps./month)

Industry	Unskilled worker	Skilled worker
Food	12,500	25,000
Textile	10,000	15,000
Wood products	12,500	25,000
Ceramics	10,000	15,000
Machinery	15,000	30,000
Metal products	10,000	15,000

(Source) Prepared by the Mission

There are also regional differences in wage levels. Wages are low in Sulawesi, and central and eastern Jawa in comparison to what they are in Kalimantan, Sumatra, with its small labor force, as well as western Jawa and the Jakarta area where there are many businesses with foreign capital. The following table shows a comparison between the monthly average of wages in Jakarta and those in Ujung Pandang. This comparison was made of the categories of management personnel, engineers, skilled and unskilled workers.

The monthly wage for permanent employees in Ujung Pandang is from Rps. 80,000 to Rps. 100,000 for managers, Rps. 50,000 - Rps. 80,000 for technicians, Rps. 15,000 - Rps. 30,000 for skilled workers and Rps. 10,000 to Rps. 15,000 for unskilled workers. Many of the companies employ day-labor as well and wages in this category are from Rps. 300 to Rps. 500 per day.

The Jakarta wage standard is thirty to fifty percent higher than in Ujung Pandang; in Jakarta, managerial class receives Rps. 100, 000 to Rps. 150, 000, technicians Rps. 70, 000 to Rps. 100, 000, skilled workers Rps. 30, 000 to Rps. 50, 000 and unskilled workers Rps. 15, 000 to Rps. 18, 000 (Table II-2).

Table II-2 Comparison of Wage Levels

(Rps./month)

	Ujung Pandang	Jakarta
Manager	80, 000 - 100, 000	100, 000 - 150, 000
Technician	50, 000 - 80, 000	70, 000 - 100, 000
Skilled worker	15, 000 - 30, 000	30, 000 - 50, 000
Unskilled worker	10, 000 - 15, 000	15, 000 - 20, 000
Day-laborer	Rps. 300 - 500/day	-----

(Source) Prepared by the Mission

Wages for corporations with foreign capital are twenty to thirty percent higher than the native (Pribumi) enterprises. Their employees are in the higher bracket for each of the above categories.

2. Financing

1) Financial Institutions in Ujung Pandang

The finance mechanism is being systematized along the lines of the Basic Banking Act, enforced in 1968. This law provides for two categories of institutions: primary institutions which include the central bank, commercial banks, development and savings banks, and secondary institutions, such as village or rice banks, public pawnshops and insurance companies. As Table II-3 shows, there are nineteen home offices or brances of various financial institutions in Ujung Pandang, and the most important of these are the branch of the Bank Indonesia, regional offices and/or branches of five national commercial banks and a branch of the national development bank, BAPINDO. The following is a summary description of these financial institutions.

(Bank Indonesia)

The Bank Indonesia plays a very important role in overall financial policy, issuing currency, regulating private credit and interest, handling government credit, and controlling, regulating and managing foreign reserves. It also functions as a commercial bank, handling direct and indirect loans through the national banks.

(National Commercial Banks)

There are seven national banks, five of them commercial banks handling short-term financing with repayment periods of less than one year. These banks have their respective areas of preference,* but competition for extending loans is quite intense among them. Bank Negra Indonesia is the most advanced commercial bank. All of these banks rely on Bank Indonesia for the vast majority of their loan funding.

* Preferred Loan Areas by National Commercial Banks.

Bank Rakyat Indonesia	Agriculture, small and medium-sized manufacturing, services
Bank Negara Indonesia 1946	Trade, manufacturing, transportation
Bank Ekspor Impor Indonesia	Trade
Bank Bumi Daya	Agricultural product export
Bank Dagang Negara	Mining, export, commerce

(Development Banks)

BAPINDO, the Indonesian development bank, specializes in medium- and long-term industrial financing. In 1971, BAPINDO's capital was increased from Rps. 110 million to Rps. 10 billion and the bank was reorganized through assistance by the government, Bank Indonesia and the International Development Association (IDA). The bank's performance in the last several years has been excellent.

Table II-3 Financial Institutions in Ujung Pandang

1.	Central Bank (Bank Indonesia)	(Branch)
2.	Commercial Banks	
	A. National Banks (5)	
	Bank Rakyat Indonesia	(Regional Office & Branch)
	Bank Negara Indonesia 1946	(Regional Office)
	Bank Ekspor Impor Indonesia	(Branch)
	Bank Bumi Daya	(Branch)
	Bank Dagang Negara	(Branch)
	B. Local Private Banks	
	Bank Tani dan Industri	(Central Office)
	Bank Antar Indonesia	(Central Office)
	Bank Masyarakat	(Central Office)
	Bank Pembangunan Sulawesi	(Central Office)
	Bank Rakyat Sulawesi	(Central Office)
	Bank Sukapura	(Branch)
	Bank Pursatuan Nasional	(Branch)
	C. Other	
	Bank Pasar K. M. M.	(Central Office)
3.	Development Banks	
	Bank Pembangunan Indonesia	(Branch)
	Bank Pembangunan Daerah S. S.	(Central Office & First Branch)
4.	Other	
	Bank Tabungan Negara	(Branch)
	Bank Tabungan Makassar	(Central Office)
	Bank Koperasi Sul-Sel	(Central Office)

(Source) Monetary Institutions in UP

2) Financing capability

(1) Supply and demand for funds

A tight money policy has been in effect since 1974 to hold down inflation. Recently, however, the policy has had to be related somewhat since it was causing a slump in business. The present monetary policy can be summed up as follows.

i) National banks may not supply funds for non-Pribumi business, chiefly those operated by overseas Chinese.

ii) Foreign banks operating in Indonesia may not extend loans to any business outside the city limits of Jakarta, but this financing may be permitted if done jointly with a domestic bank.

iii) An absolute-term ceiling has been placed on net increase in total assets of financial institutions.

iv) Financial institutions must have 10 percent of savings and liabilities on deposit with the central bank and retain 20 percent of the same on hand as *reserve assets.*

v) An absolute-term ceiling has been placed on the amount of finances obtained from foreign sources.

The tight money policy remains in effect but now there is a glut in the supply of financing on the market. This is due to the fact that the slump in business conditions has made corporations reluctant to invest in either new plant and equipment or in the expansion of existing plant and equipment. Another factor contributing to the overabundant supply is the restriction on financing to non-Pribumi corporations.

(2) Interest rates

Interest rates for savings and loans at the national commercial banks are the key factors in the money rate structure for Rupiah funds. These rates are, of course, are determined by the central bank, serving as indices for overall interest rates. There are no regulations on dollar financing, hence interest rates vary from bank to bank. However, most banks apply an interest rate on

dollar financing that is somewhat higher than that for the Asian dollar.

(*Interest on Savings*)

Annual interest rates on time deposits were lowered in January 1977 as follows:

2-year deposit ---- from 24 to 18 percent
1-year deposit ---- from 15 to 12 percent
6-month deposit ---- from 12 to 9 percent

(Interest on Loans)

Loan interest at the national banks is:

i) Small financing (less than Rps. 5, 000, 000) ----- 12 percent per annum

ii) Long-term operating capital (less than Rps. 5, 000, 000)
----- 15 percent per annum

iii) *General financing*

a) 12 percent per annum
* Financing of "Bimas" rice and second harvest of "Bimas"
* Import financing for PL 480 fund
* Financing the importation and distribution of basic agricultural necessities such as fertilizers and insectided.
* Financing flour mill development

b) 15 percent annum
* Financing "Bimas" poultry raising
* Financing farm product development
* Financing production and export of government-Promoted export goods.
* Financing textile industry development
* Financing public transportation development

c) 18 percent per annum
* Financing the importation and distribution of import-regulated goods.
* Other production financing

d) 21 percent per annum

* Financing domestic trade
* Financing production and trade of export goods
* Others

e) 24 percent per annum

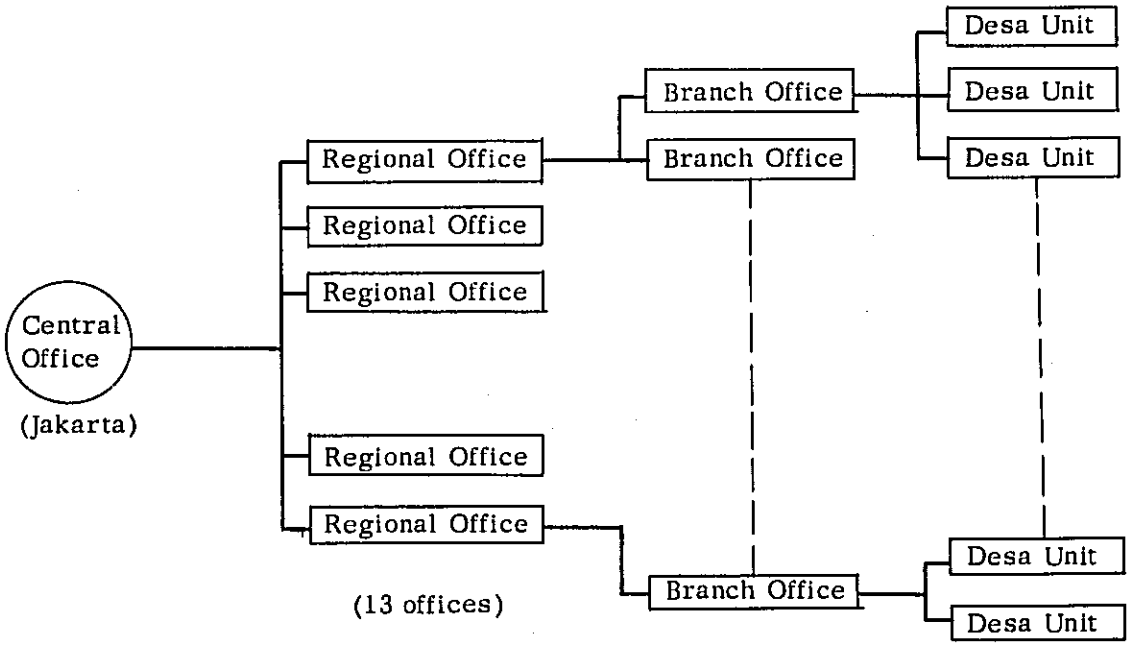
* Commercial and service industries

(3) Terms and amounts of loans by major financial institutions

Among the banks in Ujung Pandang, most actively engaged in financing operations are the two national commercial banks, BRI and BNI, and the national development bank, BAPINDO. Below is a brief description of their financial activities, including their past performance and the terms of loans to various projects, such as total amount and repayment period.

i) Bank Rakyat Indonesia (Regional Office and Branch)

BRI is a national commercial bank financing agriculture, manufacturing and service industries. As is shown in the chart below, the organization of the bank centers on the main office in Jakarta and radiates out to thirteen regional offices and then to small branch offices in each city. Below the branch offices are a great number of village branches called Desa Units, whose network covers as much of the rural area as possible.



There is a regional office in Ujung Pandang which is in charge of the three provinces of South and Southeast Sulawesi and Maluku. The regional office directs the activities at eighteen branch offices set up in various cities such as Ujung Pandang, Pare-Pare, Watampone and Majene, and below the branches are a total of 182 Desa Units, a number which will be increased to 250 through plans now under way.

Types of industries the Bank Rakyat Indonesia finances are limited to the agricultural, manufacturing and service sectors. Terms of Loaning differ with each of these industries, depending on the size of the project and whether it is a government program or not. Financing conditions are summarized in the following Table II-4. Financing for government programs is classified

Table II-4 Financing Conditions of Bank Rakyat Indonesia

	Amount	Period	Interest (per annum)
1) PROGRAM CREDIT			
① Bimas Credit	Max. Rp 35,000/ha	Max. 7 months	12 %
② Small Credit Investment	Max. Rp 5,000,000	Max. 5 years	12 %
③ Working Capital Credit	Max. Rp 5,000,000	Max. 3 years	15 %
④ General Investment Credit	no limit	Max. 5 years	
2) NON-PROGRAM CREDIT			
① Agriculture, Fishery Livestock, Industry Transportation	no limit	Max. 1 year	15 %
② Trade, Service	no limit	Max. 1 year	18 %
3) SMALL CREDIT			
① For Investment	Max. Rp 100,000	Max. 1 year	12 %
② Working Capital			15 %

(Source) Bank Rakyat Indonesia in UP : Regional Office

under four credit categories, Bimas credit, small credit investment (KIK), working capital credit and general investment credit. With the exception of general investment credit, a ceiling is placed on the amount that can be lent, a distinctive feature of government programs since no limits are placed on loans for non-government projects. But government programs are more advantageous than non-government for longer periods of financing. Government programs are given a maximum of three to five years for repayment, compared with the one-year limit for non-government projects. The only government program that is an exception is that of Bimas credit which requires seven months for repayment to correspond with the time of the rice harvest. The interest rate for government programs is about 12 percent per year with the exception of working capital credit which is 15 percent. Non-government programs are charged higher rates of 15 to 18 percent. The ceiling on small credit investment is Rps. 100,000 and repayment period is one year. However, such loans are given preferential treatment as far as interest is concerned, with rates varying from 12 to 15 percent per annum.

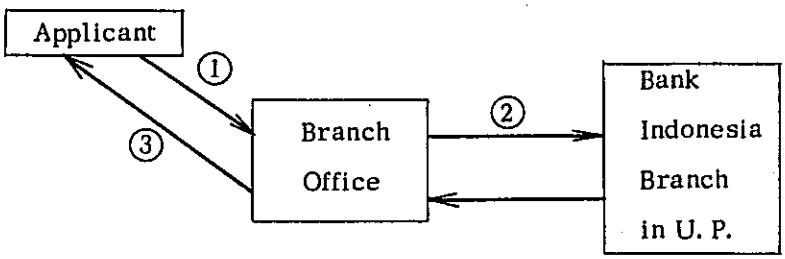
The regional office of Bank Rakyat Indonesia began operation in Ujung Pandang during the early part of the fifties, and it has handled a total of Rps. 11,000 mil. in financing up to the present time. Rps. 7,500 mil. of this went into government program credit, Rps. 3,000 mil. for non-government programs and Rps. 500 mil. into small credit investment.

Procedures for receiving loans from the bank differ depending again upon whether it is a government or non-government program. The branch office has been authorized to grant government program credit and the procedures to be taken in getting this credit are as follows:

① An application for credit is submitted to the branch office.

② The application is then submitted to the Bank Indonesia branch in Ujung Pandang where a joint evaluation is made.

③ The application and evaluation are returned to the branch office where the final decision is made on the granting of credit.

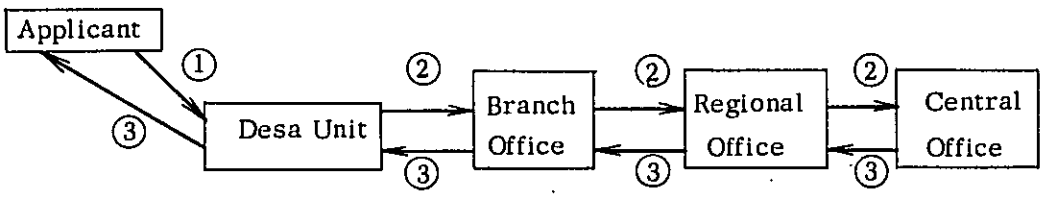


With non-government program credit, no other banks participate and the decision for granting is made at the home office of BRI.

① The application for financing is submitted to a Desa Unit of BRI.

② The application is then sent to a branch office, then to a regional office and finally to the home office where the decision is made.

③ Approval or rejection is then reported to the applicant by the Desa Unit.



ii) Bank Negara Indonesia 1946 (Regional Office)

The Bank Negara Indonesia is a national institution designed to extend financing to all manufacturing and commercial activities. Financing is given to native Indonesian enterprises or to joint ventures, but no loans are made to companies with totally foreign capital. Minimum on any financing made is Rps. 15 mil., with no specific regulation on the maximum. As in the case of BAPINDO, BNI financing is usually syndicated with Bank Indonesia. BNI puts up 30 percent of the funds while the Bank Indonesia covers 70 percent.

Total financing handled by BNI from 1966 to 1976 is in the neighborhood of Rps. 5,000 mil. About Rps. 2,000 mil. went into government programs, with the remainder for non-government programs.

Government programs included such things as 1) wheat flour mill (development and importation of raw materials, distribution of products), 2) fertilizer plants, 3) contracting business, 4) railroads, 5) cement (import and product distribution), 6) cloves, and 7) export. In the area of indigenous small-scale manufacturing, funds were provided for small investment and permanent operation capital. With non-government programs there were a variety of projects in 1) agriculture, 2) forestry, 3) fishing, 4) mining, 5) electricity, gas and water supply, 6) construction, 7) trading, 8) transportation, 9) warehousing, 10) communications, and 11) service industries.

BNI interest rates on loans to the manufacturing sector are 18 percent per annum and for the commercial sector, 21 to 24 percent. BI lends 70 percent of these loans to BNI at an interest rate of 12 percent per year. Prior to the recent revision of rates, interest on two-year time deposit accounts was 24 percent per year, five percent of which was subsidized by the Bank Indonesia. Interest on ordinary savings accounts was a high rate of 18 percent. The bank also paid interest on current deposits at a monthly rate of 1/4 to 3/8 percent (3 to 4. 5 per cent per year), depending upon its funding position at any one time. But with the January 1977 revision of rates, all savings account interest was lowered by 20 to 25 percent. BNI also has branches in Tokyo, Hong Kong, and Singapore.

iii) Bank Pembangunan Indonesia (Branch)

This is the Indonesian development bank, abbreviated BAPINDO, and it has ten branches and eight representative offices throughout the country. In the east Indonesian region there are one branch at Ujung Pandang, and five field office at Ambon, North Sulawesi, Central Sulawesi and Irian Jaya. Together they now handle financing for a total of 14 projects.

The Ujung Pandang branch of BAPINDO began operation in 1973. One of the important features of the financing that this bank handles is that total for any project must be more than Rps. 25, mil. and period of loans has to be more than five years. The reason is that the bank has set a goal for its financing to extend long-term capital credit to large-scale projects. Consequently, there is no ceiling on the amount that may be lent. One of the

projects BAPINDO financed together with BNI and BI was a syndicated loan to the PT. Tonasa Cement Company for a total of Rps. 32, 000 mil.
This represents another characteristics of BAPINDO operations. The development bank always forms a consortium with other banks for financing, handling about 30 percent while the others take care of 70 percent. When applying for a loan from BAPINDO, the investor has to take into account what BNI and BI think of the project, which in turn involves the government development policy and the overall financial situation at the time.

The chief financing method that the bank uses is the long-term investment loan, and in addition, it will lend operating capital (permanent) to those who have borrowed investment lonas. A dividing line is set at Rps. 200 mil.; any investment loans lower than this are charged 15 percent interest and those greater, 12 percent. A 15 to 18 percent range is set on operating capital, the rate depending on the type of industry involved, but preferential treatment is given to loans for export industries with an interest rate of 12 percent per year. Fixed assets (land, buildings, machines) or fluid assets are required as collateral.

3. Distribution

Distribution of almost all products in South Sulawesi is made by wholesalers and retailers, except for some manufacturers in Ujung Pandang using the direct-sale method, automobile plants relying on special dealers and government-operated organizations distributing rice, sugar and cement.

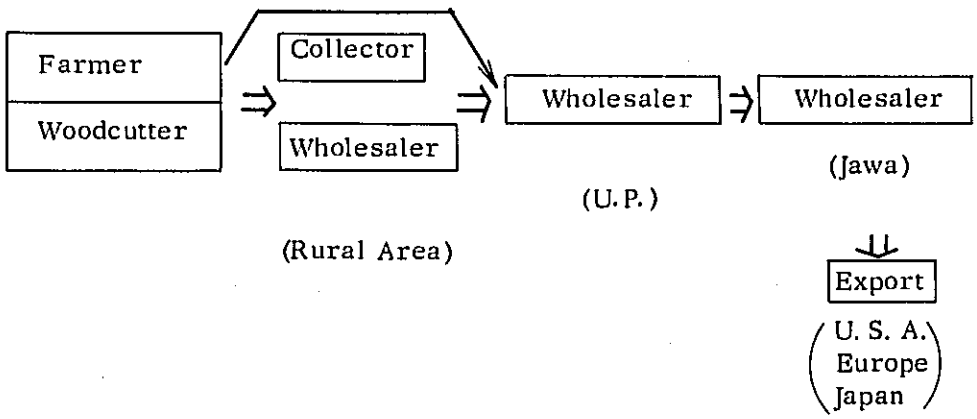
It is estimated that more than 300 wholesalers and over 3, 000 retailers are operating at present in Ujung Pandang, but these is much that is unknown about them. The following points will be discussed in this section, based on information obtained from interviews will distributors in Ujung Pandang: 1) distribution routes; 2) seasonal fluctuations in sales volume; 3) terms transaction; 4) discount sale and purchase; 5) warehouse ownership and lease; 6) methods of transporting goods.

1) Distribution routes

Products handled by Ujung Pandang distributors can be divided into three categories: 1) local products for export; 2) domestic products for local consumption; and 3) imports for local consumption. Local products for export mainly consist of agricultural and forest products from Sulawesi destined for the United States, Europe and Japan. Almost all of these are handled by wholesalers. Domestic goods for local consumption are marine, agricultural and forestry Products mainly from Sulawesi and industrial products from Ujung Pandang and Jawa. Their market centers around Ujung Pandang but covers almost all of Indonesia. Imported goods for local consumption consist mainly of industrial prodicts and the bulk of these come from Asian nations, particularly Japan.

(1) Distribution route of local export products

Except for occasional direct purchase from farmers and woodcutters by Ujung Pandang wholesalers, agricultural goods such as nutmeg, mace, coffee and copra, and forest goods like ebony, all produced in Sulawesi, are collected by wholesalers and agents in the areas where the goods are produced (see the chart below). The goods are then taken to wholesalers in Ujung Pandang and then to wholesalers in Jawa who export them to the United States, Europe and Japan.



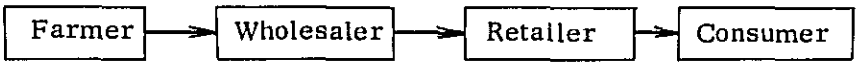
(2) Distribution route of domestic products for local consumption

i) Local distribution in Sulawesi

There are two main distribution channels. One is for agricultural, forest and marine products going from the farming and fishing villages in Sulawesi to urban areas like Ujung Pandang. These products include vegetable fish, shrimp and lumber for home furniture. The distribution route is shown in the chart below.

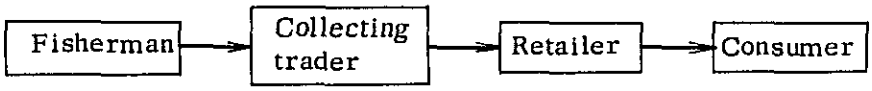
The other channel is for industrial products manufactured in Ujung pandang and other urban centers of South Sulawesi and then shipped to other parts of the island and to the rest of Eastern Indonesia.

(Vegetable, fruit)



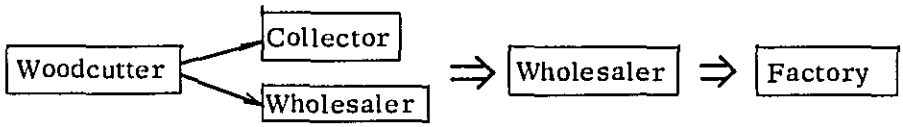
(Rural Area) (Urban Area)

(Fish, shrimp)



(Urban Area)

(Wood)

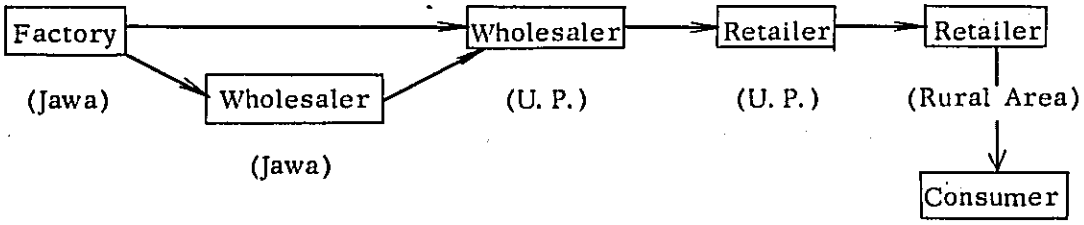


(Rural Area) (U. P.) (U. P.)

These industrial goods (textiles, galvanized iron sheets, cement, etc.) from the factories in the Ujung Pandang area may go from wholesalers in the city directly to rural retailers, or may be distributed via retailers in Ujung Pandang.

ii) Interinsular trade with Jawa

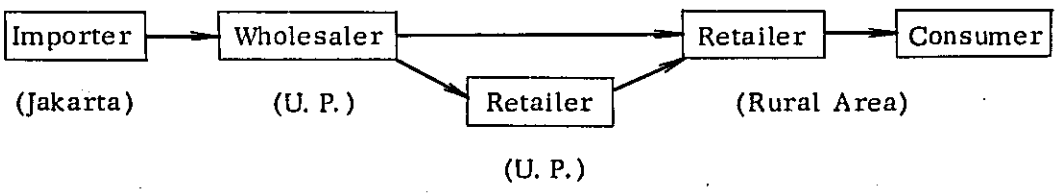
Since the range of industrial products produced in Sulawesi is limited, Ujung Pandang dealers import an assortment of industrial goods from Jawa and Surabaya. Among them are sugar, milk, beer, textiles, building materials (paint, window glass, eternit pipes), bicycle parts, tires and sundry goods. These products are distributed through the channels indicated below.



(3) Distribution routes for locally consumed imports

Ujung Pandang dealers handle many imported products that come to the island by way of Jakarta. Most are manufactured items not produced in Indonesia, such as farm machines, diesel engines, pumps, automobile and motorcycle parts, electrical goods, textiles and sundry goods. Most are from Japan, followed by Hong Kong, China and Taiwan. Some are imported from Europe and the United States. Most of the imports from Japan are machines, and the main products from Hong Kong, China and Taiwan are bicycle parts and stationery.

The distributing channel for these goods is similar to that of industrial goods produced in Jawa. As the following chart shows, imported goods are distributed from importers (wholesalers) in Jakarta to East Indonesia through wholesalers and retailers in Ujung Pandang.



2) Seasonal fluctuations in sales volume

Nearly seventy percent of wholesalers and retailers surveyed say that they have seasonal changes in volume of goods handled. Of this group more then half report that sales rapidly increase around Ramadan from August to November, and then greatly drops off between December and March. This is the case for consumer goods like food, textiles and furniture. On the other hand, dealers handling galvanized iron sheets and cement inform that sales increase in the period from April to July and then fall off between December and March.

In reply to the question of what the difference was between a high volume month and the monthly average, about half of the wholesalers said 150 to 200 percent and two-fifths indicated it was less than 150 percent. Three-fifths of the retailers said that the increase was greater than 200 percent. This shows that seasonal fluctuations in sales volume are greater for retailers than wholesalers, for they are more directly affected by the consumer's purchasing behavior.

Types of goods not easily affected by seasonal changes are not many, but include, for wholesalers, marine products, foodstuff and vehicles, and in the case of retailers, sundry goods and machines, which includes vehicles.

3) Terms of transactions

Transactions between distributor and customer are made one either or credit basis. About half of the dealers said their business was done only in cash, and only a fifth said they sold goods totally on credit. The rest, little more than a fourth, have both credit and cash transactions, although they grant credit only when the transaction is large enough. Classed separately almost sixty percent of the retailer deal only in cash while the wholesalers put more weight on credit transaction (one-third deal only on credit, and another fourth use both cash and credit).

A one-to-two-month repayment period is the most prevalent among both wholesalers and retailers. This is true for almost sixty percent of the retailers and slightly more than forty percent of the wholesalers. Next most popular is a two-to-six-month term used by about one-third of the retailers and about one-fourth of the wholesalers. Slightly less than one-fifth of the wholesalers allow

more than six months for credit repayment, particularly those who extend credit for automobiles, motorbikes and foodstuff. But, such long-term credit is rare for retailers with exception of auto dealers whose merchandise is rather expensive.

4) Discount sale and purchase

A little less than one-third of the wholesalers and slightly more than one-fourth of the retailers purchase goods at discount from factories or wholesalers. Most of the dealers purchase at list price. In any case, the rate of discount is low. Nearly half of the discount purchasers buy goods at less than 2 to 3 percent off, and only less than a fifth receive more than three percent (The highest discount rate is 5 percent). The products purchased on discount are mostly transportation vehicles such as automobiles and motor cycles by the wholesalers and agricultural and forestry products, textiles and transportation vehicles by the retailer.

Discount sales, on the other hand, are practiced by less than ten percent of the wholesalers and about one-third of the retailers. Considering that slightly less than one-third of the wholesalers and a little more than one-fourth of the retailers purchase at discount, it is evident that there are a great many wholesalers who purchase products at discount and sell at list price and give a discount. In most cases the rate of discount is within two to five percent, but of those retailers who sell stationery, some given ten percent off. As far as products are concerned, discount sales are often seen for agricultural and forestry goods, textiles, transportation vehicles and sundry goods, items most often purchased at discount.

5) Warehouse ownership and lease

Almost seventy percent of wholesalers have their own warehouses. Another ten percent rent, so that twenty percent have no warehousing facilities. Only a little more than ten percent of the retailers own warehouses and most handle products requiring a great amount of space, such as agricultural, forestry and food products. The ninety percent who neither own or rent warehouses, keep the goods in their shops. Small volume makes this possible, and it is more to their

advantage to have the goods on display. The wholesalers handle a much greater volume and there is no need for displays, meaning that they either have to rent or buy a warehouse. Of the wholesalers who neither own nor rent warehouses, some lumber dealers store their goods on the beach.

6) Methods of transporting goods

In reply to the question of how goods were transported, about one-third of the wholesalers said that they made they deliveries, another third said that their customer handled the transport of goods while another third said that it depended upon the situation. A great number of those who replied that they would handle the transport were dealers in farm, forestry or marine products and this delivery service is probably made because of the large volume of each transaction. Those who answered that it would depend on the situation said that if the purchase were large they would take care of delivery. Whereas the two-thirds of the wholesalers, said they would handle deliveries either always or at times, almost 90 percent of the retailers said that their customers would carry the goods.

One reason for this discrepacy between the two is that the there is quite a difference in the volume of one purchase between wholesaler and retailer and another is that most of the retailers do not have means of transportation. Compared to the more than 60 percent of wholesalers who had some sort of transportation vehicles, such as truck or station wagon, only slightly more than twenty percent of the retailers had such means. Of these most of the wholesalers were equipped with trucks while the majority of the vehicle-owning retailers had station wagons, motorcycles, tractors, or beca. This is an important reason for the difference in their transport capability.

4. Infrastructure

The following is a brief description of the infrastructure (roads, ports, airfields, electrical power, water supply, communications, housing, etc.) in Ujung Pandang and its vicinity. This will be a discussion of specific needs for infrastructure that will arise in connection with the construction of an industrial estate in the area.

1) Transportation-related infrastructure

(1) Roads

The chief market for products manufactured at the Ujung Pandang industrial estate will probably be in East Indonesia. But the market in South Sulawesi will command relatively high weight since more than one-third of the East Indonesia population resides there. The characteristics of that market will dictate the type and scope of the industrial estate under consideration. Here, we will take a look at the conditions of roads in South Sulawesi and those in Ujung Pandang, separately.

There are a total of 2,163 km of arteries in South Sulawesi, 538 km of national and 1,530 km of provincial roads. This road network is shown in Fig. II-1. The only national road is the one going from Ujung Pandang northward to Central Sulawesi and the portion from Ujung Pandang to Pare-Pare is probably the most well-maintained road in Sulawesi. The entire road is asphalt paved and an average speed of 50 kmph can be maintained. The volume of traffic on the road is high with about 500 vehicles using it on an average day.

There is a great deal of flat land in South Sulawesi, making the road conditions in the area relatively better than those of other provinces on this island. However, taking into consideration the levels of road density and quality, they are not yet up to a standard that will support and facilitate the development of industry in the area. One of the major problems with roads here is that design standards are at a very low level. By the five-level road classification as used in Indonesia we find that even the national road mentioned above would rate a III or IV, with its design load at five tons. When an attempt is made to

Fig. II-1 Highway Network in South Sulawesi Province

construct or improve as many roads as possible with limited funds, it is unavoidable that very inferior standards be applied. However, with inferior standards for road bed and surface, and inadequate drainage facilities the life of any road will be shortened. An extension of roads which are readily subject to damage will mean increased costs for maintenance and repair, which in the long run is highly uneconomical. Considering that there will be future increase in the demand for transport of goods and that the vehicles used will grow larger in size, it will be necessary to have a qualitative improvement in road structure.

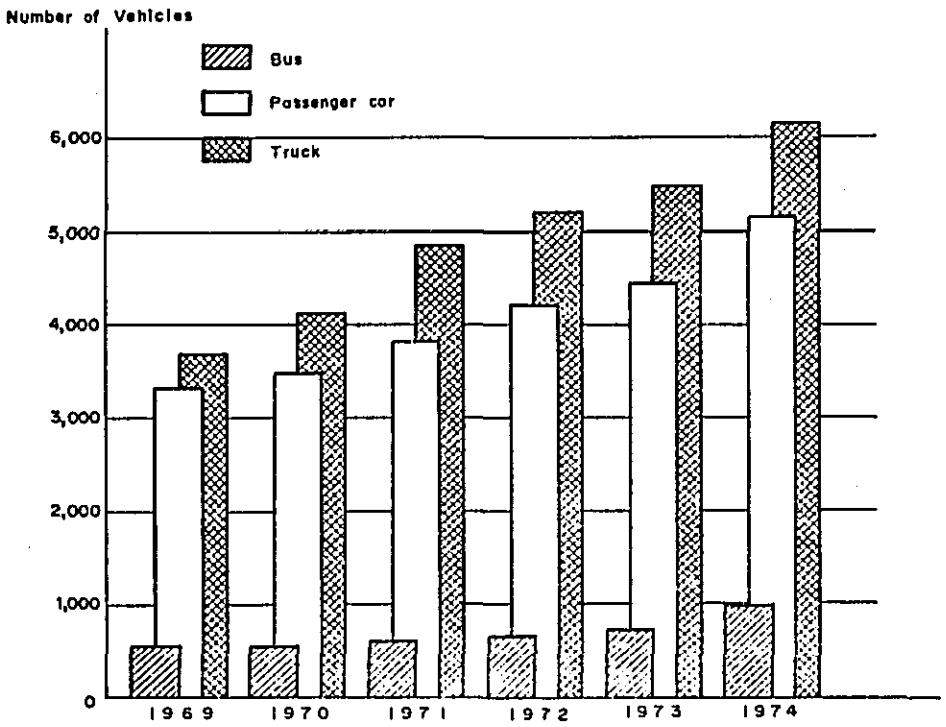
The second problem involves extremely poor bridge conditions. There are 322 bridges on the national highway and about 40 - 50 % of them are dilapidated. Almost all of these are constructed from wood or are steel-plate Bailey bridges on which temporary expedients are being made but their load capacity is very low, making measures for rebuilding of these bridges an urgent necessity. In addition, almost all of the permanent steel bridges were built during the 1930s and due to poor maintenance they are rusting, many of them needing to be completely replaced. In the 155 km between Ujung Pandang and Pare-Pare, there is a 120 km stretch on which all bridges have a load limit of 5 tons and another 35 km where the load limit is 3. 5 tons. The government is working with Canada on an economic cooperation project, to have bridges in the entire route able to carry a load of five tons by 1979.

Road Length in South Sulawesi Province (1972)

	Total Length	Paved	not paved	good	ordinary	bad	extremely bad
National Highway	583	248	335	85	326	97	75
Provincial Highway	1580	479	1101	445	337	325	443
Local Road	26000	200	2322	200	800	1522	-
Village Road	35000	-	-	-	-	-	-

(Source) Prepared by the Mission (Pre-feasibility Study)

Projects for road improvement can have a very important effect for development in the long run, but since there is such a low volume of traffic at the present time, it is often difficult to justify the economic feasibility of these projects for the short run. The average daily traffic on the national highway near Ujung Pandang is at present about 300 - 500 vehicles and in other sections about 100 - 200. On other roads the traffic is much lower, between 30 and 50 vehicles per day. The number of four-wheeled vehicles in South Sulawesi was 12,502 in 1974, with 75 percent of these registered in Ujung Pandang. In a breakdown of vehicles according to type, 42 percent were passenger cars, 50 percent turcks and 8 percent buses. Many of the passenger cars are vans, jeeps and pick-up trucks, while all of the trucks are small, rated at less than 5 tons. Changes in automobile ownership are shown in graph below.



(note) Prepared on the basis of South Sulawesi Provincial Government Statistics

Fig. II-2 Change in Automobile Ownership in South Sulawesi Province

The total length of roads in Ujung Pandang is 359 km, of which 285 km is asphalt paved. Ground area occupied by roads is 2,223 ha, or 14 % of the entire city area. The majority of this is in built-up areas, which would bring the

percentage up if just those areas are considered. There are two intercity highways leading out of Ujung Pandang, one going north to Kabupaten Maros, the Gowa Jaya, and the other going south to Kabupaten Gowa, the Gowa Raya. The built-up area of the city has three arterial thoroughfares running in parallel to the sea-coast, with a network of cross-streets composing a grid. The asphalt surface is not adequately mainteined and there are many portions with large amounts of cracks and potholes. With the lack of proper drainage facilities there are a number of portions which wash out during periods of heavy rain. At the present time there are relatively few cars and trucks so traffic jams are seldom seen but in downtown areas automobiles are forced to slow down during the rush hour by congestion caused by Beca.

Length of Roads in Ujung Pandang City

No.	Class	Road Condition (m)				Design Load
		Asphalted	Solid Road	Unsolid Road	Total	(ton)
1.	I	117,739	16,592	-	134,311	7 - 12
2.	II	23,943	2,000	-	25,943	5
3.	III	40,081	2,980	-	42,989	4
4.	IV	103,974	2,000	50,000	155,975	2.5 - 3
	Total	285,739	23,480	50,000	359,219	-

(Source) Prepared by the Mission (Pre-feasibility Study)

In order to find out the distinctive traffic tendencies on the two intercity highways leading out of Ujung Pandang, a road-side origin & destination survey was taken in simple interview form. This survey was part of the field survey undertaken by the JICA mission, and its results are included in the appendix volume but its chief findings are as follows:

i) At both points the traffic in three- and four-wheeled vehicles was less than 200 going one-way in one hour, which does not even reach 1/4 of the roads capacity of 800 vehicles.

ii) The observation point on the Gowa Jaya Road faces one of the sites planned for an industrial estate, but there was little hourly fluctuation in

traffic here. No peak periods for traffic were distinctly registered. During the peak period on the Gowa Raya Road from 7:00 - 8:00 AM traffic consisted mainly of motorbikes and motorcycles. During this hour a great number of bicycles were in the traffic going to the city.

iii) At both points the number of transport vehicles (trucks, small trucks) in the traffic was very low at about 20 percent. Most of the trucks were small, of about 1.5 - 2.0 tons capacity, their cargo consisting mainly of rice, cement, aggregate (gravel, sand) and sometimes livestock and rattan for those on the Gowa Jaya while those on the Gowa Raya were carrying mostly sand, bricks and rice.

iv) The transport of daily necessities and fresh food from adjacent areas is chiefly by bicycle.

v) Trip length is very short. Eighty to ninety percent of the trips originating or terminating in Ujung Pandang are to or form adjacent Kubup Maros in the north Gowa and Takalar in the south. The rare long-distance trip may be to or from Pare-Pare or Traja in the north or Bone and Bulukumba in the south.

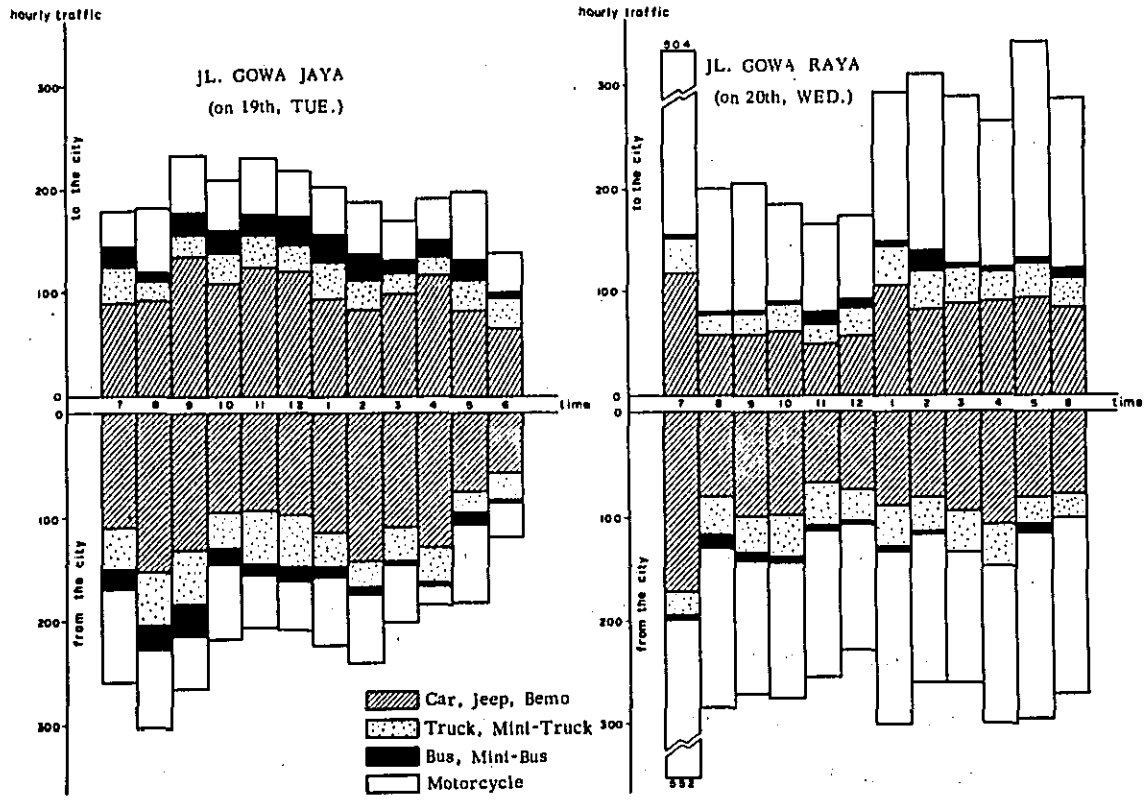


Fig. II-3 Hourly Traffic Volume of the Two Intercity-Highways (Oct. 1976)
(Source) Prepared by the Mission

Long-distance bus-service between the cities of South Sulawesi province is relatively well developed. There are 37 bus companies in Ujung Pandang, operating a total of approximately 500 buses. The fare is Rps. 4 per person/km. The backs of these buses and their rooftops are piled high with passenger baggage. In this region it seems more common for the sender to haul his goods by bus or any other method than to have them sent by an agent. This practice is perhaps related to the low cost of hourly labor per person and the underdeveloped state of the land transportation industry, but the greatest reason is apparently that the lot size of freight to be transported is usually so small that there are just too few instances where a truck would be necessary.

There are at present, 500 land transport companies in Ujung Pandang and since the total number of trucks owned by these companies is 2,015, this means an average of about 4 trucks per company. About half of these trucks are of two-ton capacity, and almost all of the rest are small with a capacity of less than one ton. Also it is not possible to use larger trucks of 3.5 tons or 5 tons to their full capacity because the roads are only able to handle those with 2-ton capacity. The legal limit on transport fees is Rps. 40 per ton/km, but the current rate is from Rps. 26 to Rps. 30. With the development of the industrial estate in the near future, this will mean an increase in the constant demand for overland transport and in order to deal with the situation, the inordinate number of small transport companies will have to form some type of affiliation and modernize their operations.

Table II-5 Number of Trucks Registered in U. P.

Capacity of trucks	Transport Companies	Other
7 ton	-	-
5	7	5
3.5	39	200
2	1,053	721
1	71	1,059
0.75	845	703
Total	2,015	2,688

(Source) LLAJ in Ujung Pandang

The development of industrial estates in Ujung Pandang will create a massive demand for freight movements, with raw materials to be transported in, and manufactured goods to be shipped out. It will also mean a concentration of commuter traffic at certain period during the day. As mentioned, present traffic levels on the Gowa Jaya are quite low, with about 600 vehicles per hour in one direction. This extra capacity is far from adequate, however, when we consider the impact that the construction of industrial estates will have on traffic. Below, we outline the problems and suggest possible solutions regarding the road and traffic conditions that will result.

i) There is a great deal of traffic congestion in the area near Hasanuddin University where the Gowa Jaya road enters the city and it will probably be in this area where traffic will be heaviest as the number of vehicles increase. One of the reasons for this is that the road is the only access route to the city from the north, hence, breaking the bottleneck will required the construction of several new access roads. As the map below shows if a road were built to the Gowa Raya where it crosses the Tallo River it would not only serve as a bypass around Ujung Pandang but would also function to distribute more evenly.

ii) Plans are now underway to move Hasanuddin University from its present location and when completed about 7,000 university people will be crossing the Tallo River on their way to work and school. Add to this those going to work in the industrial estate (15,000 - 20,000 people) and the volume of freight, raw materials and finished products travelling the road. A situation will occur in which the two-lane bridge over the Tallo will be inadequate to accommodate the traffic. A new bridge will have to be built.

iii) For the same reasons, the time will come when the Gowa Jaya Road to the north of the Tallo River bridge will have to be reconstructed and evidenced. The Ujung Pandang city authorities would like to see this road improved to Class I standards (100 m wide) in the future but unless the time is nationally chosen for the execution of the plan it may very well result in an over-investment. When this road is improved, there will absolutely have to be built a separate, slow-speed lane to accommodate bicycle, beca and horse-cart traffic.

iv) A large amount of freight will be moving between the port and the industrial estate when the latter is completed toward the end of the 1980s. It will be highly desirable, both for the smooth flow of traffic and for safety reasons, to have roads built so that trucks can carry these goods to and from the port without having to go through the city. Fortunately there is also a plan underway to have a bridge built across the mouth of the Tallo River. If this is developed as an industrial road carrying traffic back and forth from industrial estate to port, and the route going by the Tallo power station is reserved for commuters, then it will work quite effectively in furnishing arteries necessary for the industrial estate.

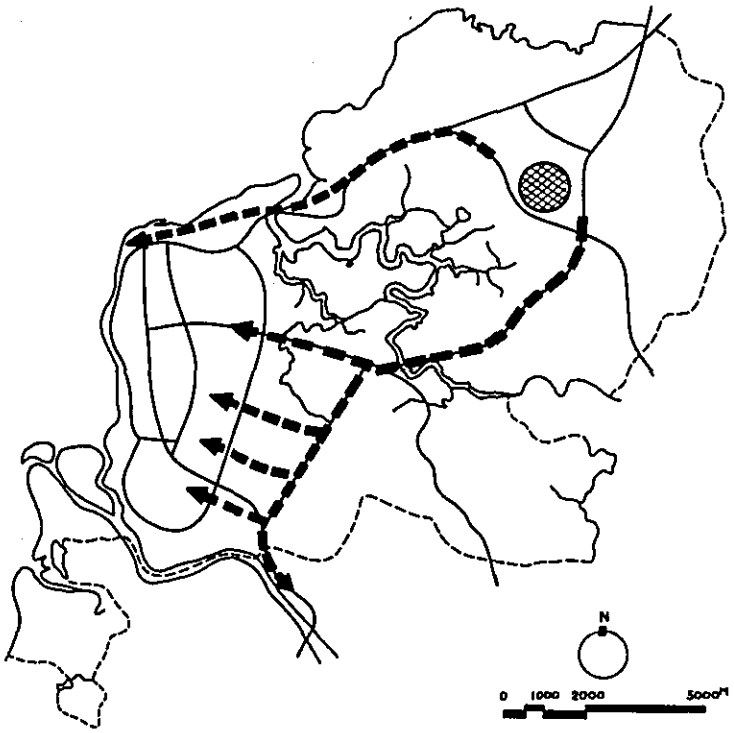


Fig. II-4 Development of Road Network in Ujung Pandang

v) The above proposals, should be implemented in the following order of priority:

1) Construction of distributor and access routes.

2) Reconstruction of the national road north of the Tallo.

3) Improvement of the Tallo River bridge.

4) Construction of the Tallo delta bridge and development of the route via that bridge from industrial estate to port.

(2) Ports

Ujung Pandang, formerly Makassar, port was the sole port for external trade in Sulawesi, until the completion of the port at Bitung. It was a busy, prosperous port, used for exporting copra and palm oil, but as many ports in other regions began to be equipped with modern facilities during the 1960s, the volume of cargo handled at Ujung Pandang has steadily declined, so much so that the port today has surplus capacity vis-a-vis demand. A very favorable point about this port is that when the industrial estate is completed and demand rises, there will be no need for great amounts of investment for new port facilities with the exception of a few cranes for handling cargo.

Ujung Pandang port has a total of 1,770 meters of mooring facilities, the Sukarno pier, 1,360 m in length, the Hatta pier 350 m. and a pier for sail boats, 60 m long. The water depth at the Sukarno pier is from 6.1 to 8.3 meters, and at the Hatta pier it is 7.0 - 8.8 meters, making it possible for ships of 10,000 tons to enter the port. There are 18 warehouses at the front of the port (50,286 sq. meters) and 18 warehouses (18,196 m^2) at the rear of the Sukarno pier. Almost all of them, however, are not being used, the total occupancy rate at the pier warehouses is on the order of 15 - 20 percent. For loading and unloading there are three-ton cranes and 2-ton fork-lifts. The number of registered employees at the port is about 3,000, and 1,000 are on hand at anytime. Twenty-six hundred tons of cargo can be handled in one day, but the actual rate of use is only six percent of that.

The map below shows the port of Ujung Pandang and the table lists the main facilities there. The port handled a total of 1,130,000 tons in 1975, export 82,000 tons, import 352,000 tons, goods going to other domestic destinations, 343,000 tons and those coming in from other parts of the country, 356,000 tons.

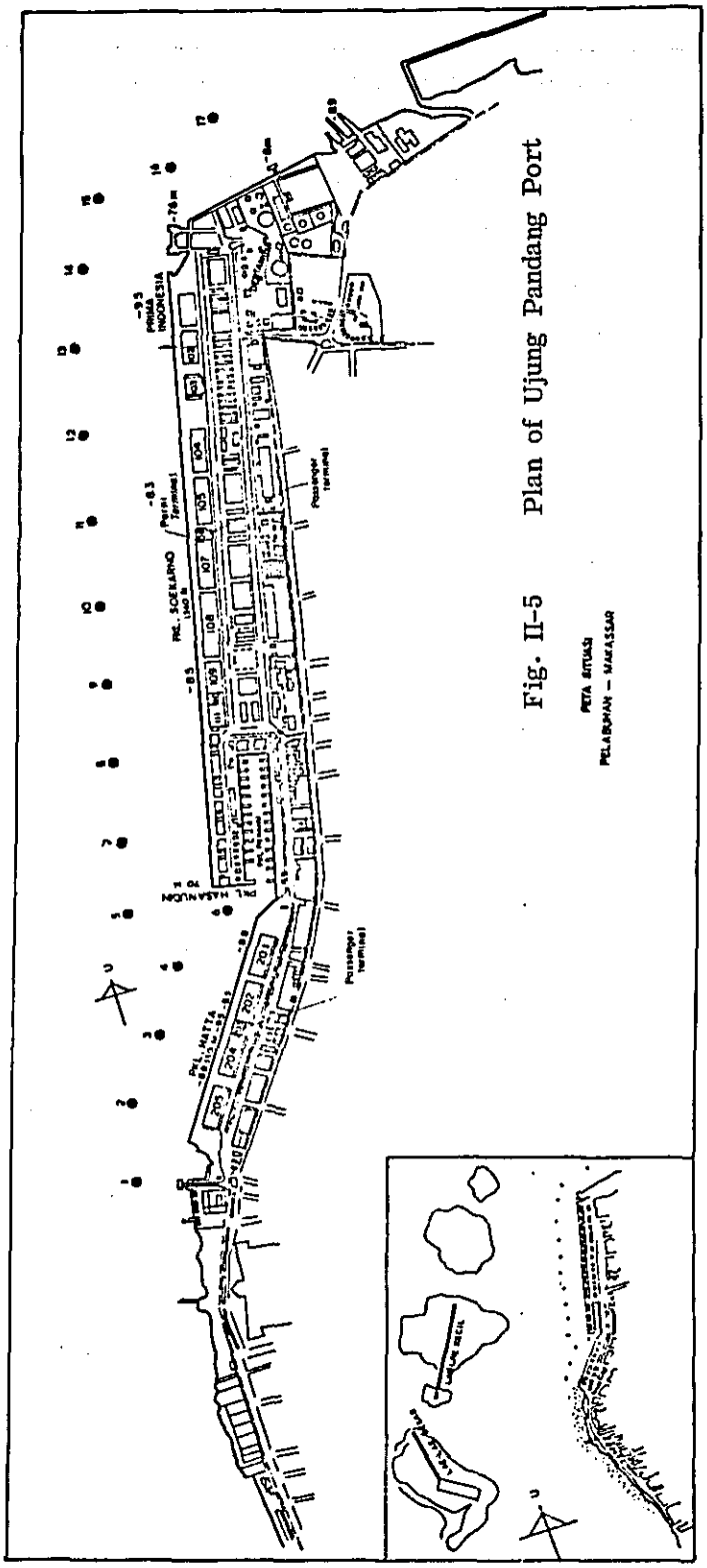


Fig. II-5 Plan of Ujung Pandang Port

Table II-6 Main Facilities of Ujung Pandang Port

Outer facilities	∘ A natural breakwater is formed by coral reefs 5 kilometers off the coast. ∘ There are two breakwaters made of stones piled up on coral reefs. ∘ There are two fairways for entering and leaving the port (northern and southern entrances), but only the northern entrance is used.
Mooring facilities	∘ The port has two piers--Soekarno Pier and Hatta Pier. Soekarno Pier--Caisson pier with an apron width of 12 meters. ∘ Besides Soekarno Pier and Hatta Pier, the port has Hasanuddin wharf, two petroleum wharves (-8.5 meters) and other mooring facilities. ∘ The tide range of Makassar Port is 1.2 meters and 3.1 meters high above the sea surface. ∘ The water depth in front of berth is 7 meters according to sounding as of April 1964.
Cargo handling facilities	∘ The total area of shedhouses of both piers is 56,000 square meters. (The ratio of used space of the shedhouses is now 20 per cent.) ∘ The two piers have no cranes. Usable at present are only two mobile cranes (7 and 5 tons).
Others	∘ Makassar Port is adjoined by a fishing port. ∘ There is no land earmarked for future expansion of port facilities in case of a sharp increase in cargoes handled.

(Source) Port of Makassar, Handbook 1973.

(3) Airports

The only airfield in South Sulawesi is the Hasanuddin Airport on the outskirts of Ujung Pandang. During the second world war several airfields were built by Imperial Japanese forces at Masambo and Rantepao in Tana Toraja, but they have not been used since the end of the war. The runway at Hasanuddin is 1,745 meters long, and 45 meters wide, and can accommodate loads of 30,000 pounds. Planes of the 45-ton class such as the DC-9 and Electra-jet can take off and land here.

As Table II-7 shows, the number of passengers going through Hasanuddin is increasing year by year, with a total of 215,320 departures and arrivals in 1975. About two-thirds of the passengers are either going to or coming from two different points, 38 percent, Jakarta, 26 percent, Surabaya. Airline companies whose planes use the airport are Garuda, Merpati, Mandala and Bourag. Development plans for the airport include accommodation for landing and take-off of DC8 by the end of the 1970s.

Table II-7 Number of Passengers at Hasanuddin Airport

F.Y.	Departure	Arrival	Total
1973	64,389	65,917	130,306
1974	95,416	101,168	196,584
1975	96,169	119,151	215,320

(Source) South Sulawesi Provincial Government

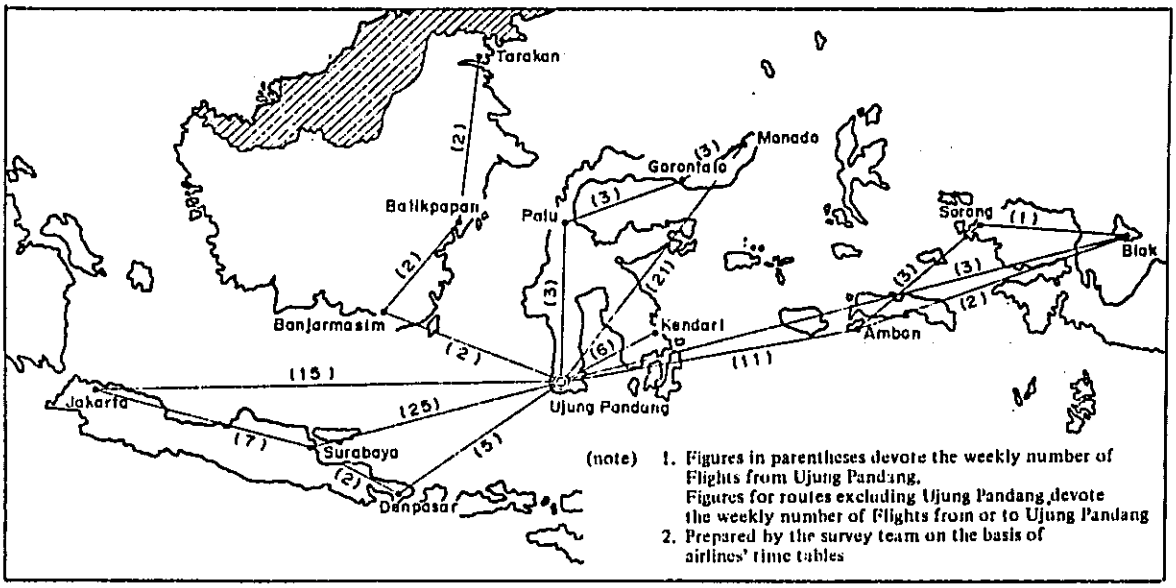


Fig. II-6 Air Routes from and to Ujung Pandang

2) Electric power

In 1974, electric power consumption in Ujung Pandang was 3,130,000 kwh, although supply capacity is 47,670,000 kwh (40,000 KW). That means that power consumption remained less than one percent of full capacity. The reason for such low consumption is that the supply of power by PLN, the public corporation, is very unstable because of thunderbolts and accidents. Because of the frequent power failures every company which requires large quantities of electricity for operations has to maintain its own generating facilities. Construction of the Tallo power station was rather recent and the installation of relay facilities is not yet complete, which is another reason for the lack of efficiency. The rate of distribution of electricity to the area population is about 25 percent. Sectoral consumption of electricity is household, 28 %; commercial, 56 %; industrial, 5.5 % and miscellaneous 5.5 %.

Depending upon how it is used, there is quite a difference in the rates per kilowatt hour, ranging from Rps. 5 to Rps. 460. The basic fee for industrial use is Rps. 320 per kwh, and as usage increases, an additional cost of from Rps. 6 to Rps. 10 per kwh is added on.

As far as long-term projects for electrical supply are concerned, one particularly worth mention is the Sadan River hydroelectric plan. At present surveys are being made for this project as part of economic cooperation with Japan. Several power generators will be built on the Sadan River, and it is projected that by 1982 these will be able to supply about 50,000 KW and by 1984 about 100,000 KW. One hundred and fifty thousand volts of this power will be sent to the Tonasa cement plant in Maros which is estimated to be using 15,000 KW in 1978, 30,000 KW in 1980 and 45,000 KW in 1990. After this has been reduced by transformers to 70,000 volts, it will enter the distribution net of the Tallo Generating Station. If this project is completed, then there will be no problem in supplying electricity to the Ujung Pandang industrial estate.

Table II-8 Power Generating & Supply Facilities in Ujung Pandang (1973)

Power Stations	No. of Generators	Capacity (kW)		Remarks
		Generating	Supply	
Bontoara (Diesel)	7	9,520	6,500	
Tallo (Diesel)	2	5,720	5,000	
Tallo (Thermal Power)	2	25,000	-	Out of order
Total	11	40,240	11,500	

(Source) Prepared by the Mission (Pre-feasibility Study)

3) Water supply

Ujung Pandang is poor in water resources and the most pressing problem in setting up industry in the area is obtaining enough water. Most of the underground water has a high level of salt in it and in order to get pure water, wells have to be sunk to a depth of 500 to 600 meters. If the industrial estate can supply sufficient amounts of water for all its plants, that will be a major incentive for prospective occupants.

There are two water supply systems in Ujung Pandang. The older comes from Sungguminasa in the southeast section of the city brought through a 1 meter-wide, 11 km-long pipe in the center of the city. This pipeline is able to pump 100 ± liters per second and during rainy periods this goes up to 120 - 150 liters per second. The pipeline was completed in 1969 but since it gives 1,000 people 1 liter of water per second, this pipeline can only serve a population of 100,000. In order to solve the problem of getting enough water the city authorities had a canal dug, 30 km long from the Maros River in Lekopacin, an area about 37 km to the northeast. A water treatment facility was built within the city. The treatment facility and canal were finished in 1976, but the pipeline is behind schedule in construction water supply has yet to be inaugurated. When finished the pipeline is expected to bring in 500 liters of water per second. With this facility the present population of 570,000 will be able to have a complete water service Plans are to have this new system bring in an increased volume of 1,000

liters per second by 1978 and eventually it will handle 1,500 liters per second (approximate 130,000 tons per day). Since there is a great deal of difficulty in obtaining underground water, the Ujung Pandang industrial estate will probably have to rely on water from the Maros River for its supply too.

Table II-9 The Charge for Water Service

(March, 1976)

I.	Industrial Water	1. Factory	Rp 225/m^3
		2. Small Scale Industry	Rp 150/m^3
II.	Tank Truck		Rp 125/m^3
III.	Government Use	1. Less than 5 m^3	Rp 30
		2. More than 5 m^3 (per one m^3)	Rp 10
IV.	Facilities for Public Use (hospital, mosque, stadium etc.)		Rp 60 ~ 130/month

4) Communications

Telegraph and telex communications are handled by the Ujung Pandang Telegraph and Telex Office which is under the control of the Ministry of Communication Telex Service was begun in Ujung Pandang in 1968 and there are at present about 60 subscribers. Because the number of applicants has increased recently, the office is now planning to have 1,000 units in service by 1980. Ujung Pandang is the only station available on Sulawesi, but an office is scheduled to be opened at Manado in 1978. Subscription fee at the beginning is Rps. 150,000 and the basic fee per month is Rps. 36,000.

The number of telephones in Ujung Pandang during 1973 was 5,511, meaning one telephone for every 16 households. In addition to the minimum of Rps. 45,000 for telephone subscription, there is a Rps. 16,000 fee for installation for each kilometer distance that the phone is from the telephone office. The charge for each telephone call is Rps. 15 and the basic charge per month is Rps. 600. The cost for a call from a public telephone is Rps. 25. The average waiting time for long-distance call between Ujung Pandang and Surabaya is from 30 minutes to 2 hours. With the orbiting of a communications satellite in 1976, it is now possible to make international telephone calls from Ujung Pandang.

Demand for telephones will, of course, increase with the development of the industrial estate. If each of the approximate 150 companies joining the estate have 2 to 4 telephones, about 450 new phones will be necessary. Also this will mean that the population of the city will increase during the 1980s to about 850,000 and with increases in income this should bring the number of telephones to about 20,000.

Table II-10 The Number of Telephones in U.P.

Year	Government	Army	Private	Total
1969	846	645	3279	4770
1970	843	644	3409	4896
1971	864	652	3457	4973
1972	881	579	3769	5229
1973	904	579	4028	5511

(Source) Prepared by the Mission (Pre-feasibility Study)

5) Housing and schools

Population increase has levelled off in the past few years making the housing situation not as serious as it once was. In general, however, the housing condition is still inadequate. It is predicted that the population of Ujung Pandang will reach the 600,000 mark in the early part of the 1980s, and if the average-sized household has a membership of five, then 120,000 homes will be necessary. The existing number is 90,000, or 30,000 short of the goal. For the development of a housing complex, the city government established a development company, P.T. Timurama, in 1974 and they are moving forward with plans for a housing project on a 300 - 400 ha. area in the Panakukan district. The planned population density is 50 - 100 people per hectare, giving this project a total accommodation capacity of 30,000 people. At present about 40 hectares have been developed. The projected population for Ujung Pandang in the 1990s is on the order of 870,000 and with the increase in incomes and the decrease in family size to about 4.5 people per family, another 200,000 housing units will be needed. Only about 60,000 of the houses now in existence will still be useable then, meaning that in

the next 14 years an average of 10,000 homes per year, for a total of 140,000, will have to be built. In order to push urban development forward, through the establishment of the industrial estate, the local construction industry will have to be strongthened. It would also be advisable that construction materials manufacturers, be brought into the industrial estate so that they could supply sufficient materials to meet the increasing demand.

In terms of balanced development, it is important that not only residential houses be built but that there are an adequate improvement of public facilities such as schools, hospitals, public halls, parks, and waste disposal and sanitation facilities. The planning standard for Ujung Pandang is to have one junior high school for every 400 households, and one elementary school for every 200, so that simply calculated on a population increase of 30,000 there will have to be 160 new junior high schools and 320 new elementary schools. With present school construction costs of about Rps. 9,000,000 per unit, for junior highs and Rps. 7,000,000 for elementary schools, this means an investment in public works of approximately Rps. 3,700,000,000. Of course, by this time school districts will be amalgamated and a greater number of students per school enrolled, so that the number of schools needed will be less than the above estimates, but still with the increase in the city's population an enormous amount of social overhead capital will be required.

In the housing project being developed by Timurama, the initial sales price was Rps. 4,000 per square meter, but this has now gone beyond Rps. 6,000. Since the size of one lot is 150 - 200 square meter, the construction cost per house is Rps. 40,000 per square meter. If a house 100 m^2 is built on a 200 m^2 lock, it will cost Rps. 5,200,000 ($12,500). Considering the present income levels in the city this means that only persons with the highest incomes could afford such housing. A policy will have to be adapted for lower-cost housing on the order of Rps. 1,500,000 - Rps. 2,000,000.

5. Case Studies on Local Enterprises

In order to investigate the activities of companies operating in the environment described above, an interview survey was made at four companies, two in food processing, one in wood product manufacturing and another in vehicle knock-down industry. Questions in the survey pertained to 1) number of employees, 2) wage levels, 3) working hours, 4) products, 5) production volume, 6) resource procurement, 7) market, 8) seasonal fluctuations in sales volume, 9) terms of transactions, and 10) credit periods.

1) Company A (Food processing)

This company has a rather large factory in Ujung Pandang producing bread and pastry.

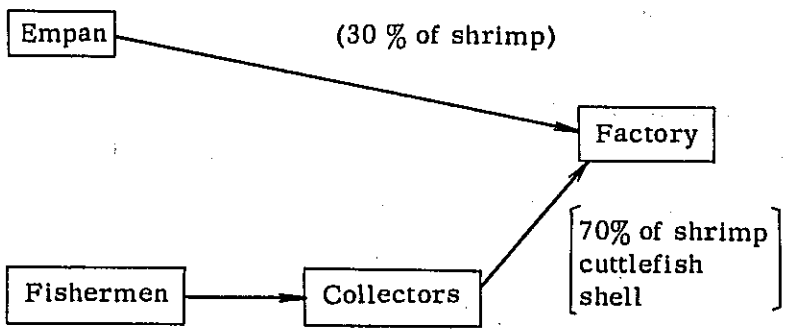
The company has about one hundred employees, but only one-fifth of them are permanent workers. The majority are almost totally women employed on a day-labor basis; their work is so easy that a beginning can learn it in a day. Wages are low. The average monthly wage for permanent workers is Rps. 30,000 and the daily rate for a day-laborer is Rps. 150. Work is seven hours a day from Monday through Thursday (8:00 AM - 12:00 N, 1:00 AM - 4:00 PM), six hours on Friday (8:00 AM - 11:00 AM, 1:00 PM - 4:00 PM) and five hours on Saturday (8:00 AM - 1:00 PM), a total of 39 hours.

It is difficult to calculate production volume, since the products are bread, cakes and pastries, but the volume of raw material used averages thirty bags (one bag = 22 kg) of wheat flour per day. Fifty percent of the market is within Ujung Pandang, while the rest is sold in other parts of South Sulawesi, Maluku, and elsewhere as far as Kalimantan and Irian Jaya. Seasonal upswings in sales are in August before the Ramadan, and in December prior to Christmas and New-Year holidays. Sales double in these periods compared to what they are normally. The company wholesales directly to retail outlets, and since the freshness of bread is mandatory, company salesmen deliver to retail stores in Ujung Pandang. Sales are either on a cash or credit basis. If the retail outlet pays cash, it receives a two-percent discount, while if it pays by credit, the balance must be paid off from two weeks to a month after purchase.

2) Company B (Sea food)

This is one of the most prominent companies in Ujung Pandang, engaged in the freezing and packing of fish and other sea food, exporting all of its products to Japan. At present, there are 130 employees, 110 of them permanently employed, including six management personnel. Twenty workers are employed on a day-labor basis. Wages for unskilled labor average Rps. 15,000 a month, semi-skilled labor Rps. 25,000, and skilled labor Rps. 40,000. The average per month for managerial employees is Rps. 100,000. Work done by day-laborers is quite simple, usually the removal of the hard skins from lobster, shrimp or squid and putting them in boxes. Payment is on a piece-work basis, the employee receiving Rps. 10 - 15 for each kilogram packed. The total wage received depends on the amount of shrimp and squid brought in for processing, but on high-volume days it goes as high as 1 ton. Wages for each person are divided equally from the total, meaning that on a high-volume day, each worker will receive between Rps. 500 and Rps. 600. Working hours in the plant are different from those in the office. In the plant work goes on twenty-four hours a day, conducted in three shifts, while in the office the work day is seven hours from 7:00 AM to 2:00 PM, with the exception of Friday when work is conducted for five hours from 7:00 AM to 12:00 N, and Saturday for six hours from 7:00 AM to 1:00 PM, a total of 39 hours a week.

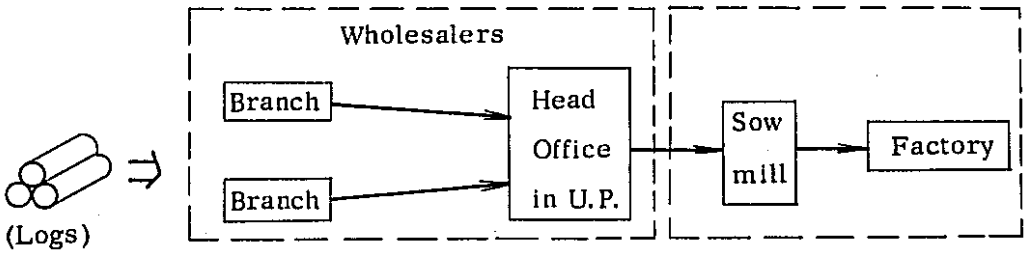
In production volume, that for shrimps, prawns and lobsters is largest at 200 tons per year. This is followed squid, with five tons processed during the five months since handling of this product began in June 1976. Since shellfish production started in October, 1976, the total volume of this item has reached seven tons per month. All live squid and shellfish are purchased from the collectors who buy them from fishermen. Thirty percent of the shrimp is raised at the 3,000 ha. breeding pond (called Empan) owned by the company.



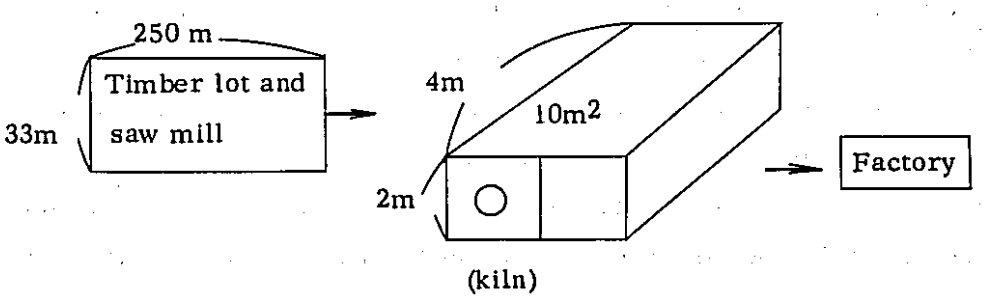
3) Company C (Wood furniture)

This company builds wood products such as cupboards, beds, tables and chairs. There are about forty employees including one manager at the plant, twenty four of them carpenters, eight painters and six metal workers. Working hours are 42 per week, Monday to Saturday, seven hours a day (7:00 - 11:00 AM, 1:00 - 4:00 PM). Unskilled laborers with no experience receive Rps. 500 a day, semi-skilled workers who have acquired some experience on their jobs receive Rps. 750 - 1,000, and skilled workers capable of training and supervising the unskilled get Rps. 1,500 a day.

Production volume differs from month to month, but on the average 15 cupboards, 10 to 15 beds, 20 tables and 50 chairs are manufactured a month. Productivity is difficult to determine, but it takes three carpenters 10 days to produce seven tables on the average. Production is planned by projection and by order, but most is according to order. Many orders come from government offices in South and North Sulawesi as well as in Ujung Pandang. High quality jatty hard wood is obtained from Southeast Sulawesi and a slightly lower quality lumber is procured in Kalimantan. Logs are brought whole from the area where they are cut. Purchases are made from Ujung Pandang wholesalers who have offices in the forest regions. (See Fig. below.)



Logs are taken to the company saw mill where they are cut to proper size and dried in a kiln. The lumber then goes to the furniture factory.



Those products not ordered are placed on display in a sales room. Some salesmen go as far is Irian Jaya. Tables sell for about Rps. 54, 000, single beds for Rps. 18, 000, semi-double beds for Rps. 25, 000, and double beds for Rps. 40, 000. High quality articles with built-in shelves sell for around Rps. 150, 000. Sales are either by credit or cash, and credit payment must be made within three to four months.

4) Company D (Automobile fabricator)

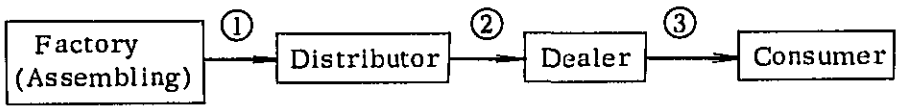
The company gets parts from West European company X, from East European company Y and from company Z, a Japanese-American joint venture. These are then assembled into automobiles. Production capacity at present is eight to ten cars if they are on a semi-knock-down basis and two to three cars per day if the components are complete knock-down. However, as the table below shows, yearly production is far below capacity, with marked ups and downs each year. This is particularly true of the years from 1973 to 1975. During 1974, the company received an order for large-volume commission production from an automaker in Jakarta, but there were no orders from this source in the following year when the Jakarta company got its own knock-down production plant in that city.

	1970	71	72	73	74	75
Commercial Car	106	132	82	276	2205	338
General Purpose Car	37	206	420	-	-	-
Total	143	338	502	276	2205	338

There are approximately 90 employees, 70 permanent workers, including three management people, and 20 working on a day-labor basis. About 20 of the permanent employees are office personnel, the other 50 are directly involved in fabrication work. The number of day-laborers changes according to projected monthly production rates; the highest number employed was 70 during 1974. This company puts great emphasis on employee training, sending production works to a plant in Surabaya, and production supervisors to Singapore. Wages are among the highest of any industry in Ujung Pandang, laborers receiving Rps. 20, 000, office personnel Rps. 50, 000 and management people Rps. 600. Pay

rates are raised at the end of each year in accordance with the raises received by government employees. The increase was 10 percent at the end of 1975 and was predicted to be 10 to 15 percent at the end of 1976.

The company has two plants, one in Jakarta, the other in Ujung Pandang. The former products for the Western Indonesian market, and products from Ujung Pandang go to the market in the east. Automobiles reach the consumer through the following distribution route.



a) After assembly, cars are sold to the distributor for cash.

b) The distributor then sells to regional dealers who pay cash.
There are four dealers in the eastern part of Indonesia, twelve in the west, and one in Jakarta.

c) The dealer sells to the consumer. Sales are made by either cash or credit. Payment on credit basis may be made over a six-month to one-year period. Interest charges are from 2. 5 to 3 percent per month.

III. ANALYSIS OF INDUSTRIAL DEVELOPMENT IN THE UJUNG PANDANG AREA

III. ANALYSIS OF INDUSTRIAL DEVELOPMENT IN THE UJUNG PANDANG AREA

1. Objectives and Methods

The objectives of this chapter are: (1) to forecast the future outlook for the activities of private firms in the Ujung Pandang area; (2) based on the results of (1), to identify occupants who may enter the Ujung Pandang Industrial Estate; and (3) to estimate the requirements of these occupants for land, electric power, water, and other utilities and facilities, for the preparation of a master plan of the estate.

From these objectives, the features of the industrial analysis of the feasibility study include:

(1) Specification of the study works has been set at a level of an industrial project.

(2) Studies have been carried out on comprehensive aspects necessary to evaluate an industrial project in the Republic of Indonesia.

(3) The characteristics of the regional industrial development in the region have been incorporated wherever possible.

(4) Studies have been carried out with consideration paid to the distinctive features of the candidate sites.

(5) In the process of identification of possible occupants, the Mission has given priority to industries which are to build factories at an early stage and which can afford the payment of the land price.

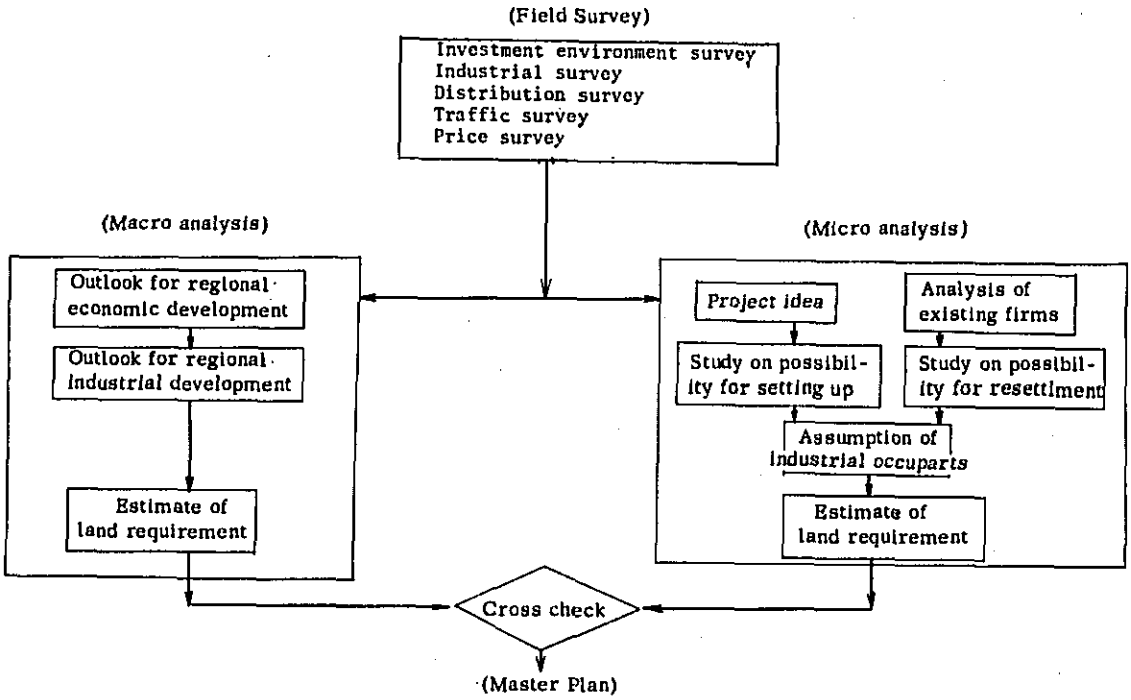
The method of analysis, in short, is comprehensive and practical. The major reason why this method is employed is that sufficient basic statistical data necessary for the analysis is unavailable in the region. The Mission has carried out several field surveys to obtain indispensable data. They covered traffic, distribution, industrial raw materials price, construction materials, manufactured goods and interviews on management and operation of leading firms. Through these surveys, the Mission has succeeded in surmounting several obstacles that might prevent us

from analyzing the future outlook for industrial development in the region.

Another reason is the availability of sophisticated methods, such as the delphi method and the questionnaire survey to forecast the future industrial development of this area. Generally speaking, however, there are no respondents suitable for these methods in the less developed areas and therefore meaningful results cannot be obtained.

The survey flow chart is shown in Fig. III-1.

Fig. III-1 Flow Chart of the Study



(Source) Prepared by the Mission

2. Outlook for the Regional Economy and Features of the Regional Market

1) Trends and outlook of the regional economy

(1) According to the regional economic survey report "Perhitungan Pendapatan Regional Propinsi Sulawesi Selatan 1969 - 1973" for South Sulawesi, the GRP (Gross Regional Products) in 1969 amounted to approximately $212 million (US$1 = Rps. 415). As the estimated population for the same year was approximately 5,198,000, the per capita GRP was only $41. The ratio of the agricultural sector to the GRP was 60.4 % which indicates that the province was featured by a lagging agricultural mono-culture type economy.

(2) It is significant to note that this area registered a high economic growth rate during the period from 1969 to 1973. The GRP during this period attained an annual average growth rate of 25 %. In 1973, the total GRP amounted to $520 million or approximately $95 per capita (estimated by the Mission).

Absolute growth was shown in all sectors but the most conspicuous growth was shown in the construction and commercial sectors. The agricultural sector grew steadily (22 % annually) but regardless of this, the relative position dropped and the ratio commanded of the GRP was 54 % (Table III-1).

Table III-1 Gross Regional Products of South Sulawesi Province

(%)

		1969	1970	1971	1972	1973	1973-1969
I	Agriculture	60.4	60.5	54.2	55.5	54.0	-6.4
II	Mining	1.0	0.9	1.3	1.8	1.5	0.5
III	Industry	6.0	5.5	4.6	6.4	6.4	0.4
IV	Construction	2.2	2.1	3.1	4.2	3.6	1.4
V	Electric power, gas	0.2	0.3	0.2	0.2	0.2	0.1
VI	Transportation, communication	1.9	2.5	1.9	1.9	1.7	-0.2
VII	Commerce	16.9	16.8	21.8	18.3	19.8	2.9
VIII	Banking, insurance	1.4	2.3	2.5	1.3	1.4	0.0
IX	Real estate	4.1	3.6	4.0	4.1	4.2	0.1
X	Government, defense	4.9	5.3	4.9	5.0	4.6	-0.3
XI	JASA, JASA Service	1.0	1.0	1.5	1.2	2.6	1.6
	Total	100.0	100.0	100.0	100.0	100.0	0.0

(Source) Hasannddin University "Perhitungan Pendapatan Regional Propinsi Sulawesi Selatan"

(3) The main reasons for the high growth and diversification of the economy can be considered to be as follows:

a. The economy as a whole became stagnant during the 1960's and from around the middle of the 1960's there was considerable devastation. During the period, utilization of the resources in any economic sector in the region had been insufficient because of many bottlenecks. This phenomenon is likened to a plant in insufficient operation that has a considerable idle capacity and lacks resources in spite of a big designed production capacity.

b. From 1969 to 1971, such an idle capacity was changed to effective one through the rehabilitation and development of the regional economy.

The high growth rate resulting from the normalization mentioned above is featured by the fact that production could be increased with comparatively little investment and that the phenomena which occurred in the Indonesian economy as a whole also occurred in this area in the similar way.

(4) The future outlook for the regional economy is based on the results of the pre-feasibility study carried out by the Mission. That is, the framework of the regional economy represents the target necessary to catch up with the national average through the development of the regional economy.

The general trend and outlook of the economy of South Sulawesi Province is as shown in Table III-2. The GRP of the province is expected to total about $873 million in 1980 or $144 per capita, and to total about $1,820 million in 1990 or $248 per capita.

Table III-2 Macro Framework of the Regional Economy (South Sulawesi Province)

		1969	1970	1971	1972	1973	1980	1990
Population	(1,000)	5,198	5,272	5,347	5,423	5,500	6,060	7,340
GRP	(M$)	212	245	481	346	520	873	1,820
GRP per capita	($)	41	46	90	65	95	144	248
Industrial Sector ratio	(%)	6.0	5.5	4.6	6.4	6.4	9.0	13.0

(Source) Prepared by the Mission.

(5) This development target of a GRP of about $248 per capita by 1990 is not a high figure compared with that of the other developing countries. But regardless of this, this is an extremely large burden for the economy of South Sulawesi Province which is now at the beginning of the take-off stage. Powerful policies, measures and development efforts will be required to realize the target. The primary problem will be how to realize investments. At present, there are no statistical data showing the gross capital formation of the regional economy, but judging from the trend as concerns the Government's development budget and investments in the manufacturing industries, the ratio of gross capital formation to GRP is assumed to be around 8 - 10%.

Assuming that the ratio is 10 % and taking the marginal capital coefficient as the 1.76 used in the framework of the Second Five-year Development Plan, then compared to the $52 million in the gross capital formation of 1973, the amount required in 1980 will be $124 million a year and in 1990 an enormous investment of $428 million will be required. On the other hand, in a situation where the income level is far below that of the national average, there is an extremely small possibility of any savings taking place in the region at least for the time being. Thus, it will be absolutely necessary to get capital resources from outside the region, such as a subsidy from the Central Government and capital from abroad (government and private) and from other regions (funds from banks such as BAPINDO), as well as to invite private enterprises from other regions.

2) The market structure of East Indonesia

(1) As one means for estimating the demand for industrial goods (market size) by area in the Republic of Indonesia there is the statistics of the Inter-island Sea Transport. The Directorat Jenderal Perhubangan Laut of Indonesia carried out a sea transportation survey on the origin and destination of commodities in 31 categories by 47 zones. This survey was conducted as a part of the integrated sea transport plan in 1974. The results of the analysis of the market structure using these data are as shown below. But this study has the following restrictions in approaches: (a) As the data are shown in tons and not in monetary terms it is difficult to have consistency with the economic indices of the region; (b) The data

is a sea transport data and does not include inland or air cargo transport to the consuming area from the producing area, and so it accurately describes only a part of the market; (c) When a certain cargo is transported by cargo fleet from Port A to Port B and then transported by feeder from Port B to Port C, the cargo will be entering the hinterlands. But as far as the above data is concerned this is added to the markets of Port B; (d) The cargo classification is too generalized to be used to analyze the market for industrial goods. Although these deficiencies exist, the data is the only information available to determine the situation of the flow of goods. At the same time, in the areas of East Indonesia where the economy is less developed, the share as an origin of industrial goods is small and so the bias from (b) above is not so significant. The zone is also considerably large and as far as the question of transportation between zones is concerned, the bias from (c) can also be ignored. Thus, the results of this analysis are sufficiently worthy of study. Moreover, the target of this analysis is limited to dry cargo and does not include petroleum and oil products from the objective of the Ujung Pandang Industrial Estate.

(2) In 1974, the dry cargo flowing into each port of East Indonesia during 1974 totaled 917,000 tons. Of this, 40 %, or 370,000 tons, were agricultural products (including 150,000 tons of rice) and 547,000 tons of industrial goods. On the other hand, the total amount of industrial goods transported by sea transportation amounted to 3,978 million tons for the whole of Indonesia, corresponding to 13.7 % of the share of East Indonesia. This corresponds closely to the population ratio of this region which was 13 % of the whole of Indonesia, but when considering the fact that the consumption of industrial goods by the inhabitants of Java who represent 64 % of the total population are supplied by inland transportation, the share represented by East Indonesia as a market for industrial goods is far below that of the share of the population and is believed not to exceed 9 % of the share of the regional GDP (the per capita GDP of this area is 74 with the national GDP placed at 100 . The disposable income is also small and the Engel's coefficient high). Likewise, in Kalimantan where the per capita GDP is the highest in the country and compared to the regional GDP the share is 8 %, the population share is 4 % while the ratio of the cargo flow of industrial goods is 9.6 %.

Table III-3 Cargo-Inflow to the Region (Dry Cargo only, Unit: 100t)

	Dry Cargo			Industrial Goods		
	1972	1973	1974	1972	1973	1974
Ujung Pandang	1379	1352	1264	n. a.	n. a.	927
East Indonesia	8350	8376	9173	n. a.	n. a.	5466
National	51902	52927	58199	35750	30798	39780

(Source) Inter-island Seatransport in Indonesia, 1974

(3) The kinds of industrial goods delivered to the East Indonesia region are mainly as shown in Table III-4. In quantity, non-ferrous minerals of Code No. 8 was the most with 148,500 tons of which 107,000 tons were cement and 26,800 tons were salt. Of the cement transported, approximately 50 % was shipped from the Tonasa Plant in Maros and about 25 % shipped from Surabaya. The next most was miscellaneous commodities (Code No. 12) with 131,700 tons which represents 40 % of the miscellaneous commodities transported by sea nationwide. The major part of the miscellaneous commodities are daily necessities or small outlet of industrial goods. The high share of these commodities in other words means the less developed industrialization in East Indonesia.

The reason why these miscellaneous commodities, 120,000 tons are accumulated in Sulawesi is that the population on this island is the most in East Indonesia, and it may also be considered that a part is being re-shipped to other regions of East Indonesia from Ujung Pandang (the miscellaneous commodities unloaded at Ujung Pandang Port was 87,000 tons). Other major products were chemical goods (74,900 tons of which 21,100 tons were fertilizer), as well as steel and iron products, wooden products, and electrical products. Conversely, as wood and wooden products, oil and fats, and leather among others are produced in the East Indonesia, the share of shipments is extremely small.

Table III-4 Cargo Inflow (Industrial Goods) by Region

(1974, Unit: 100 tons)

Commodity Group / To Region	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Sumatra	669	1291	399	2887	117	14	231	2926	-	959	718	725	753
2. Java, Bali	5410	2210	42	6081	411	16	119	2334	1	467	406	1014	300
3. Kalimantan	120	645	77	611	34	-	59	1199	-	440	338	208	105
4. East Indonesia	337	749	28	195	50	-	163	1485	-	465	441	1317	225
(Sulawesi)	(317)	(378)	(22)	(163)	(29)	-	(112)	(800)	-	(248)	(123)	(1206	(167)
Indonesia	6535	4895	546	9774	612	30	572	7934	1	2331	1903	3264	1228
Composition (%)													
1. Sumatra	10	26	73	30	19	47	40	37	-	41	38	22	61
2. Java, Bali	83	45	8	62	67	53	21	29	100	20	21	32	23
3. Kalimantan	2	13	14	6	6	-	10	15	-	19	18	6	8
4. East Indonesia	5	16	5	2	8	-	29	19	-	20	23	40	18
(Sulawesi)	(5)	(8)	(4)	(2)	(5)	(-)	(20)	(10)	(-)	(11)	(6)	(37)	(14)
Indonesia	100	100	100	100	100	100	100	100	100	100	100	100	100

Code of Commodity Group

1. Fatty substances and waxes; animal and vegetable
2. Chemicals and allied product
3. Rubber and rubber manufactures
4. Wood, cork and manufactures thereof
5. Paperpulp, paper and paperware
6. Hides, leather and manufactures thereof
7. Textiles and make-up textile goods, articles of all materials
8. Non-metallic minerals, pottery, porcelain and glass and manufactures thereof
9. Ores of precious metals, precious metals, precious stones, pearls and manufactures thereof
10. Basemetals (including their ores) and manufactures thereof
11. Machinery, apparatus and appliances, electrical materials and transport equipment
12. Miscellaneous commodities
13. Asphalt, tar

(Source) Prepared by the Mission from "Inter-island Seatransport in Indonesia, 1974"

(4) In 1974, 270,000 tons of cargo were shipped out from Ujung Pandang Port. Of this, approximately 150,000 tons were agricultural products (including 50,000 tons of rice, and 84,000 tons of wheat flour), and 120,000 tons were industrial goods. The main items among the industrial goods were cement (53 %), oil and fats (10 %), paper (8 %), steel bar and gulvanized iron sheets (5 %), salt (6 %) and fertilizer (4 %). These items represent 86 % of the total and the feature is that the kinds of industrial goods shipped out were extremely few. Fig. III-2 shows the flow of commodities shipped out by destination from Ujung Pandang.

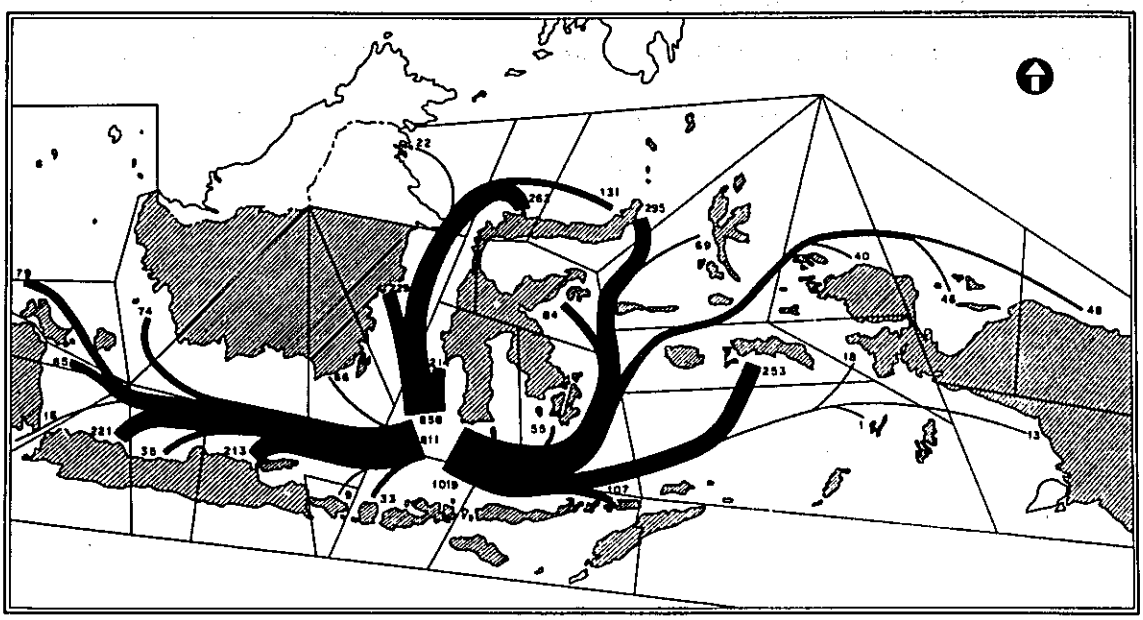


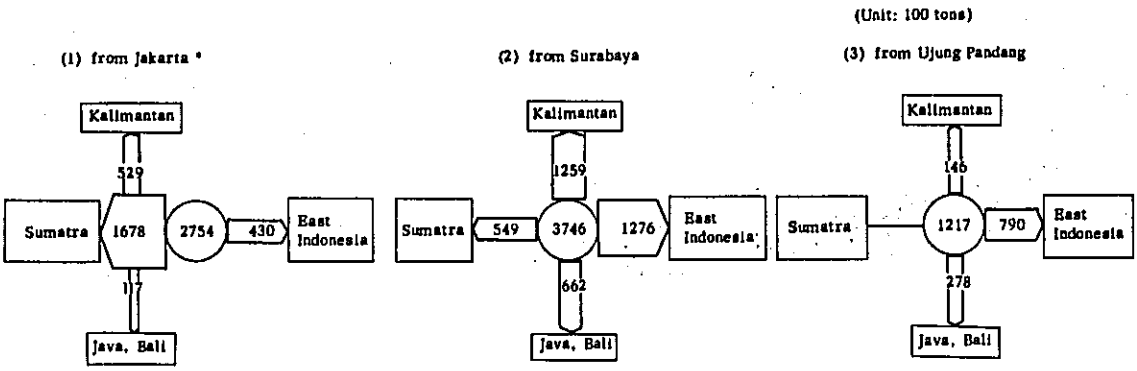
Fig. III-2 Sea Transportation (dry cargo) from Ujung Pandang Port (1974)

(Unit : 100 tons)

(5) In Fig. III-3 is shown a comparison of the volume of industrial goods shipped out by destination for the three leading ports of Jakarta, Surabaya, and Ujung Pandang. The cargo flow from Ujung Pandang Port as shown in Fig. III-2 is divided into 3 parts, one for the North, one for the West, and one for the East with almost comparative volume by each direction, but when looking at the industrial goods alone, 80,000 tons of the 120,000 tons flow into the East Indonesia market. This shows that the port of Ujung Pandang is supplying agricultural products and livestock products to Java and Kalimantan to the west, as well as industrial goods to Maluku and Irian to the east. When comparing Jakarta with Surabaya it can be clearly seen that the direction of the markets of the two ports differ greatly. In the case of Jakarta, 60 % of the total industrial goods transported by sea are destined for Sumatra and only 15 % are destined to East Indonesia. Compared to this, in the case of Surabaya, 34 % of the total flow into East Indonesia while 15 % flow to Sumatra. Also as concerns the Kalimantan market, practically all of the goods from Jakarta flow into West Kalimantan and the majority of the goods from Surabaya flow into East Kalimantan. The volume of industrial goods transported from Sumatra to Kalimantan exceeded that of Jakarta by 2.4 times. This is because development of East Kalimantan is com-

paratively more advanced than that of West Kalimantan, having such development centers as Bandjarmasin, Balikpapan, and Samarinda, and a larger market.

The main items of the industrial goods of these two ports include chemical products, cement, salt, metal material, and machinery.



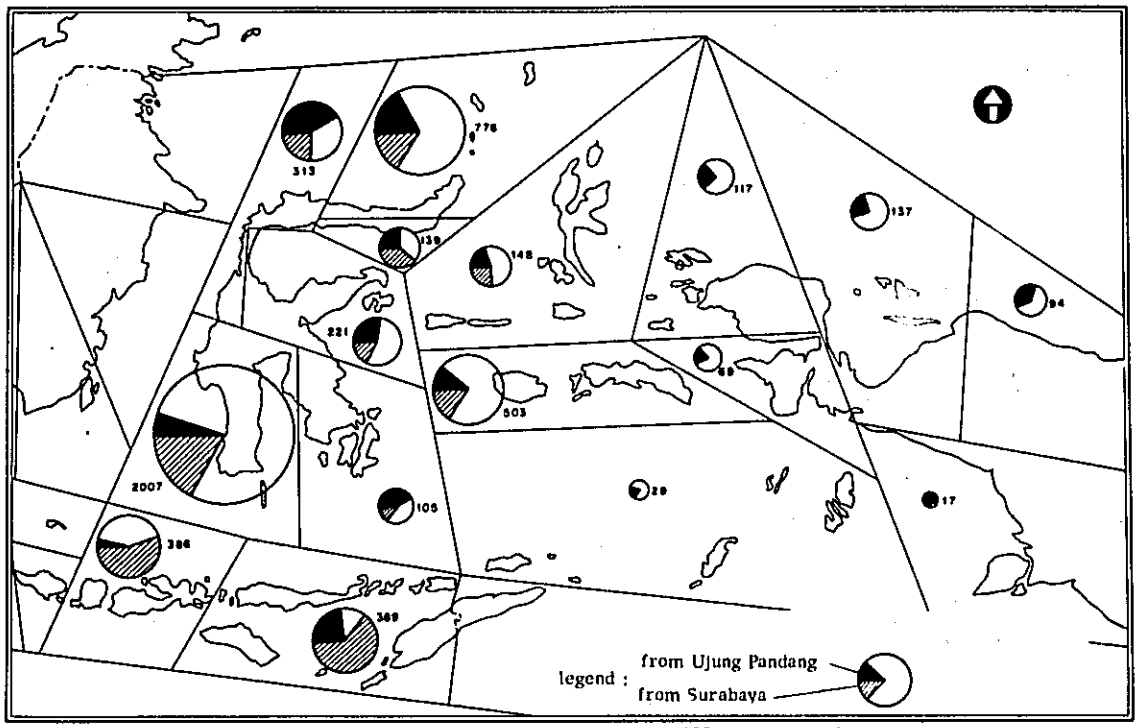
(Note) * Including Tg. Priok, Kalibayu, Sunda Kelapa

(Source) Prepared by the Mission from "Inter-island Seatransport in Indonesia, 1974"

Fig. III-3 Destination of Industrial Products from Major Ports in 1974

(6) As seen up to now, it is clear that when the Ujung Pandang Industrial Estate is developed, the industrial goods from Surabaya will be the most competitive ones to those from the estate that are oriented to the East Indonesia as the primary market. The competitiveness of industrial goods in East Indonesia, from Ujung Pandang and Surabaya is shown in Fig. III-4. Surabaya has the majority in share only in the islands from Lombok and Timor, the Maluku Islands, and a part of North Sulawesi. In the other areas, the share of the market held by Ujung Pandang is dominant. When compared with the 128,000 tons of industrial goods flowing from Surabaya into East Indonesia, the volume of goods flowing from Ujung Pandang (70,000 tons) is smaller, but Ujung Pandang makes a relatively larger market than Surabaya because the total volume flowing from Ujung Pandang is 1/3 that of Surabaya. However, the principal items of industrial exports from Ujung Pandang at present, i.e. cement, paper, salt, and wheat flour, are all products by state-owned factories with the distribution system or under the control of the Central Government. When we pay attention to the fact that the mentioned market share is artifical to some extent and enjoys some incentives, we cannot hastily judge that the competitiveness of the goods from the new industrial estate

will be stronger than those from other regions. To judge this matter, more detailed study on competitiveness of each industrial goods' marketability from various origines should be conducted.



(Note) Figures indicate volume of inflow cargo (unit 100 tons) into each region.

Fig. III-4 Interinsular Import of Industrial Goods by Region

(7) As concerns the market of East Indonesia it is clear that Ujung Pandang is clearly in a better position geographically than Surabaya. At present, a large factor in heightening the price competitiveness of the products of Ujung Pandang must be the fact that the domestic sea transportation cost of Indonesia is extremely high. Fig. III-5 shows the difference in the distances from Ujung Pandang Port and Surabaya Port to the various other ports. In the same Figure are shown the markets where Ujung Pandang is in a superior position based on a comparison of distances of the two ports. The sea transport freight in the case of Indonesia is proportionate to the distance. For example, when transporting cement to Ambon the charge is Rps. 4,320/ton from Ujung Pandang and Rps. 5,310/ton from Surabaya, or a difference of 23 %. Therefore, if all other conditions are equal, then within the spheres shown in the Figure, the market share of Ujung Pandang should be larger than that of Surabaya. Especially as

concerns East Kalimantan, Ujung Pandang exports practically only agricultural or livestock products at present, but in the future it is expected that as a market for the products of the industrial estate of Ujung Pandang, it will surpass that of the products of Surabaya. The distribution sector of Ujung Pandang should be developed and strengthened in East Indonesia so as to expand its market share, based on the advantageous geographical location that it has not only in South Sulawesi but also in the considerably large market of North Sulawesi and Ambon.

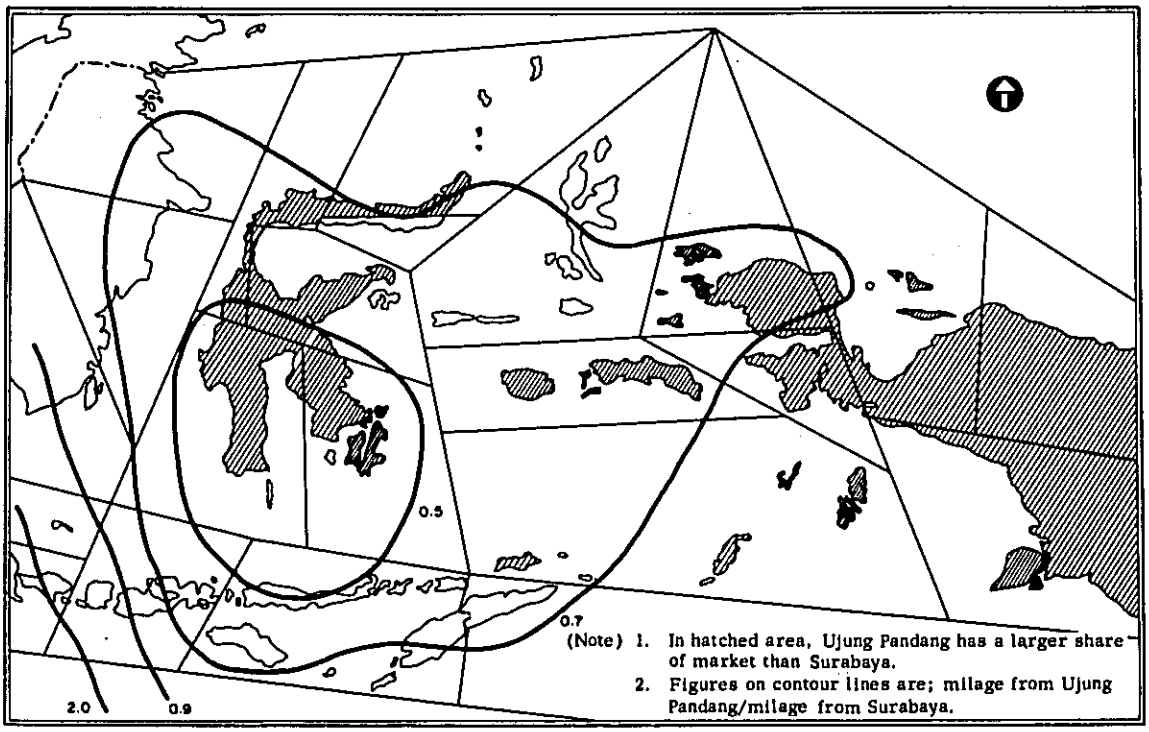


Fig. III-5 Potential Market of Ujung Pandang in East Indonesia

3. Outlook for Regional Industrial Development

1) Estimation and future outlook of the regional market for industrial goods

(1) One of the major factors which can be considered for the level of industrial development of South Sulawesi Province being considerably below the national average, up to now, is the smaller market for industrial goods, as well as the slower growth of that market. Concerning this point, both the opinion of the provincial government officials of the development department and the opinion of local businessmen are in accord and it can be inferred to a certain degree from

the macro economic indices. However, there are practically no statistical data available which show the size and growth of the market for industrial goods. Thus, this matter was most likely discussed in the past from the point of one's feelings rather than on statistics.

(2) Arrangement of the market data for the region is particularly important and urgent for planning the regional industrial programs. For the purpose of this feasibility study, the Mission worked out an estimation to figure out the regional market structure in 1973, using various related data and necessary assumptions.

As a result of this estimating work, we could spell out broadly the profile of the market structure for industrial goods.

The processes taken for the analysis are shown below.

(3) According to "the provincial income survey", the per capita consumption expenditure was $82 in South Sulawesi Province, in 1973. The greater part of the consumption expenditure was for purchases of rice and perishable foods. However, judging from the items the purchased industrial products came to $19.4 (24 % of the total) per person.

Clothings, shoes, hats	$7.0 per capita
Durable consumer goods	$6.6 per capita
Housing, fuel, water	$3.5 per capita
Cigarette and tobacco	$2.1 per capita
Canned goods	$0.2 per capita
Total	$19.4 per capita

Thus, when multiplying the above figure by the total population of 5,500,000, the market for industrial goods would be $107 million, in terms of personal expenditure. (Refer to Appendix for personal expenditure.)

(4) Concerning the demand for industrial goods by the industrial and governmental sectors, the lack of statistical data and information was the greatest here. The demand in this category is for imported capital goods and for imported material goods.

Imported capital goods	$14. 2 million
Imported material goods	$13. 3 million
Sub-total	$27. 5 million

Apart from the above, fertilizers and industrial materials and parts are being imported through inter-island trade but the total amount of this cannot be accurately grasped. However, the demand for industrial goods in this category would be $50 million when the imports and the inter-island trade are added together.

(5) Next, an estimate was made of the supply of industrial goods in the light of the demand. The added value of the industrial sector of South Sulawesi constituted 6. 4 % of the GRP, or $33 million. Dividing this by the added value ratio of 45 % for the industrial sector of the province, the amount would come to $73 million. The value of shipment here was assumed to be the same as the total value of production. Ninety percent of the value of shipments by the manufacturing companies of South Sulawesi was to the domestic market and 10 % overseas (INVENTARISASI ULANGAN INDUSTRI 1973). Domestic shipments amounted to $65. 7 million. However, this does not mean that all the domestic shipments to South Sulawesi are consumed within the province. A large amount is being shipped to East Indonesia as well as to Java and Kalimantan. However, the amount could not be estimated from the data available on inter-island trade. Therefore, the ratio of inter-island trade was estimated from the sales territories of the large factories in the province obtained from the pre-feasibility study report. East Indonesia is the prime market for large factories but when that market alone is not sufficient to maintain their capacity utilization, these factories also look for sale to Java and other islands. The percentage of sales to areas other than East Indonesia corresponds to 8 % of the total value of their output. The ratio of dependence on East Indonesia was 15 - 20 % when judged by impressions gained through interviews and also by the fact that a larger sales territory could not be developed when viewing the kind of industries of South Sulawesi, the size of the manufacturing companies and when analyzing the maritime commodity flow of goods. Thus, shipments to areas other than South Sulawesi is seen to be around 25 % of the total. If this assumption is taken as being correct then shipments within the province would amount to approximately

$49 million. Adding the distribution margin and the transportation costs, the amount of sales on a user's price basis would come to about $65 million (an increase of 30 % with the distribution margin and transportation costs).

(6) South Sulawesi Province imported a total amount of $57 million in 1973. Of this, the capital goods and material goods were for industrial goods while the greater part of the consumer goods amounting to $29 million was seen to be for foodstuff and $2-3 million for industrial goods. Adding about 10 % for the distribution margin and transportation costs to the total of $30 million will bring the user's price to $33 million.

Imported capital goods	$14. 2 million
Imported material goods	$13. 3 million
Imported consumer goods	$ 2. 5 million
Total	$30. 0 million
Total in user's price	($33. 0 million)

(7) Industrial goods introduced into South Sulawesi Province during 1973 through inter-island trade amounted to $70 million. However, a part of this was re-exported to various parts of East Indonesia and the amount sold in South Sulawesi is seen to be about $50 million. Both consumer goods and producer goods were supplied through the inter-island trade and putting distribution margins and the transportation costs at around 20 %, the user's price base would be $60 million.

(8) The supply and demand structure of industrial goods, in 1973, as obtained above is shown in Fig. III-6 and Table III-5.

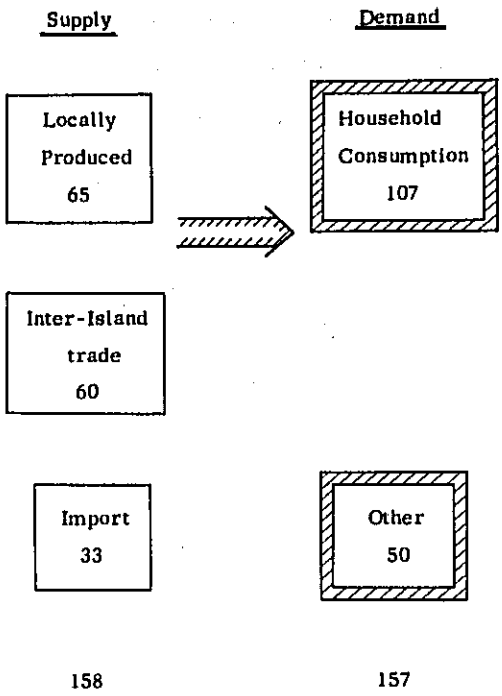


Fig. III-6 Supply and Demand of Manufacturing Goods

(Mil US$)

(Source) Prepared by the Mission

Table III-5 Supply and Demand for Industrial Goods in 1973
(based on the user's price)

Supply			Demand		
	$ Million	(%)		$ Million	(%)
Local production	65	41	Personal consumption	107	68
Inter-island Trade	60	38	Industrial demand	50	32
Imports	33	21			
Total	158	100	Total	157	100

(Source) Prepared by the Mission

(9) To grasp the structure of supply and demand for industrial goods in more detail, the industrial goods coming in from the 3 supply categories, i. e. local production, inter-island imports, and imports were estimated as to the degree each category consumed by the two demand categories of personal consumption and industrial/governmental demand.

Table III-6 Supply and Demand for Industrial Goods of Various Categories (1973)

($ Million)

Consumption / Supply	Personal consumption	Industrial demand	Supply total
Production within the privince	59	6	65
Inter-island trade	45	15	60
Imports from abroad	4	29	30
Total consumption	108	50	158

(Source) Prepared by the Mission

The overwhelming majority of the industrial production in South Sulawesi Privince take a pattern of consumer goods production through the traditional light industries, including the cottage industry and the textile industry. On the other hand, personal expenditures in the Province also showed a high Engel's coefficient, and from the fact that there was little allowance for luxurious expenditure. Consequently stress is placed on purchasing low price industrial goods. Therefore, as concerns consumer goods, the pattern of production within the province is the main. The amount that cannot be supplied within this pattern is mainly imported from Java through inter-island trade. On Java, the textile industry and the durable consumer goods assembly industry are sufficiently developed and these industries can practically meet the demand of the whole country. Also as import barriers have been set up to protect these industries it would not be an exaggeration to say that apart from this pattern there is no other way to eliminate any deficiencies in supply to South Sulawesi. Imports through foreign trade are limited to high quality items and products which cannot be produced in sufficient quantity domestically, and so from the overall viewpoint, they can almost be ignored.

As concerns producer goods (capital goods and material goods) the demand cannot be met with the supply from within the province nor from Java, and so the major part is being imported from foreign countries, both from the point of quality and performance.

(10) In Table III-7 is shown the regional structure for the industrial goods market in which the industries of South Sulawesi are making shipments to other areas of the country and where the trading companies of that province are re-exporting the products to the various areas of East Indonesia.

Table III-7 Market Territory of Industrial Goods via South Sulawesi Province (1973)

($ Million)

Demand / Supply	South Sulawesi	East Indonesia	Other domestic regions	Foreign countries	Supply total
South Sulawesi	65	14	6.5	9.5	95
East Indonesia	Negligible	-	-	-	Negligible
Other domestic regions	60	24	-	-	84
Foreign countries	33	Negligible	-	-	33
Demand total	158	38	6.5	9.5	212

(Note) User's price base

(Source) Prepared by the Mission

(11) The development of the regional market will be a basic factor in determining future industrial development.

As we have mentioned above, there are two kinds of regional market for industrial goods, from the aspect of the demand in South Sulawesi Province and from the aspect of the market territory from the province. For future industrial development, the changes in the market territory will be of great importance.

However, the changes will be greatly influenced by the regional development policies of the Republic as a whole, and in particular by the industrial location policies. In other words, the changes are not a matter of forecasting.

Thus, the Mission estimated the future industrial market from the aspect of the demand in South Sulawesi Province. As concerns the market territory from the province, the Mission studied one of the alternatives for regional industrial development.

(12) If the annual increase of the macro regional economy, or the GRP of South Sulawesi Province, is placed at 7.5 %, then the annual increase rate of the industrial goods market, even when estimated at the minimum, would be 10 %. When viewing this from the past trend, an annual increase of around 11.5 % (income elasticity of demand is 1.5) can be expected. This is as shown in Table III-8.

Table III-8 Projection of the Market of Manufacturing Goods in South Sulawesi Province

(Unit: $ Million)

	1973	1980	1990
Conservative estimation (10%/yr)	158	308	799
Ordinary estimation (11.25%/yr)	158	333	950

(Note) Based on the user's price

(Source) Prepared by the Mission

On the other hand, without considering any effective factors (such as a national project), the value of industrial goods supplied to the market of South Sulawesi Province by the industries of South Sulawesi should increase at an annual rate of over 13 % (mentioned later) and is estimated to reach $156 million by 1980 and $580 million by 1990. And the market for industrial goods, including domestic markets other than the Province, as well as the export market will be $229 million in 1980 and $848 million in 1990.

Table III-9 Outlook of Self-sufficiency Ratio for Industrial Goods

	1973	1980	1990
Consumption in South Sulawesi Province (A)	158 M$	308 M$	799 M$
Locally produced industrial goods destined for South Sulawesi (B)	65 M$	156 M$	580 M$
Industrial production in the province (C)	95 M$	229 M$	848 M$
Self-sufficiency ratio within province B/A	41 %	51 %	73 %
Self-sufficiency ratio of the industrial sector C/A	60 %	74 %	106 %

(Note) Based on the user's price

(Source) Prepared by the Mission

(13) Based on the estimated demand and supply, the self-sufficiency ratio in the future is calculated. The self-sufficiency ratio by the provincial manufacturing industries to the estimated demand (conservative one) will rise from that of 41 % in 1973 to 51 % in 1980 and to 73 % in 1990. However, even in 1990 dependence will have to still be placed on imports and inter-island trade to the extent of 27 %, or in value $219 million.

From the point of the inter-regional balance with the other provinces in the industrial sector covering inter-island exports and foreign exports, the self-sufficiency ratio in 1973 was 60 %. This is expected to reach 74 % in 1980 and by 1990 is anticipated to attain a complete self-sufficiency rate of 106 %.

(14) To say that the self-sufficiency ratio of the industrial sector will become 106 % in 1990 means that the first step of the industrialization of South Sulawesi has been tentatively realized but it is necessary to pay attention to the fact that this alone would still be far away from the target of becoming a development center of East Indonesia.

The population of the other areas of East Indonesia is 2 times that of South Sulawesi Province and the per capita income level is almost the same. Simply

stated, there is a market potential 2 times greater than that of South Sulawesi. However, from the points of delay in urbanization and low population density, there is a low economic density and for this reason the tempo of these areas becoming a significant market for industrial goods is slow. Then, it can be assumed that the demand per capita for industrial goods will not exceed a half that of South Sulawesi. That is, the market for industrial goods for East Indonesia other than South Sulawesi Province, as a whole, is assumed to equal that of South Sulawesi. The share of industrial goods supplied by South Sulawesi to these areas will instead drop from the 14.7 % in 1973 to 11 % in 1980, and to 16 % in 1990.

From the point that the Ujung Pandang City in the province has been projected as the development center of East Indonesia, it is believed that one-third of the demand for industrial goods in East Indonesia should be supplied from South Sulawesi. The demand for industrial goods in this region will be met by local production, imports from South Sulawesi, as well as imports from Java. It is considered that the target for the time being would be for each of these categories to supply one-third of the demand. Should the supply from South Sulawesi fall greatly below the one-third share, then the supply from Java will constitute the largest share of the industrial goods supplied to this region.

An annual industrial production growth rate of 15 % would be necessary for South Sulawesi to be able to supply one-third of the demand of East Indonesia.

2) The trend of industrial development and future outlook

(1) During the period of the First Five-year Development Plan, South Sulawesi Province had succeed to rehabilitate and normalize the provincial economy. And the province is now carrying on the Second Five-year Development Plan (1973/74 - 1978/79), in which the Government has been giving priorities to the following development programs.

Forestry conservation and flood control through afforestation and tree planting

Increasing the production of food

Diversifying the agriculture, forestry and fishing industry, as well as the livestock industry, and the promotion of the agriculture supporting

industry

Training of manpower, especially engineers for the agriculture supporting industry

The development and improvement of the economic and social infrastructure

A review of the disbersement and implementation of the Second Five-year Development Plan has not to be made yet, but great progress is being made in flood control, as well as development and improvements in irrigation, roads, and bridges among others.

The Third Five-year Development Plan period will be starting from 1979 fiscal year and plans are now being prepared by the agencies concerned. But it is seen that the planning work will take up to the end of the Second Five-year Plan and so the present situation does not permit any detailed discussions on this. However, according to the government officials in charge of planning, as the fundamental development or improvement in infrastructures has already completed, steps would be progressed to carry on some big projects.

Following are some of the major industrial development projects which would be carried on under the Third Five-year Development Plan.

Development of the Ujung Pandang industrial estate

Development of the sugar industry

Hydropower development through the construction of a multi-purpose dam on the Sadang River.

Development of a heavy industry in Majene

Development of an industrial belt along the west coast of the province.

(2) The trend in the industrialization from 1969 to 1973 was as shown in Table III-10. The ratio of the industrial sector in the GRP was 6.0 % in 1969, dropping to 5.5 % and 4.6 % in 1970 and 1971 respectively. The drop is due to a drop in the relative position resulting from the remarkable development of the commercial sector and the construction sector. In 1972, industrial production increased rapidly to hold 6.4 % of the GRP. exceeding that of 1969. The same ratio was

also recorded in 1973. Industrial production continued to expand steadily in 1974 and it is believed that the percentage of the industrial sector will exceed 6.4 %.

What must be noted in the changes in the industrial structure during this period is the development of modern industries such as the basic industry and the chemical industry.

Table III-10 Industrial Development in South Sulawesi Province

(based on current price)

	1969	1970	1971	1972	1973
GRP (M$)	212	245	481	346	520
Ratio of industrial sector to GRP (%)	6.0	5.5	4.6	6.4	6.4
Light industry (%)	4.5	4.1	3.1	4.0	4.1
Cottage industry (%)	0.3	0.3	0.3	0.4	0.3
Basic industry (%)	-	-	0.1	0.2	0.1
Chemical industry (%)	0.9	1.0	1.0	1.4	0.1
Maritime industry (%)	-	-	-	0.1	0.1
Textile industry (%)	0.2	0.1	0.1	0.4	0.1

(Source) *Same as Table III-9*

(3) With 1973 as the base year, the ratio of the industrial sector to the GRP in 1980 and 1990 would be 9 % and 13 % respectively. This coincides with the figures of the macro framework of the pre-feasibility study.

In the pre-feasibility study the correlation between the per capita GRP and the industrial sector's ratio to GRP was obtained through a cross-countries analysis. At this time, the Mission employed an estimate formula which was developed by UNIDO through its own international industrial survey. This method can be considered to be more objective because of the larger number of samples used. More important is, however, that these two estimation results give almost the same figure. For reference, the formula is shown below.

$$\log V = a + b \log Y + c \log P$$

V: Value Added

a: Constant

b: Growth coefficient

c: Size coefficient

Y: Per capita GRP

P: Size of population

(4) Table III-11 shows the future outlook by industry according to the categories employed up to now in the region, for the manufacturing industry such as the light industry, the cottage industry, the basic industry, the chemical industry, the maritime industry, and the textile industry.

As mentioned earlier, such modern industries as the chemical industry, the basic industry, and the maritime industry are being newly promoted and are presently making amazing advances in the province. On the other hand, the light industry and other traditional industries are also developing steadily.

As for the main changes likely to take place in the future, it can be said that first of all the development of modern industries will be actively promoted leading to the industrial development of this area. In 1973, the added value of the modern industries alone hold about 20 % of that of all manufacturing industry. By around 1980 this is expected to rise to 50 % and in 1990 to about 80 %. Rather than being a forecast, this is a target to bring the traditional industrial structure to the average structure of Indonesia (as of 1973 modern industries comprised 80 % of the total).

The traditional industries which have been developing steadily up to now will of necessity have to cast off their traditional ways and become modern industries through mechanization and the employment of modern management method. Thus, a part of the light industry and the textile industry which rely on a manual production system will be hard put to maintain their present position.

The only industrial statistic of the province from which time series data could be obtained employs the 6 classification method. However, when considering the convenience in studying the various industrial developments, the ISIC classification will be employed. If possible, it would be desirable if the statistical figures in the past obtained through the traditional classification data can be rearranged to the ISIC classification.

Table III-11 Outlook of the Industrial Development in South Sulawesi Province

	1973 (actual)	1980 (estimate)	1990 (estimate)
GRP (M$)	520	873	1820
Ratio of industrial sector to GRP (%)	6.4	9.0	13.0
Light industry (%)	4.1	4.0	4.0
Cottage industry (%)	0.3	0.3	0.3
Basic industry (%)	0.1	2.0	4.5
Chemical industry (%)	1.1	2.0	3.0
Maritime industry (%)	0.1	0.5	1.0
Textile industry (%)	0.1	0.2	0.2

(Source) Actual : "Regional Income Survey"
Estimate: Japanese Survey Mission

(5) The gross output of manufacturing industries in the province was estimated by the Mission through the procedures explained below.

First, the growth rate of the various industries according to the 3-digit classification of ISIC was obtained from the future GRP and future population of South Sulawesi Province using the estimate formula and coefficients from the results of UNIDO's cross-countries analysis of developing countries. The results obtained are as shown in Table III-12. One bias indicated by the results of the estimation was the low growth rate of those products such as cigarettes and tobacco, leather goods, wood products, furniture, and ceramics, among others, where industrial development depends to a high degree on the availability of raw materials.

Table III-12 Estimated Average Growth Rate

(Percent/Year)

Industry	ISIC	1973-1980	1981-1990
Food	311-2	11	12
Beverage	313	12	12
Cigarettes & tabacco	314	9	9
Textiles	321	11	11
Clothing	322	14	14
Leather and leather goods	323	12	12
Shoes	324	11	11
Wood products (excluding furniture)	331	10	10
Furniture (excluding metal furniture)	332	11	11
Paper and paper products	341	18	19
Printing	342	14	14
Chemical products for industrial use	351	14	14
Other chemical products	352	16	16
Refinery	353	13	13
Other petroleum products	354	4	5
Rubber products	355	16	17
Plastic products	356	17	18
Ceramics	361	13	14
Glass and glass products	362	14	15
Other nonferrous and mineral products	369	13	14
Basic metal	371	19	20
Nonferrous refined metal	372	12	12
Metal products	381	15	15
Machinery	382	17	17
Electrical machinery	383	19	20
Transportation equipment	384	15	16
Precision machinery	385	16	16
Other products	390	15	15
Manufacturing industry, total			

(Source) Prepared by the Mission.

In Indonesia, these industries are expected rather as high growth industries. For example, when looking at the target growth rate (annual) for the Second Five-year Development Plan, leather products represented 53. 1 %, wooden products 18. 2 %, and non-ferrous metals 21. 1 % (see Table III-13). In South Sulawesi also, problems are few as concerns the supply of the raw materials for these products and so when using the UNIDO's formula it can be considered that the estimation is an underestimate.

Table III-13 Average Annual Industrial Growth Target Under the Second Five-year Development Plan

(%)

Industry	Annual Growth Rate
Leather and leather products	53. 1
Paper and paper products	51. 0
Machinery	30. 0
Metals	24. 1
Chemicals, drugs	23. 4
Nonferrous metals	21. 1
Wood products	18. 2
Textiles	12. 0
Foods	10. 4
Rubber products	8. 1
Manufacturing industry, total	11 - 13

(Source) The Second Five-year Development Plan

The growth rate shown in Table III-12 is generally correct if the above-mentioned bias is eliminated.

Next, the future output of industries was obtained using the ISIC base statistics "INVENTARISASI ULANGAN INDUSTRI TUHUN 1973" of South Sulawesi as the basic data. For the industrial classifications the 2-digit classification of ISIC was employed (using 3-digits would cause the industries presently not being developed to be dropped completely). The objective of this

analysis could be fully obtained with the 2-digit classification. Concerning the estimation of the growth rate of each industry, consideration has been given to the estimated growth rate by the 3-digit classification and the composition of the industries in 3-digit within the 2-digit base industries.

As shown in Table III-14, it is estimated that the industrial output in 1980 will be $176 million and in 1990 will be $651 million.

Table III-14 Estimated Industrial Output (Based on the ex factory price base)

Industry	1973 value of production ($1,000)	Annual growth rate (%)	1980 value of production ($1,000)	1990 value of production ($1,000)
Food	32,485	10.6	65,763	180,103
Textile	5,548	13	13,052	44,307
Wood products	3,504	12	7,746	24,058
Paper, paper products	8,614	16	24,345	107,399
Chemical products	1,679	14	4,201	15,575
Glass, ceramics	7,373	14	18,449	68,396
Metals, metal products	7,300	17	21,909	105,310
Machinery	5,986	18	19,068	99,799
Others	511	15	1,359	5,499
Total	73,000	13.4-13.7	175,892	650,446

(Source) Prepared by the Mission

Table III-15 Estimated Industrial Output (Based on the user's price)

Industry	1973 Value of production ($1,000)	Annual growth rate (%)	1980 Value of production ($1,000)	1990 Value of production ($1,000)
Food	42,275	10.6	85,582	234,381
Textile	7,220	13	16,986	57,660
Wood products	4,560	12	10,081	31,310
Paper, paper products	11,210	16	31,950	140,950
Chemical products	2,185	14	5,468	20,269
Glass, ceramics	9,595	14	24,010	89,008
Metals, metal products	9,500	17	28,511	137,047
Machinery	7,790	18	24,815	129,875
Others	665	15	1,769	7,156
Total	95,000		229,172	847,656

(Source) Prepared by the Mission

(6) Not only can a steady industrial development of more than 13 % annually be expected in South Sulawesi Province, from 1973 to 1990, but it is also anticipated that the industrial diversification will progress appropriately.

Looking at the industrial structure for 1973, one of the features was that compared to the comparatively advanced food industry which held 44. 6 % of the total industrial production, the development of the other industries was not so advanced. Apart from the food industry, the three other industries making outstanding developments (those holding 10 % and more of the industrial output total) were paper and paper products (11. 8 % share of the value of industrial production), glass and ceramics (10. 1 %), and metal products (10 %). The total of these three industries is not more than 31. 9 % and is not as high as that of the food industry.

Compared to this, in 1990, the share of output of the food industry will fell to 27. 7 % and it is expected that the four items, i. e. paper and paper products; metals and metal products; machinery; and glass and ceramics will rise 16. 5 %, 16. 2 %, 15. 3 % and 10. 5 % respectively.

Looking at Indonesia as can be seen in Table III-17, food industry, textile industry, and chemical and rubber industry show remarkable growth while on the other hand the ratio occupied by the various other industries extremely small. Compared to the national average, in 1973 the balance among the industries of South Sulawesi Province was better and this balance is expected to improve further in the future.

Table III-16 Estimated Composition of Industrial Output by Industry (South Sulawesi Province)

(%)

Industry	1973	1980	1990
Food	44.5	37.4	27.7
Textile	7.6	7.4	6.8
Wood products	4.8	4.4	3.7
Paper & paper products	11.8	13.8	16.6
Chemical	2.3	2.4	2.4
Ceramics	10.1	10.5	10.5
Metal products	10.0	12.5	16.2
Machinery	8.2	10.8	15.3
Others	0.7	0.8	0.8
Total	100.0	100.0	100.0

(Source) Prepared by the Mission

Table III-17 Composition of Indonesian Industrial Output

(%)

Industry	1973	1978
Food	42.2	35.1
Textile	31.8	28.5
Chemicals, drugs, rubber products	15.0	16.2
Metals, machinery	6.8	10.5
Leather	1.1	4.6
Non-metals	2.0	2.7
Paper	0.4	1.7
Wood	0.7	0.7
Total	100.0	100.0

(Source) C. A. F. I., BASIC INDUSTRY IN THE REPELITA II OF THE R. I.

(7) As the last paragraph of the macro-scopic outlook of industrial development a few words will be said about the future regional structure of the industry.

There are 5 development centers in South Sulawesi Province. They are Ujung Pandang City, Pare-Pare City, Majene, Palopo, and Watampone. The plan is to push forward development mainly with these development centers and it can be generally said that the possibilities promoting industrialization are existing in the 3 centers facing the Makassar Straits, i.e., Ujung Pandang, Pare-Pare, and Majene. It is said that these development centers will carry the responsibility of of future industrial development. As for Palopo and Watampone these centers will be limited as a developing center for the agricultural and fishery development on the Bone Gulf side.

Based on the growth pole policy, there is a magnificient conceptual plan for the regional industrial development. That is for the three development centers of Ujung Pandang, Pare-Pare and Majene to form an industrial belt facing the Makassar Straits (See Fig. III-7). The skeleton of the conception is based on the premise of the construction of hydro power facilities on the Sadang River. With abundant electricity, there would be developed petrochemical and steel complexes in Majene, and would be developed industrial agglomeration in Ujung Pandang and Pare-Pare. Farthermore, a large industrial belt would be formed between Ujung Pandang and Pare-Pare, using the abundant river water and labor force as well as electricity along the coast.

The plan is truly grandiose but an important point which has been overlooked is that such a plan can be realized only through the development of various aspects, including development of the infrastructure, development of manpower resources, cultivation of an enterprenueur's spirit, and changes in the value sense of the people. The industrial belt area development plan is a "super long-range plan" and should be considered separately, for the time being, from the industrial development plan which should be carried out in this area.

What is the area that should shoulder the responsibility for industrial development until 1990? The present situation and development strategy of the 3 centers facing the Makassar Strait are as shown in Table III-18. It is not an overstatement to say that of these the only area which will make industrialization

possible over the next 10 years is Ujung Pandang. Sufficient attention must be paid to the fact that the development of Pare-Pare will compete with that of Ujung Pandang, otherwise the development of both areas may end in failure. Efforts should first be concentrated on the industrial development of Ujung Pandang.

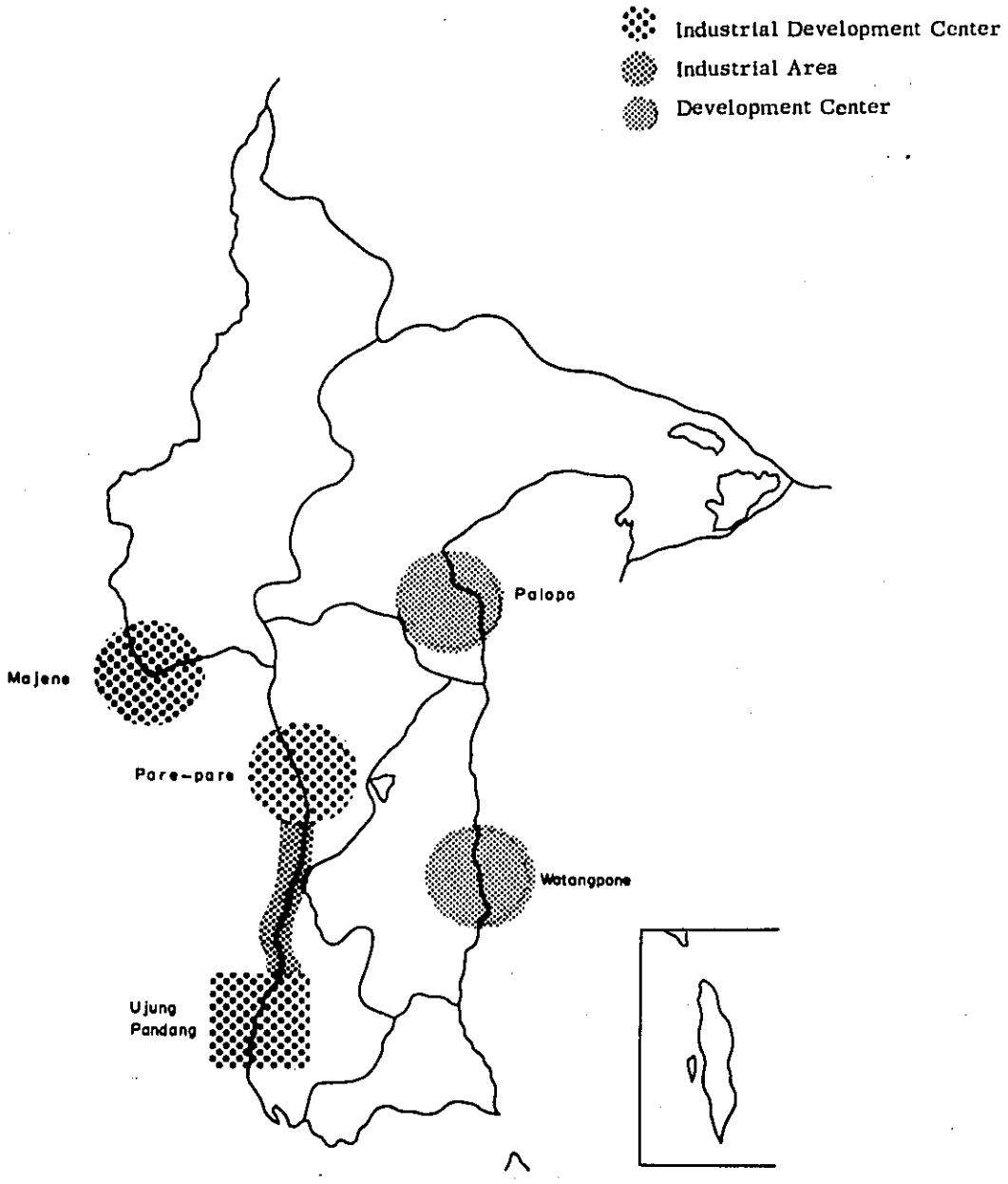


Fig. III-7 A Conceptual Plan of Industrial Development

(Source) Prepared by the Mission

Table III-18 Characteristics and Development Strategies of Three Development Centers.

Ujung Pandang	Pare-Pare	Majene
(Present Situation)		
1. The most important development Center in Eastern Indonesia with the largest industrial infrastructure and accumulations in this region. 2. Economic, cultural and political center in South Sulawesi Province.	1. Has a superior port and plays a role of the distribution center of abundant farm products and livestock products produced in the back area. 2. Abundant supply of electricity as a result of development of the Sadang River.	1. Faces deep sea. Thus, the port and harbor capable of accepting large ships can be constructed. 2. Possibility of becoming a major port if the Lombok Strait is designated as an international shipping route. 3. Abundant supply of electricity as a result of development of the Sadang River.
(Development Strategy)		
1. Eastern Indonesia's sole area with the concentration of modern industries. To pay a role of supporting the development of the second and third development Centers as well as the development of existing light industries and home industries. 2. Development of medium-sized industrial estates should be considered in order to promote the introduction of modern industries as a means for prompt industrialization.	1. In order to make use of the function as the distribution center of farm and livestock products, the development of small-size industrial estates composed of the industries processing these products should be examined.	1. When it becomes necessary to construct a large-sized industrial complex for petrochemical, fertilizer, steel and non-ferrous metal industries in Eastern Indonesia as part of the national project, Majene should be one of the candidate sites. In this case, the possibility of exports should be examined in detail as the possible consumption in the Eastern Indonesian market in not large.
(Timing for Development)		
1. If the feasibility study, now under way, indicates that the development is feasible, the construction should be started as soon as possible.	1. It is desirable that the development will be delt with as a medium-term development program. Competition with the construction plan of the Ujung Pandang Industrial Estate should be avoided.	1. The development is still with stage of the conceptual plan because of too many uncertain factors.

(Source) Prepared by the Mission.

4. Identification of Possible Industrial Investment Opportunities for Manufacturing Firms

(1) Generally speaking, the identification of investment opportunities of a developing area is being carried out with a practical and rather primitive approach. And also studies and experiences on industrial development teach us the following facts.

a. Processing industries which process locally produced raw materials are usually the easiest to find investment opportunities.

b. Import substitution industries including inter-island import substitution are the second easiest industrial projects to set up.

c. The development of a large-scale infrastructure as well as the establishment of large plants would create new industrial markets for which some industrial projects would be set up with good financial prospects.

d. If there exist abundant labor resources in a region, industrial projects which consist of labor-intensive processes as divisions of an internationally integrated production system may be developed.

e. There are cases where transit processing industries are set up when the geographical location is favorable.

If the development level is out of question, we can easily indicate the existing examples in the region by the stated type of project. Adding the possible projects which would be developed in the near future, Table III-19 was completed for easier understanding.

Table III-19 Types of Industrial Projects of the Area

A.	Locally produced raw material processing type	
	a) Local market oriented (example: bricks)	(1)
	b) Local and East Indonesia market oriented (example: biscuit)	(2)
	c) Local, East Indonesia and other domestic market oriented (example: paper)	(3)
	d) Domestic market and export market oriented (example: markisa juice)	(4)
	e) Overseas market oriented (example: cattle feed)	(5)
B.	Import substitution type	
	a) Inter-island import substitution type (example: undergarments)	(6)
	b) Import substitution type (example: flour milling)	(7)
C.	Band wagon type (example: electric wiring) *	(8)
D.	Transit processing and export processing type	
	a) Transit processing and exporting of domestic products (example: cold storage)	(9)
	b) Export processing (example: electronic components) *	(10)

(Note) * Denotes not existing at present

(Source) Prepared by the Mission.

(2) The approved capital investment in the manufacturing industry in this region is as shown in Table III-20.

Table III-20 Current Industrial Investment Projects in the Province

Field of Activities \ Year	67	68	69	70	71	72	73	74	75	76*	Total
Food	-	-	(1)	2	2	1	3	2	1	-	11 (2)
Textiles	-	-	-	-	-	2	1	-	-	-	3
Wood products	-	-	-	-	-	-	1	1	-	-	2
Paper and pulp	-	-	-	-	-	-	2	-	2	-	4
Chemicals	-	-	-	-	-	-	-	-	-	-	0
Ceramics	-	-	-	-	-	-	3(1)	-	2	-	5 (1)
Metals	-	-	(2)	(1)	-	-	2(1)	-	-	-	2 (4)
Machinery	-	-	-	-	-	-	-	-	-	-	0
Others	-	-	-	-	-	-	1	-	-	-	1
Total	0	0	(3)	2(1)	2	3	13(2)	3	5	0	28 (7)

(Note) 1. Figures in parentheses denote PMA while the others are PMDN.

2. There is one investment by PMA, the year of which is unclear.

(Source) Prepared by the Mission from local BKPM data.

The trend in the number of projects carried out up to now from 1967 when the foreign capital investment promotion program was first started is somewhat similar to that of whole Indonesia, with the following changes taking place.

a. Capital investment in manufacturing started from 1969. And foreign capital investment took precedence over domestic capital investment.

b. Up to 1973, capital investment had been increasing steadily.

c. After the announcement of the new guideline for foreign and domestic capital investment in 1974, investments have been slowing down.

But the fact that the number of projects in 1974 and 1975 was 3 and 5 respectively shows the healthy activities of the PURIBUMI firms (indigenous

ventures) which did not bear the brunt of the new guide line.

Viewing the fields of activities of the industrial projects, the most numerous was the food industry with up to 13 cases of investment made by PMA and PMDN together, to hold 37 % of the total. This was followed by 6 cases (representing 17 % of the total) each for ceramics and metal products as well as 4 cases (14 % of the total) for paper, and paper products. The pattern of capital investments in the region is very different from those of whole Indonesia, and may be said to indicate one of the features of the industrial capital investments in this region. Capital investments of the Republic in the field of manufacturing industry is inclined greatly toward textile, chemicals and drugs and metal products. By way of comparison with the industrial investments in the whole country, those of South Sulawesi have the following characteristics.

a. Few capital investment projects in the textiles and chemicals.

b. Comparatively many capital investment projects in ceramics, paper and paper products.

(3) In order to find the factors for financial feasibility of approved industrial projects, raw material supply and market for each project are indicated as shown in Table III-21.

Table III-21 The Source of Supply of Raw Materials and the Markets for Products

A Case of the Approved Industrial Project

(Legend)
L: Local
E: East Indonesia (except South Sulawesi)
D: Domestic
F: Foreign

Field of Activities	Raw Material				Products' Market			
	L	E	D	F	L	E	D	F
1. Cattle feed	X							X
2. Alfalfa feed	X							X
3. Wheat flour milling				X	X	X		
4. Rice milling (1)	X				X			
5. Rice milling (2)	X				X			
6. Coconut oil	X				X	X	X	
7. Citronella oil	X							X
8. Bakery	X				X			
9. Noodle	X				X			
10. Ice making	X				X			
11. Cold storage (prawn) (1)		X						X
12. Cold storage (prawn) (2)		X						X
13. Food industry *note 1	X				X			
14. Under shirts			X		X			
15. Sucks for packing of agricultural products				X	X			
16. Leather tanneries	X							X
17. Saw mill	X				X			
18. Plywood	X							X
19. Paper (1)	X				X	X	X	
20. Paper (2)	X				X	X	X	
21. Tissue paper	X				X	X	X	
22. Printing			X		X			
23. Cement (1)	X				X	X		
24. Cement (2)	X				X	X		
25. Cement (3)	X				X	X		
26. Cement (4)	X							X
27. White cement			X					
28. Glass tableware				X	X	X		
29. Galvanized iron sheet				X	X	X		
30. Steel and iron bar (1)				X	X	X		
31. Steel and iron bar (2)				X	X	X		
32. Steel and iron bar (3)				X	X	X		
33. Steel pipe				X	X	X		
34. Metal intermediate materials				X	X	X		
35. Housewares *note 2				X	X	X		

* (Note) 1. Original data did not indicate detailed field of activities of the projects
2. Original data did not indicate the materials of the projects

(Source) Prepared by the Mission from data of BKPMD

Looking at the type of industries, the majority is of the locally produced raw material processing type, followed by the import substitution type. Together they total 30 cases or 70 % of the total. It may be said that they represent the leading pattern of industrial development in this region.

Locally produced raw material processing type	20 cases	57 %
Import substitution type	10 cases	28 %
Inter-island import substitution type	3 cases	9 %
Transit processing type	2 cases	6 %

Turning to the aspect of the market, it can be seen that up to 71 % of these industrial projects have expanded their market territories to areas other than South Sulawesi Province. In East Indonesia, price competitiveness of most cases exceeds that of the products from Java. At the same time, without East Indonesian market most of the industries would not be able to obtain an opti-minimum production scale. However, a few industries are in the position to meet the national market including the industrially advanced region of Java.

Local and East Indonesian market-oriented	13 cases	37 %
Local market-oriented	10 cases	29 %
Export market-oriented	8 cases	23 %
National market-oriented	4 cases	11 %

(4) In Table III-22 are shown the raw materials supply and market of each industrial project in a concise form for the various industrial projects proposed by BAPPEDA under the Second Five-year Development Plan for South Sulawesi Province. It can be clearly seen from the table that the locally produced raw materials processing type was overwhelmingly in the main and that they represented 33 cases of the 50 cases, or a percentage of 66 %. The next largest was the import substitution type with 13 cases, or 24 %. The inter-island substitution type represented only 4 cases, or 8 %.

Table III-22 The Source of Supply of Raw Materials and the Markets for Products

A Case of the Proposed Industrial Projects in the Provincial Second Five-year Development Plan

(Legend)

L: Local
E: East Indonesia (except South Sulawesi)
D: Domestic
F: Foreign

Field of Activities	Raw Material				Products' Market			
	L	E	D	F	L	E	D	F
1. Cassava feed	X							X
2. Alfalfa feed	X							X
3. Coffee processing	X				X	X	X	
4. Banana flour milling	X				X	X	X	
5. Maize flour milling	X				X	X		
6. Sugar and sugar refinery	X				X	X		
7. Coconut processing	X				X	X	X	
8. Coconut oil	X				X	X	X	
9. Palm oil	X							X
10. Corn oil	X							X
11. Citronella oil	X							X
12. Markisa juice	X				X	X	X	X
13. Tabacco and cigarettes	X				X			
14. Agar - agar	X						X	X
15. Yarn thread				X	X			
16. Weaving			X		X			
17. Silk	X				X	X	X	
18. Garments			X		X	X		
19. Leather tanneries	X							X
20. Leather products	X				X	X	X	
21. Shoes making	X				X	X	X	
22. Wooden, bamboo furniture	X				X	X	X	
23. Rattan processing furniture	X				X	X	X	X
24. Ebony handicrafts	X				X	X	X	X
25. Wooden handicrafts	X				X	X	X	X
26. Bamboo handicrafts	X				X	X	X	X
27. Paper	X				X	X	X	
28. Carton boxes	X				X	X		
29. Caustic soda	X				X			
30. Fertilizer			X		X	X		
31. Salt	X				X			
32. Cement	X				X	X		
33. Tile	X				X	X		X
34. Bricks	X				X	X		
35. Mortar	X				X	X		

(continue)

Field of Activities	Raw Material				Products' Market			
	L	E	D	F	L	E	D	F
36. Eternite boards				X	X	X		
37. Ceramic tableware	X				X	X		
38. Glass bottles	X				X	X		
39. Plate glass				X	X	X		
40. Wheels				X	X			
41. Smith				X	X			
42. Agricultural machinery				X	X	X		
43. Motor cycle (knock down)			X		X	X		
44. Printing machine				X	X			
45. Car battery				X	X			
46. Sound recorder				X	X			
47. Typewriter, calculator				X	X			
48. Parts for motor vehicle				X	X			
49. Ship building				X	X			
50. Gold and silver handworks	X				X	X	X	

(Source) Prepared by the Mission from the provincial Second Five-year Development plan.

On the other hand, turning to the market territories, projects which were mainly export-oriented numbered 7 cases out of 50, or 14 %, with the remaining 43 projects, or 86 %, oriented toward the domestic market.

Looking a little more in detail at the contents of the 43 projects, there were 13 cases which placed their target at the local market, 15 cases where the target was the local market and the East Indonesian market together, and 15 cases (including 6 projects where a part of the target was the overseas market) where the target was the national market.

Considering the scale of economy or the opti-minimum scale of industrial production system, preliminary conclusions for possible industrial projects in the area would be obtained through the careful observation of the existing or proposed projects. They are summarized as follows.

a. There is little feasibility for the establishment of big plants while there is the possibility of setting up medium- and small-sized firms.

b. Even medium- and small-sized firms using locally produced materials would not be feasible with the provincial market only, but must expand to the

East Indonesian market as well. They also have price competitiveness with advantageous geographical location to catch the East Indonesian market as their market territories.

c. The majority of the import substitution type are assembling firms of which the scale of economy is small or even negligible. Those firms would be profitable with small market territory limited to the local area.

d. In the category of the inter-island import substitution type, promissing projects are quite few.

(5) A comprehensive and practical approach has been employed to identify future industrial investment opportunities in the region.

First step was completing a list of project idea that could be obtained through various information sources. Sources are as follows:

a. Our own knowledge and experiences stocked by implementing lots of studies on industrial development in developing regions.

b. Data and information obtained by the field survey on the local industrial development.

c. Issues of the industrial profile provided by the international agency like UN, UNIDO and OECD.

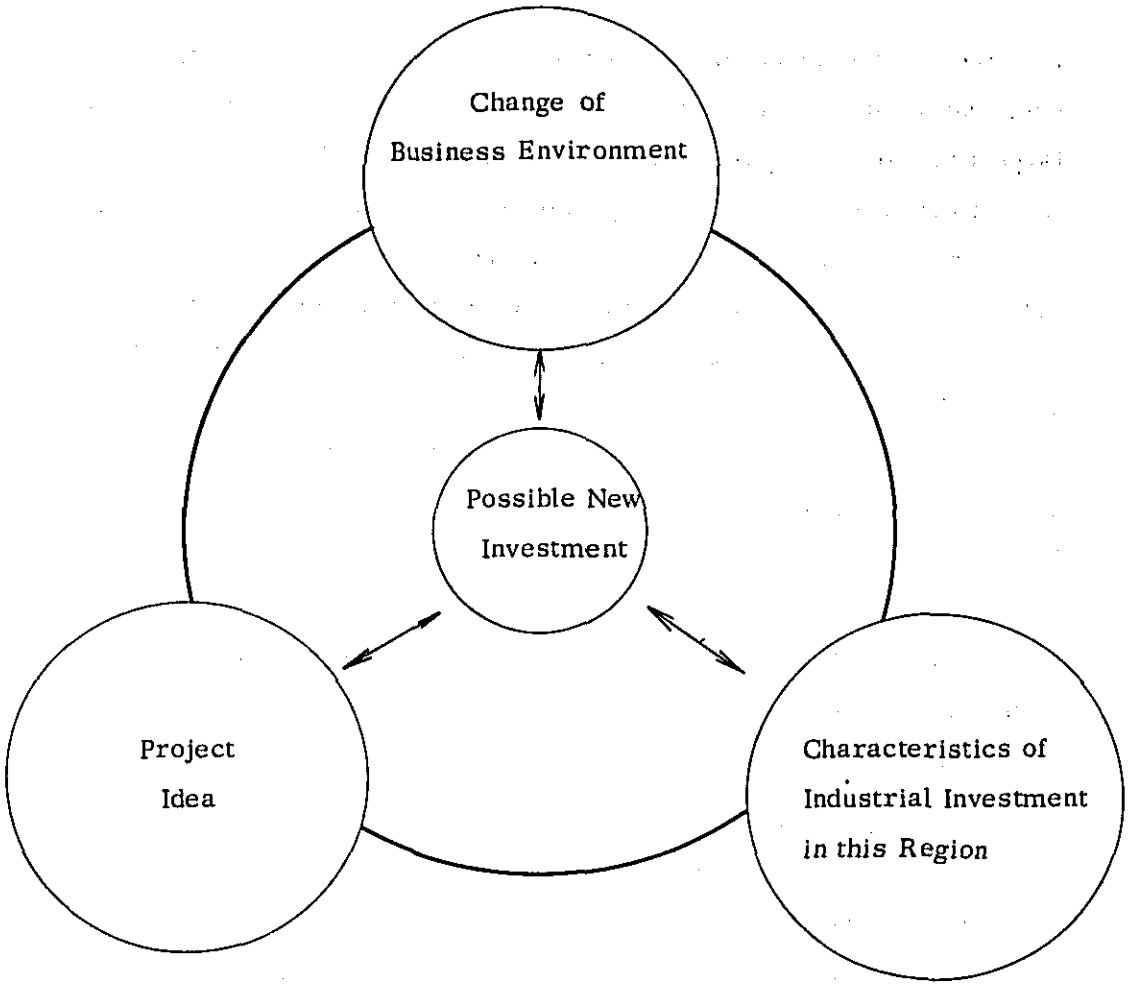
d. Discussion and brain storming with staffs of an international agency who had experience to charge in an industrial development program.

Next step was screening of the project ideas using several criteria as opti-minimum scale, requirement of engineers and technicians, availability of local raw materials of each industries and so on.

Those criteria were ruled out for possible project. The remainders were tentatively considered as projects with possibilities of being set up in the area.

This work for taking in the dynamic change of future economic development and development of various industrial infrastructures in the region is rather complicated. Nevertheless, the findings obtained by the work may not be sufficient in accuracy. However, in spite of the defect of the approach mentioned

above, it could be said that this is the only practical and applicable method to identify industrial investment opportunities in the region with a great number of projects. Following is a general outline of the works.



(6) In a changing business environment, such as development of a local economy, development of industrial infrastructure, technical innovations, and framework of international economy, feasibility of industrial projects would be also continuously changing. In other words, correlation between an environment and investment opportunities is dynamic and variable in a growing economy. A brief explanation of this concerning the regional conditions follows:

a. Projects that could be feasible immediately mainly consist of those types similar to the implemented projects, as well as those proposed under the Second Five-year Development Plan. They are the locally produced raw

material processing type for medium- or small-sized projects (mainly food industry, wood products, and ceramics), as well as the import substitution type for relatively small-sized projects (for example some metal products as well as some machinery).

b. There exists probability of industrial projects appearing in the near future with changes in the agricultural sector. South Sulawesi Province is the 4th largest rice producing region after the 3 provinces of Java. A shortage in the agricultural labor force is appearing due to movement of younger generation leaving rural area for urban area. To counter this situation, an agricultural mechanization program (SSS = South Sulawesi System) is being carried out. A study carried out with the cooperation of Gaja Mada University and Bogol University arrived at the conclusion that this was economically feasible and so a plan to introduce 7,370 small-sized tractors (amounting to 18,675 million rupiahs).was set up and in part is actually being carried out. With this demand alone, it would justify setting up of a knockdown production firm. Moreover, the SSS aims at a full scale mechanization of agriculture and so it is probable that there would be knockdown production firms of other types of agricultural machinery developed together with the progress of the SSS.

c. Many cargo vessels for inter-island trade and fishing boats are possessed by local people due to the development of inter-island trade and coastal fishing in the area. Changes are creeping up on cargo vessels as well as on fishing boats in the form of modern engine-powered ships replacing traditional sailing ships. Traditional ships are made by highly-skilled ship carpenters without using any blue print. For modern shipbuilding, however, modern facilities and modern technologies are necessary. Already two shipyards for the building of small-sized modern ship are set up in Ujung Pandang City. At the starting point of modernization, prospects of market maritime industries are considered promising. Projects such as shipbuilding, marine engines, and ship equipment could be realized in the near future here.

d. Symbolizing the modernization of this area is the rapid advance in the popularization of motorcycles. The ownership of motorcycles in South

Sulawesi Province has reached 60,000 units. The annual demand for motorcycles in Indonesia is already 260,000 units. Judging from the fact that four full-scale assembly plants are doing good business in Java, an assembly plant for the East Indonesian market would be feasible in the near future.

e. One of the changes that can be predicted in the medium- and long-term future is that the locally produced raw material processing industry would enter a mature stage of growth while on the other hand needs of people would be diversified with higher income level. In particular, the demand for durable consumer goods will become greater. As such a time, the import substitution projects for durable consumer goods would be in a good prospects.

f. Related with the Sadang River hydro power development project scheduled to be completed during the first half of the 1980's there is the possibility of the setting up of the following industries.

(a) Power transmission and distribution-related industries --- Electric wiring, power meters

(b) Diffusion of electricity-related supplies --- Light bulbs, flourescent lamps, household electric appliances

(c) Surplus electric power usage-related industries --- Non-ferrous metal smelting and refining

g. The industry which is expected to grow constantly and dynamically toward the long-term future is construction. In Ujung Pandang, construction companies are vigorously building bank offices and hotels and developing high-class residental quarters. In the future, as the industrial development and urbanization in Ujung Pandang proceed, they will build factories and office buildings and develop low-cost housing programs. So the market prospect of the construction materials industry is very good.

(7) The industrial projects which the Mission identified as possible of being established by 1990 are as shown in Table III-23.

Table III-23 List of the Feasible Industrial Projects in the South Sulawesi Province

(Legend)

L: Local
E: East Indonesia (except South Sulawesi)
D: Domestic (except East Indonesia)
F: Foreign

Field of Activities	Raw Material				Products' Market			
	L	E	D	F	L	E	D	F
1. Meat processing	X							X
2. Tinned fish	X							X
3. Fishing meal	X							X
4. Fish sausages	X				X			
5. Cold storage		X						X
6. Animal oil and fat	X							X
7. Cassava feed	X							X
8. Alfalfa feed	X							X
9. Assorted feed	X							X
10. Coffee processing	X							X
11. Banana flour milling	X				X	X	X	
12. Maize flour milling	X				X	X		
13. Wheat flour milling	X				X	X		
14. Rice milling	X							X
15. Starch	X							X
16. Sugar manufacturing and refinery	X				X	X		
17. Coconut processing	X				X	X	X	X
18. Coconut oil	X				X	X	X	X
19. Palm oil	X							X
20. Corn oil	X							X
21. Citronella oil	X							X
22. Peanuts oil	X							X
23. Rice oil	X							X
24. Bakery products	X				X			
25. Biscuit	X				X	X		
26. Candies and sweets	X				X	X		
27. Soy bean sauce	X				X	X		
28. Ice makings	X				X			
29. Ice-cream	X				X			
30. Soft drinks	X				X	X		
31. Markisa juice	X				X	X	X	X
32. Tobacco and cigarettes	X				X			
33. Agar-agar	X						X	X
34. Yarn thread				X	X			
35. Weaving			X		X			
36. Silk	X				X	X	X	
37. Coconut fiber	X				X	X		

Field of Activities	Raw Material				Products' Market			
	L	E	D	F	L	E	D	F
38. Rope				X	X	X		
39. Fish net				X	X	X		
40. Mosquito net				X	X	X		
41. Socks				X	X	X		
42. Men's shirt sewing			X		X	X		
43. Women's shirt sewing			X		X	X		
44. Children's shirt sewing			X		X	X		
45. Fatigue clothes sewing			X		X			
46. Hat			X		X	X		
47. Carpet			X		X	X		
48. Towelling			X		X	X		
49. Satin			X		X	X		
50. Cloth bags				X	X	X		
51. Leather tanneries	X							X
52. Leather products	X				X	X		
53. Shoes making	X				X	X		
54. Saw mill	X				X	X		
55. Plywood	X				X			X
56. Special plywood	X				X		X	X
57. Wooden boxes & containers	X				X			
58. Wooden refrigerator	X				X	X		
59. Wooden, bamboo furniture	X				X	X	X	
60. Rattan processing	X				X	X	X	X
61. Rattan furniture	X				X	X	X	X
62. Ebony handicrafts	X				X	X	X	X
63. Wooden handicrafts	X				X	X	X	X
64. Bamboo handicrafts	X				X	X	X	X
65. Paper making	X				X	X	X	
66. Carton boxes	X				X	X		
67. Cardboard boxes	X				X	X		
68. Kraft paper	X				X	X		
69. Tissue paper	X				X	X	X	
70. Notebooks	X				X	X		
71. Tires & tubes for bicycle	X				X	X		
72. Reclaimed rubber	X				X			
73. Hoses, belts	X				X	X		
74. Asphalt	X				X	X		
75. Beach sandals				X	X	X		
76. Petro-chemical products*			X		X		X	X
77. Fertilizer			X		X	X		
78. Caustic soda	X				X	X		
79. Salt	X				X	X		
80. Medical drugs				X	X	X		
81. Agricultural chemicals				X	X	X		
82. Paints				X	X	X		
83. Adhisives				X	X	X		

Field of Activities	Raw Material				Products' Market			
	L	E	D	F	L	E	D	F
84. Soap				X	X	X		
85. Detergents				X	X	X		
86. Dry ice			X		X			
87. Cement	X				X	X	X	
88. Tile	X				X	X		X
89. Ceramic ware	X				X	X		
90. Sanitary ware	X				X	X		
91. Glass	X				X	X		
92. Bricks	X				X	X		
93. Glass tableware				X	X	X		
94. Glass bottles				X	X	X		
95. Plate glass				X	X	X		
96. Concrete blocks	X				X			
97. Concrete poles/piles	X				X	X		
98. Hume concrete pipes	X				X	X		
99. Asbestos sheets	X				X	X		
100. Plaster boards	X				X	X		
101. Paving materials	X				X			
102. Building stone	X				X			
103. Mortar	X				X			
104. Eternite boards	X				X	X		
105. Iron & steel				X			X	X
106. Nonferrous metallic smelting				X				X
107. Electro-plating				X	X			
108. Iron and steel wires				X	X	X		
109. Bolts, nuts				X	X	X		
110. Can manufacturing				X	X	X		
111. Wood screw				X	X	X		
112. Nails				X	X	X		
113. Wire netting				X	X	X		
114. Aluminum housewares				X	X	X		
115. Wheels				X	X	X		
116. Agricultural tools				X	X	X		
117. Hand tools				X	X	X		
118. Cutlery, tableware				X	X	X		
119. Cooking ranges				X	X	X		
120. Oil lamps				X	X	X		
121. Instrument for ship				X	X			
122. Structural Material				X	X	X		
123. Door-knobs, window-knobs				X	X	X		
124. Screws				X	X	X		
125. Casting	X				X	X		
126. Electric wire				X	X	X		
127. Electric covered wire				X	X	X		
128. Small size diesel engines				X	X	X		
129. Small generators				X	X	X		

Field of Activities	Raw Material				Products' Market			
	L	E	D	F	L	E	D	F
130. Small size tractors				X	X	X		
131. Manual sprayer				X	X	X		
132. Power sprayer				X	X	X		
133. Manual duster				X	X	X		
134. Power duster				X	X	X		
135. Rice-hulling machine				X	X	X		
136. Rice-milling machine				X	X	X		
137. Pumps				X	X	X		
138. Oil refrigerators assembly				X	X	X		
139. Television receiver sets				X	X	X		
140. Radio receivers			X		X	X		
141. Sound recorder				X	X	X		
142. Calculating machines				X	X	X		
143. Typewriter				X	X	X		
144. Electric bulb				X	X	X		
145. Fluorescent lamps				X	X	X		
146. Electric refrigerator				X	X	X		
147. Electric fan				X	X	X		
148. Switchboards				X	X	X		
149. General use motor				X	X	X		
150. Transformer				X	X	X		
151. Car battery				X	X	X		
152. Assembling automobile				X	X	X		
153. Assembling bicycle				X	X	X		
154. Assembling small-sized track				X	X	X		
155. Assembling large-sized track				X	X	X		
156. Parts industry				X	X	X		
157. Repair of automobile	X				X			
158. Ship building & repair				X	X			
159. Polyethylene form				X	X	X		
160. P. P. yarn bags				X	X	X		
161. PVC pipes				X	X	X		
162. Container boxes				X	X	X		
163. Plastic containers				X	X	X		
164. Polyester buttons				X	X	X		
165. Gold & silver handiworks			X		X	X	X	
166. Sign pen				X	X	X		
167. Ball point pens				X	X	X		
168. Sewing machine needles				X	X	X		
169. Chalk	X				X	X		
170. Matches	X				X	X		

(Source) Prepared by the Mission.

5. Possibilities of Resettling the Existing Industries to Ujung Pandang Industrial Estate

1) Situation of the existing firms

(1) As of 1976, the number of firms listed by the South Sulawesi Government totaled 3,848. Of these firms, some will most likely move to the new industrial estate when the Ujung Pandang Industrial Estate is constructed. However, when studying the possibility of resettling the existing firms, it will not be practical to make all the 3,848 firms the object. The question of the resettling of the firms should be studied with the existing firms in Ujung Pandang City as the target. The reasons for not including the firms outside the region are as follows:

a. It is believed that there would be more demerit than merit if firms outside the city are resettled to the Ujung Pandang Industrial Estate. A resettlement of this kind would become a factor in reversing the industrial development of an area and would also be a factor which would unduly concentrate the overall industrial development of South Sulawesi into Ujung Pandang.

b. The existing industries are contributing to the industrial development of Kabupaten and are a source of tax revenue and therefore there is little possibility of a chief of Kabupaten to approve their resettlement. For example, there is an industrial agglomeration following that of Ujung Pandang City at Sung Minasa (Kabupaten Gowa) only 11 km distant from Ujung Pandang City, which would constitute the main candidates resettlement other than the city. But there is little possibility of receiving approval from Kabupaten for resettlement of the firms to Ujung Pandang.

(2) In contrast to this, the existing firms in Ujung Pandang City have little institutional obstacles and for this reason the possibility for resettlement is high. Not only from this, but from the point of orderly development of the city, the resettlement program should be actively carried out, instead. A guideline has been set forth already for Ujung Pandang City to become the framework for future development and for this purpose areas have been designated for residential home development and industrial development. Under the guideline,

the existing firms will be expanded and new firms are set up in the industrial development area. This guideline is actually in effect and new firms are spreading out radially from the Old Makassar area (to be explained later). The Ujung Pandang Industrial Estate will serve as a saucer to heighten the realization of the guideline.

For the above reasons, the Mission considered the matter of resettlement of firms of Ujung Pandang City.

(3) At present, there are 1,288 firms in Ujung Pandang City. Significant points concerning the situation of these firms as well as the future resettlement program are as follows:

a. The existing firms are concentrated in certain areas within Ujung Pandang City and this is creating some bad effects. The location of the firms in Ujung Pandang are as shown in Fig. III-8 (the areas have been designated by blocks A, B, C, D, E, and F are only for the convenience of the analysis. Actually there is no such designation.). The greatest significance in Fig. III-8 is that the overwhelming majority of the firms are concentrated in the old Makassar area blocks B, C, and D. In fact, nearly 90 % of all the firms are concentrated here. The reasons for the firms being concentrated here are: (a) as a historical factor, up to only recently the Old Makassar area and its environs were the city district while the other areas were rural districts; and (b) as an economical factor even today, the area is favored by its proximity to ports and to the market place.

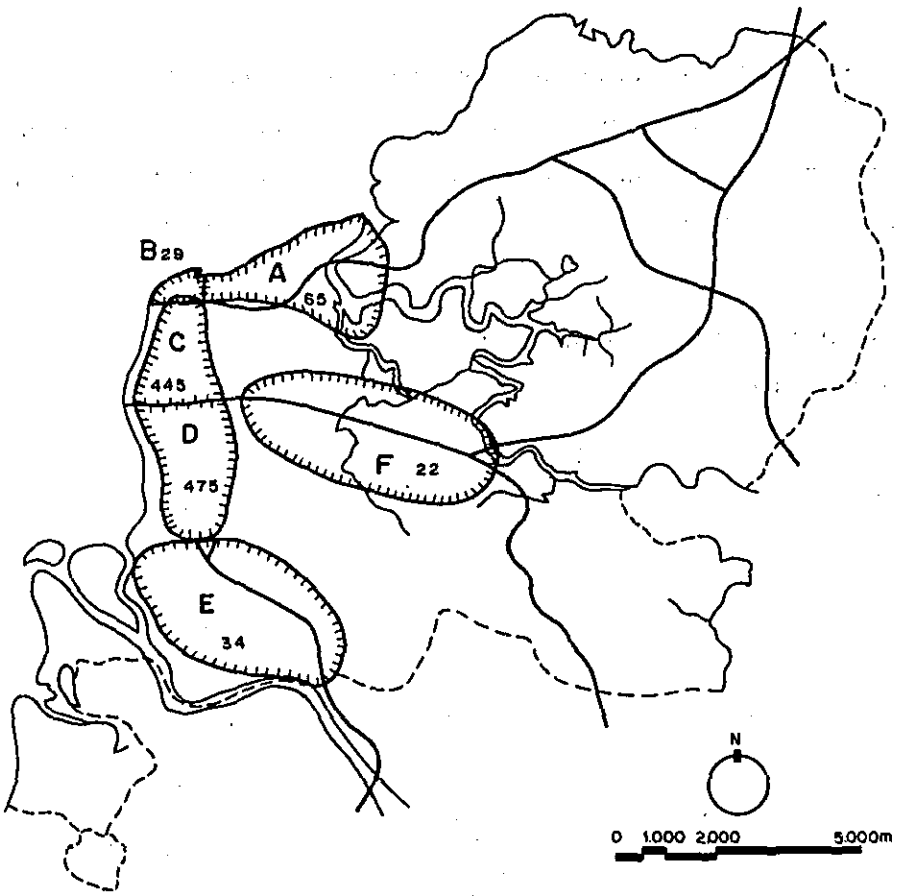


Fig. III-8 Location of existing farms in Ujung Pandang City

(Source) Prepared by the Mission

Table III-24 Location of the Existing Firms in Ujung Pandang City (1976)

Name of Block	Number of Firms	Composition (%)
A	65	6. 1
B	29	2. 7
C	449	41. 6
D	475	44. 4
E	34	3. 2
F	22	2. 0
Total	1,070	100. 0

(Note) This data cover 83 % of the number of firms in the City.

(Source) Prepared by the Mission from the Provincial Industrial Office's Data.

The firms in operation in the Old Makassar area are generally small in size and their production processes are also simple and it would not be an overstatement to say that compared to the developed countries there is little pollution or noise. However, as these firms are literally right next doors to residential homes and shops, it is a fact that even the smallest pollution, bad odor, or polluted drainage water are causing pain to the residents. It is said that more than 10 cases of grievances concerning industrial pollution have been brought to the city authorities.

The Old Makassar area has an especially dense population within the city district and the government and commercial center functions and facilities are centered here. There is the need to recognize it as a grave problem that the mingling of the firms will become the cause of a confusion in function. From this consciousness of the situation, (i) it would not be desirable to increase the number of firms any further, and (ii) the present firms should be resettled to the designated area, as much as possible.

b. It is estimated that the land area of the above firms is between 80 - 90 ha. At the request of the Mission, a survey was carried out on the area per worker. When viewing the 1,022 small and medium-sized firms covered at that time in the Old Makassar area (Blocks B, C, and D), this was as follows:

Building area	231,868 m^2	(approx. 23.2 ha.)
Open space	243,605 m^2	(approx. 24.3 ha.)
Total	475,473 m^2	(approx. 47.5 ha.)

Converting this to average space per firm, the building space would be 227 m^2, the open space 238 m^2, and the total 514 m^2, or 0.05 ha. From this it can be seen how small the firms are. Concerning the 266 firms in the areas other than the Old Makassar area, i.e. Blocks A, E, and F, no survey has been carried out but in this area there are 10 firms with an area of about 1.5 to 2 ha, including a comparatively large coconut oil factories, woodworking firms, a galvanized iron sheet firm, iron rod plant, a small-sized truck assembly (knock down) plant, and a motor vehicle assembly (knock down) plant. There is also a shipyard which is a government project as well as a private

shipyard with a land area of about 5 ha. respectively. If the areas of the remaining small and medium-sized firms are taken to be the same as in the case of the firms in the Old Makassar area, then this would be about 13 ha. With the above, this would give 38 - 43 ha.

Large firms	15 - 20 ha.
Shipyards	10 ha.
Others	13 ha.
Sub-total	38 - 43 ha.

2) Concerning the possibility for the resettlement of the existing firms

(1) At the time the Mission went to carry out the survey, there was the restriction that the Ujung Pandang Industrial Estate plan could not be made known publicly as there was the need to prevent land speculation. Therefore, concerning the possibility of resettlement of the existing firms this was considered from the point of information obtained through interviews with the leading firms and through adding the Mission's evaluation after viewing the location of the existing industries.

(2) The existing firms are facing the need to carry out investments for expansion and modernization as they are in an environment where the market is growing and where a technical innoration is taking place. At present, about 30 % of the leading firms (the largest firms within a industrial category) have an intention to carry out investments while the ratio of the other firms is seen to be much lower. However, it is certain that in the near future changes will take place that will motivate the firms owners to make investments, such as for the development of the market, in the area, as well as the for the advancement of industrialization. It is believed that the majority of these firms which have no intention of making investments at the present time will in the near future have this desire.

(3) At the time the existing firms carry out investments, they will resettle their facilities if the expansion of their present facilities should be extremely disadvantageous at their present location. This will be a push factor. Also, they will resettle their facilities if a plant area exists which is extremely favorable to them. This will be a pull factor.

The push factors and the pull factors for the resettlement of the firms of Ujung Pandang City are as follows:

Push factors (concerning the Old Makassar area)

1. The guideline of the government concerning establishment of firms -- The city authority is promoting to establish in designated industrial districts.
2. High price of land in the downtown -- Land prices have risen from Rps. 10,000 to Rps. 40,000 per square meter and therefore are too high to be purchased as a plant site.
3. Being adjacent to shops and to residential homes there is no space to expand.
4. The residents in the area harbor grievances making the possibility of resistance against expansion strongly.

Pull factors (concerning the completed Ujung Pandang Industrial Estate)

1. Government encouragement.
2. Compared to the city area, land prices may be low.
3. The industrial estate provides an infrastructure that is far better than that in the downtown.
4. Training can be received, both technical and managerial mordanization.

(4) The clear differences in the conditions of the location factors brought about by the completion of the industrial estate, as mentioned in (3) above, can be expected to bring a considerable number of firms to the Ujung Pandang Industrial Estate from the Old Makassar area. The number of firms resettling from other areas such as the present industrial areas of Blocks A, E, and F is not believed to be many. This is because in these areas the push factor will not be so effective.

Including the Old Makassar area, a number of firms in the city are receiving considerable merits in their present locations and so even when the Ujung Pandang Industrial Estate is completed it is believed that they would not move their present plants to the new industrial estate. For example, the largest rattan processing firm in this area has set up its facilities at the back of Makassar

Port and as the rattan materials are supplied through Makassar Port and the products exported from the port, the firm considers this the ideal location. Therefore, even should a need arise in the future for investments to expand or to modernize the firm would not make to consider setting up their facilities away from their present site and surrounding. The owner of the sawmill in Block A has almost the same thinking.

Another reason for not resettling their plants and staying at their present location is the difficulty in obtaining funds needed for the resettlement. The number of plants applicable to this case are believed to be the most.

3) Recommendations to the Government of the Republic of Indonesia on this matter

It is suggested that for the analysis of the possibility for the existing firms' resettling to the Ujung Pandang Industrial Estate, an independent survey should be carried out. This will serve as the necessary basic survey for the development plan of the city and for the development plan of the industrial estate.

The basic premise for the effective carrying out of this survey is that an outline of Ujung Pandang Industrial Estate must be shown to the factory owners. Also, if some form of incentive is to be provided concerning the resettlement of existing firms, the details of such should be made clear.

Based on this, a questionnaire form will be prepared and a questionnaire survey carried out covering the items necessary for the analysis, such as whether the existing firms owners have any intention to resettle and their reasons, the details of the expansion plan and investment plan for modernization as well as the financial capability of the existing firms. Moreover, an interview survey will be carried out on those firms owners who have an intention of resettling and resettlement forecasting data of extremely high accuracy will be prepared.

The costs required for the survey is estimated at around Rps. 820,000 not including printing.

1. Cost for preparing questionnaire

Personnel cost	9 man days	36,000 Rps.

	Printing		
	Mailing, collecting		140,000 Rps.
2.	Costs for interviewing	100 man days	400,000 Rps.
3.	Analysis work	60 man days	240,000 Rps.
4.	Preparation of reports		-
5.	Total		816,000 Rps.

6. Assumption of Possible Occupants for the Industrial Estate

1) Identification of possible occupants

(1) The possible industrial projects that can be set up in this area (Section 4) as well as the existing industries in the Ujung Pandang City (Section 5) are the potential candidate occupants but their possibility of becoming occupants will vary depending on a location policy of each industrial project or a basic policy of the new industrial estate concerning promotion or prohibition to each project. For example, the cement factories and sugar factories will not want to set up their plants within the city area as they must be close to the location of their raw materials. A cassava feed factory which requires a great quantity of industrial water and drainage water and causes high degree of pollution will be probably rejected to become an occupant of the industrial estate. Therefore, it will be necessary to identify those firms which have a high possibility of becoming an occupant in the Ujung Pandang Industrial Estate from among those industrial projects, mentioned earlier, which are possible of being newly established, as well as from the existing firms.

(2) Judging from the development objectives of the Ujung Pandang Industrial Estate project and from necessity to get financial stability of the project, the following would most likely constitute the basic principles required to the occupants.

1. The locational requirement of a candidate occupant would be equivalent to the location of the estate.

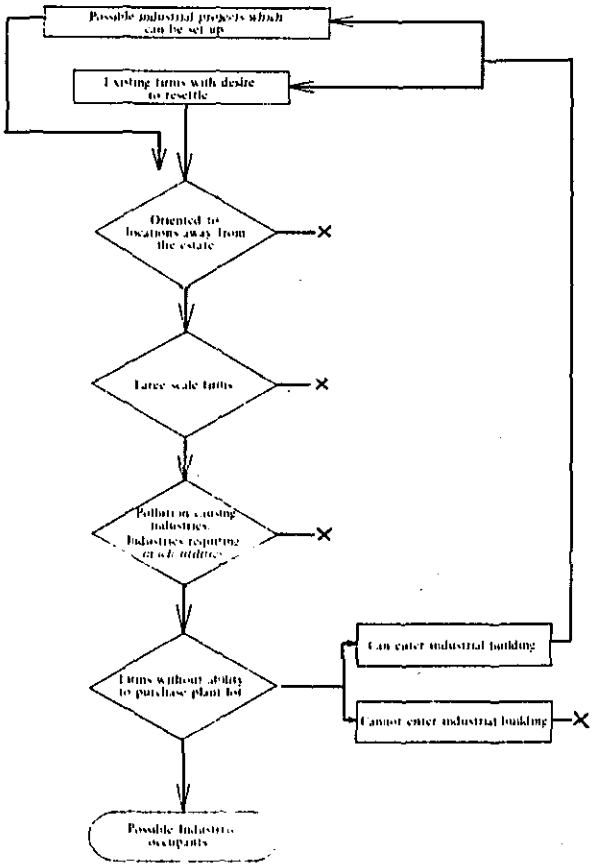
2. The category of the occupant would be the medium - small scale industries.

3. No pollution would be spread by a candidate occupant to outside the industrial estate.

4. The utilities provided by the industrial estate will be sufficient for the operations.

5. The plant lot or industrial building provided by the industrial estate will be suitable for the operation.

According to the basic principles mentioned above, the flow chart of the study was set up as in Fig. III-9.



(Source: Prepared by the Mission)

Fig. III-9 Flow Chart for the Study of Possible Industrial Occupants

(3) The industrial firms which, it is believed, would not set up their plants in the industrial estate are as follows:

(5)	Cold storage	(79)	Salt manufacturer
(8)	Alfalfa feed	(87)	Cement
(6)	Sugar manufacturing and refinery	(105)	Steel
(65)	Paper manufacturing	(106)	Non-ferrous metal smelting
(76)	Petrochemical	(158)	Shipbuilding, ship repair
(77)	Fertilizer		

(Note) Numbers in parentheses denote identification number.

(4) Apart from those mentioned in (3) above, there are no other large firms which should be rejected occupancy for the reason of size.

(5) The most important items which will be checked as concerns occupancy would be that of requirement for industrial water and industrial pollution by an occupant. It may be desirable that some controls be instituted by the industrial estate as concerns those industries which require a large quantity of water, as well as those with high industrial pollution. In particular, industries which would place an unfairly large burden on the industrial estate corporation or to the local community compared to their benefits should be prohibited from occupancy. Those types of industries which it is believed should be prohibited from becoming occupants are as shown in Table III-25.

Table III-25 List of Industries which should be Prohibited to enter the Estate

	Requiring much water	Causing water pollution	Creating bad odors	Using harmful substances
(3) Fish meal	X X X	X X X	X X	
(6) Animal fats and oil	X	X X	X X	
(7) Cassava feed	X X X	X X X		
(15) Starch	X X X	X X X		
(36) Silk	X X X	X X		
(51) Tanneries		X	X X X	
(78) Caustic soda	X X X			X X X
(84) Soap	X X X			
(107) Electroplating				X X X
(127) Electric covered wire				X X X
(151) Car battery				X X X

(Note) X X X : very much
X X : much
X : little
Blank : not applicable

(Source) Prepared by the Mission

(6) If the minimum lot size in the industrial estate is set at 0. 5 ha., then it must be taken that there will be a considerable number of small-sized firms which will not require that much space. In the category which includes miscellaneous textile products, leather products, handicrafts, and plastic, among others, there are many which need only 0. 2 - 0. 5 ha. The existing firms in the Old Makassar city area are small size firms with an average space of 0. 05 ha. To accommodate small-sized projects such as these the normal measures are to build an industrial building and lease the floor.

2) Land requirement

(1) It is estimated that the total lot space required at the Ujung Pandang Industrial Estate, with full occupancy would be 140 ha. to 160 ha.

a. Cumulative estimate

When the minimum space requirement of each potential occupant plant mentioned in 6-1) above is totaled this will constitute the total space requirement. The minimum space for each project has been estimated, based on the industrial profile of the developing countries. Of course, it will not be an overstatement to say that not even a notion exists concerning the minimum size as concerns the small scale industries such as handicrafts and miscellaneous textile products and so a figure of an average of 0. 2 ha. has been applied. The results of the estimate are as shown in Table III-26 being approximately 150 ha.

III-26 Estimated Land Requirement (net)

	(ha)
Foods	25.0
Textile	9.0
Wood products	15.0
Paper products	4.5
Chemicals	4.5
Ceramics	27.0
Metal products	17.5
Mechinery	39.5
Others	7.0
Total	149.0

(Source) Prepared by the Mission

b. Estimate by the macro approach

What is meant by estimate by the macro approach is the backward calculation of industrial land demand on the basis of the future value of industrial production forecast by the Mission. Of course, this estimate, which com-

plements the above-mentioned cumulative estimate, calls for some assumptions.

i) Industrial factory area in South Sulawesi Province in 1973 is estimated at about 200 ha. As we estimated earlier, factory area in Ujung Pandang in 1976 is 80 to 90 ha. The figure in 1973 is assumed to have been 80 ha. Although the factory area in the province outside Ujung Pandang City is not known for certain for lack of data, the figure comes to about 120 ha. on the assumption that the area per factory is about the same as in the Old Makassar district. Since factory sites are easily available in rural areas, the 120 ha. may be an understatement, but we will use this figure for the sake of convenience.

ii) If the value of industrial production per hectare of factory site remains unchanged in the future, total factory are should increase in proportion to the increase in industrial production. And the increase in industrial factory area will reach 1,574 ha. by 1990:

$$200 \text{ ha.} \ (1 + 0.137)^{17} = 1,774 \text{ ha.}$$

$$1,774 \text{ ha.} - 200 \text{ ha.} = 1,574 \text{ ha.}$$

iii) However, industrial production per hectare of factory site is believed to increase in response to industrial development. This increase will come from the two factors -- a rise in labor productivity (increase in production per worker) and a decrease in employment per hectare.

$$P/A = P/L \cdot L/A$$

P : industrial production

A : factory area

L : number of laborers

From the target of manufacturing operation in the Second 5-year Plan, the increase in labor productivity is estimated at about 6 % per annum. Assuming that about 170 employees per hectare of factory area in Ujung Pandang City will decrease to 125 employees per ha. as targeted for the industrial estate for 1990 (see Fig. III-10), the decrease in employees per hectare of factory area is estimated at 2 % per annum. From these estimates, production per hectare of factory area will increase at an annual rate of 5.7 %.

$$13.7\,\% - 6\,\% - 2\,\% = 5.7\,\%$$

This calculation leads us to believe that the expected increase in the demand for factory area by 1990 will not be 1,574 ha. but 618 ha.

$$1,574 \text{ ha.} \div (1 + 0.057)^{17} = 618 \text{ ha.}$$

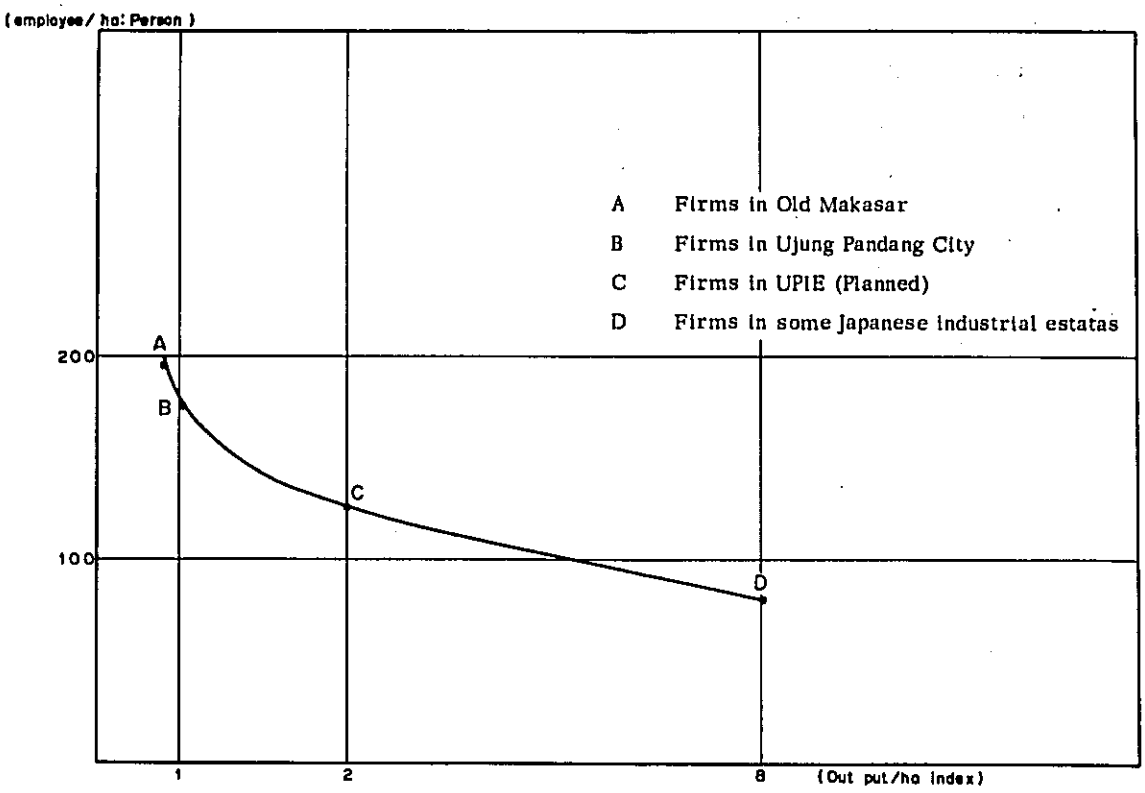


Fig. III-10 Correlation of Land and Labor Productivity

(Souce) Prepared by the Mission

iv) Taking into account the plans to set up many large-scale factories outside Ujung Pandang City, the demand for factory sites within the city is estimated at 205 ha., or one-third of 618 ha. (The present percentage is estimated at about 40 %.)

v) All the 205 ha. will not be supplied by the Ujung Pandang Industrial Estate because the candidate sites are located inland and thus cannot meet the demand for sites for coastal industries like shipbuilding. Moreover, there is a possibility that some investors have secured factory sites some-

where within the city. If these sites outside the industrial estate account for about one-fourth of the total, then the demand for sites within the industrial estate will amount to about 153 ha.

vi) Apart from the afore-mentioned new demand for factory sites, there is a demand for sites for relocation of the existing factories. It is highly difficult to estimate this demand, which heavily depends on actual resetllement programs. Assuming that 10 % of the 47.5 ha. of factory sites within the Old Makassar district is to be relocated, the demand for resetllement comes to about 4.7 ha. However, what motivate factory relocation are expansion and modernization, which call for a threefold expansion of factories in most cases. Therefore, on the same assumption, the demand would amount to about 14 ha.

vii) This brings the total demand for factory sites to 167 ha. The difference of 18 ha. between the accumulative estimate of 149 ha. and the macro estimate of 167 ha. comes from the difference in approaches, and these two figures should be considered virtually identical for the purpose of estimation.

These estimates obtained by the two difference approaches lead us to conclude that the demand on the safe side for industrial factory area lies between 140 ha. and 160 ha.

(2) It can be assumed that the demand for land will be as shown in Table III-27 when divided into immediate, medium and long term. Generally, it is believed that demand for plant space will increase in parallel with industrial development but as far as the Ujung Pandang industrial estate project is concerned, the immediate demand will be comparatively large. The reasons for this are as follows:

1. There are a large number of projects awaiting approval. This is because while the local government has designated a northern part of Ujung Pandang City as an industrial area, infrastructure in that new industrial area is not developed. Thus, the firms cannot decide on a location and are obliged to wait for approval, because the planned location is one of the essential items to complete the application to get the approval.

It is believed that when the industrial estate is constructed the first firms desiring to become occupants will be these waiting projects.

2. An opti-minimum space of those firms with early possibility, i.e. the food industry, the wooden products factsries and ceramic factories will be relatively large among the candidate projects.

In contrast to the above, it is believed that the demand for space will decrease for the medium and long-term. However, if the local economy should develop steadily, firms of a considerably higher level than those of the initial period and the medium-term will become occupants in the long-term.

Table III-27 Estimated Land Requirement by the development stages

	immediate	0.5	1.0	2.0	3.0~	medium-term	0.5	1.0	2.0	3.0~	long-term	0.5	1.0	2.0	3.0~
Food	16.5	3.5	3.0	2.0	8.0	8.0	2.0	2.0	4.0	-	0.5	0.5	-	-	-
Textiles	4.0	1.0	3.0	-	-	2.0	1.0	1.0	-	-	3.0	-	-	-	3.0
Wood	9.0	-	1.0	2.0	6.0	2.5	0.5	-	2.0	-	3.5	0.5	-	-	3.0
Paper & pulp	3.0	1.0	2.0	-	-	1.5	0.5	1.0	-	-	-	-	-	-	-
Chemicals	3.5	2.5	1.0	-	-	1.0	1.0	-	-	-	-	-	-	-	-
Ceramics	17.0	-	6.5	4.5	6.0	7.5	0.5	2.0	2.0	3.0	2.5	-	-	2.5	-
Metals	5.5	3.5	2.0	-	-	9.5	0.5	1.0	-	8.0	2.5	0.5	-	2.0	-
Machinery	9.0	2.0	1.0	6.0	-	9.0	0.5	3.0	2.5	3.0	21.5	1.0	2.0	8.5	10.0
Others	3.5	2.5	1.0	-	-	3.5	3.5	-	-	-	-	-	-	-	-
Total	71.0	16.0	20.5	14.5	20.0	44.5	10.0	10.0	10.5	14.0	33.5	2.5	2.0	13.0	16.0

(Source) Prepared by the Mission

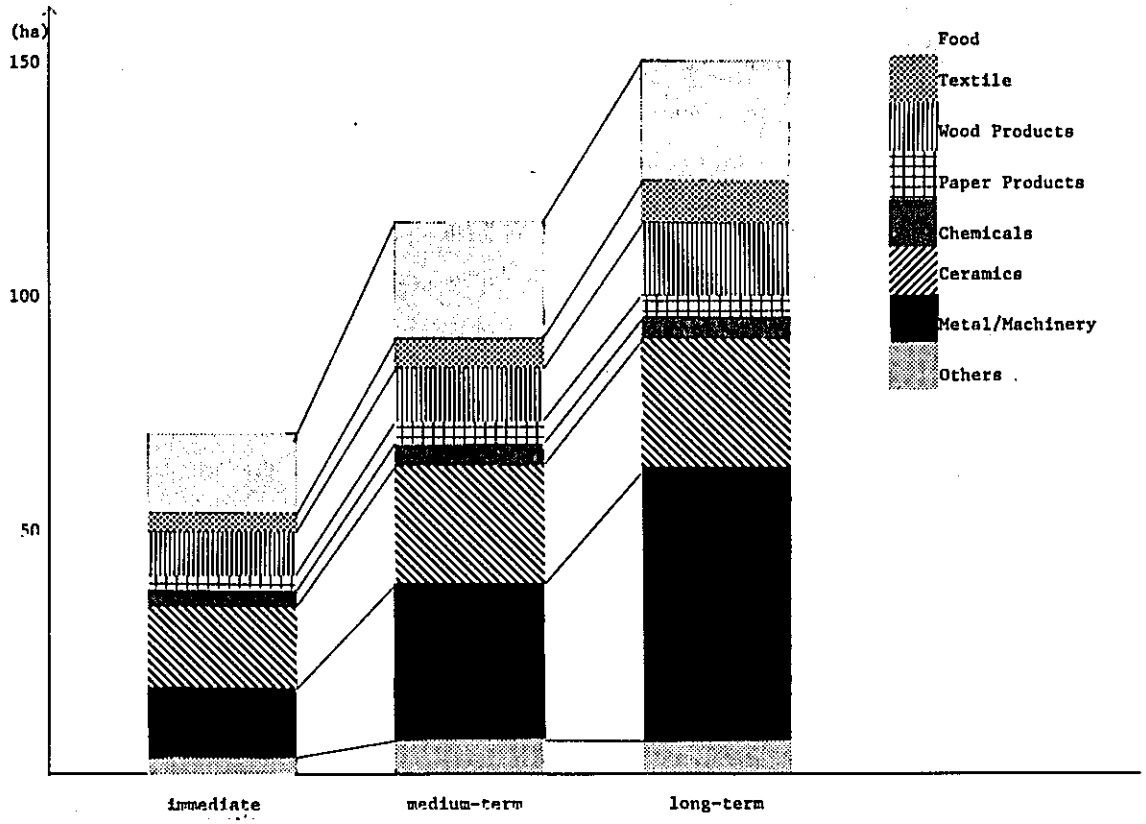


Fig. III-11 Accumulated Land Requirement of Possible Occupants

(Source) Prepared by the Mission

3) Utilities and facilities

(1) Table III-28 shows a brief outline of the industrial estate at its full development stage.

(2) The amounts of industrial water and electric power to be supplied by the Ujung Pandang Industrial Estate would be almost equal to those supplied by an ordinary inland-type industrial estate.

(3) Sufficient facilities should be prepared for commutation of employees and transportation of industrial materials and shipment of products.

Table III-28 Outline of the Estate at a Full Development Stage

Industries (ISIC)	Plant site area (ha)	No. of employees	Output ($1000/day)	Industrial water (t/day)	Electricity (kWh/day)
31 Food	25.0	3,300	146	3,400	13,190
311-2 food	19.5	1,475	100	2,350	9,430
313 beverage	2.5	1,630	42	1,000	3,460
314 cigarette	3.0	195	4	50	300
32 Textile	9.0	3,670	60	170	8,220
321 weaving	3.0	750	23	110	5,500
322 garments	6.0	2,370	25	50	2,710
323 leather product	-	150	3	5	5
324 shoes making	-	400	9	5	5
33 Wood Products	15.0	3,230	62	150	11,000
331 wood products	9.5	530	12	140	10,800
332 furniture	5.5	2,700	51	10	200
34 Paper Products	4.5	800	19	90	150
341 paper products	4.0	650	17	90	130
342 printing	0.5	150	2	-	20
35 Chemicals	4.5	1,300	42	500	200
352 chemicals	2.5	850	32	400	130
355 rubber products	2.0	450	10	100	20
36 Ceramics	27.0	1,700	67	1,160	25,000
361 ceramics	10.0	680	40	540	12,600
362 glass products	3.0	300	5	100	7,500
363 others	14.0	720	22	520	4,900
38 Metal Products and Machinery	57.0	9,340	279	2,500	56,000
381 metal products	17.5	1,920	52	1,280	21,000
382 machines	8.5	1,850	50	640	10,000
383 electric apparatus	14.5	3,850	103	320	10,000
384 transportation equipment	16.5	1,720	74	320	15,000
39 Others	7.0	1,740	40	50	200
Total	149.0	25,080	715	8,020	113,960

(Source) Prepared by the Mission

7. Strategies to Induce Firms and the Need for Protection and Incentives

(1) The firms which it is believed will become occupants of the Ujung Pandang Industrial Estate present no problems when compared with the higher-level policies and plans or with the industrial estate development plan. In other words, they are industries which can obtain a passing mark. Put in another way, these industries may directly contribute to perform the target of the higher-level policies and plans and the industrial estate development plan, i.e. the development objectives. Therefore, there is sufficient reasons for the government to provide protection and assistance to these firms in the event for some reasons the industrial projects become infeasible.

(2) The greater the protection and assistance from the government, the greater will be the desire on the part of the firms to make investments but on the other hand, from the long range point of view this would lead to the creation of investments without essential competitive strength and which would be a negative factor to industrialization. Apart from the following two cases, it is believed that protection and assistance exceeding the normal should not be given by the government, regardless of whether the firm concerned which becomes an occupant of the industrial estate will be important for the industrial and economic development of the region.

a. Strategic industries which the government would like to nurture and which are willing to become an occupant but which require investments and facilities exceeding their financial capacity (Refer to (c) below).

b. In the event the existing firms are forcefully resettled to the industrial estate due to the need for urban development by the government.

c. The following is an explanation of (2)-a above taking the agricultural machinery firms as an example.

It is necessary that for the development of the economy of South Sulawesi Province diversification be carried out through industrialization and through extricating the economy from an agricultural monoculture. Based on this reasoning, and taking note that introduction of agricultural machinery has started in some parts of the province, then naturally the idea can be conceived

of introducing agricultural machinery forms into the Ujung Pandang Industrial Estate. At the present stage, a small size tractor knockdown production would be feasible. However, from the fact that the medium-term and the long-term plans call for the mechanization of the agri-industry it would be desirable not only to set up a knockdown plant for one line of machinery only but rather to set up a production system for a total line of agricultural machinery. Moreover, from the fact that the agricultural machinery producers have a store of know-how as concerns agri-mechanization great contributions can be made to the promotion of the mechanization of the agri-industry by first setting up a full line agricultural machinery production center in the industrial estate and a test course in the center. Also, by carrying out a full line production it will be possible to realize production of common parts as well as production of materials even though the lots for each type may be small. This will also contribute greatly to industrialization. That is, the benefits brought forth by placing priority on the induction of a strategic industry of this kind will be many. Therefore, the government should position this as a comprehensive program extending over both the agricultural sector and the industrial sector and take steps so that the participating private firms will not be overly burdened with initial investment funds, through offering them protection and incentives.

(3) Generally, this would be as follows:

The promotion of the development of the regional economy, the promotion of regional industrialization, and the role of the development center of East Indonesia, which are the highest objectives for the industrial estate development plan, will be difficult to realize unless these strategic industries or industrial groups are introduced.

Although not as typical as an agri-machinery industry center, it should be possible to set up strategic industries (or industrial groups) among those industries with a high scale merit, as well as industries with a collectivation merit. In detail, the applicable industries will be the woodworking industry group composed of the sawmill-wood furniture firms and the ceramics industry group composed of the various ceramics firms.

These strategic industries (or industrial groups) will in addition to helping attain the objectives of the development, mentioned earlier, also become good clients greatly contributing to the finances of the Industrial Estate Company. This is because the demand for space will be speeded up and the area of the land requirement will become larger than when compared to the event the strategic industries (or industrial groups) are not formed.

(4) To repeat, the normal incentives and protection granted to those firms presumed to become occupants of the industrial estate should also be granted to those firms not positioned as strategic industries. What must be emphasized concerning this point is that there is a need to overcome the various demerits arising out of the locality of this area and to build up objective conditions which would make possible the setting up of industries with normal incentives and protection. Even though there is quality under the Investments Law, if for reasons of lesser administrative efficiency, among others, the firm is caused to suffer a demerit, then this will not mean that normal incentive and protection has been granted. From this context, the programs which should be carried out by the government are not necessarily satisfactory in the present condition and there is the need to promote the projects even more positively. It is considered that it would be desirable that the execution and improvement of the following programs be carried out urgently.

1. The carrying out of studies on industrial project development in the region (the setting up of a regional industrial development center).
2. The introduction of engineers and skilled labor through trans-immigration program and the setting up of a training program for local talent.
3. Making the procedures for approving industrial projects more efficient.
4. The extension of the funds lending limit for industrial projects as well as the rationalization of the procedures.

IV. SELECTION OF SITES : FACTORS AND EVALUATION

IV. SELECTION OF SITES: FACTORS AND EVALUATION

1. Optimal Areas for Industrial Estates

In this section we will show how we have chosen certain areas as appropriate for industrial estates, while excluding certain others. We approached the task from the dual perspectives of urban planning and land conditions. The details will be found in the pre-feasibility survey submitted previously.

1) Industrialization and Location of Industrial Estates

The development strategy for industrialization and the geographical location of industrial estates are closely related in the context of urban planning. In planning for the development of an industrial estate in the Ujung Pandang area, it is possible to envision the following three phases.

The first phase would involve the formation of an industrial estate for such industries as food and metal processing. Each plant will be allotted an area ranging from 0.5 to 3.0 hectares. The location of such an estate is clesired to be about 10-15 kilometers from the downtown areas or the center of the city if easy access by automobile is available. It is not desirable, however, to place the industrial estate too close to the built up area of city, lest it should stimulate urban sprawl.

The second phase is to introduce chemical, electrical machinery, wehicle production and general machinery industries, each plant of which will have lots of 1.0 to 5.0 hectares. Preferably, the site should be faced with a highway connecting Ujung Pandang with other regions. It would be even more desirable if such a site is further connected by a loop rood that allows closer relationship among factories.

The third phase is setting up an industrial estate for the large-scale steel, petrochemical and fertilizer plants which will be shipping their products out to the markets of Eastern Indonesia and overseas. An ideal site would be within convenient distance to the heart of the city and the airport, as well as to the port,

which should by then be equipped with a modern system for handling large quantities of cargo.

Since industrialization in Ujung Pandang is in the first stage, the selection of optimal areas for its industrial estate will have to be made in that context.

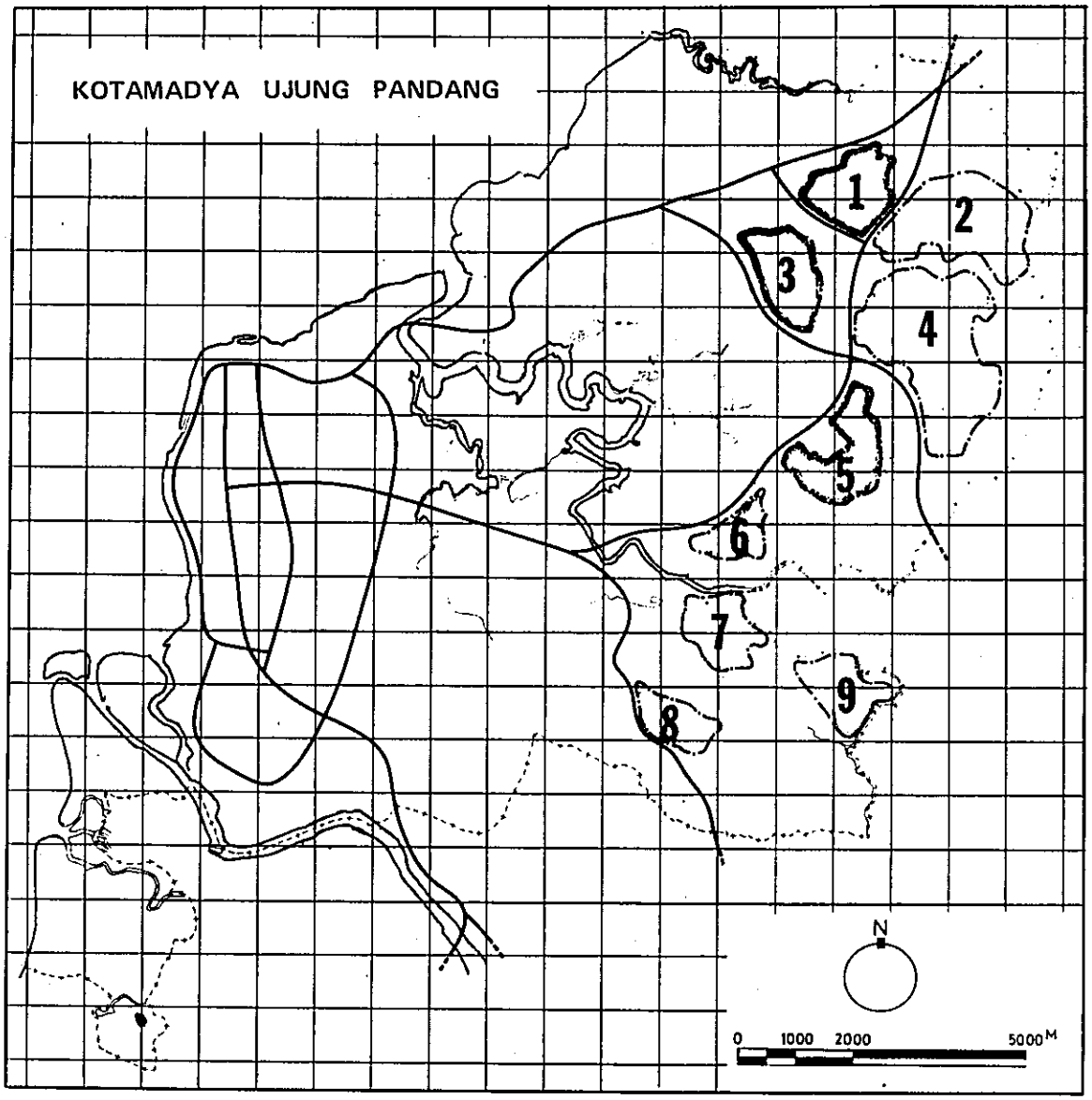
2) Land Conditions and Optimal Areas for Industrial Estate Development

Land conditions around the Ujung Pandang areas were examined in terms of present land use, productivity, development costs and traffic conditions to choose appropriate areas for industrial estate development from a geographic point of view.

Considering present use, such areas were excluded as the built-up sections in the city, rural settlements, rivers, fish ponds and those areas being considered for use under an existing plan. Designated as the most appropriate were those with rice paddies, fields or marshland. Also excluded were those areas which had been flooded or otherwise damaged by water in the past. For productivity it was discovered that given an index number of 100 for wet rice land, dry rice fields come to 40, soy bean fields 29, peanuts fields 58, and maize fields 14. In view of their high level of productivity, it was decided to exclude wet rice fields as much as possible from potential sites for the industrial estate.

In calculating costs for land development, an index number of 100 was assigned to dry fields. This puts the index for wet rice fields at 130, while that for wet marshland varied depending on the place. In any case, the development costs for marshland would be quite a bit higher than dry fields. Since the index for sandy, rocky soil comes out to be 270, it was considered that dry fields were by far the most appropriate. Traffic conditions seemed to be uniform throughout the entire area, with the exception of the decline in road density in the eastern and southern sections of the city area and the area south of the Jeneberang River.

Using the above criteria, nine sites were selected as areas appropriate for industrial as is indicated in Fig. IV-1.



LEGEND

	Site No. 1 ~ 9

Fig. IV-1 Potential Sites for Development of Industrial Estate

2. Optimal Sites and Criteria for Selection

In selecting optimal sites for industrial estates, examinations were made of a range of factors, including natural and socio-economic conditions, infrastructural and urban structural conditions of each potential site.

1) Natural Conditions

By natural conditions, we do not mean those in general, but that are relevant to and even essential for the construction of an industrial estate, namely, topography, soil conditions, weather, and rivers.

(1) Topography

The most important topographical consideration is the slope of the land on which the site of the estate lies, and the overall slope of the entire region encompassed by the plan. Most desirable is land with a gradient of 5 percent or less before construction is begun. It would be possible to build on land with a gradient of from 5 to 10 percent, but anything over 10 would be exceedingly difficult. Even if the gradient is not over 10 percent it would be also very difficult to build on any land with ridges and valleys on it.

The nine potential sites are all located east of Ujung Pandang. This area is on the west side of a mountain chain running from Mt. Lompobtang to Mt. Laposo in the central part of the western peninsula of South Sulawesi. It is presumed that due to repeated flooding in alluvial plains, the mud and sand washed out of the valley regions by the rains formed into plateaus and lowlands. Thus, the nine sites are all similar in overall topography, but they contain certain variations in specific topographical features.

Site numbers 2, 3, 4, 5, 6 have hills running through them which divide the areas into two or three slopes. Of these five sites, numbers 3, 4 and 6 are complicated by the presence of lowlands in them. Generally, numbers 7 and 8 are flat lands, but microscopically, they are made more intricate by small flat lands and plateaus. Site 1 is slightly basin-shaped, with the lowest part at the middle, and is complicated by plateaus and lowlands while site 9 is in the bed of the Tallo river and has a great deal of marshland.

(2) Soil Conditions

Soil conditions and ground foundation are important factors in determining the costs and relative technological difficulty of building an industrial estate.

Since boring data were not obtainable for any of the nine sites, an examination of soil surface was made by visual observation.

According to reports received from those involved in agricultural affairs in Ujung Pandang, the area to the west of the Gowa Jaya Road (i.e. sites 1 and 3) has quite a number of rock formations, but the area to the east has very few rocks. A canal which was constructed as part of the Ujung Pandang water treatment project runs in an eastwest direction on the south side of the Gowa Jaya Road. We visited the canal just before water was run through and we could see that on the west side there was a great deal of exposed rock, but very little on the east side. Thus, the reports from people in the locality can be deemed accurate. The other seven sites are also quite rocky, so no matter which one is selected, they will present obstacles to any large-scale earthworks.

In sites 1 and 3 exposed rock is most evident in areas which border on paddy and dry fields; it reveals extensive, thin stratification. Also much of the northern part of site 3 is occupied by the grazing land for cattle.
Since there is very little top soil it can be regarded as an exposed rock area. In addition, there are rocky areas on top of the low hills and in the paddy fields, so that regardless of elevation, site 3 generally seems to be an area composed of stratified rock. Almost the same conditions apply to site 7, here and there rocky surfaces appear, with some boulders as much as one to three cubic meters.

Sites 2 and 4, contain a relatively thick layer of top soil compared to the others, and they have few exposed stratified rock. These two areas lie lengthwise in an east-west direction and their topographical conditions are different for the eastern and western portions. In both areas, there are low portions on the west side, where rice paddies lie, and part of that low area has stratified rock formation. The hill where cassava fields lie, next to the Gowa Jaya Road, probably has a rock base near the surface.

Sites 5 and 6 seem to have broad exposed rock strata on the hill which lies adjacent to the Gowa Jaya Road, and in that respect there is little difference from the above-mentioned areas.

Much of site 8 is on a gentle slope with relatively few rock strata that are found in the lower portions of the area. The view of site 9 is not absolutely clear because of the trees there, but probably it is almost the same in soil conditions as site 8.

(3) Rivers, Floods and Drainage

Most of the area in sites 1 and 2 belong to the Bonetengga River Basin which flows through a region bordering on the north of Ujung Pandang. The other sites belong to the Tallo River Basin. There are no large rivers going through any of the sites, but the canal which supplies water from the Maros River to the city runs through sites 7 and 9. The width of this canal and adjacent roads is about 20 meters, so that when developing either of these sites, these factors will have to be given special consideration.

Areas which had been flooded in the past were excluded from consideration at the time of the pre-feasibility study. But there are some among the nine sites which are in danger of being flooded.

When we conducted the pre-feasibility study, the rainy season was on, but our second visit was made toward the end of the dry season. In the rainy season parts of the roads were inundated and the mud made passage difficult, we were unable to inspect sites 8 and 9. However, when we visited again, we found that site 8 itself will most likely not be damaged by flood.

Even the lower paddy fields portions of sites 1 and 3 were completely dry during the dry season, so that a jeep could be driven on their surface. There are few areas where roads are submerged during the rainy season so it can be said that there is little danger of flooding.

However, some care will have to be taken in developing sites 6, 7 or 9. The plateaus at the north end of 6 and 9 are fine, but there is submersion at the south end where paddy fields are located in both sites, as can be seen in the photographs taken during the rainy season. Also in site 7 there are more

rice paddies than we had thought, and even during the dry season these fields are still damp. As far as distance from major rivers is concerned, the first six sites are from 1 to 2 km, while the latter three (sites 6, 7 and 9) have a much higher rate of risk, as they are only 0 to 0.5 km away from any particular river.

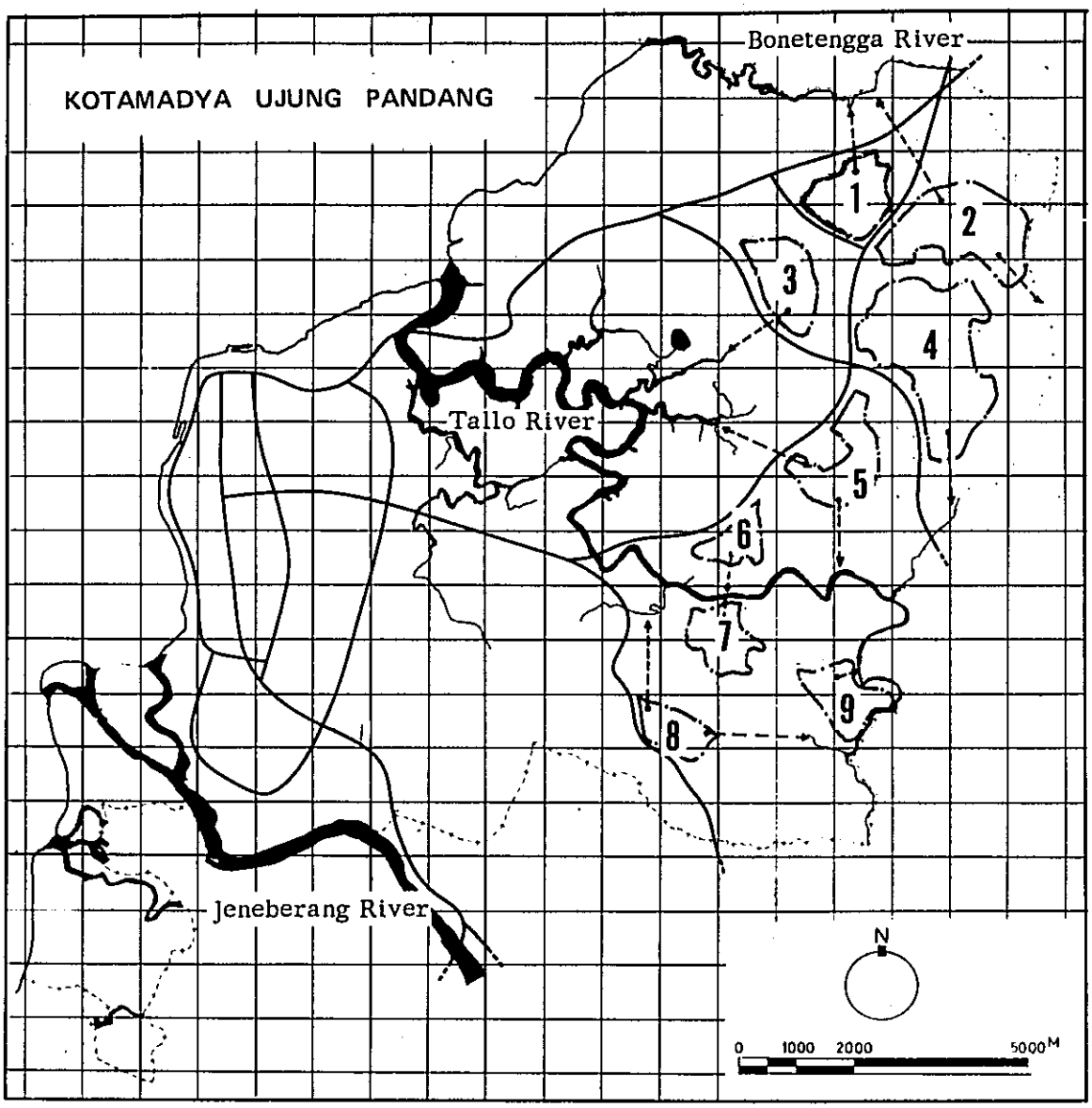
For the convenience ease of drainage of rain water and factory waste water, it is better to place the site close to river, and for this reason the position of sites 6, 7, 9 and 1 is favorable. Sites 2, 3 and 8 are farthest from the rivers, at a distance of approximately 2 kilometers. Sites 4 and 5 are in between, but these two and site 6 have ridge lines running through their central portions. This means that the drainage routes would go in two directions, east and west, even though the Tallo River would be their destination.
Thus, we cannot say with certainty that the conditions in those areas are good. A much more detailed examination will be required. (See Fig. IV-2)

Sites 1 and 2 are located close to the Bonetengga River, but since this river is affected by the ebb and flow of ocean tides, it is mandatory that full consideration be given to whether or not there will be damage to fish ponds.

(4) Land Use

Information on land use is indispensable for estimating land prices and degree of difficulty in construction and for making decisions on areas to be designated for development and preservation, as well as on the range of development. However, since there are no maps by which we can get a detailed idea of land use in each site, we have had to rely on visual judgements from a macro-perspective.

Land use in sites 1 and 3 is quite mixed. There is little difference in the ratio of fields, paddy, dry (mainly cassava) and forest. In and around the small-scale fields are planted mangga and banana trees. In the woodland are few areas where trees are either dense or tall. Most are mixture of waste lands, grassy fields and bamboo forests and some teak trees. This leads us to conclude that no clear distinction can be made for in land usage.



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	River
	Drainage

Fig. IV-2 Major Rivers & Distance Required for Drainage

In sites 2 and 4 fields with tall Cassava plants stand out in land use. In the lower elevation portions there are paddy fields and around the dry fields are planted large Kapok trees, mangga and nangka, trees, but the fields themselves are quite large.

Site 5 has alternating bands running in north-south direction consisting of dry fields (incl. grass fields), forest land and villages. Most of site 6 is villages and wooded land.

In the lower portions of site 7 there are paddy fields, and surrounding the villages are high and dense bamboo groves and woods. Site 8 is distinguished by large-scale Cassava fields and banana and coconut plantations. Site 9 is predominantly wooded land.

There are two major contrasting views on the current use of land in the Ujung Pandang area. One is the view represented by the agricultural sector in South Sulawesi province. Rice cultivation, they say, is a very important resource for the province, but Ujung Pandang's irrigation system is totally undeveloped, making wet rice paddies unuseable during the dry season. Hence, rice cultivation in Ujung Pandang is much less profitable than in other areas in the province. Since it is the capital of the province and its population will continue to increase in the future, this view maintains that Ujung Pandang should concentrate efforts on supplying enough vegetables, fruit and flowering plants for its citizens. To follow this line of thinking, there is not much point in protecting the wet rice paddies in the Ujung Pandang area; rather they should be treated equally with the dry fields in our development planning.

The other view is held by the agricultural sector in Ujung Pandang, based on the relatively high productivity of wet rice paddies. Even though limited to the rainy season, rice cultivation brings in an average yearly income of Rps. 200,000-300,000 per hectare, compared with Rps. 150,000-200,000 per hectare for Cassava fields, even including the mangga and banana crops, and Rps. 100,000-150,000 for corn fields. This, they say, is the reason why the rice paddies must be given the first priority, followed by Cassava fields and, then mangga plantations. Both groups were of the opinion that the banana and

coconut trees can be just left planted as they will spread their roots and are not necessary to be kept.

Opinion is divided on whether the development site should include paddy land or not. But due to the possibility of flooding and the large amount of earth that would be required for land fill, this will mean added expense for construction costs and it would be better to exclude the paddy areas. In sites 3 and 5 where there are a large number of dry paddies, Cassava is planted during the dry season and the types of crops planted may change from year to year. Thus, it is difficult to distinguish one type of field from another, but there will be perhaps no need to worry about strict demarcation of land by usage in developing such an area.

(5) Weather and Constant Wind Direction

In coastal Ujung Pandang, the wind during the day is off the sea in the WNW direction at 11-12 knots. During the evening there is a breeze blowing from inland in an ESE direction at 1-5 knots. Assuming that almost all factories will be operating during the daytime none of the sites would have any deleterious effect on the urban area because of these winds. Although there are some worries about the effects that use of sites 5, 6 and 7 would have on existing small villages, none of the others would present any problem.

From April to October, the dry season, the east monsoon blows and from October to April, it is the west monsoon. Ujung Pandang is affected by these monsoons. During the east monsoon season winds blow toward to west or northwest, while during the west monsoon, the winds blow to the east or southeast. Consideration should be given to both these wind directions, but there is little worry that factories on sites 1, 2, 3, or 4 in the north would affect the city even when strong winds are blowing from the east.

2) Social and Economic Conditions

In this section discussion will focus on land value of each site which has an important relationship with cost of constructing the industrial estate. The results of our examination will also be shown of the economic activities and social conditions in the areas which will have an important bearing on selection of sites for development.

(1) Land Value

As far as the productivity of land is concerned wet paddy fields are more productive than dry land. But in terms of the value as a housing lot the dry land is much higher than wet. At hearings in IPEDA Kotamadya, the sales price for wet land at site 1 is from Rps. 100,000 to Rps. 500,000 per hectare, but the price for dry land was from Rps. 500,000 to Rps. 4,000,000. The top limit of this latter quotation, Rps. 4,000,000, is the official price offered when the land was sold for the construction of a school. The top price quoted when a school was built in an area between sites 7 or 8 was also Rps. 4,000,000.

The price for all paddy land at the Panakukan housing project, which is now under construction on the east edge of the old city, was Rps. 2,500,000. Land for the new campus of Hassanuddin University which faces site 6 across the Gowa Jaya Road is mainly dry field and wooded land but the highest official price was Rps. 2,500,000 per hectare.

Since we could get hold of very little data, we had to depend on hearings from our Indonesian counterparts for estimated prices on the land in each of the nine sites. Assuming that land will be purchased as a newly opened area, the cheapest sites will be 3 and 9 at Rps. 2,500,000 - Rps. 3,000,000 per hectare. Sites 2, 4 and 8 will be Rps. 3,000,000 to Rps. 5,000,000 per hectare, sites 1, 5 and 6 will be more than Rps. 5,000,000 per hectare and site 7 will be from Rps. 10,000,000 to Rps. 20,000,000 per hectare. The lowest price will, of course, be the most economical, but land development costs will have to be taken into consideration as well.

(2) Relation with Existing Villages and Desa Centers

Information on how many villages there are in each of the selected sites, or if there are villages or markets adjacent to the sites, is indispensable in estimating the cost in moving these villages or markets, and in determining whether or not it will be necessary to create an buffer zone between villages and industrial estate. It also involves decisions on the necessity of separating traffic arising from the industrial estate and that within the villages, and whether there is enough space for future expansion.

In sites 1, 3, 8 and 9 we consider it necessary to either widen or add on to existing roads, since there are many villages along the roads in those sites. However, since there are no villages within the site, costs for moving will be low.

Since sites 2 and 4 are wide, there are a number of narrow roads traversing them. Since the villages are right next to these roads, it is all the more necessary to have these villages removed and improve the environmental conditions of surrounding villages, costs of which are estimated much higher that areas mentioned above.

The number of villages on sites 5, 6 and 7 are greatest and costs will be the highest for improvements in the surrounding environment. In the middle of sites 3 and 4 there is the market of Desa Daya. In the area approaching site 7 there are gas stations and other business establishments. Rather than being a problem it may be an advantage since there is a very good possibility that these establishments can function to provide service for the newly developed industrial estate.

(3) Relations with Existing Businesses and Facilities

There is a communications facility in the northern area of site 1. In the northern area of site 3 are located a golf course, workshop, research lab and the provincial development planning office. In the northern part of site 5 there is an agriculture experimental station and in the central region is an army barracks. On the west side of site 6 is the area designated for the new campus of Hassanuddin University, as well as an army barracks and a Catholic church along the road. The water supply canal runs through sites 7 and 9. (See Fig. IV-3)

We will examine whether there is conflict between the development of the industrial estate and these existing facilities or whether they will help attract the building of the industrial estate there.

The first facilities that may present problems are the army barracks and agriculture experimental station at site 5. In discussions with our contacts in Indonesia, they said that it would be inconceivable that the army

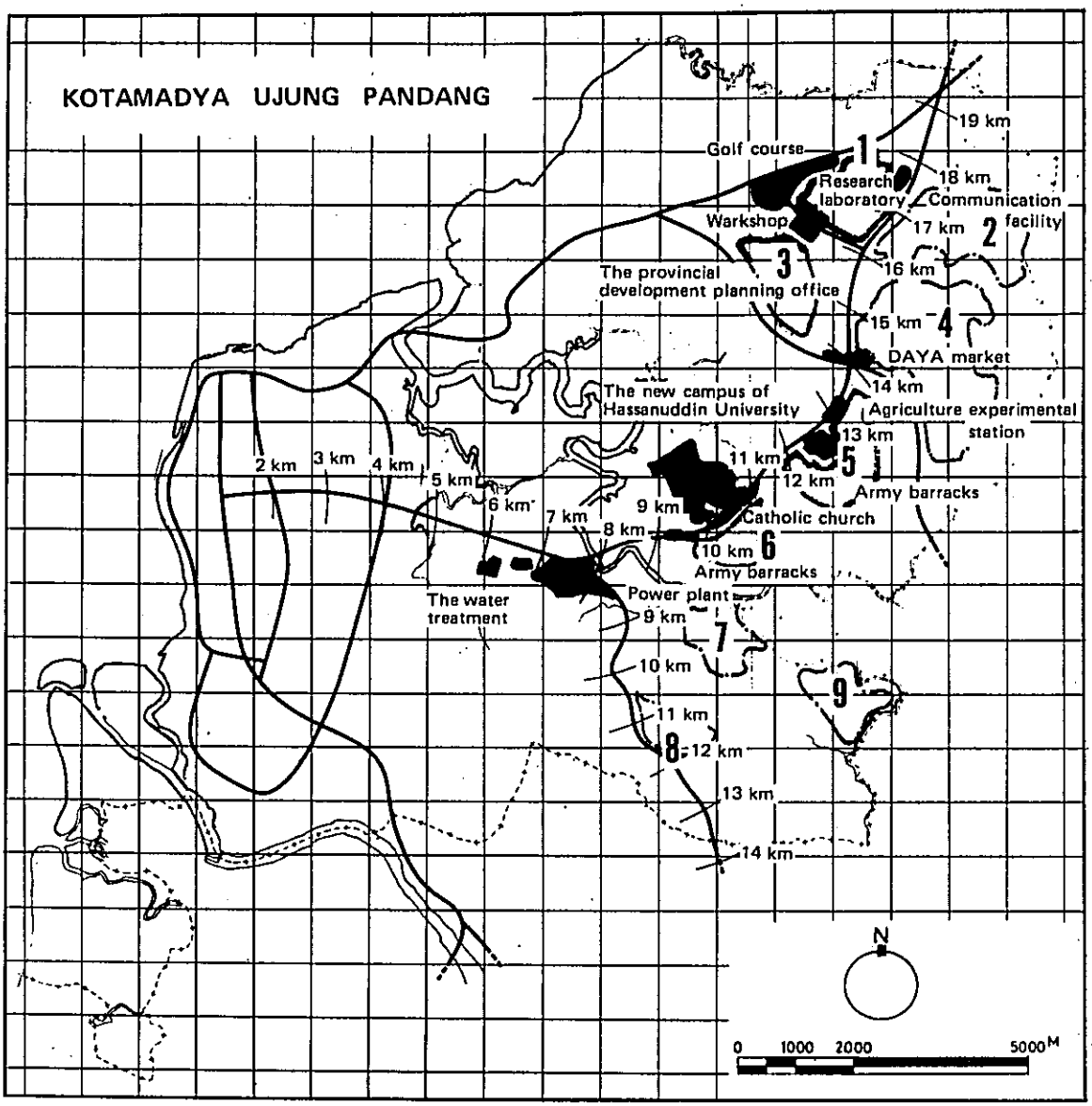
barracks could be moved. If it is not moved, then the area in which the barracks is would be the very front of the site and this would present a rather poor image to people visiting the industrial estate or the city. An easier problem would be that of making the industrial estate on the site where the agriculture experimental station is included but we would be presented with difficulties as far as the preservation of the station's environment is concerned.

Another site that we have misgivings about its conflict with other facilities would be site 6, which is located adjacent to the planned college campus. The transfer project of this college, the best university in Eastern Indonesia, with 7,057 students in 1972 is a task as large as the development of the industrial estate itself. If the move is actually made, then this will require an assorted number of services for a college population of about 10,000. Thus, in a site as convenient as 6, establishment of the campus will create an even greater demand for various urban facilities. Given such prospects, it will be exceeding difficult to convince anyone of the need for an industrial estate there.

There are no large problems with other facilities. The water-supply canal going through sites 7 and 9 is very advantageous since it will provide the necessary water for the industrial estate. However, we will have to be exceedingly careful in the planning stage to make sure that no waste water is allowed to contaminate that canal.

(4) Trends in Factory Location and Potential Areas

There are three areas in Ujung Pandang where there has been a noticeable or potential increase in the number of incoming factories. The first is along the Gowa Jaya Road from the heart of the city in the direction toward the airport, and is the area where there are water treatment and power generation facilities, about 6 to 8 kms from the center of the city. The second area is to the north of the city and close to the mouth of the Tallo River, approximately 4 or 5 km from the heart of the city. The third is close to the Jeneberang River to the south and about 5 to 7 kms from the heart of the city, along the Gowa Raya Road. The new factories in Ujung Pandang are expanding outward as the pace of urbanization moves on, and is moving towards the sites selected as possibilities for the industrial estate. Due to this, the site that offers the



LEGEND

■	Existing businesses & Facilities
┼	Distance

Fig. IV-3 Existing Businesses & Facilities and Their Distances from the Heart of the City

greatest possibilities, is site 6 which is on the line of industrial expansion and has most favorable conditions as well. As far as distance is concerned site 7 is about as close as site 6 but when industries move in individually, there are likely to select one that offers better road conditions and for that reason the potential of site 7 is much less than that of site 6. In the third direction, there are no candidate sites but site 3 is on the line of the second group of outwardly expanding factories. It is planned at present to build a bridge over the mouth of the Tallo River. If completed will substantially improve this road conditions leading to site 3, then it will have higher potential.

(5) Wide Sphere of Economic Activity and Potential Area

The relationship between the potential sites and the wide economic sphere is dictated by the level of the infrastructure. The most important policy objective for the development of the Ujung Pandang industrial estate is that this area be made is a center for overall industrial development in Eastern Indonesia. Thus, one of the chief requirements is that the estate be accessible to ports where goods will be exported and or transfered to other areas. In order to get to the Ujung Pandang ports all of the sites would require shipping traffic to travel on the national highways and through the built-up area within the city. Given the present conditions, there does not seem to be much difference among the nine sites with regard to this requirement. In the future as improvements are made in the infrastructure then conditions will change. On this point we will go into further detail later.

A second condition is that there be good trasportation linkage between the estate and the other parts of South Sulawesi. The most important route in the province's traffic network is the only national highway that goes north from Ujung Pandang to Pare Pare and then to Tadatanan through Palopo. In order to spread the impact of industrialization throughout all of South Sulawesi, and to stimulate industrialists to invest, it is very important that industrial development take place in such a way that the estate is directly connected up with this arterial road. For that reason, sites 1 through 6 would be much more convenient than the other three.

The second most important route is the provincial road that connects the southern areas, such towns as Gowa, Takalar, and Jenepont, with Ujung Pandang. However, since none of the possible sites are located in this area, it is not perhaps necessary to make an examination of their potentialities.

(6) Commuting Situation

All of the sites under consideration were selected so as to avoid including or surrounding the settlements. Hence, the population around each site numbers only several thousand. The number of people to be employed at the industrial estate is estimated to exceed 20, 000 and it will probably be necessary, for some time at least, to recruit people from the more populous older sections of the city and have them commute to work.

The chief mode of transportation is by motorcycle and bicycle with a great many betchas being used within the city. The time for going to work is in the early part of the morning and there is quite a stream of traffic of these vehicles going into the heart of the city. Buses are also well used as well as cargo carrying trucks that take on passengers. There are also quite a number of vans and jeeps but there is very little use of the passenger car. Motorbikes, motorcycles, scooters and bicycles are used for quite long-distance travel, but in the last few years there has been increased use of small buses that are owned by the large factories in order to transport their workers back and forth. Such a system is indispensable when hauling large numbers of people at specific times and there will probably be a great number of buses used when the industrial estate begins operation.

It is desirable that commuting time be limited to thirty minutes. It is possible at present to travel on the Gowa Jaya Road at an average speed of 50km/h but considering the traffic jams within the city the thirty-minute commuting time would be confined to those areas not farther than 15 kms away.

If road conditions are considered as uniform, then site 6 is closest at 10 km, with the six sites from 3 to 9 at a distance of less than 15 km. Sites 1 and 2 are about 17 km distance, somewhat far, but if bus transportation is used there is not much of a differance between these and other sites.

Considering that the average speed of a bicycle is 10 - 15 km/h, this means that the 30 - minute traveling time is about 5 - 7 km from the site. Thus, coming from the center of the city, this will make all the sites somewhat far away, but the residential area of Ujung Pandang extends about 4 - 5 km from the center of the city and sites 6 and 7 could be easily reached by bicycle. (See Fig. IV-3)

(7) Likely Change in the Sites and Local Enthusiasm for Development

There are two aerial photographs hanging in the office of the Ujung Pandang Civil Engineering Bureau, one taken in the 1950s, the other in the early '70s. One can't see the outward expansion of the old city from these photographs but can readily get an idea of the large-scale construction that has been taking place in the suburban areas, particularly along the Gowa Jawa Road.

There is a microwave relay station in the northern part of site 1 and on the border of site 3 a golf course is being expanded. With these purchases the land prices of areas in the immediate vicinity went skyrocketing so we have to consider the rise in land prices as a negative point.

In sites 2 and 4 a new road has been built which does not appear on the maps. There are farmhouses along the road as well as a new school under construction. Farm lands are fairly large and it is an appropriate area for factory construction but care will have to be taken to avoid interfering in agricultural development plants. In the northern section of site 3 there are a golf course, a public works ministry workshop and the state development agency offices. The Desa Daya market in site 4 is a focal point for this area. According to information from our Indonesian contact, almost all of the people living on site 3 are farmers and their incomes are low. There was discussion of an agricultural development project in this area some time ago, but nothing came of it because of poor land conditions, and there is a great deal of desire to have the industrial estate built in this area.

There are large army barracks built on sites 5 and 6 and another problem for the project is the effect that the transfer of the university will have.

On sites 7 and 9 of the water supply canal and the accompanying roads were built which allowed to use water artially, and led to build and develop farmhouses and farm lands. Considering these trends, the development of a industrial estate in these sites would have negative impact for it would mean the waste of other existing investments.

3) Infrastructure Conditions

(1) Roads

Of all the roads around the potential sites, the best maintained one is the Gowa Jaya national road. This road goes along sites 1 through 6. The road connecting the workshop and golf course between sites 1 and 3 is paved and the seacoast road running along the west side of the same sites is lightly paved in sections. The road on the south side of site 3 is scheduled to be repaired next year so that the infrastructure in this area is being strengthened at a fairly rapid rate.

There are roads being repaired in sites 2 and 4 but they are not paved.

Sites 7, 8, and 9 are away from the national road and the roads leading to the site are not paved, during the rainy season these roads are sometimes impassable. Thus, if these sites are used the access roads to the national road will have to be upgraded.

(2) Port Facilities

The 10,000-toners class can enter into Ujung Pandang port. The port has three 3-ton cranes and six 2-tbn fork lifts. As other ports have been built, the volume of freight handled here has declined, but there will probably be an increase as industrial development proceeds

All of the sites are at present connected with Ujung Pandang port by the national Gowa Jaya road and plans are now underway to build a new bridge across the mouth of the Tallo River. The existing bridge narrowly allows 5-6 ton trucks to run but if the proposed bridge is upgraded for heavier loads together with the improvement of seacoast road, the transport conditions for sites 1 and 3 will become vastly favorable.

These sites are also close to an area considered optimal in the future construction of a new Ujung Pandang port (refer to the urban development plan for Ujung Pandang city in the pre-feasibility study). Thus, they both hold great potentialities for the future.

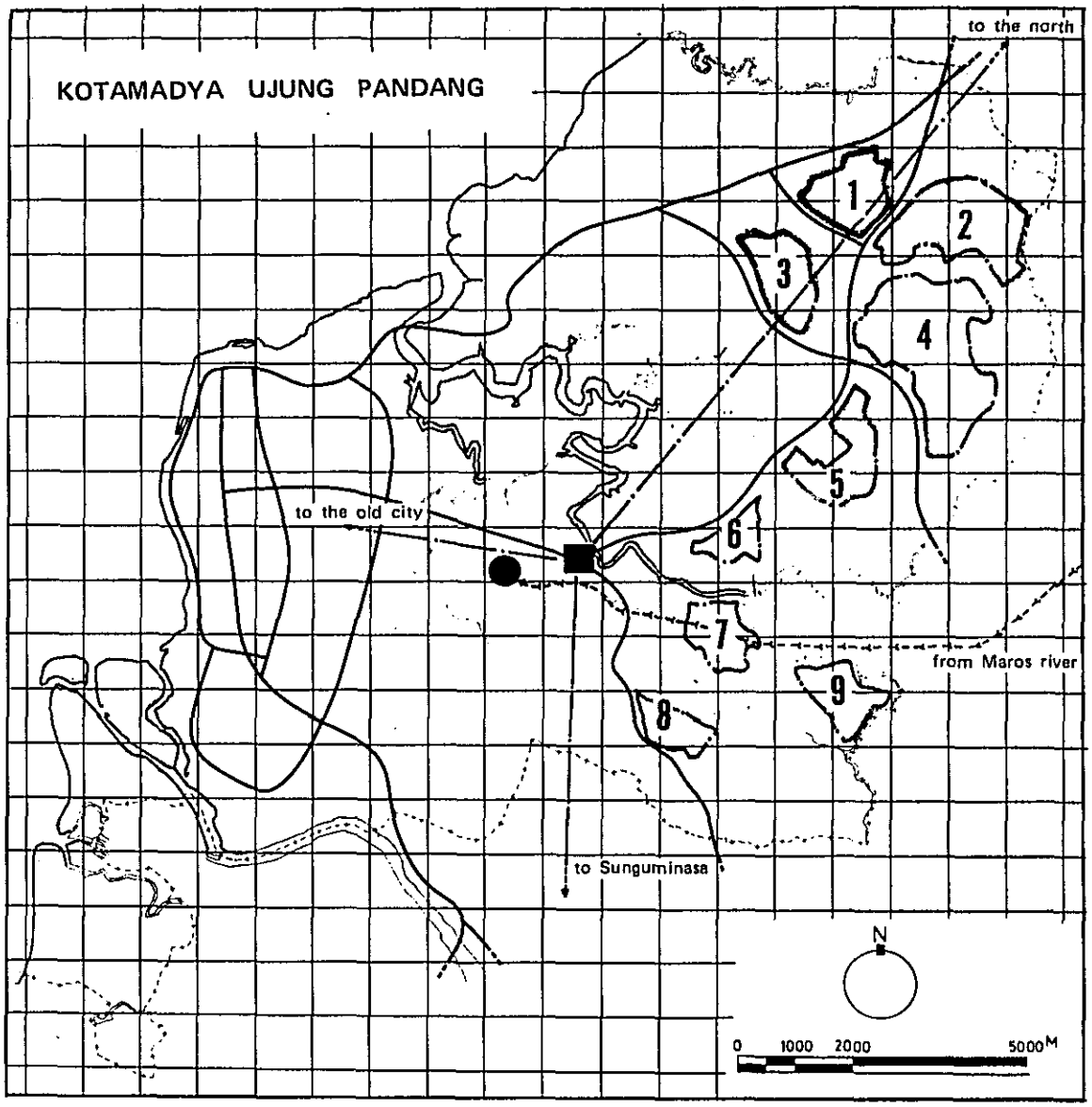
(3) Electric Power Supply

The chief supply of electric power for Ujung Pandang comes from the two 12,500kW steam turbines at the Tallo River thermoelectric generating unit. Add to this a 5,270kW diesel generator and another 9,520 kW diesel generator at Bontoara and this brings the entire capacity to somewhat more than 40,000kW. But, current actual consumption is only slightly more than ten percent. It is safe to assume, then, that the industrial estate will be able to get electricity from the thermoelectric generators on the Tallo River.

The transmission line from the power plant extends in three directions; one part goes to the old city, another to the factories in Sunguminasa and Boronglowe, and the third goes to the north to Tonasa. The line that goes to the north runs through sites 1 and 3, making these areas the ones that could be supplied with electricity the easiest. Sites 2, 4, 5, and 6 are located nearly parallel to the line but would require feeder lines set up about 0.5 - 1km in length. Sites 7, 8, and 9 would require feeder lines from the power line going to the south, the distance for 7 and 8 would be about 2km and the distance for 9 would be about 4km. (See Fig. IV-4)

(4) Water Supply

Possible sources of water are: a) under ground; b) river and streams; c) construction of a multi-purpose dam; d) from city facilities covered by present plans. According to information from our Indonesian counterpart, water can be easily obtained from underground sources at sites 1 and 2 even during the dry season. However, the allowable quantity is not clearly known. There are a number of problems that may occur if methods b) and c) are used, so we made our examination on the assumption that the canal supplying water to the city would be available for use.



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■	Power plant
←---·---→	Transmission line
●	Water treatment
←-·-·-·-→	Water supply canal

Fig. IV-4 Power Plant & Transmission Line and Water Treatment & Water Supply Canal

The canal goes through sites 7 and 9 and would require a lead-in channel of about 0.5 - 1 km to bring water into site 8. For sites 1 through 6 it would be necessary to build channels or pipes that would cross the Tallo River and the distance to site 6 would be approximately two kilometers while that to sites 1 and 2 would be about eight kilometers. (See Fig. IV-4)

(5) Communication Facilities

According to a report published by the South Sulawesi provincial government, a communication network including telephone, extends from the city center to the north where all sites are located. It is not certain whether these facilities also have been built in the area south of the Gowa Jaya Road. There are no telephones in the government workshops and office on sites 1 and 3 but we were told that facilities will be installed in the near future.

A telex circuit was installed last year and it is expected that communication facilities will be expanded rapidly.

Since there are certain unclear points with regard to this particular item, we have excluded it from the comparative examination of the conditions of the proposed sites.

4) Urban Development Conditions

(1) Compatibility with Provincial Planning

In selecting an appropriate site for the industrial estate development, the South Sulawesi Provincial Industrial Development Office conducted a preliminary survey prior to participation by the Japanese group.

Four areas along the west side of the Gowa Jaya road were examined in this preliminary survey as potential sites and two were selected. They overlap with sites 1 and 3.

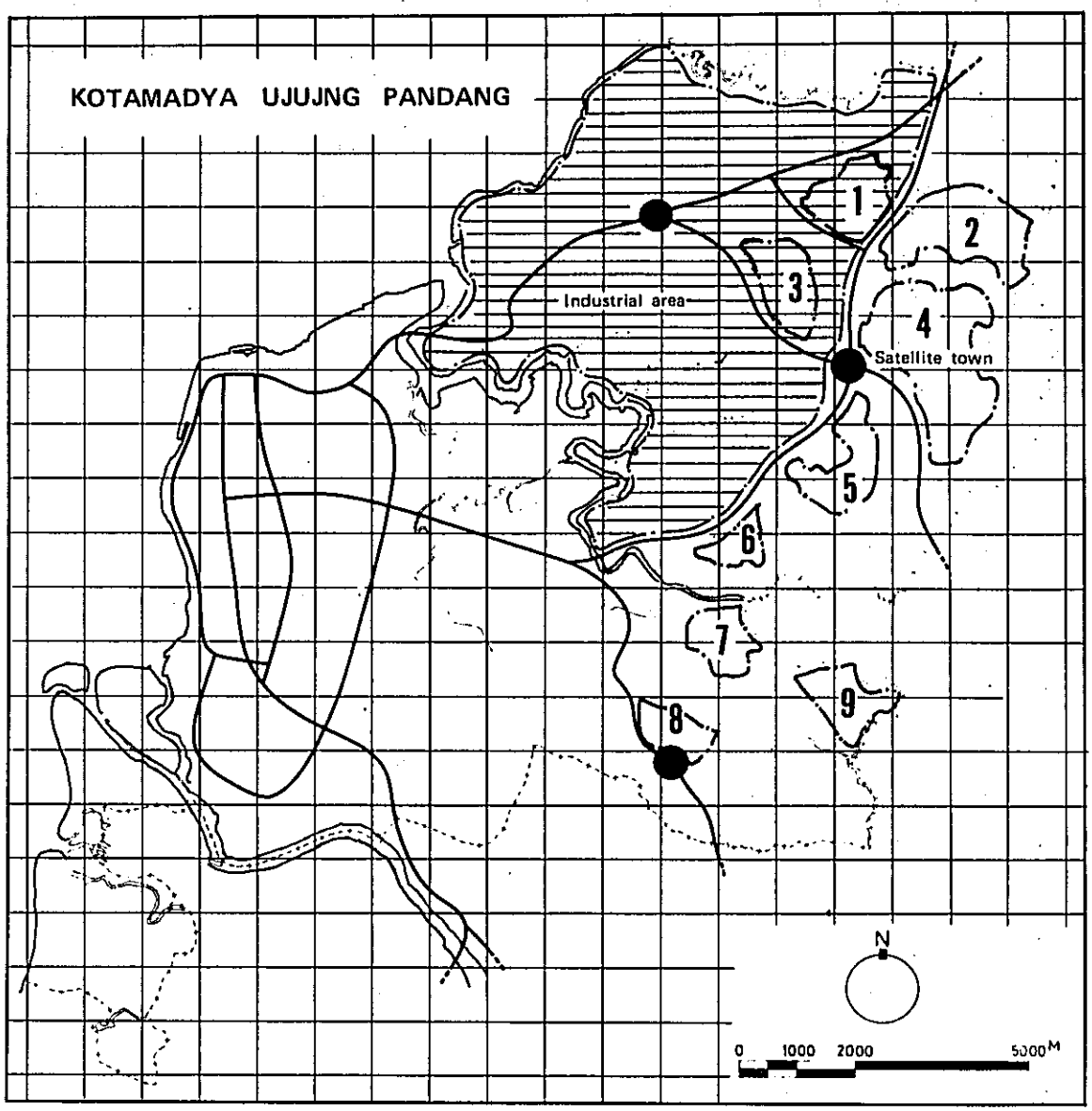
In the plan for the future urban development of Ujung Pandang, an area equivalent to site 8, the western section of site 3 (Desa Bulurokeng), and a zone between site 3 and site 4 (Desa Daya) are being considered as areas for the development of satellite cities.

There is also a plan to widen the Gowa Jaya Road into a 100 meter green belt.

The differences between the way that these areas are covered in our survey and in the plan are too great, while the situation is not clear with other sites. On the whole, however, sites 1 and 3 seem to be in conformity with those of the provincial development plan. (See Fig. IV-5.)

(2) Integration with City Planning

The city government plan is still in the research stage, and little of it is known so it has been excluded from this study.



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	Industrial area
	Satellite town

Fig. IV-5 The Future Urban Development Plan of Ujung Pandang
(The South Sulawesi Provincial Industrial Development Office)

3. Results of Evaluation

A summary of the study has been listed in Table IV-1. In this survey each of the sites was rated according to its evaluation so that a final selection could be made. There are twenty categories on which the sites were evaluated. the maximum for any category would be ten points meaning that the greatest possible score that could be received would be 200. The evaluation was also further aided by weighting each of the categories in order of importance.

The items considered most important were land value and soil conditions, which have a commanding influence on construction costs, the situation for commuting, so that a large work force can be obtained, linkage with wide sphere economic activity so that the industrial estate can be used to its fullest potential, and the sentiments and preferences of the local population in the area.

In listing points item by item, firstly items were ranked according to comparative differences and lowest points were again assigned after re-evaluation of the actual differences. Then the points were judged for the sites standing in the middle. Results are shown in Table IV-2.

Site 3 is highest on the chart, followed by 2 and 8. One thing wrong with this type of evaluation is the danger that some very fatal point may be overshadowed, although site itself will receive a high overall rating. For example, site 3 has received the highest number of points in its overall evaluation, but it received lowest points on four items, more than three counts. On the other hand both sites 4 and 8 received lowest point on the three items. Looking at the actual situation of site 3 we find that the costs of land are low for this site, but construction costs would become higher because of the rocky soil. What Indonesian authorities want to do with the area complies with the needs of the industrial estate, and there are solid connections with the entire economic area, but it has the disadvantage of being poorly located in terms of the distance for commuting. Compared to these conditions, Site 4 is somewhat further inland, but it is better as far as soil conditions are concerned.

For these reasons, a master plan proposal and a more detailed comparative study should be made of the most-favored site 3, and the next in order, site 4.

Table IV - 1 Evaluation of Candidate Sites

	Area of candidate sites and possibility of expansion		Topography	Geology	Danger of flood	Land use	Land price Rps./m^2	Existing villages	Existing facilities and fixed plans	Tendencies of changes in the surroundings of the candidate site and the willingness of the inhabitants
	Area (ha)	Room for expansion								
Site 1	190	No	The central part of the site is lowland, but the details of topography of the site are completed.	Despite of difference in altitudes, rocks formations are exposed all over the site area.	No	Fields, paddyfields, etc. are scattered.	500 - 600	There are many villages around the site, but few within the site	Communication facilities. A golf course	Land price is increasing rapidly because of the expansion of the golf course
Site 2	350	Yes	Difference in altitudes is little, but slopes are running towards several directions.	There are rock formations in the western part of the site, but most areas of the site are composed of soft-earth formations.	No	Most areas are cassava fields.	300 - 400	There are villages along the road in the site.		Many farm-house have been built along the newly constructed road.
Site 3	180	Yes	The central part of the site is highland, but the site is complicated by lowlands.	Despite of difference in altitudes, rocks formations are exposed all over the site area.	No	Fields, paddyfields, mango and banana fields, etc. are scattered.	250 - 300	There are many villages around the site, but few within the site.	A golf course A workshop A laboratory	The wage levels of the inhabitants are so low that they expect eagerly industrial development.
Site 4	550	Yes	Difference in altitudes is little, but slopes are running towards several directions.	There are rock formations in the western part of the site, but most areas of the site are composed of soft-earth formations.	No	More than half areas are cassava fields.	300 - 400	There are villages along the road in the site.		Many farm-houses have been built along the newly constructed road.
Site 5	200	No	The topography is made of mild slopes where difference in altitudes is little.	Rock formations are observed at a part of the hill.	No	Grass fields, villages, farming lands, etc. are scattered one after the other.	500 -	Villages are widely scattered in the site.	An agricultural experiment station Barracks of army	A problem is how to deal with the facilities listed in the adjoint left column.
Site 6	95	No narrow	Surrounding areas are lowland that earth is needed to be brought from other places.	"	A possibility of flood in the lowland.	Farms and forests are surrounding villages.	500 -	"	Transfer of facilities of the university. Barracks of army A catholic church	Impacts from urbanization on this area is very strong.
Site 7	140	No	The site is almost flat, but for lowland earth is needed to be brought from other places.	There are rock formations and rocks almost all over the site.	A possibility of flood all over the site area because the site is entirely lowland.	Paddyfields, bamboo field, fruits orchards and forests.	1,000 - 2,000	"	Canal for water supply	Farmers intend to construct new houses and expand farmlands after the canal opened.
Site 8	110	Yes	Most areas are flat, but a part of topography is complicated.	The highland is composed of soft-earth formations. Rocks are exposed in a part of the lowland.	No	Cassava fields and coconut and banana plantations	300 - 500	There are many villages around the site, but few within the site.		
Site 9	150	No	A part of the area is a flat land, and some are lowland.	"	A possibility of flood in the lowland.	Paddyfields, fields and forests.	250 - 300	"	Canal for water supply	Farmers intend to construct newhhouses and expand farmlands after the canal opened.

	Road network	Linkage to the neibouring economies		Electricity	Water		Communication facilities	Drainage		Commuting condition		The location related to a geographically expanding pattern of factories	The position in the urban development plan	Problems for protecting environment
	Distance to national highway	Access to the harbour	The road network extension	The distance to a high-voltage power line	The distance to the canal for water service			The distance to the river nearby	Drainage condition	Distance from the center of the city	A possibility to commute by bicycle			Direction of wind
Site 1	Access to a national highway. A road in the south-side is paved.	Able to reach using a road along the beach crossing bridges.	Connected to the northern area and the city by a national highway	A high-voltage power line runs across the site	8 km	Crossing the Tallo River	Have been provided	1 km to the Bonetunggah River		17 km	(more than 30 minutes)		Designated as a suitable site for industrial development in the state plan.	No effects on existing town areas.
Site 2	Access to a national highway. Roads in the site are unpaved.	"		0.5 km	8 km	"	"	2 km to the Bonetunggah River		17 km	(")			"
Site 3	Access to a national highway. Roads in the site are unpaved	Able to reach using a road along the beach crossing bridges	"	A high-voltage power line runs beside the the site	6 km	"	"	2 km to the Tallo River		15 km		Is located on a line extended from a pattern of expanding factories along the beach.	Development area for industrial and satellite towns	"
Site 4	Access to a national highway. Roads in the site are unpaved.	"		0.5 km	5-6 km	"	"	1-2 km to the Tallo River	Topographically two directions of drainage must be considered	15 km				"
Site 5	Access to a national highway.	"		0.5 km	3-4 km	"	"	1-2 km to the Tallo River	"	12.5 km				Influences will be against villages inside.
Site 6	"	"		0.5 km	2 km	"	"	0.5 km to the Tallo River	"	10 km	Yes	About 3 km to factories which are expanding along the national highway		"
Site 7	2.5 km to a national highway.	The hinterland is small in area		2 km	The canal runs to the south of the site		n.a.	Beside the Tallo River		10.5 km	Yes			Wind blows to the existing town areas
Site 8	3.5 km to a national highway. Traffics become impossible in the rainy season.	"		2 km	0.5 - 1 km		"	2 km to the Tallo River		11.5 km			Development area for satellite towns	"
Site 9	5 km to a national highway.	"		4 km	The canal runs to the south of the site		"	Beside the Tallo River		13 km				"

Table IV-2 Evaluation of Candidate Sites

Item / Points / Site Location	Area & Space for Extention	Topography	Soil Conditions	Risks of Flood	Land Use	Land Value	Village Community	Existing Businesses & Facilities	Likely Change & Local wishers	Road Condition	Wide Sphere Linkage	Electric Power	Water	Drainage Condition & Distance	By Bicycle accessibility distance from city center	Trends of Industrial Location	Urban Development Condition	Environmental Problems	Number of Receiving Highest Points	Gross Points	Rank	Total Evaluation
	10	10	15	10	5	20	10	10	15	10	15	5	10	10 (7) (3)	20 (15) (5)	5	10	10	20	200		
Site 1	8	6	10	(10)	4	14	10	(10)	10	10	13	(5)	5	6 1	8 -	1	(10)	(10)	7	151	5	
Site 2	10	9	(15)	10	(5)	18	8	(10)	12	8	11	4	5	4 1	8 -	-	7	(10)	6	155	4	Soil condition is not so good but the site may be regarded as suitable.
Site 3	(10)	7	8	(10)	4	(20)	(10)	(10)	(15)	9	(15)	5	6	4 (3)	10 -	2	(10)	(10)	11	168	1	
Site 4	(10)	10	(15)	(10)	(5)	18	8	(10)	12	8	11	4	6	5 -	10 -	-	7	(10)	7	159	2	Soil condition is excellent. Easy to develop
Site 5	8	7	12	(10)	4	14	7	5	8	10	10	4	7	5 -	13 2	3	7	8	2	144	8	
Site 6	4	7	12	8	4	14	7	5	8	10	10	4	8	6 -	(15) (5)	(5)	7	8	4	147	6	
Site 7	6	8	10	6	4	8	7	9	10	6	8	3	(10)	(7) 2	(15) 4	2	7	6	3	138	9	
Site 8	(10)	(10)	(15)	(10)	(5)	16	(10)	(10)	12	5	6	3	9	4 2	14 3	-	4	8	7	156	3	Soil condition is good. Road improvement required.
Site 9	6	8	13	8	(5)	(20)	(10)	9	10	4	5	2	(10)	(7) 2	12 1	-	7	8	5	147	6	

V. MASTER PLAN

V. MASTER PLAN

1. Basic Approach

1) *Planning objectives*

(1) Building a model of an inland industrial estate to be constructed in Eastern Indonesia

Up to the present time industrial estate have been constructed in the Republic of Indonesia in Jakarta, Surabaya, Cilacap and Medan, but there are absolutely none in the eastern part of the country. If the proposed Ujung Pandang industrial estate is eventually constructed, it will be the first of its kind in Eastern Indonesia.

The relationship between the industrialization of Eastern Indonesia and the building of this industrial estate should be considered. It is estimated that the population in this region will reach 32,800,000 by the year 2001. To industrialize the country to the level of the advanced nations by that time will require land for factories of more than 30,000 ha. If, for reasons of land use and environmental preservation, 50 percent of this land for factory use were supplied in the form of industrial estates, then 15,000 ha. would be needed for construction of such estates.

It is significant to build an industrial estate in Ujung Pandang for the industrialization of Eastern Indonesia. One of our goals in planning is to prove a feasibility of an industrial estate can be built in this region, and to make it a model for the development of other industrial estates.

(2) A new image for Ujung Pandang city

The city of Ujung Pandang has many different images, but an industrial image is not easily found. Its political face is represented by the Provincial Office, education by Hassanuddin University, and its image of the urban center is represented by the Karebosi plaza and tree-lined streets. As far as industry

is concerned, there are some light industries and cottage industries scattered throughtout the city, as well as a few transportation machine factories along the Gowa Jaya Road. But there is no major industry to speak of.

The industrial estate that we envision building here must be the kind that the citizens of Ujung Pandang can be proud of and that will also represent the new image of industry in the area.

(3) Providing a focal point for industrial activity in South Sulawesi Province

South Sulawesi is an agricultural province, as shown by the fact that 66 percent of those employed there are engaged in primary industry. The fact that ninety-two percent of the people in secondary and tertiary industries work in Ujung Pandang, indicates that as far as the industrial structure is concerned, the city is modernized and has a base for high-level industrialization in the future. In order to generally raise industrial activity throughout South Sulawesi province, it is necessary to encourage the development of secondary and teritary industries. That industrial activity must be centered around the manufacturing industry, but transportation and commerce also must be solidly incorporated into the overall organization. Consequently, the industrial estate as planned here will include not only manufacturing, but also such service industries as trade and transport.

2) Planning philosophy

(1) Creating a superior productive environment

Most important role of this industrial estate in promotion of regional industrialization, is to have a very favorable environment for productive activities. There are very few factories in Ujung Pandang city which have such an environment. A favorable productive environment is the kind of space in which the workers can enjoy their work. Such an environment must also be conductive to smooth transport of raw materials, fuel and finished products. In order to provide the estate with these qualities, it is necessary to have welfare and recreation facilities for workers' health, appropriate size of lots for each type of industry entering the estate, and arrangement of factories in such a pattern that they form a cooperative and communal system. There must also be a road system

which allows smooth movement of people and goods, and auxiliary facilities for backing up production activities. Meanwhile, when the industrial estate is in operation, it should not create any harm to the living environments of surrounding desa and urban areas.

(2) Considerations for agriculture and aquaculture

In the Tallo River basin, there are a great many rice paddies, dry fields and fish ponds. Therefore, it may be said the livelihood of the people in the area largely depends on this river. Since the industrial estate will be located along the midstreams of the Tallo River, utmost care must be taken to control the quality of water emitted from the factories and to make sure not to cause flooding or washouts.

(3) Creating an industrial estate that the citizens can be proud of

The image of industrial estate under this study is one that attract and make local residents want to work in, and further make these people be proud of the fact that they are working at such an establishment. Efforts have to be made to ensure that the land used by the various companies, the buildings of the factories and even the guide maps are as beautiful as possible. Parks and green areas must be constructed. And maintenance and general upkeep of various facilities on the estate must be thorough and sanitary.

2. Planning Premises

1) District formation

Sites 3 and 4 selected for the industrial estate are about 15 kilometers from the heart of the city. Major facilities include a market in site 4 which supplies vegetables and grain to the city, and in site 3, there is Ujung Pandang's only golf course and a workshop, which plays an important role in civil engineering and construction projects for the city. Because these facilities are very important to Ujung Pandang, they will not be included in the areas planned for the industrial estate.

For its future course of development this area could become a major sub-center of the city, composed of the industrial and commercial area centering on the industrial estate and the market and also of the technology and knowledge accumulated area centering on the new campus of Hassanuddin University. The residential part of the area will be along the east edge of the Gowa Jaya Road from the new campus to the Daya market.

2) Types of industry and the industrial estate plan

(1) Premises of planning by type of industry

The type of industries which may be thought feasible to be located in the estate are as follows. For details refer to Chapter III.

Food	food, beverages and tobacco
Textiles	textiles, clothing, leather goods and shoes
Wood products	plywood and lumber, furniture
Paper, printing	paper, paper products, printing
Chemical	chemical and rubber products
Ceramics	ceramics, glass, glass products, stone and plaster
Metals, machinery	metals, machines, electrical and transport equipments
Miscellaneous	plastic products, office equipments, others

From this list, it will be necessary to layout the estate by group of factories as those which have clean buildings; those related to distribution facilities, those requiring outdoor storage yards, those that produce noise, vibration, noxious gases, or dust and those categorized by kind of wastewater or other fluids that they emit.

(2) Premises of planning by size of work force and plant area needed

The total number of people employed at the industrial estate will be 25,080 and the land area required for factories will be 150 ha.

Type	No. of Employees	Area (ha)	Persons/ha
Food	1,475	19.5	75.6
Beverages	1,630	2.5	652.0
Tobacco	195	3.0	65.0
Textiles	750	3.0	250.0
Clothing	2,370	6.0	395.0
Leather goods	150	0.5	300.0
Shoes	400	0.5	800.0
Plywood	230	6.5	35.4
Furniture	3,000	8.5	352.9
Paper and paper products	650	4.0	162.5
Printing	150	0.5	300.0
Chemicals	850	2.5	340.0
Rubber products	450	2.0	225.0
Ceramics	680	10.0	68.0
Glass and glass products	300	3.0	100.0
Stone and plaster	720	14.0	51.4
Metals	1,920	17.5	109.7
Machines	1,850	8.5	217.6
Electrical	3,850	14.5	265.5
Transportation machines	1,720	16.5	104.2
Others	1,740	7.0	248.6

The main types of industries in the industrial estate, according to size of work force and plant area required, are food, beverages, clothing, furniture, metals, machines, electrical, transport machines and others. Some factories entail particularly high concentrations of personnel per hectare, such as shoes, 800; beverages, 652; clothing, 395; furniture, 353; and chemicals, 340. Since many of these factories are small-scale operations, it is feared that there will be inadequate welfare and recreation facilities for them. Thus it will be necessary for the industrial estate to supplement such needs for those industries. It will also be most desirable to locate plants in one area according to type of environmental hazards that they may create. That would mean placing the

19.5 hectares for the food processing plant, the 2.5 hectares of the beverage plant, and the 10.0 hectares for the ceramics factory all in one location for the treatment of wastewater from these facilities. Those producing polluted water would be placed in another area, such as the 6.5 hectares for the sawmill and the 2.5 hectares for the chemical factory. There would also be another area for plants that produce vibrations and noise, such as sawmill with 6.5 hectares, rubber factory with 2.0 hectares and metal factory with 17.5 hectares.

(3) Planning premises by outputs

When the industrial estate is operating at full capacity it will probably turn out products valued at US$715,000 per day. The value per item is listed as follows:

Industry type	Value per day (US$)	Product type
Food	42	canned goods, grain, vegetable oil, bread, pastries
Beverages	100	soft drinks, Markisa juice
Tobacco	4	cigarettes
Textiles	23	spinning, weaving, rope making
Clothing	25	shirts, work clothes, carpets, towels
Leather goods	3	briefcases and bags
Shoes	9	shoes, leather sandals
Wood and plywood	5	boards and sheets
Furniture	57	desks, chairs, bookshelves, handicrafts
Paper and paper products	17	paper containers, corrugated cardboard boxes, Kraft paper bags
Printing	2	books
Chemicals	32	pharmaceuticals, sprays, paints, adhesives, detergents
Rubber products	10	hoses, belts, rubber sandals
Ceramics	40	tile, chinaware, insulation, bricks, asbestos cement pipes
Glass and glass products	5	glass dinnerware, bottles, plate glass
Stone and plaster	22	building stone, plaster, eternit pipe

metals	52	steel wire, bolts, nuts, cans, nails, knives and cutlery
Machines	50	diesel engines, generators, rice mills
Electrical	103	television sets, radios, calculators, lighting
Transport machines	74	trucks, motorcycles, bicycles
Others	40	container boxes, plastic containers, ball-point pens

It is necessary to consider the appropriate mode of transport according to product propensity, form, weight and allowable transport costs for: agricultural and forestry products (grain, fruits, meats, fish, lumber, etc.); mining (gravel, sand, stone, limestone, etc.); petroleum products (volatile oils, kerosene, light oil, gasoline, heavy oil, etc.); metal products and machinery (metal products, machines, cement products, etc.); chemicals (chemicals, farm chemicals, paint, etc.); and light industry products (paper, textiles, food provisions, etc.).

(4) Planning premises by size of factory plot and time period

The total amount of land area required for the factories will be 149 hectares (net), but the demands for land can come in three time periods.

First period	1978 - 1983	71. 0 ha.
Second period	1983 - 1987	44. 5 ha.
Third period	1987 - 1990	33. 5 ha.

Demand for land may be classified as follows by size of factory plots for each of the above periods:

Table V-1 Demand for Size of Factory Plot and Time Period

Period / Size of lot	I	II	III
below 0. 5 ha.	16. 0 ha. (32 factories)	10. 0 ha. (20 factories)	2. 5 ha. (5 factories)
1. 0 - 1. 5 ha.	20. 0 ha. (22 factories)	10. 0 ha. (10 factories)	2. 0 ha. (2 factories)
2. 0 - 2. 5 ha.	14. 5 ha. (6 factories)	10. 5 ha. (5 factories)	13. 0 ha. (6 factories)
above 3. 0 ha.	20. 0 ha. (6 factories)	14. 0 ha. (4 factories)	16. 0 ha. (4 factories)

Demand for standard-type factories of 1,000 square meters each is estimated at 2.5 hectares during the first period, 3.5 hectares in the second, a total of 6 hectares. On the whole, during the first period the demand will center on small-sized plants of 0.5 to 1.5 ha. and the standard type of 0.1 ha. During the second period the demand will tend to be equally distributed among sizes, ranging from the standard type all the way up to 4.0 ha. During the third period the relative scale of factory land is estimated to be rather large, anywhere from 2.0 to 5.0 ha.

3. Comparative Study of the Master Plans

1) Gist of the plan and the area covered (see Fig. V-1)

(1) Plan - L type

i) Aim of the plan

This plan excludes as much as possible the relatively more productive rice paddyland, and aims primarily at the dry fields and woodland along the ridge line of site 3.

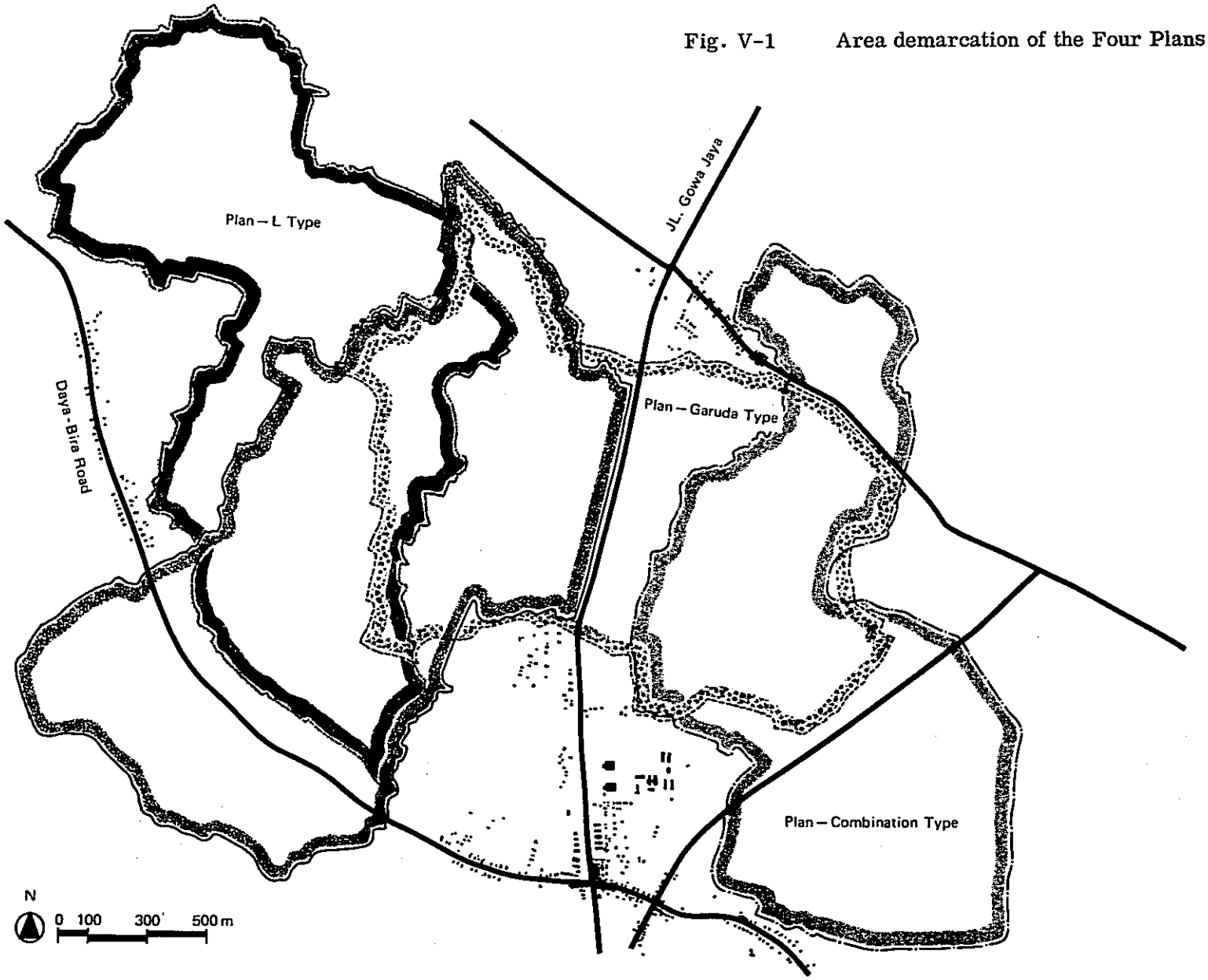
ii) Area demarcation

The proposed land area will go as far to the north as the golf course and workshop located within the site. The southern borderline will be drawn about 50 meters away from the nearest dwellings Kapasak, in order to protect the environmental conditions of the village. To the east the line separating the dry fields from the paddyfields provides natural demarcation. The west side will end where the land drops off sharply.

iii) Present topography and land use

The land area covered in the plan is approximately 202 hectares. The highest point on the site is 29 meters above sea level, the lowest 6 meters. The distance between these two points is 1,800 meters and the average gradient is about 1.3 percent. Thus, construction in the area will not be very difficult, but there are some areas in this part where the slope is on the

Fig. V-1 Area demarcation of the Four Plans



order of more than 5 percent. At present, 32 percent of land is used for dry field, 27 percent for wet rice paddy, and 41 percent for wooded land. The figure for the rice fields may seem high, but it is unavoidable because some of those fields come right up to the ridge line. Fig. V-2, Fig. V-3.

iv) Land for factory use and artery roads

From its topography, the area can be divided into three zones, i. e., three clusters of factories. The approach roads to the site will hook up with the Daya Bira Road and the workshop road. The Jl. Gowa Jaya will not be considered because a feeder road there may obstruct irrigation of the rich paddies on the site. The arteries within the industrial estate is shown in Fig. V-4.

v) Arrangement of main facilities

The center of the industrial estate will be located somewhat north of the mid-point of the site. A sub-center should probably be established in the south, since the walking distance would be too far for people working in that zone to reach the center. Utilities will be located at the lowest point of 6 meters in the southern edge of the site. This is largely because of the need for a wastewater treatment facility.

Distribution-related facilities will be located in the western block of the estate, assuming that road S1 (see p. 156 of the English, or page 128 of the Japanese, report on the pre-feasibility study) will be an industrial road in the future. Commercial and service facilities will be placed where the largest flow of pedestrians is expected, namely, at a point in Kapasak where one of the intra-estate arteries originates. Green belts and parks will be built in the central portion of the industrial estate, since that zone is unsuitable for buildings and residences due to the 10 percent slope. A sports park will be set up within these green areas. There will also be disaster prevention ponds equipped with sand basins and special reservoirs for any dangerous articles or substances flowing into rainwater ditches. These will be located at the far reaches of each of the three water catchment areas. The arrangement of these major facilities is shown in Fig. V-5.

vi) Land use by percentage

An outline of the land area used in this plan for the industrial estate gives 63 percent for factories, 5 percent for center, subcenter, distribution-related facilities, commercial and service facilities, 11 percent for road use, and 21 percent for green areas, parks, disaster prevention ponds. Fig. V-6

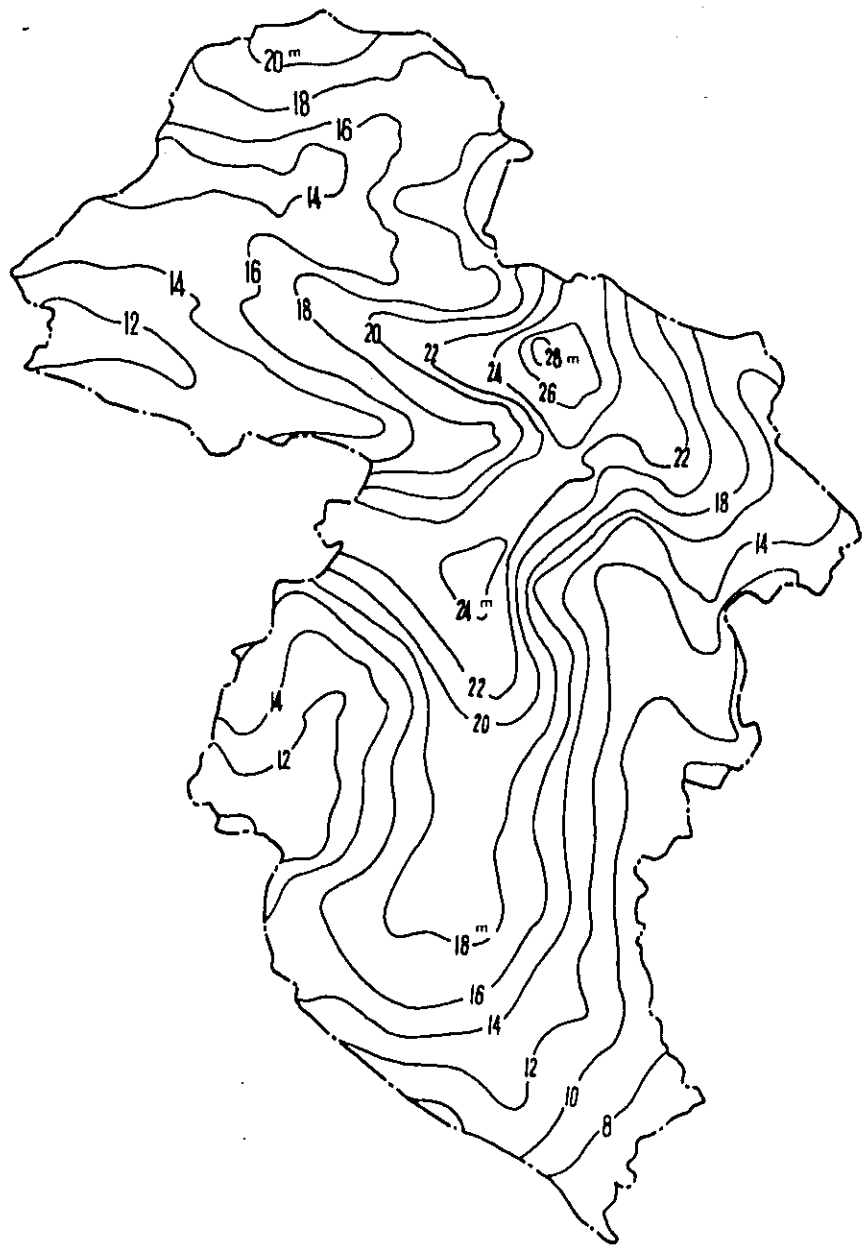


Fig. V-2 Present topography in the Plan-L Type
(meters above sea level)

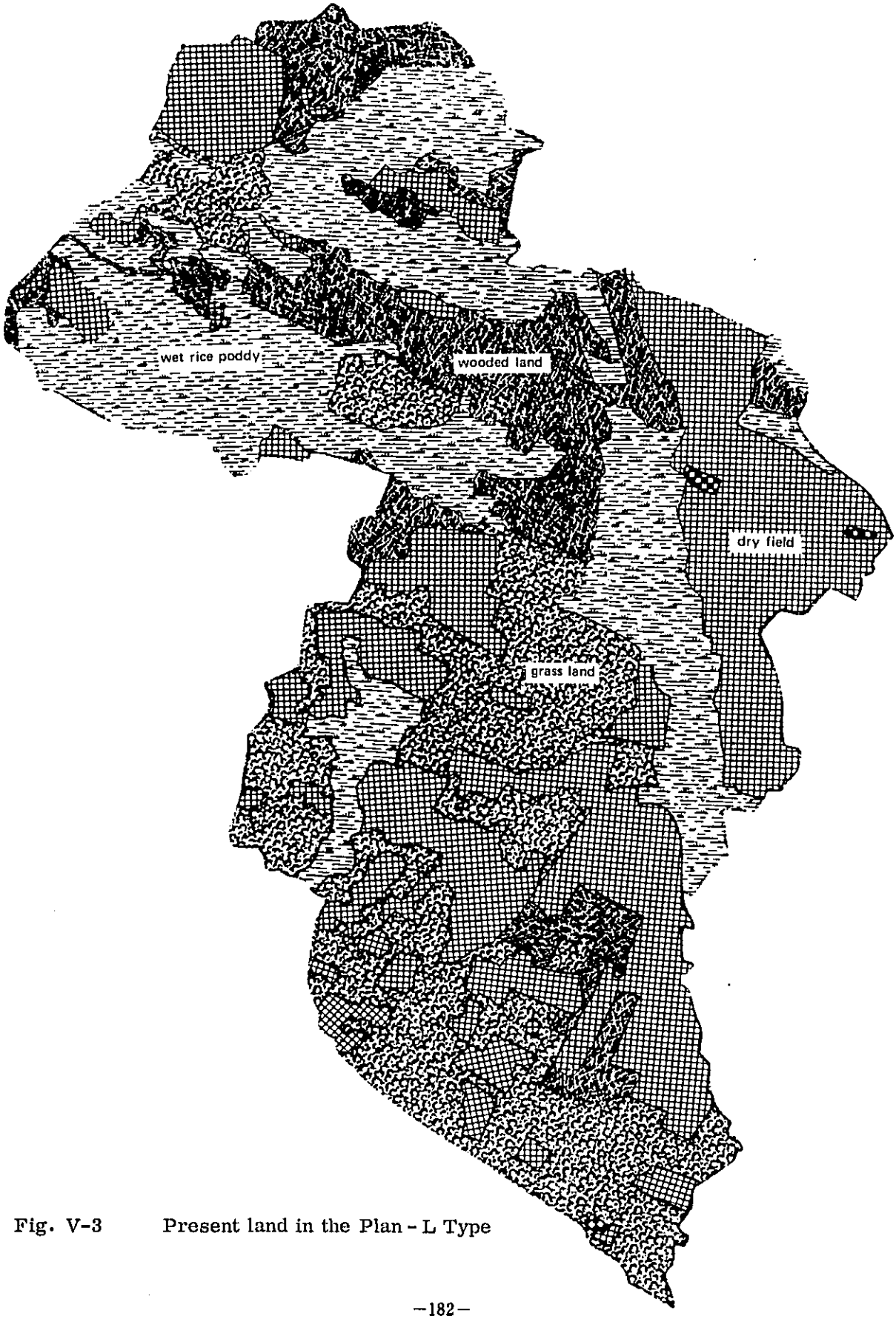


Fig. V-3 Present land in the Plan - L Type

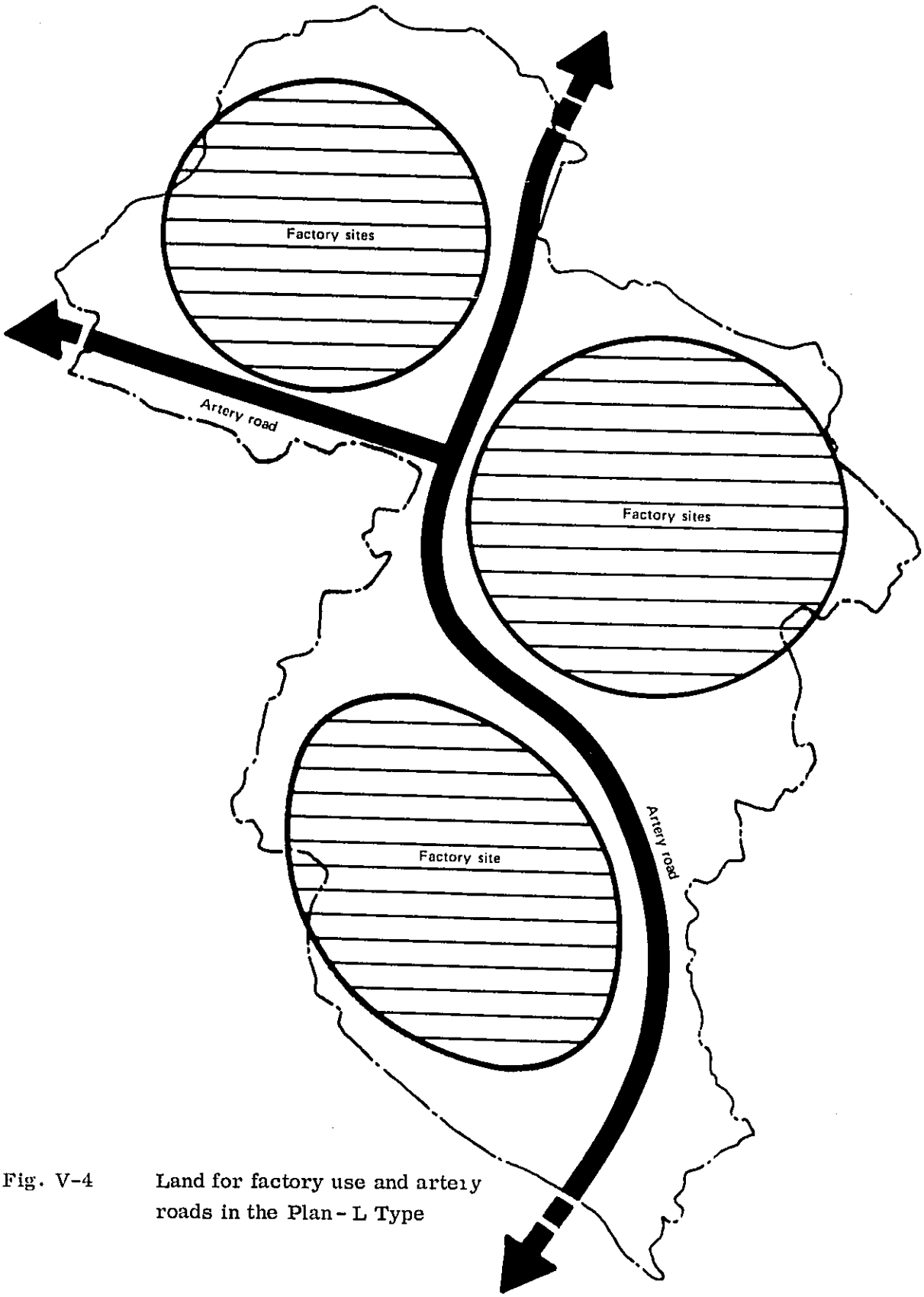


Fig. V-4 Land for factory use and artery roads in the Plan-L Type

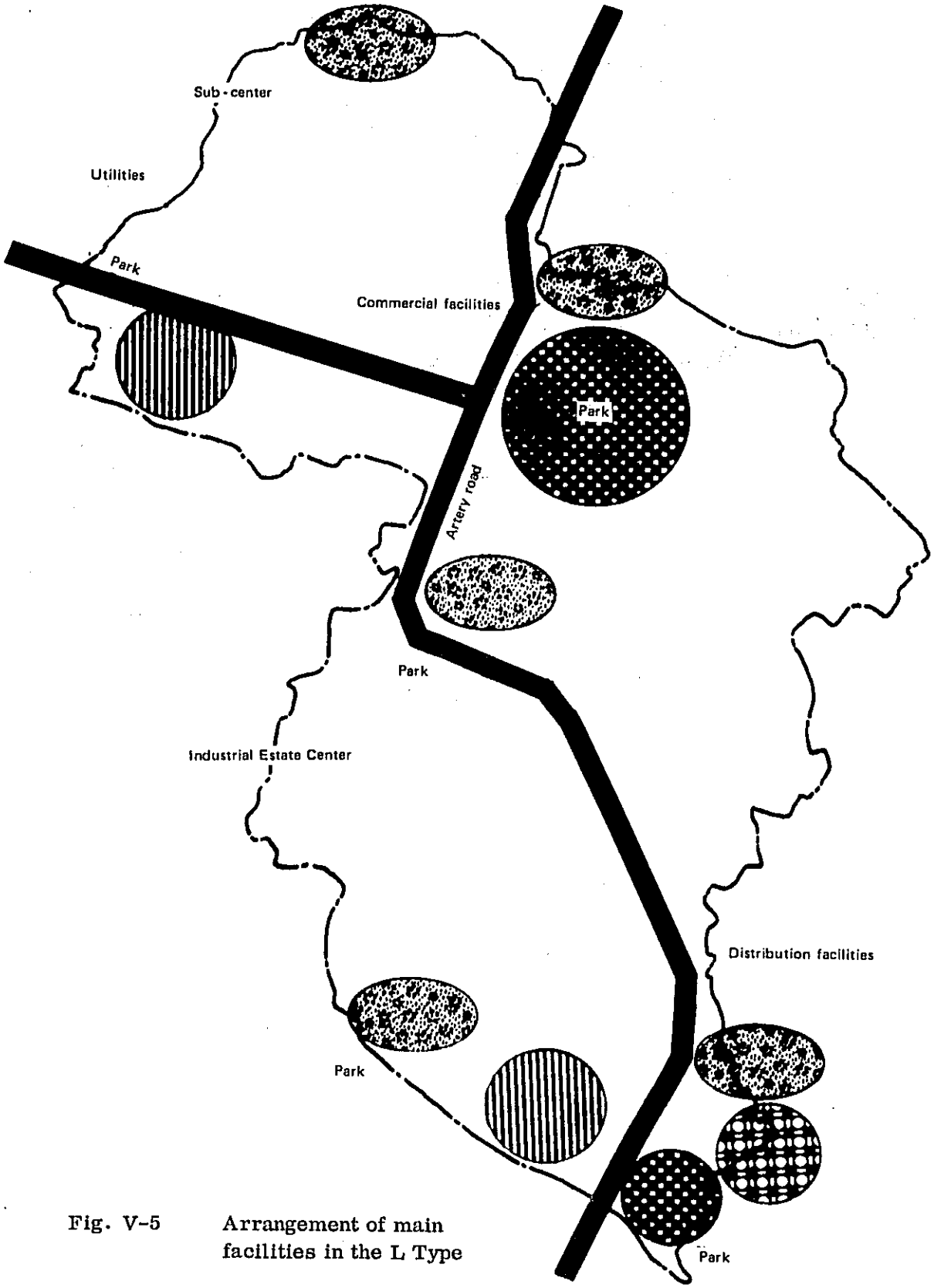


Fig. V-5 Arrangement of main facilities in the L Type

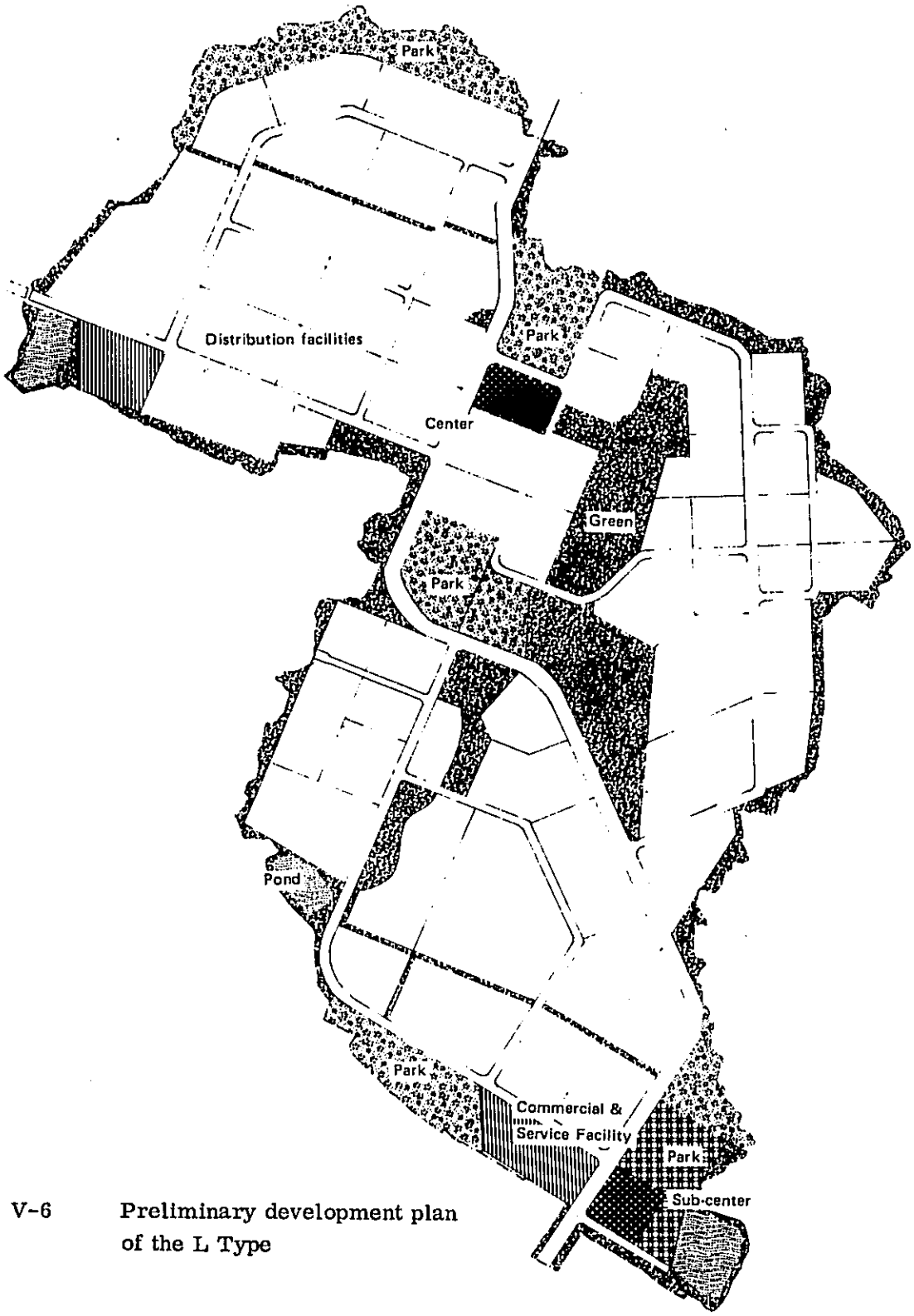


Fig. V-6 Preliminary development plan of the L Type

(2) Plan - Camel type

i) Aim of the plan

The aim of this plan is the same as that of the L type, in that it avoids destroying the relatively more productive rice paddyfields. The difference is that it involves site 4 instead of site 3.

ii) Area demarcation

The northern border will reach the series of paddyfields running east-west in the low area and will be situated just this side of the Kalenfebung. The southern border will run in front of the Berna. The eastern edge will be marked by the Tangkala and the line separating dry fields from paddyfields. The western border reaches as far as the built-up area, Daya, and paddyfields. The area of the projected site is about 195 hectares.

iii) Present topography and land use

The topography in this area is complex, the highest point being about 20 meters, with three hilly places forming humps of about 18 meters. The low area converges from different directions. The lowest point is 12 meters (above sea level), with the north-south ridge line running through the area at a gradient of 0.6 percent. (See Fig. V-7.) As much as 84 percent of the land is presently used as dry field, 4 percent for housing, 2 percent for paddyfield, 10 percent for wooded and waste land, and 1 percent for road. (See Fig. V-8.)

iv) Land for factory use and artery roads

From its topography the land will provide one large area of about 100 hectares and four smaller areas of 20 - 30 hectares as factory sites. The approach roads will originate from the Jl. Gowa Jaya, Jl. Daya and the workshop road. The artery roads will be set up in a Y pattern spreading in three directions, as shown in Fig. V-9.

v) Arrangement of main facilities

The estate center will be placed at the fork of the Y pattern. Taking into consideration of walking distances, a sub-center will be set up in the northern

zone. Utility facilities will be placed at the lowest point of 12-meters on the southern edge. Distribution-related establishments and commercial and service facilities will be built where one of the arteries originates on Jl. Gowa Jaya. Green parks will be built next to both the center and sub-center. Disaster prevention ponds will be built in the lower reaches of each of the four water catchment areas. The arrangement of these major facilities is shown in Fig. V-10.

vi) Land use by percentage

A general outline of land use for the industrial estate as based on this plan gives factory use at 63 percent; center and sub-center, distribution-related establishments and commercial and service facilities, 6 percent; roads 16 percent; parks, green areas and disaster prevention ponds, 15 percent. Fig. V-11.

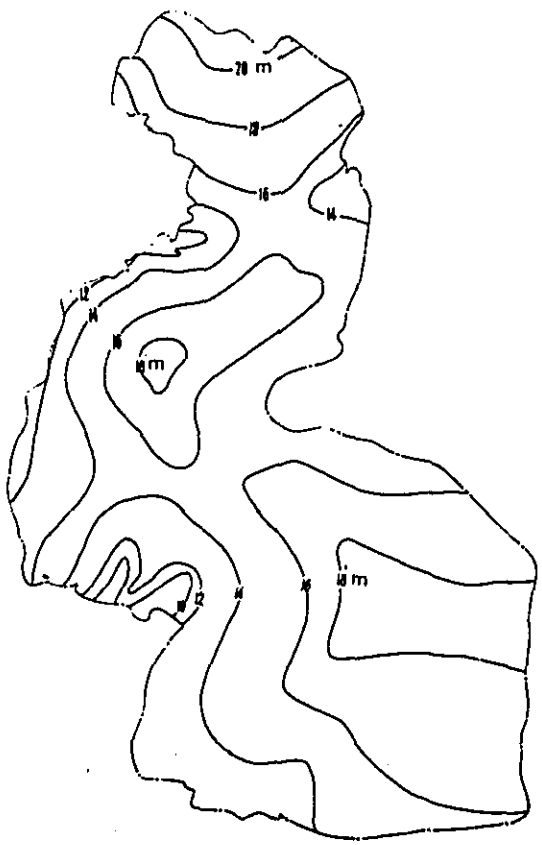


Fig. V-7 Present topography in the Plan-Camel Type

Fig. V-8 Present land use in the Plan - Camel Type

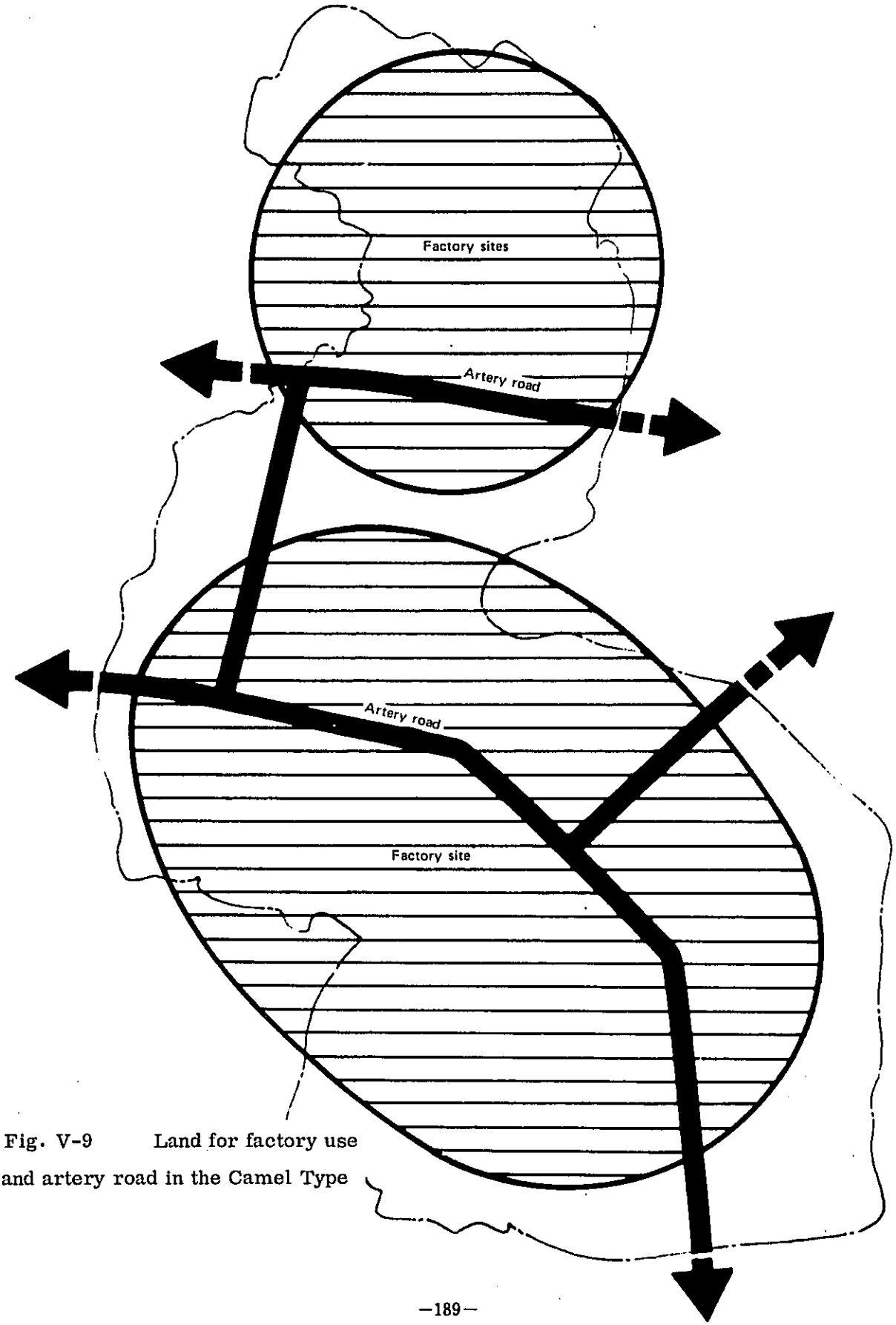


Fig. V-9 Land for factory use and artery road in the Camel Type

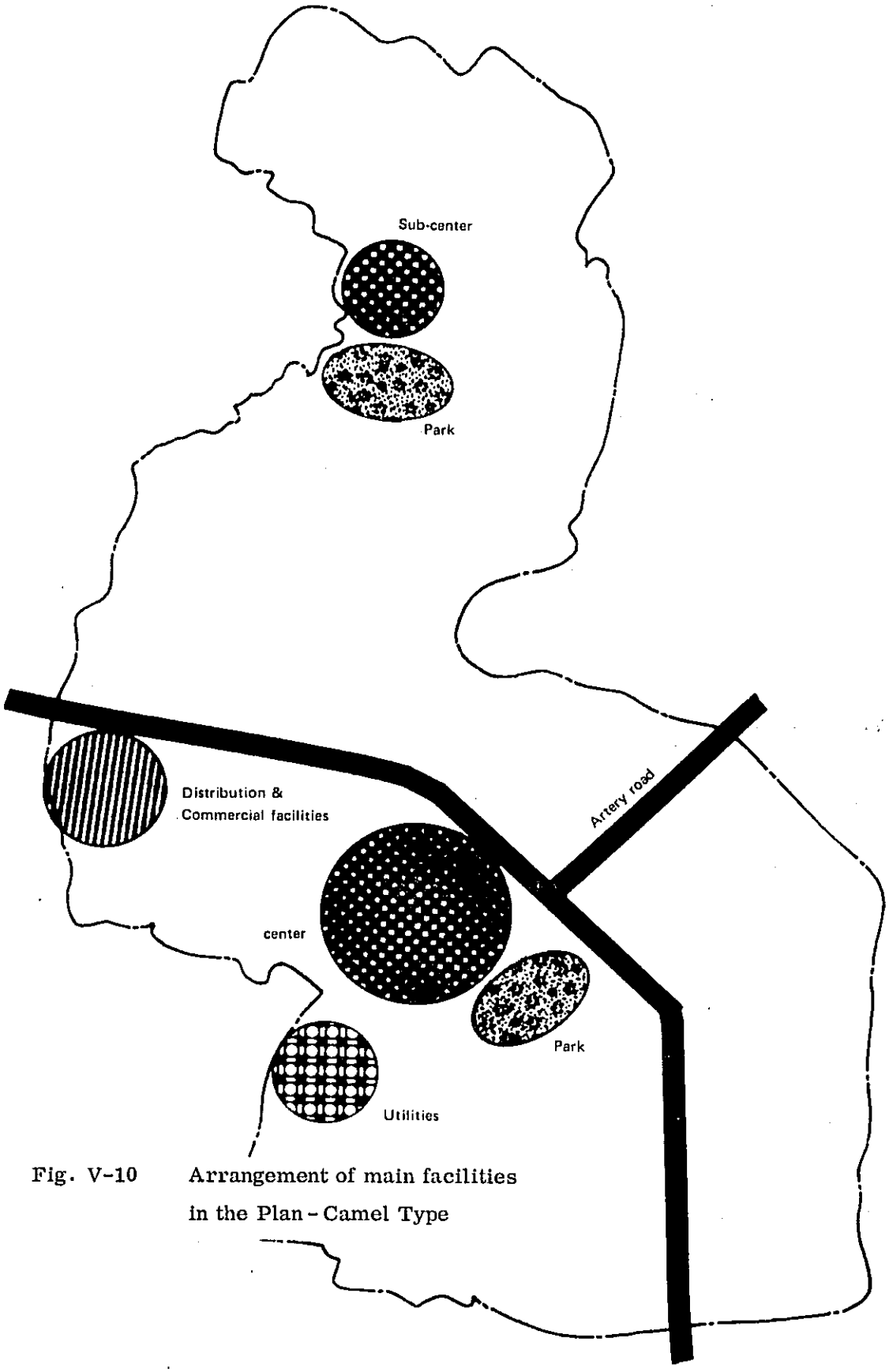


Fig. V-10 Arrangement of main facilities in the Plan - Camel Type

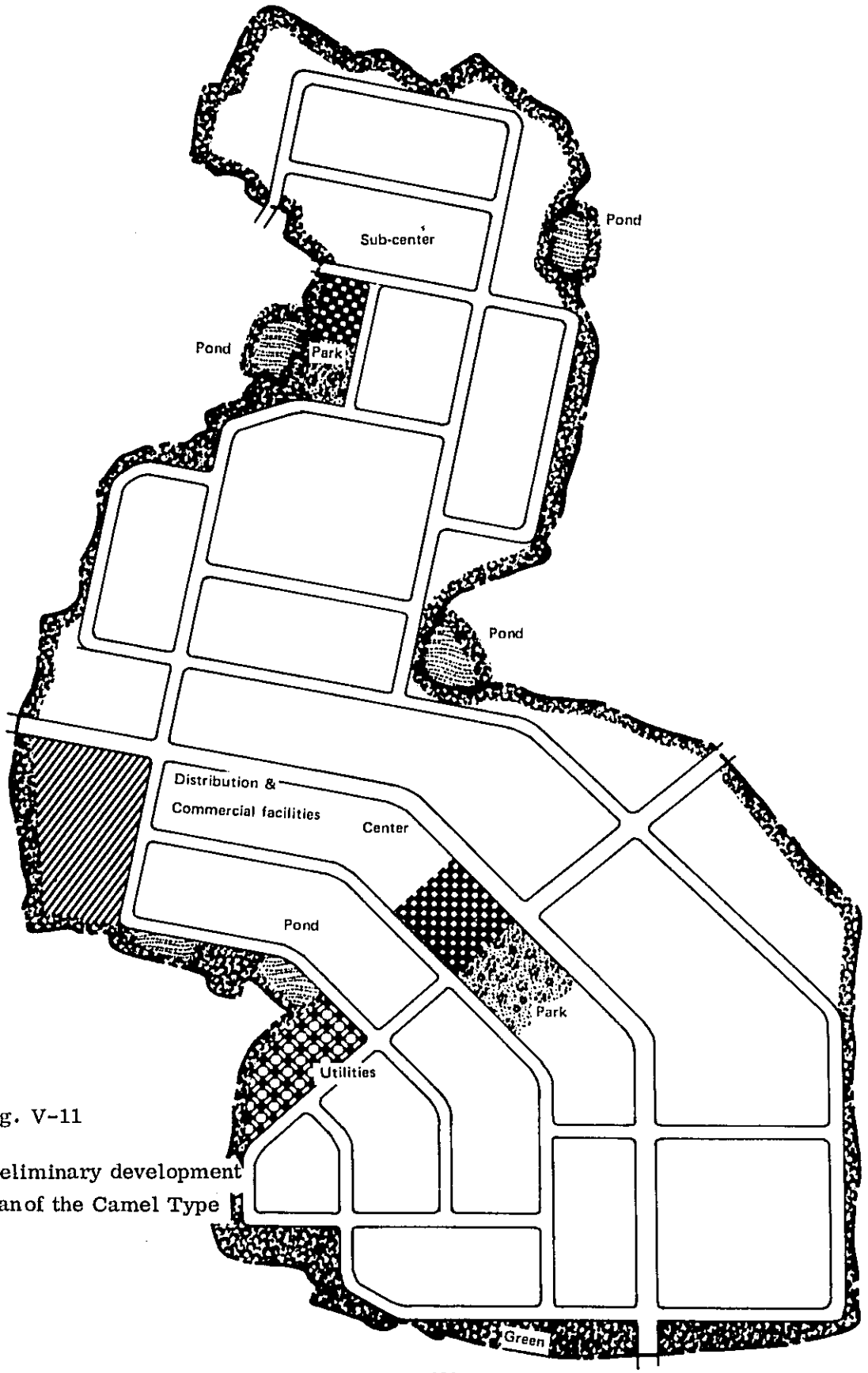


Fig. V-11

Preliminary development Plan of the Camel Type

(3) Plan - Garuda type

i) Aim of the plan

This plan calls for site 3 to be used as a showcase for industrial activity in Ujung Pandang city.

ii) Area demarcation

The northern borderline will be drawn just this side of the workshop and the settlement there. To the south the line separating the dry fields from the wet rice paddies will form the edge. The eastern boundary will go as far as the dividing line between the dry fields and Jl. Gowa Jaya. To the west the slope of a 5 - 10 percent gradient will provide a natural line of demarcation. The total land area covered in this plan will be approximately 212 ha.

iii) Present topography and land use

The topography of the area is divided into ridge and valley lines. The highest point along the former is 24 meters above sea level, while the lowest 6 meters. Given an average gradient of 1.3 percent, land development work for the industrial estate will not be excessively difficult to carry out. Along the valley line the lowest point comes to 7 meters, as opposed to the highest point of 16 meters. With a 0.7 percent gradient, construction will be no problem here, either. (See Fig. V-12.)

Land use at present is 37 percent for dry fields, 24 percent for rice paddies, 6 percent for residential dwelling, and 33 percent for woodland and wasteland. One problem is that this area includes a desa within its boundary. (See Fig. V-13.)

iv) Land for factory use and artery roads

From its topography the area should be able to provide two large zones for factory land, one along the ridge line, and the other along the valley. Approach ways to the estate will intersect with Jl. Gowa Jaya and Daya-Bira street. The intra-estate artery will go through the middle of the two zones, making the 24-meters high point the symbol of the estate. For its route, see Fig. V-14.

v) Arrangement of main facilities

The center will be located at the highest 24-meters point, the symbol of the whole estate. Sub-centers will be placed in three points, taking the maximum walking distance into consideration. The utility facilities will be at the southernmost edge of the lowest point of 6 meters, by virture of accessibility to service water and electricity from the power-transmission line. Facilities related to distribution, commerce and service will be located close to the intersection on the artery road in the southwestern edge of the estate. It is assumed that road S1 will become an industrial artery in the future. For parks and green areas, a natural park will be created in the hilly area where the center will be located, and a sports park in the south. The area along Jl. Gowa Jaya will be turned into a scenic green belt. A retarding basin, will be constructed in the low area in the center of the estate, and it can also function as an athletic ground. Disaster prevention ponds will be located in the lower reaches of each of the four water catchment areas that the topography of the area necessitates. Fig. V-15.

vi) Land use by percentage

Based on this plan, the industrial estate will be divided into the following categories of land use: 64 percent for factories, 4 percent for the center, sub-centers, facilities related to distribution, commerce and service, 12 percent for roads, and 20 percent for parks, greens and disaster prevention ponds. Fig. V-16.

Fig. V-12 Present topography in the Plan - Garuda Type
(meters above sea level)

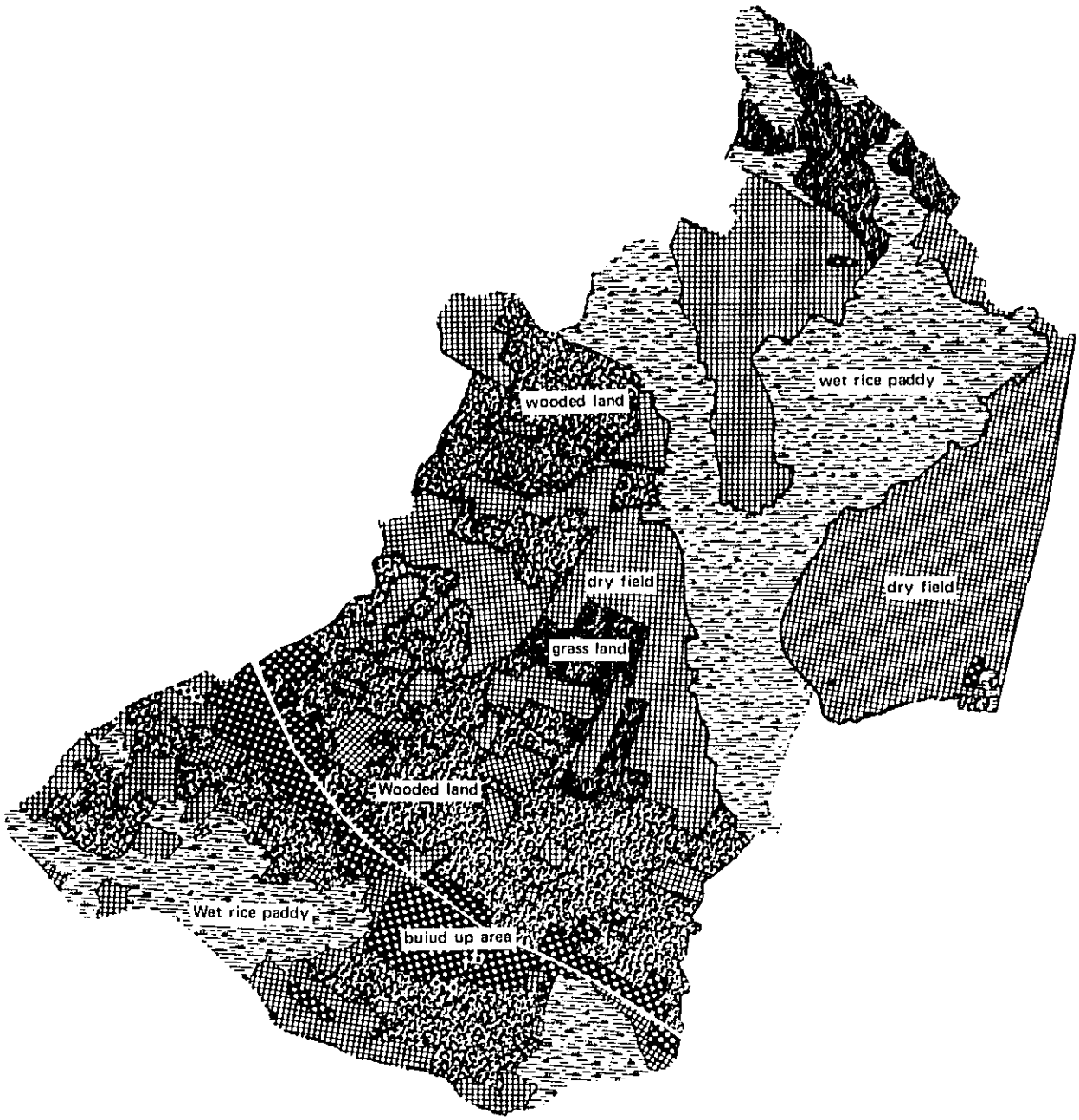


Fig. V-13 Present land use in the Plan - Garuda Type

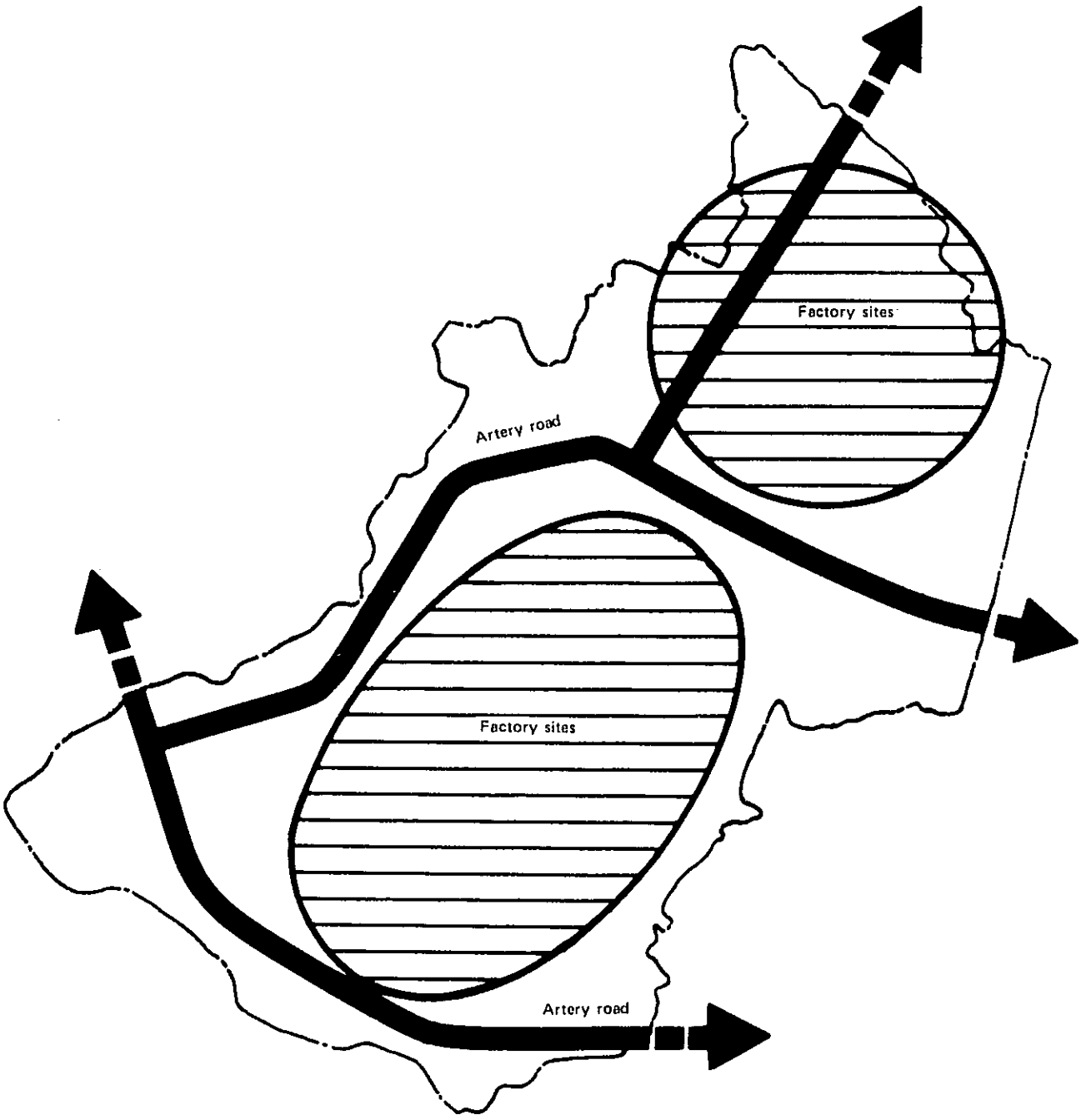


Fig. V-14 Land for factory use and artery roads in the Plan - Garuda Type

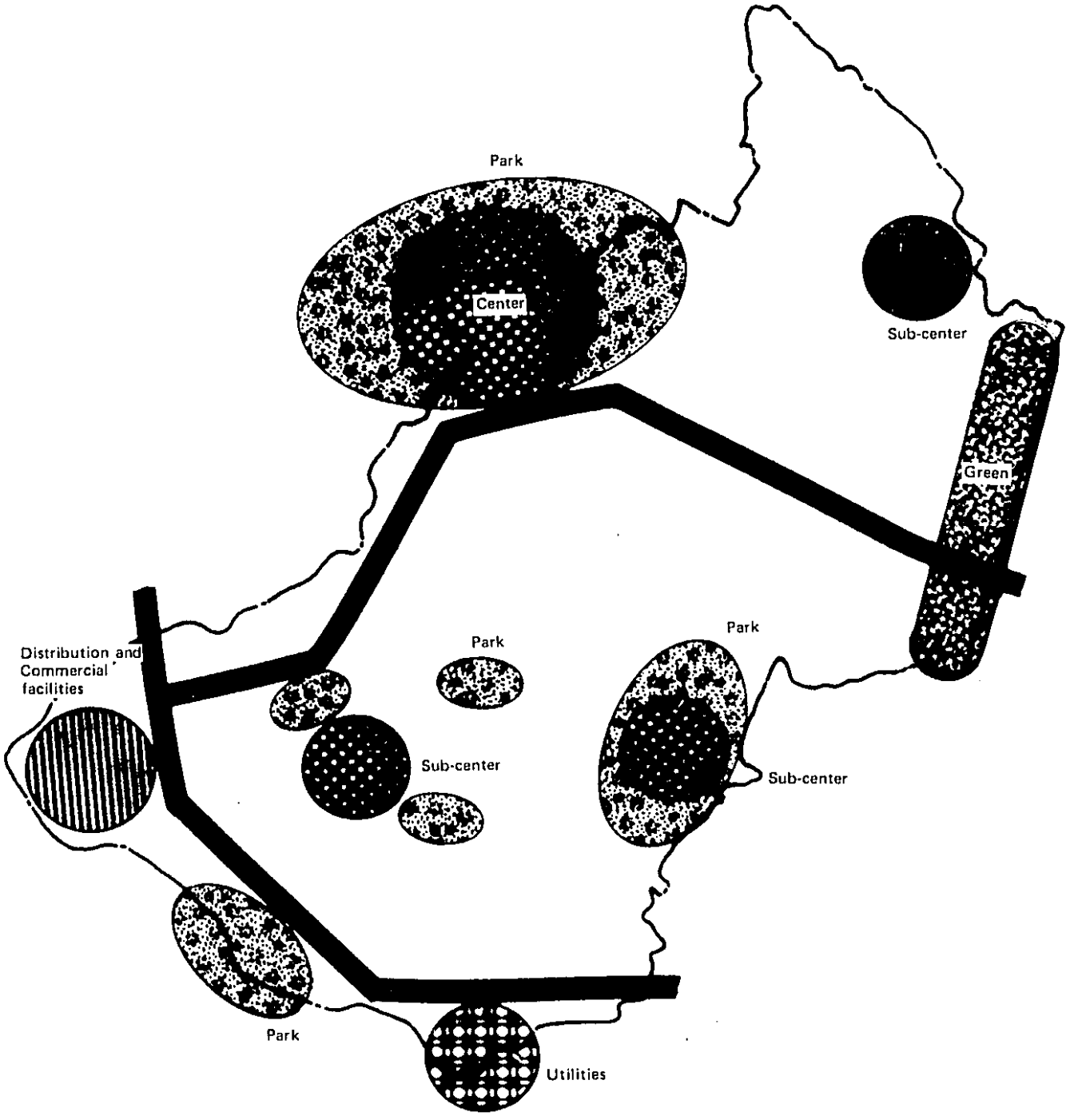


Fig. V-15 Arrangement of main facilities in the Plan - Garuda Type

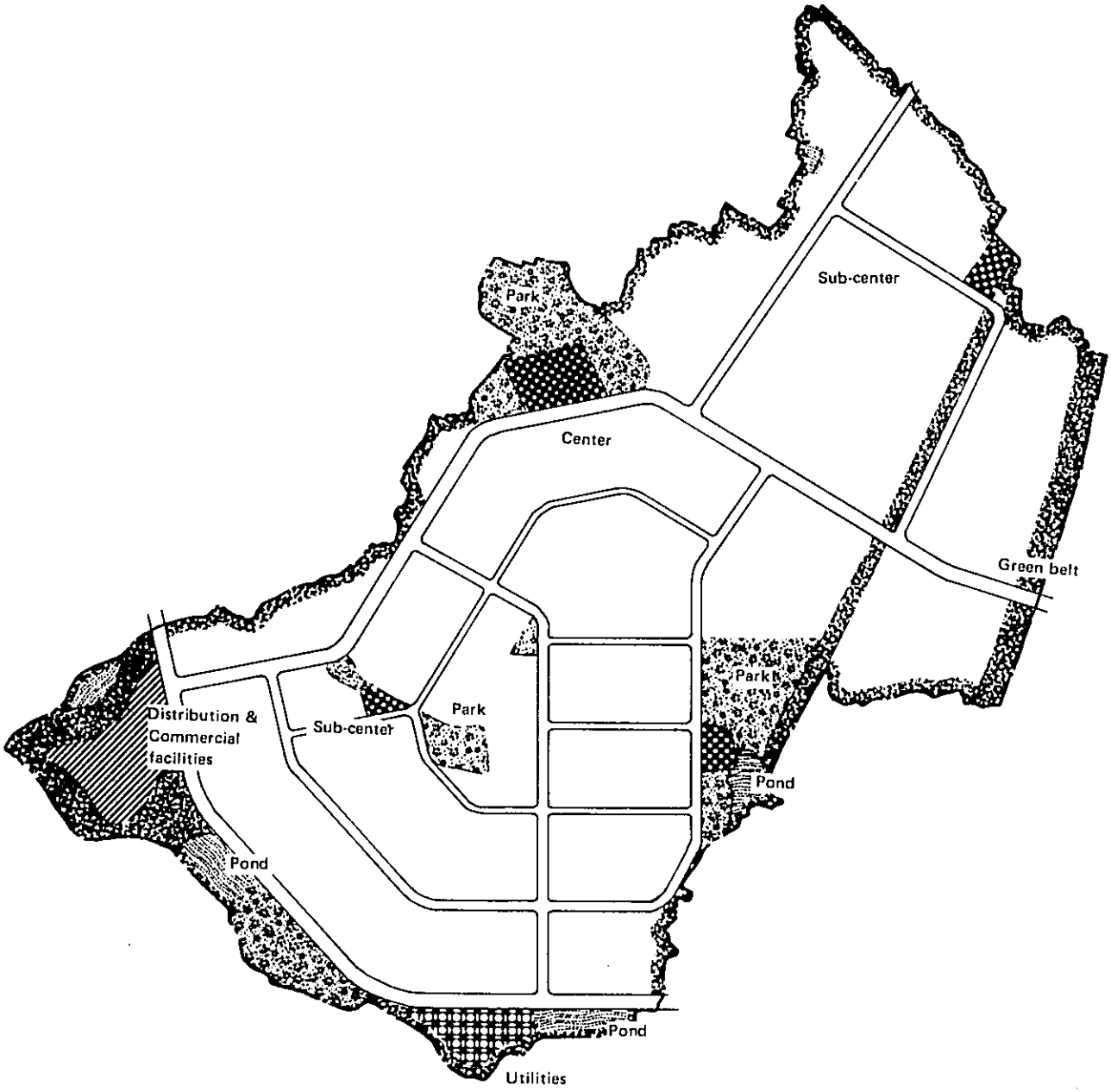


Fig. V-16 Preliminary development Plan of the Garuda Type

(4) Plan - Combination type

i) Aim of the plan

This plan emphasizes the showcase aspect of the estate and encompasses parts of both sites 3 and 4, with the national road in between.

ii) Area demarcation

The northern boundary will go as far as the workshop and the desa, while the southern border will be located along the line between wet rice paddies and Daya. On the east side Tangkala and rice paddyland will come within the boundary. The western edge will be located just where the land begins to decline sharply. The total land area covered in this plan is 190 ha.

iii) Present topography and land use

The topography of the area is as such that it can be divided roughly into three parts. Running on the east side of the Jl. Gowa Jaya are a ridge line and a valley, and another large valley line cuts through the west side. The highest point along the ridge line is 18 meters, while the lowest 12 meters. In the middle is a hilly area, and the north-south declination is 12 percent on the average. The highest point along the small valley is 15 meters, and the lowest is 9 meters. The average decline is 0.4 percent. The highest point in the large valley is 16 meters, the lowest is 1meter, giving a 0.7 percent gradient. Fig. V-17.

These facts portend some difficulty in achieving a balance between the amount of earth to be excavated and that needed for banking. The present land use in the area are: 63 percent for dry fields, 29 percent for wet rice paddies, 3 percent for housing, 4 percent for woodland and wasteland, and 1 percent for roads. Fig. V-18.

iv) Land for factory use and artery roads

From the topography, this area will provide three zones for factory plots. An approach road may be connected with the Jl. Gowa Jaya. The intra-estate artery will be made a loop road, but its northern intersection with the Jl. Gowa Jaya will have to be an overpass, since it will be only 300 meters away from the workshop street intersection. Fig. V-19.

v) Arrangement of main facilities

The center will be located near the point of origin of the intra-estate artery. Two sub-centers will be needed east and west within walking distance. The utility facilities will be in the lowland, west of the Jl. Gowa Jaya, for accessibility to the power-transmission line. Facilities related to distribution, commerce and service will also be located close to where the artery road begins. For parks and greens, an area across the Jl. Gowa Jaya from the estate center will be reserved for a large park, and a smaller park will be attached to each of the sub-centers. Disaster prevention ponds will be located in each of the three water catchment areas. Fig. V-20.

vi) Land use by percentage

The plan designates 62 percent of the land area for factory sites, 6 percent for the center, sub-centers, and distribution, commercial and service facilities, 16 percent for roads and another 16 percent for parks and greens. Fig. V-21.

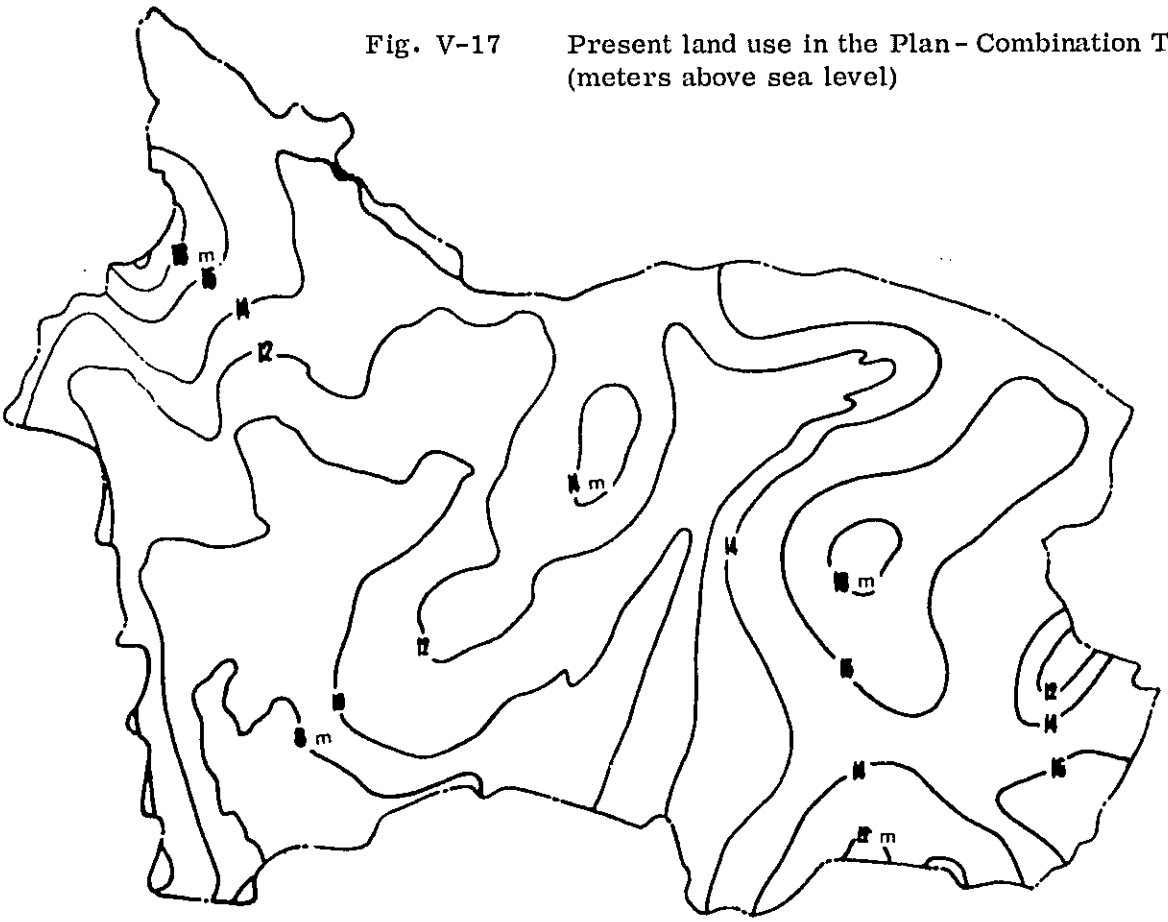


Fig. V-17 Present land use in the Plan - Combination Type (meters above sea level)

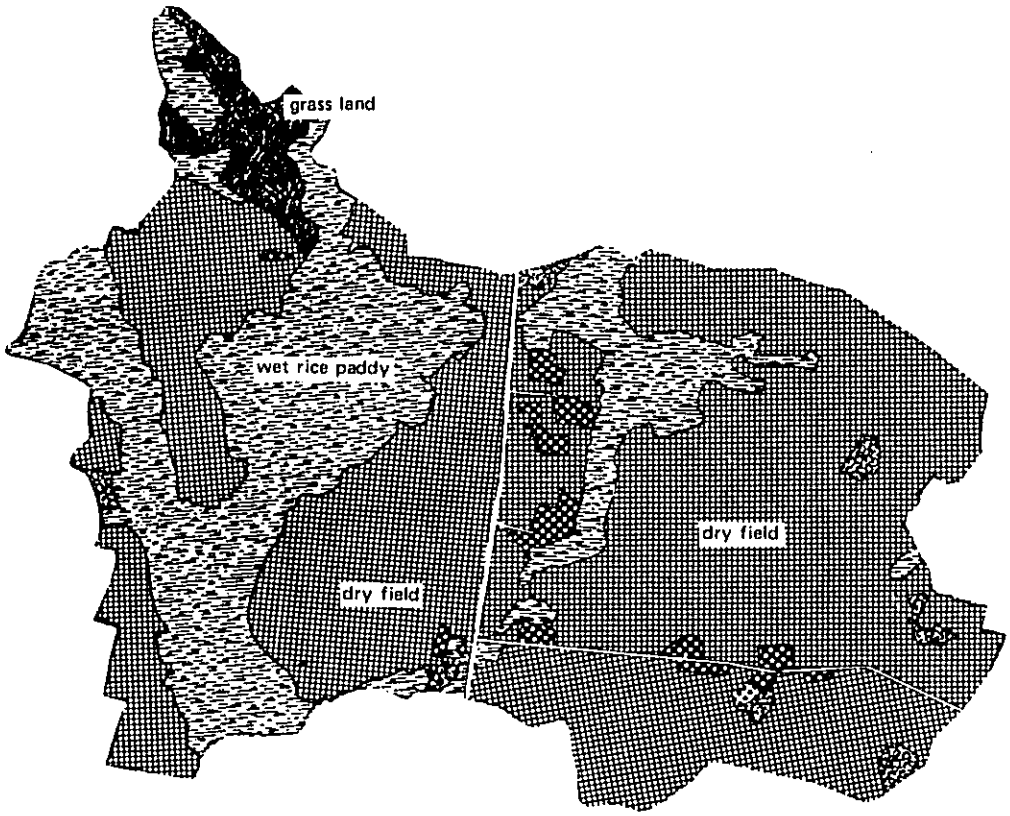


Fig. V-18 Present land use in the Plan - Combination Type

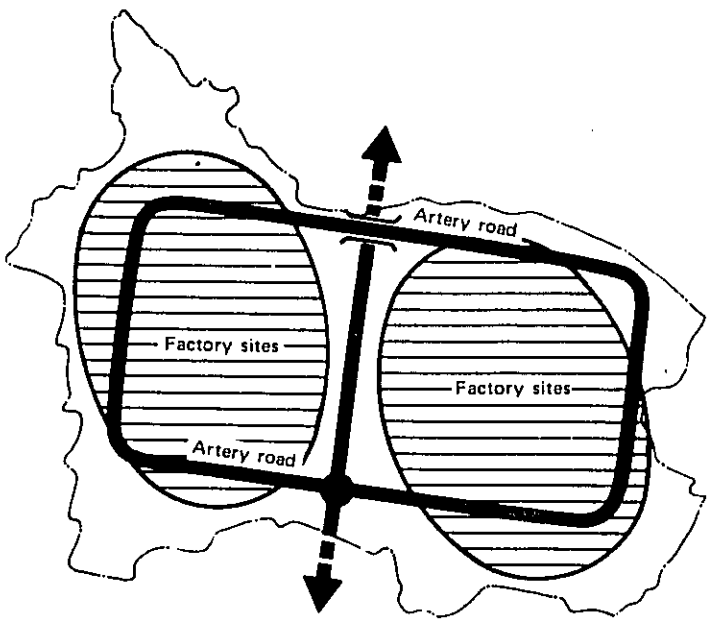
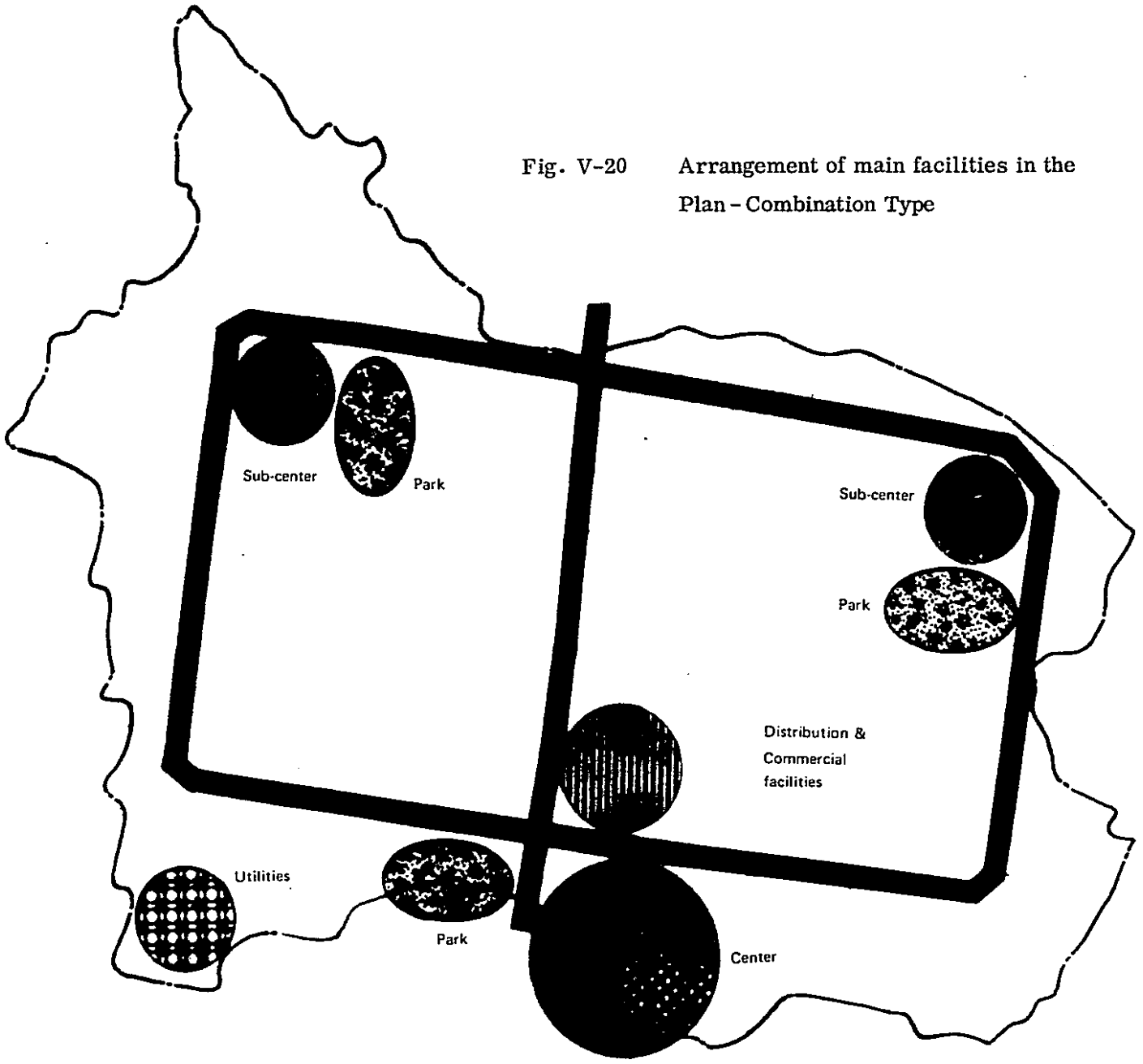


Fig. V-19 Land for factory use and artery roads in the Combination Type

Fig. V-20 Arrangement of main facilities in the Plan - Combination Type



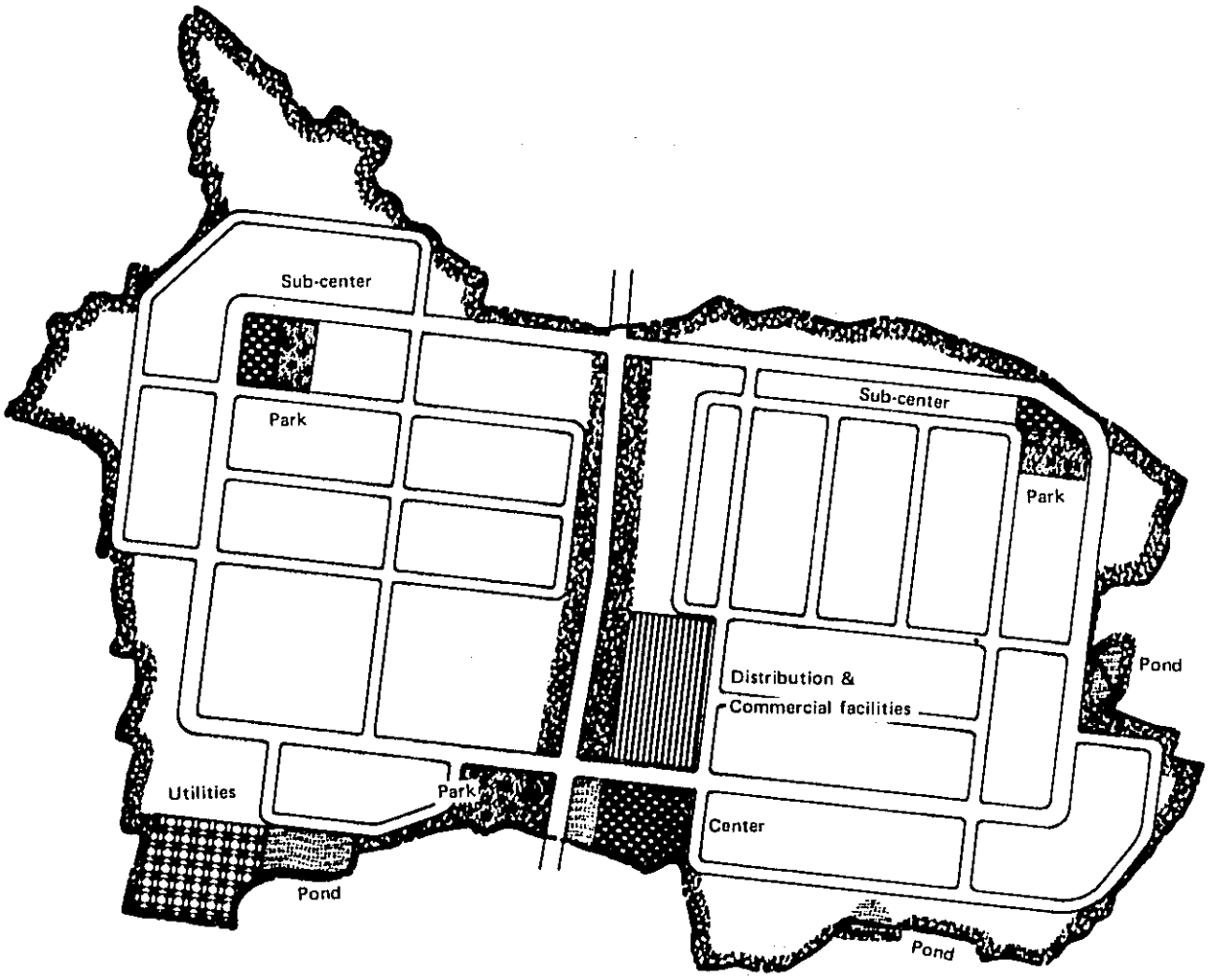


Fig. V-21 Preliminary development Plan of the Combination Type

2) Comparison of the four plans

The following is a comparative evaluation of the four plans outlined above -- L type, Camel type, Garuda type and Combination type. Points of comparison will include land productivity, difficulty of land development, space available for factory use, percentages of factory sites by size, traffic, number of settlements and facilities in the surrounding environment requiring protection measures for safety reasons. The four plans will be evaluated according to a demerit mark system, grading on each of these points.

(1) Productivity of land

Patterns of land use in all of the areas covered in the four plans fall into one of the following: dry fields, wet rice paddies, residential land, and woodland - westeland. Putting aside the residential land, which comprises only a negligible percentage, we know that the productivity rates for dry fields and woodland are less than 50 percent of that for wet rice paddies. As indicated earlier, it is desirable to exclude rice fields as much as possible from the site chosen for the industrial estate.

Wet rice fields account for 27 percent of the total land area covered in Plan-L type because they cut into the proposed site along the valley line from both east and west. The Camel plan incorporates only 2 percent paddyfields, since it covers an area along a ridge line connecting three hills. Wet rice paddies come to about 24 percent of the area under Plan-Garuda type, which centers on a large ridge and a medium-sized valley. Rice paddies are all in the valley area. The Combination-type plan covers an area comprising a ridge and a small valley in the east, and another medium-sized valley in the west. Rice paddies spread in both these valley areas, accounting for 29 percent of the total land area under the plan. L-type, Garuda-type and Combination-type plans all receive a demerit, insofar as the land area they cover contains more than 20 percent rice paddies.

(2) Difficulty in land development

By this stage of planning, the focal point of land development is whether or not a balance in cut and fill can be achieved. Difficulty arises when such a balance is not possible within the site, for it excavation surpasses embankment, then an outside area must be secured for dumping earth removed. Conversely, if more earth is need for banking than what excavation yields, then extra earth will have to be brought in from the outside. In either case, measures will have to be taken to prevent landslides or washouts in the outside area used. In the northern part of the area under Plan-L type, 400,000 cubic meters of earth will have to be brought in from the outside to convert the exposed rock bed into building land. A balance will be possible under Plan-Camel type, since the proposed site is predominantly in the hill area. The Garuda-type plan will involve removing earth from the hilly northwestern zone and using it to fill in the valley of the southeastern zone, but there should be no need for outside dumping or excavation. The Combination-type plan will require 500,000 cubic meters of extra earth to fill in the two valleys there. Thus, the L-type and Combination-type plans lose points because of their requirement for extra earth.

(3) Percentage of factory land

Productive space is essential to any industrial estate. Such space, however, will become functional only when the land for factory use is organically and rationally combined with other types of land use such as for roads, business administration and welfare facilities, recreation facilities, utilities, and distribution-related establishments. Thus, it is ideal to limit the space for plant use to create a favorable production environment and increase the proportions for recreational, welfare and other facilities. On the other hand, from the point of business management of the estate, it would be more profitable, or at least easier to break even, if a higher percentage of the land area is sold or rented for factory use and for facilities related to distribution. Both of these conflicting considerations must be taken into account, and a feasible balance sought. A reasonable percentage of the lots for sale or rent would be somewhere around 55 - 65 percent of the total area. Calculated at the scale of 1/5,000, the four plans under considerations provide the following percentage of space for sale and rent: L-type, 63 percent; Camel type, 63 percent; Garuda

type, 64 percent; Combination type, 62 percent. Thus, there is no noticeable difference among them.

(4) Size of lots

The sizes of lots for the types of industries potentially feasible to be located in the estate are 0.1 hectars for standard factories, 0.5 hectars for the small-sized, 1.0-2.5 hectars for the medium-sized, and 3.0-5.0 hectars for large plants. Areas earmarked for factory use must be improved into lots of appropriate size according to these standards. Total land area needed for each size of factory lots is 28.5 hectars (19%) for those less than 0.5 hectars lots, 70.5 hectars (47%) for 1.0-2.5 hectars lots, and 50.0 hectars (34%) for 3.0-5.0 hectars lots. The question here is how compatible each of the four plans is with these requirements.

Under Plan-L type some difficulty is expected in creating lots of more than 5.0 ha., whereas the Camel-type plan will pose no problems in making such large lots available. The other two plans also seem compatible with the needs here. Thus, none of the four plans will receive a demerit mark on this point.

(5) Water catchment areas

Each of the four plans covers a land areas of 190-210 hectars, but the number of necessary water catchment areas differs among them. The number is based on the assumption that the same rate of rain water drainage must be taken between before and after the land development works for the estate. To assume otherwise is likely to cause flooding in the down streams of the rivers in the area and submerge fields under water. The more water catchment areas needed, the greater the costs of building waterways and disaster prevention ponds will be. Their maintenance costs will be that much higher, too.

Counting number of catchment areas, the L-type and Combination-type plans each require three areas, the Garuda-type four, and the Camel-type five. The Camel-type is definitely inferior, especially to the L-type and Combination-type plans.

(6) Waste water discharge

The industrial estate will drain off rain water and waste water. Rain water will be discharged into the Tallo River through the existing waterways

closest to the area or, if necessary, new waterways will be installed. Even when the existing waterways are available, they will perhaps have to be repaired or replaced. The volume of work involved in each case will increase in proportion to the distance from the area to the river. Discharge of waste water will also be made through a waterway or conduct, and here too, the cost and volume of work will vary according to the distance from the river.

The distance between the utilities area and the Tallo River is 3 km for the L-type and Garuda-type plans, 4 km for the Combination type and 5 km for the Camel-type. Here again, the Camel-type will lose a point, in comparison with the L-type and Garuda-type plans.

(7) Traffic conditions

Specific measures for intra-estate traffic will be a subject of consideration at a later stage in planning. Here, we must examine the kinds of problems that will arise in the overall traffic system in the areas surrounding the estate. We will also have to consider the effects of heavy concentration of traffic to and from the estate on the living environment of the population in the vicinity. Particularly important is the impact of heavy through traffic on their communities. One common assumption here is that the Jl. Gowa Jaya and Jl. Bira-Bulurokeng (the extension of Jl. Tinumbu that goes across the Tallo River toward the airport) will have been improved and widened by the completion of the estate.

Under Plan-L type the traffic will be dispersed in two directions: Jl. Daya-Bira and the Workshop street. These vehicles going toward the port and the northern section of the built-up area will take the route from Jl. Daya-Bira to Jl. Bira-Bulurokeng. Those going toward the city center will take the Jl. Gowa Jaya via Jl. Daya-Bira. Thus, this plan will make it necessary that Jl. Daya-Bira and the Workshop street be expanded and upgraded.

The Camel-type plan will result in the dispersal of traffic in three directions: Jl. Gowa Jaya, the extension of Jl. Daya-Bira and the extension of the Workshop street. Under this plan, since the estate is placed on the east of the Jl. Gowa Jaya, much of the traffic between the estate and the city center or the port will concentrate in the Daya Market intersection, resulting in traffic congestion and the environmental disruption in that area. The two extension road mentioned above will have to be widened and upgraded.

Vehicle traffic under the Garuda-type plan will spread in three directions: Jl. Gowa Jaya, Jl. Daya-Bira and the Workshop street. Those going toward the port or the northern section of the built-up area will take Jl. Bira-Bulurokeng via either Jl. Daya-Bira or the Workshop street. Those headed for the city center will proceed straight to the Jl. Gowa Jaya or go by way of the Jl. Daya-Bira. In any case, the Jl. Daya-Bira and the Workshop street will have to be widened and upgraded.

All vehicle traffic under the Combination-type plan will take the Jl. Gowa Jaya, meaning that the Daya Market intersection will be a passage point for both those going to the port and those headed for the downtown area. The level of congestion and environmental disruption at the intersection will probably be worse than that estimated under the Camel plan.

Comparison of the four plans in terms of the traffic conditions they are likely to entail seems to show that the Camel-type and Combination-type plans have definite disadvantages for their negative effects on the Daya Market area.

(8) Preservation of the surrounding environment

Depending on the site selected, it is sometimes inevitable that an industrial estate be located too close or adjacent to desa or even urban areas. The industrial estate as a space for industrial activity is responsible for the preservation of the existing environments that are living space for the communities. The volume of work involved for preservation and safety measures will depend to a large extent on the number of houses in the potentially affected areas. At this stage, however, we do not have reliable statistics on all of the desa in the areas; hence, we have to estimate the volume of work on the basis of the number of desa, rather than that of houses and other dwelling units.

Under the L-type plan, the estate will share borders with two desa, Kanasak and Bontomatene. Adjacent to the estate under the Camel plan will be five desa, including the Daya Market, Berua, Parangbontoa, Leang, and Pangkok. Two desa, Kanasak and Leang, will be affected by the Garuda plan, while the Combination type will involve the four desa of Leang, Pangkok, Berua and the Daya Market.

It is clear that the L-type and Garuda-type plans are superior to the other two as far as the number of desa to be directly affected by the development of the estate.

(9) Results of evaluation

The following table sums up the comparison of the four plans on eight factors. Solid triangles indicate demerit marks given as a result of the comparative evaluation.

From the above table, it is clear that the Garuda-type and L-type plans received the least number of demerit marks. In the next section, therefore, we will discuss these two plans in greater detail.

Table V-2 Evaluation of the Four Plans

	L-Type	Camel-Type	Garuda-Type	Combination-Type
(1) Percentage of paddy involved	27 % ▲	2 % ▲	24 % ▲	29 % ▲
(2) Land improvement	extra 400,000 m^3 of earth are required ▲	balanced	balanced	extra 500,000 m^3 of earth are required ▲
(3) Percentage of factory area	61 %	63 %	64 %	62 %
(4) Composition of size variety	medium size is predominant	large and medium sizes are predominant	well balanced small, medium and large	well balanced small, medium and large
(5) Number of water catchment area	3 areas	5 areas ▲	4 areas ▲	3 areas
(6) Distance required for drainage	3 km	5 km ▲	3 km	4 km
(7) Traffic conditions	upgrading is required	traffic congestions at Daya ▲	upgrading is required	traffic congestions at Daya
(8) Number of villages involved	2	5 ▲	2	4 ▲
Demerit Points	▲ 2	▲ 4	▲ 2	▲ 5

4. Detailed Examination of the Master Plans

In this section we will take a look at both the Garuda-type and the L-type plans. These plans will be carefully examined in regard to their general policy measures, and specific plans for land use, for roads, for facilities, for waste water, for parks and green belts, for land development, for disaster prevention, and for utilities. All this will be done to determine which plan should ultimately be selected.

1) The formation and detailed examination of the Garuda plan

(1) General policy of planning

i) Balance between production and non-production space

As a model for the industrial estate to be built in the Eastern part of Indonesia, the objectives of this estate are not just productive efficiency and profitability but attention also has to be given to the factors such as safety and amenity. Along with raising the facility standards of the estate as much as possible, we have to give a great deal of attention to maintain balance between the productive space, consisting chiefly of factories, and the non-productive space where the green parks and industrial estate center will be located.

ii) Ensuring the beauty of the industrial estate

In order to ensure that the people passing by the estate or walking along the Jl. Gowa Jaya have a very good impression of this project, a 50-meter wide green belt will be placed along the road, and through the trees of this wooded area, they will be able to see the factories inside. When entering the site on the artery road or auxiliary roads, one of the landmarks will be the industrial estate center which will be placed on a 24-meter hill and surrounded by trees and shrubs.

iii) Introduction of commercial and transportation industries in the estate

Since the estate is intended to be a focal point of industrial activity, the types of industries to be located there will consist not just of manufacturing

but also commercial operations such as trading firms and banks, transportation firms such as truck terminals and warehouses, and in services there will be business like auto repair and gas stations. These will be located in the southwest area of the estate along the intra-estate artery and Daya-Bira roads.

iv) Placing the center and sub-centers within the walking distance

In order to assist the lives of those working at the industrial estate, the center and sub-centers will be located in four places which have health and welfare, shopping service, education and recreation facilities.

v) Large factories to be located closest to the Jl. Gowa Jaya and smaller ones farther away

There are certain restrictions on construction due to the topography of the site, but in order to preserve the quality and good appearance of the industrial estate it will be necessary to allocate specific areas for the larger and for the medium-sized and smaller factories. The more attractive large-scale factories can be placed in the eastern section of the site closer to its entrance on the Jl. Gowa Jaya, the medium-sized factories can be set up along the artery road across a green belt, and the small factories can be positioned in the back of the site.

vi) Factory placement according to the type of industry

There will be a wide variety in the type of industry that have potential to be located at this estate, and if no consideration is given to placing these according to type we are likely to wind up with a fairly ugly industrial estate. In addition to the general principle of arrangement by plant size we also have to consider the density of employees at the plant, the type of raw materials and fuel it will require, the patterns of land use on the factory lot, and the types of environmental hazards that the plant is likely to put out. With these in mind we can have fairly clear zoning of plant facilities.

vii) Green belts, ponds and lakes

There is a great deal of difference in this area between the wet and dry seasons and since there are no rivers or watery area near this site it can be well imagined that it is a rather parched area during the dry seasons. We

want to have as many ponds and green wooded areas in the industrial estate to ease this feeling of desolation to the people who work there and for those in the surrounding villages.

(2) Natural conditions (detail)

i) Micro-topography

In order to achieve the objective of constructing the industrial estate, our microscopic view of the area's topography is as follows.
The slope areas may be divided into three categories: those greater than 10 percent, those from 5 to 10 percent and those under five percent.
See Fig. V-22.

According to the land classification of the area slopes lie on the borders between wet rice paddies, on the one hand, and dry fields and wooded areas, on the other. The distribution of sloped areas in the entire site is such that those with slopes greater than 10 percent occupy 2 percent of the land, those with slopes from 5 - 10 percent at 10 percent and those with slopes at less than 5 percent or areas of flat land are 88 percent of the total area. The largest slope area above five percent runs from north to south along a 15-meter high contour line in the center of the site. There are also some smaller slopes in the southwest and southern parts of the site.

ii) Wooded areas and lone trees

In this area there are some trees taller than 10 meters in a group of ten, twenty or more trees with a diameter of around 10 meters at their crown. In addition, there are some smaller trees, shrubs and bushes. The species are mango, jhatti (a type of teak) and plams. Most of these trees are in the southern section of the site and the largest stand occupies about one hectare, but there are usually about five or six trees in most groups.

Other than these groups there are trees standing by themselves and they are generally about the same height and diameter of crown of those in groups. The total number in the projected site is about 100. See Fig. V-25.

iii) Water

There are six water catchment areas within the prospective site, as shown in Fig. V-24.

Of these, D, E, and F can be grouped into a single larger zone covering a valley area. Also, E extends as far as the north side of the workshop road and F goes to the eastern edge of the Jl. Gowa Jaya.

iv) Rock bed distribution

Rock bed is most prevalent in the area north of the Jl. Daya Bira, followed by the area around the 24 meters high hill in the northwest of the site. There is about 5 hectares of exposed rock bed, or 2.3 percent of the total area. It is estimated that about 3 to 5 meters below the surface is a layer of rock beds. See Fig. V-25.

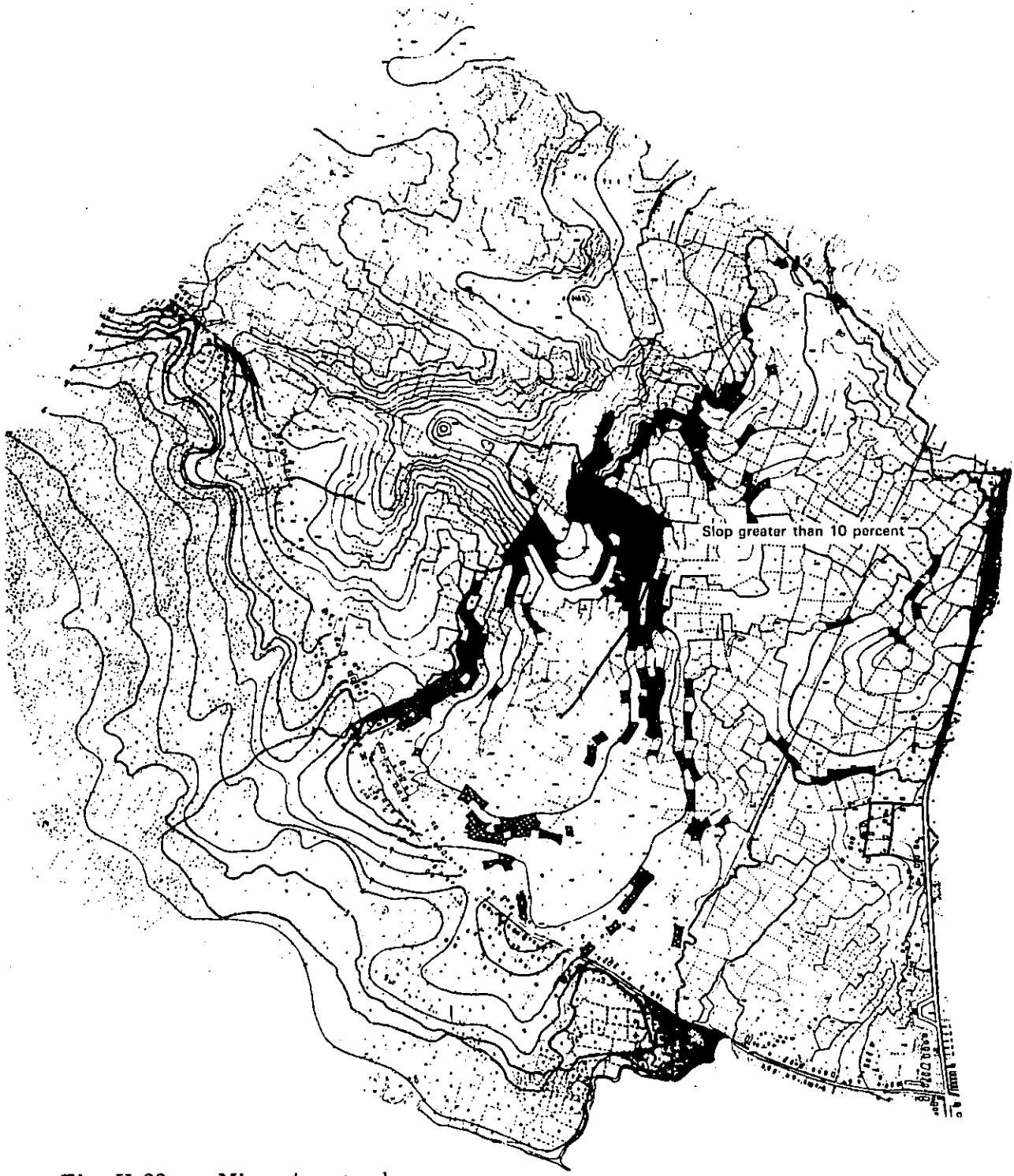


Fig. V-22 Micro-topography
in the Plan - Garuda Type

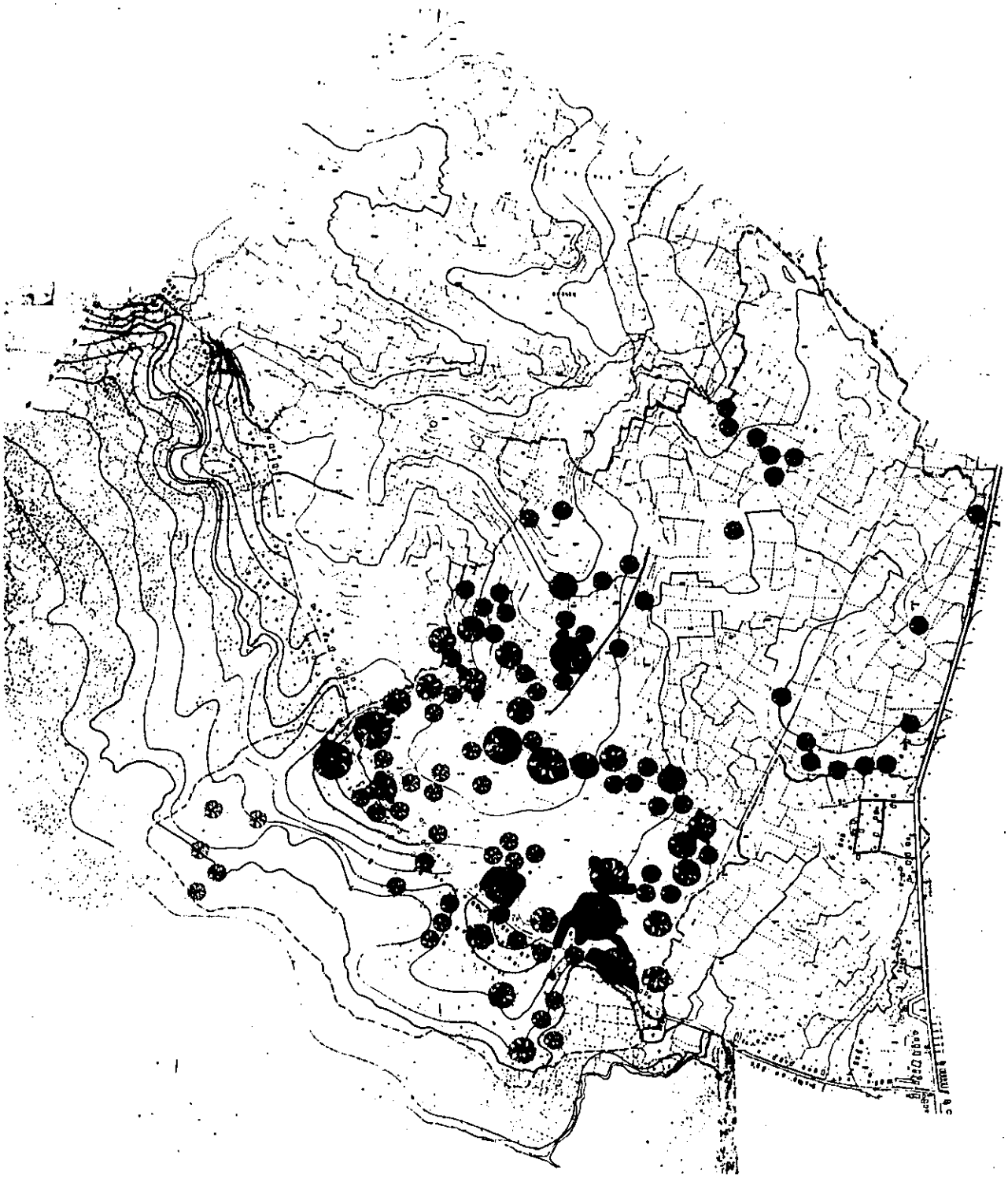


Fig. V-23 Wooden areas and lone trees in the Plan - Garuda Type

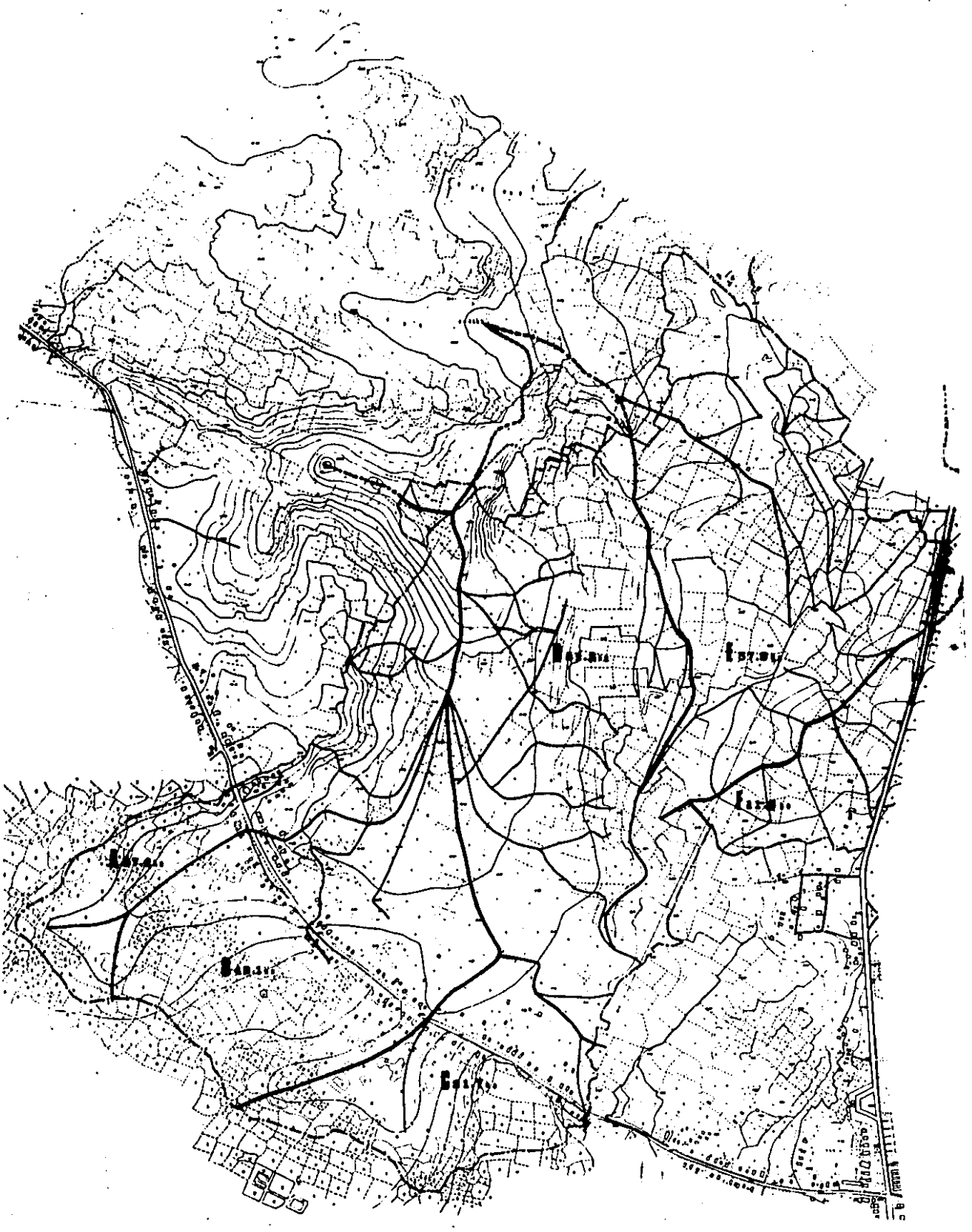


Fig. V-24 Water catchment areas in the Plan - Garuda Type

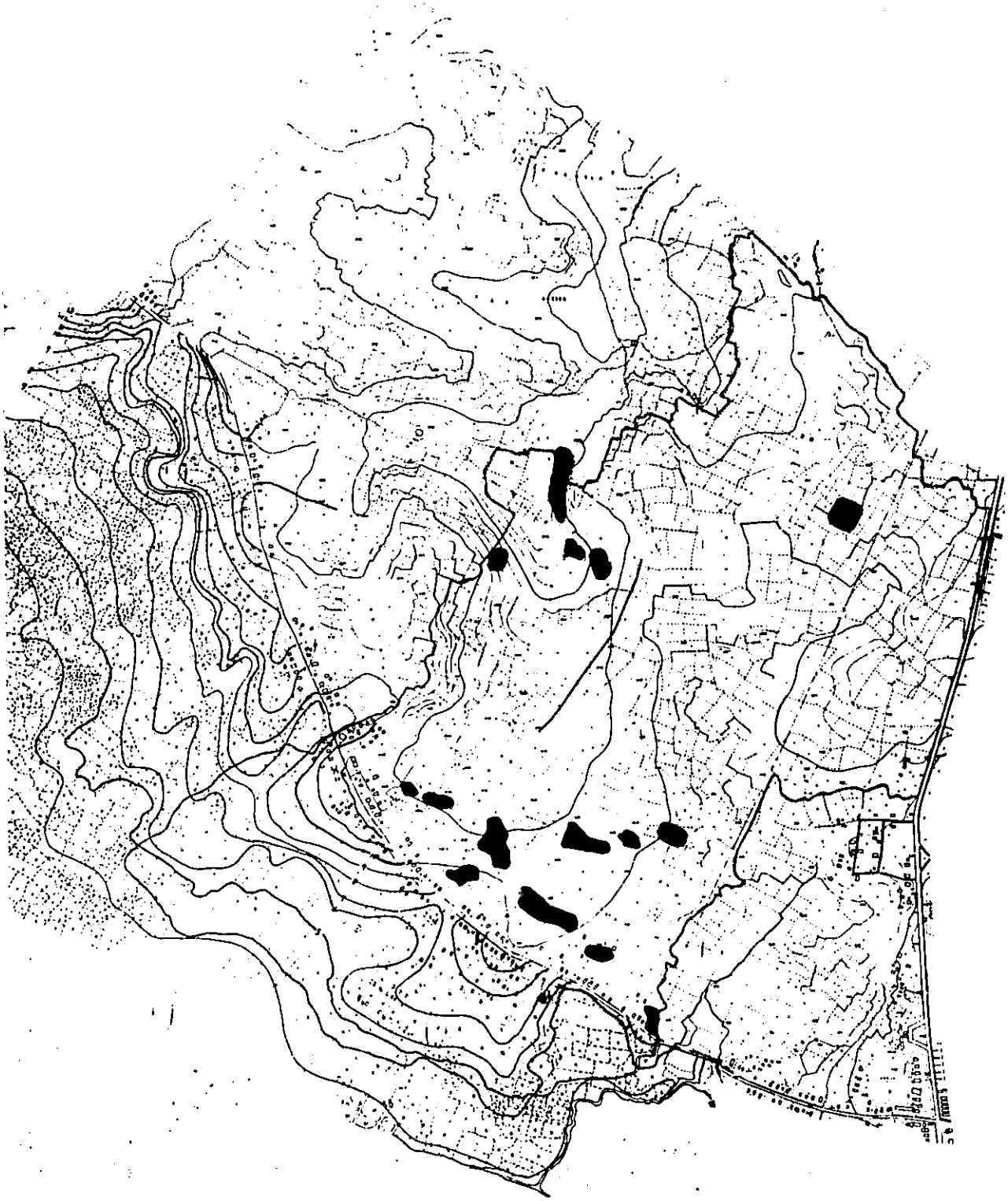


Fig. V-25 Rock bed distribution in the Plan - Garuda Type

(3) Land use in the Garuda plan

i) Overall design of the industrial estate

The area proposed in this plan is surrounded by agricultural areas, consisting of fields, wet paddyland, wooded areas and farm houses. Since the industrial estate will be incorporated into such an area, it is necessary to create an intermediate zone so that as little damage is done to either side as possible. In order to fulfill this need, the entire industrial estate will be surrounded with these, plants and shrubs, the estate center will be a symbol of the entire project and will stand on top of the central hill and commercial and transport facilities will be located in the southern part of the site. The factories will be placed within this framework and entrance and exits will be built at the Jl. Gowa Jaya.

ii) Factory land

The factories that will enter the industrial estate will require a total land area of 149 hectares out of the total land area of the estate of 212 ha. In order to ensure a proper balance between the productive and the non-productive space the factories will actually occupy a total of 140 ha. The general policy for constructing the factories is not to assign them to areas divided by the artery road but to place them together in as large an area as possible. As a result, approximately 65 hectares along the line of valleys in the northeast section and 70 hectares along the ridge line in the southwest will be used for factory location.

iii) Land for facilities.

i. Industrial estate center and sub-centers

The industrial estate center will occupy 2 hectares of land and will have such facilities as an administrative office, clinic, bank, fire station, post office, meeting room, restaurant and parking lots. The sub-centers will carry out part of the functions of the center; each sub-center will be located on 0.5 hectares of land and will have stores, a cafeteria, and small meeting rooms. They will be located within easy walking distance for employees and visitors' convenience, along with parks and green areas in the north, south-central and southwest sections of the site.

ii. Utility facilities

Utility facilities will require 1. 5 hectares consisting of a tank to receive fresh water and a pump house, waste treatment station, electrical transformer station, and refuse dump. These facilities will be placed in the areas which are close to the electric transmission line, to the water purification plant and to the waste water disposal facility that is in the southern extreme of the site at its lowest elevation point.

iii. Distribution, commercial and service facilities

Four hectares will be needed for the distribution-related facilities consisting of truck terminal and warehouse, the commercial facilities made up of the trading firms and others, the service facilities consisting of a food preparation center, auto repair service, and gas station. They will be placed in the southwest section of the industrial zone next to the Jl. Bira-Bulurokeng which will function as an industrial road in the future.

iv) Green belts

i. Parks and sports square

A large park of 4 hectares will surround the industrial estate center. Smaller parks of 0. 5 hectares will be placed in the middle of the site and at three places adjacent to the sub-centers. A sports park will be built at the south of the site on approximately 3 hectares and have a number of facilities such as soccer field, basketball court and swimming pool. A sports square with wading pool will be built in the center of the estate on the left side of the transmission line.

ii. Buffer-zone green belts

These buffer-zone green belts are designed to be used to protect from fire, to provide visual distance, to improve the scenery, to conserve trees and to serve as recreation areas. The trees in the vicinity of the industrial estate shall be left as they are and lined up with disaster prevention ponds, they shall surround the entire estate. There will be a 50-meter wide green belt for landscaping in the area that faces the Jl. Gowa Jaya and 10-meter wide strips along the intra-estate artery road.

(4) Road plan

A road network will be set up to provide total service to all the various industries and facilities shown in the land use plan. For this network the following points shall be examined in consideration of the characteristics of existing roads in the vicinity of the estate, the patterns of land use both inside and outside the project and natural conditions.

* Overall road system and roads within the industrial estate
* Type of roads within the estate and their classification
* Estimate of traffic volume
* Road layout
* Width of roads

i) Overall road system and roads within the industrial estate

The Jl. Gowa Jaya is a main highway in South Sulawesi, connecting Ujung Pandang with Pare-Pare and then going further north. This is a very important regional trunk road (V1) for it connects the heart of Ujung Pandang city with the airport and along the way are located various administrative, cultural and educational facilities such as various government office, the new campus of Hassanuddin University, agricultural research stations and military posts.

When the bridge is constructed over the mouth of the Tallo River, the Jl. Bira-Bulurokeng will be a main artery for the region. The flow of material goods to and from Pare-Pare and other points north of Ujung Pandang will go along this road. Since the Jl. Gowa Jaya passes through a number of towns and cities it is not very desirable to use it as a transport route for goods. Consequently, the Jl. Bira-Bulurokeng will become a future regional trunk road (V_1-II) for carrying goods to areas north of Ujung Pandang.

The Jl. Daya-Bira will probably become an important loop road for Ujung Pandang when the city reaches a million population. This road will rank as a regional trunk road (V_1-III) supporting the industrial activities over a wide area from the northeast of Ujung Pandang to Kabupaten Maros and Kabupaten Gowa.

The workshop road will be used as an important route connecting the Desa Bulurokeng and the Desa Sudiang. Along this road are the workshop and the golf course, and in the future it will function as an important regional intermediate road (V_2-I) for life and recreation in the area. See Fig. V-26.

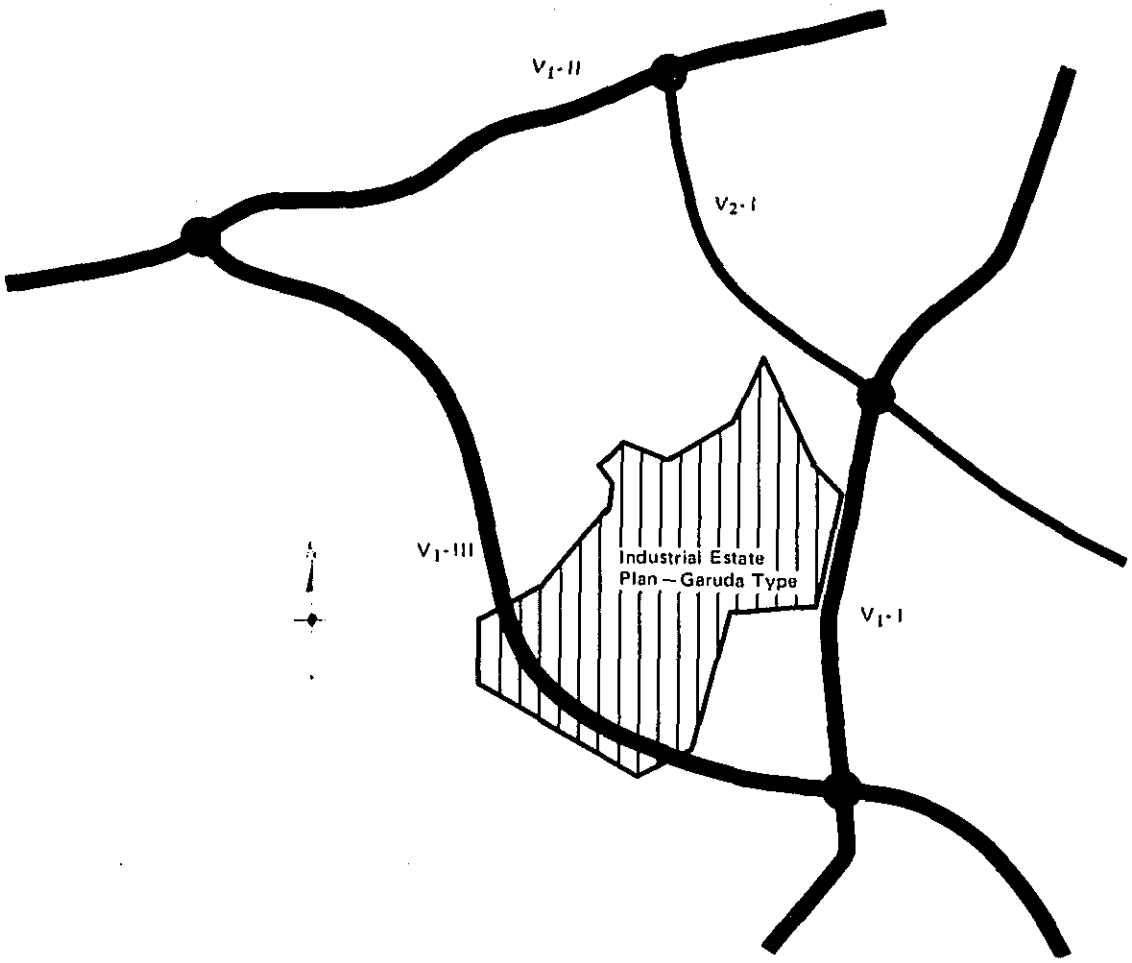


Fig. V-26 Overall road system

ii) *Class and function of roads in the industrial estate*

i. Intra-estate artery (V2)

This road will start at the Jl. Gowa Jaya (V_1-II) and enter the project at a point midway between the Daya Market intersection and the workshop road intersection. It will pass by the estate center and go on to the Jl. Daya-Bira (V_1-III). It will be a main axis (V_2-II) for productive functions connecting both the northeast and southwest sections of the industrial estate.

ii. Intra-estate sub-arteries (V3)

The sub-artery No. 1 (V_3-I) will be in the northern section of the industrial estate. It will connect, on a straight line, the workshop road (V_2-I) and the intra-estate main artery (V_2-II) and be an axis for both productive and living activities as the route for workers and goods coming and going through the north section of the estate. It has been moved slightly to the west in order to provide the large lots for factory use in the north central portion of the estate.

Sub-artery No. 2 (V_3-II) will head to the north along the east side of the power transmission lines at a point 300 meters from where the intra-estate artery road originates at the Jl. Gowa Jaya. It will then turn to the left to go pass the sub-center in the northern section and meet with sub-artery road No. 1 (V_3-I). This feeder road is intended to serve as an axis for production activities providing services for large and medium-sized factories in the northern section of the industrial estate.

Sub-artery road No. 3 (V_3-III) goes south from the main artery at a point 600 meters from its juncture with the Jl. Gowa Jaya (V_1-II). It goes through the southeast sub-center, and moving further southward it turns to the left at 200 meters before the Jl. Daya-Bira (V_1-III). Going west in parallel with the Jl. Daya-Bira, it connects again with the intra-estate artery road. This road loops around the south part of the project site, designed to serve as an axis for production and other activities at the large and medium-sized factories and the sub-center.

Sub- artery road No. 4 (V_3-IV) connects the Jl. Daya-Bira (V_1-III) with the estate's artery road (V_2-II) and is an auxiliary axis road providing service to the medium and small factories in the southern zone. Fig. V-27.

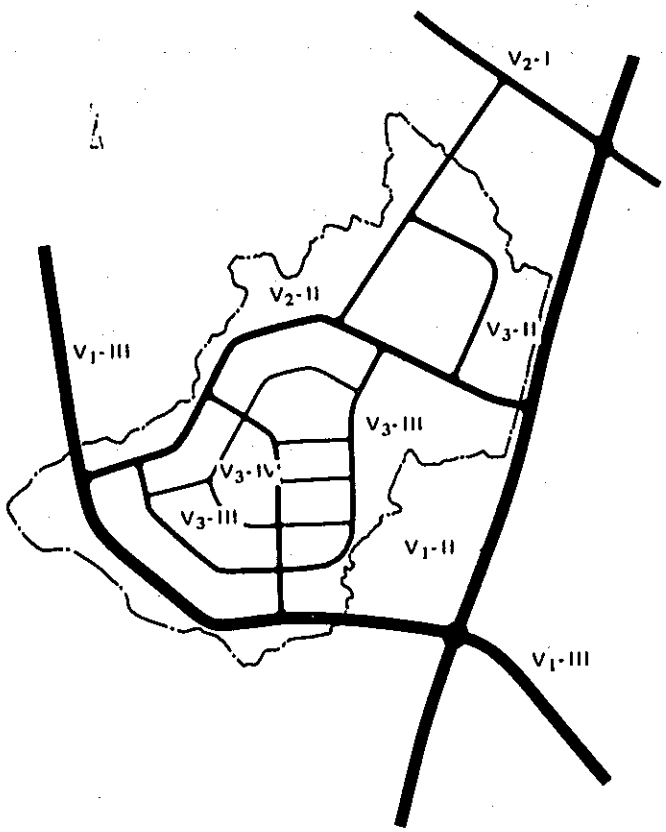


Fig. V-27 Class of roads in the Plan - Garuda Type

iii. Boundary streets

These streets will be used for commuting and transportation sub-systems functioning as service roads for short cut and to the small factories and standard factories within the industrial estate. These will be built in the southern section.

iv. Bicycle roads

Roads with a standard of sub-artery roads (V_3) or above will have bicycle roads attached to them.

v. Pedestrian walkways

Those roads with a standard of sub-artery road (V_3) or above will have paths placed on each side or on one side for pedestrian use. With this distinction between walkways and vehicle roads, pedestrian safety will be secured. Wherever necessary, boundary streets will also have such walk-

ways. Also the green areas, as well as the slopes used for boundary, will have walkways for pedestrians only, connecting the estate center with sub-centers, parks, and other major facilities so that people can use them for commuting, shopping and recreation.

iii) Estimated volume of traffic to and from the estate

Here we have estimated the volume of traffic to and from the industrial estate from the flow of goods, commuters and visitors, and also from the patterns of land use.

i. Estimated traffic volume by flow of goods, commuters and visitors

a. Volume of traffic from transport of raw materials and finished products

* *Incoming and outgoing freight based on the value*

$$\frac{\text{Value of Goods shipped US\$715,000/day}}{\text{US\$600/t}} = 1,192 \text{ t/day}$$

1,192 t/day x 1.3 (rate of raw materials and fuel) = 1,549 t/day

Incoming and outgoing freight 1,192 t/day + 1,549 t/day = 2,741 t/day

* Incoming and outgoing freight based on flow of goods by type of industry

Food	3,300 persons	x 60 t/year	÷ 300 days/year	= 660 tons/day
Textiles	3,670	x 30	÷ 300	= 367
Lumber	3,230	x 40	÷ 300	= 430
Paper & printing	800	x 50	÷ 300	= 133
Chemical	1,300	x 50	÷ 300	= 217
Ceramic	1,700	x 70	÷ 300	= 397
Machine	7,420	x 15	÷ 300	= 371
Metal	1,920	x 50	÷ 300	= 320
Others	1,740	x 40	÷ 300	= 232
Total				3,127 t/day

Assuming the daily cargo volume at the industrial estate at 3,000 tons, this means a traffic volume of 2500 vehicles per day.

3,000 tons/day ÷ 4 tons/vehicle ÷ 0.6 (load factory) x 2 (to and from) = 2500 vehicles/day.

b. Commuting traffic going to the industrial estate

The total number of employees at factories, distribution and commercial facilities will be around 30,000. The percentage by mode of transport used is automobiles 5%, small buses 40%, full-sized passenger bus 40%, while bicycles and pedestrian traffic will acount for about 15%. The number of vehicles per day for commuting will be about 4,700.

Automobile 30,000 persons x 0.05 ÷ 1.3 persons/vehicle x 2 (to and from) = 2,308 vehicles/day

Small buses	30,000 x 0.4 ÷ 1.5 x 2 =	1,600
Full-sized passenger buses	30,000 x 0.4 ÷ 30 x 2 =	800
	Total	4,708
	Approximately	4,700 vehicles/day

c. Traffic to major facilities

The total floor space for major facilities is estimated to be 11,000 m^2. The number of vehicles coming to visit these facilities will be about 275 per day.

Thus, the estimated total vehicles in transport, commuting and visiting (a total of a, b, and c) will be 7,475 per day.

ii. Estimated traffic volume from land use

The major categories of land use at the industrial estate are factory, major facilities (center, sub-centers, distribution and commercial facilities), utilities and parks. The volume of traffic produced by these facilities will be 5,350 vehicles per day.

Factories	137 ha x 30 vehicles/ha =	4,110 vehicles/day
Major facilities	7 ha x 150 vehicles/ha =	1,050 vehicles/day
Utilities	2 ha x 45 vehicles/ha =	90 vehicles/day
Parks	10 ha x 10 vehicles/ha =	100 vehicles/day
	Total	5,350 vehicles/day

The total volume of traffic to and from the industrial estate according to estimate by material flow and commuting comes to 7,475 vehicles per day and estimate by land use is 5,350 vehicles per day. Including a margin for excess we can estimate traffic to and from the estate to be on the order of 6,500 vehicles per day.

Items \ Directions	Total	City center	Maros Pare-Pare	BIRA	Pangkok
Materials & products	2,200	700	400	1,100	-
Commuters	4,100	2,870	410	410	410
Major facilities	200	140	20	20	20
Total	6,500	4,710	830	1,530	430

iv) *Distribution of traffic volume*

Estimating a breakdown of incoming and outgoing traffic volume according to direction of origins and destinations, we used the following indexes: level of industrial activity by area, the degree of dependence on harbor and airport facilities, the area in which employees or visitors reside, location of government offices, and the level of commercial activity. It was assumed that a bridge will be constructed on the Jl. Tinumbu, and that all traffic going to the northern section of the city or to the port will traverse that bridge.

A further breakdown according to the route will show the following results:

Traffic going to the heart of the city Fig. V-28

Traffic volume via the Jl. Gowa Jaya	2,355 vehicles per day
Traffic volume via the Jl. Daya-Bira	2,355 vehicles per day
Total	4,710 vehicles per day

Traffic going toward Maros and Pare-Pare Fig. V-29

Volume using the Jl. Gowa Jaya	490 vehicles per day
Volume using the Jl. Daya-Bira (going east)	85 " "
" " " (going west)	85 " "
Volume using the workshop road	170 " "
Total	830 vehicles per day

Traffic going toward Bira Fig. V-30

Volume using the Jl. Bira-Bulureokeng	(south bound)	1,230 vehicles per day
" " "	(north bound)	150 " "
Volume using the workshop road		150 " "
Total		1,530 vehicles per day

Traffic going toward Pangkok Fig. V-31

Volume using the Jl. Daya-Bira		215 vehicles per day
Volume using the Jl. Gowa Jaya	(south bound)	110 " "
" " "	(north bound)	85 " "
Volume using the workshop road		20 " "
Total		430 vehicles per day

The distribution of traffic volume according to roads used is shown in the following map. The figures indicated are the number of vehicles per day. Fig. V-32

This will bring future increases to the present volume of traffic on the Jl. Gowa Jaya which ranges now from 150 to 200 vehicles per hour.

Fig. V-28 Traffic volume to the city center

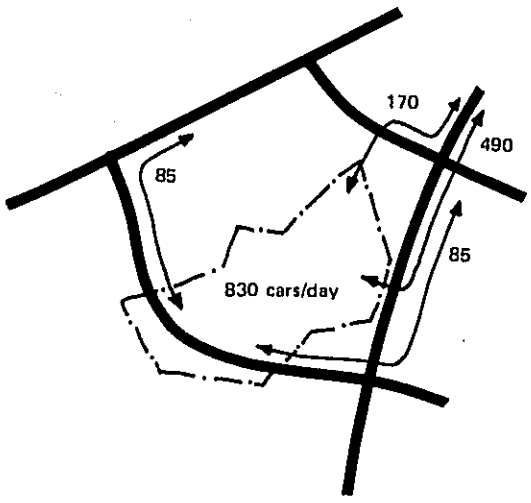


Fig. V-29 Traffic volume going toward Maros and Pare-pare

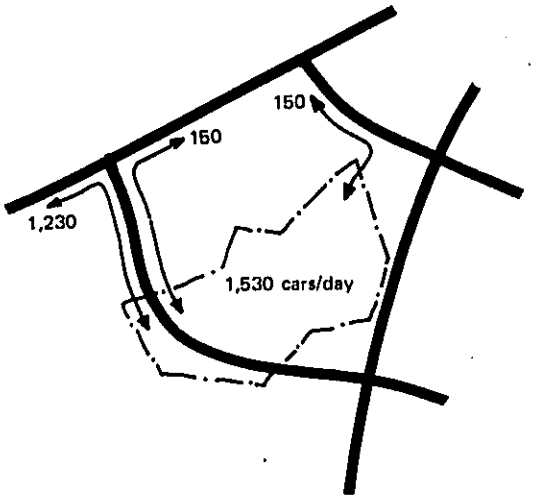


Fig. V-30 Traffic volume going toward Bira

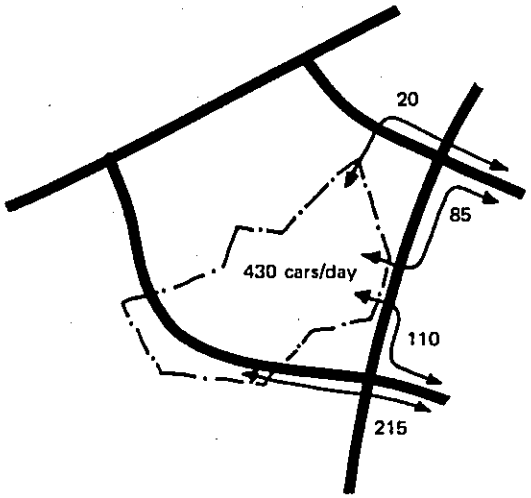


Fig. V-31 Traffic volume going toward Pangkok

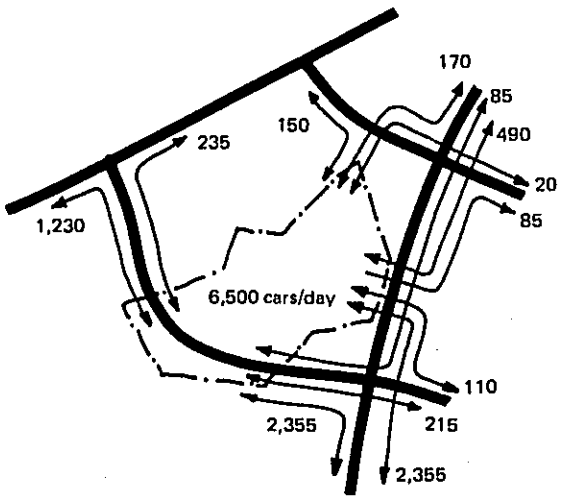


Fig. V-32 Distribution of traffic volume to the four directions

v) Road layout

In order to make a decision on road layout within the industrial estate we have to consider how it can be harmonized with the topography and patterns of land use and also have to examine it in terms of continuity, economy and potential advantages and disadvantages in traffic operation. It is important to ensure the safety and smoothness of traffic. The categories of roads and their design specifications are shown in the table below.

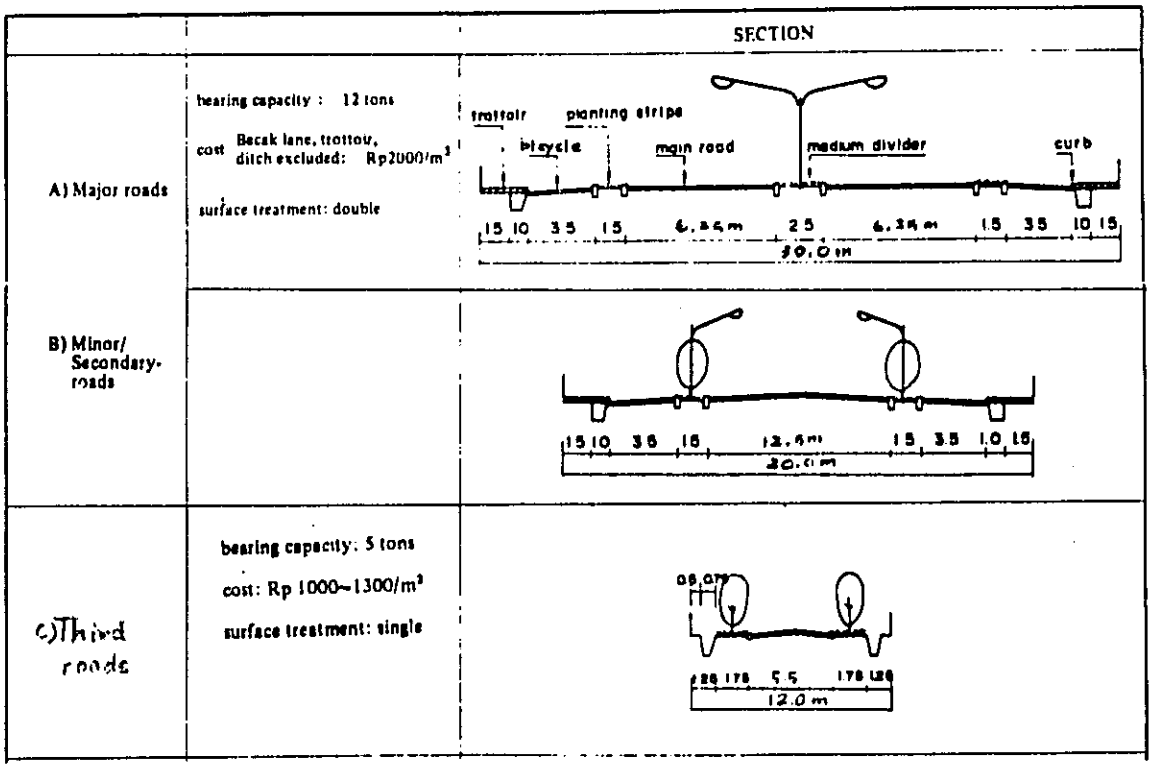
	Design speed	Width of lane	Minimum radius	Stop distance	Inclination
Artery roads	50 km/h	3.00 m	60 m	40 m	below 6%
Sub-artery roads	40 km/h	3.00 m	30 m	30 m	below 8%

Since a bicycle road will be set up running parallel to the arteries it is desired to keep the longitudinal declination at less than 4 percent.

vi) Road width

At its busiest point the volume of traffic per day on the main artery will be on the order of 2,665 vehicles. The standard plan of this road will include sidewalks, a bicycle road and strips of grass and shrubs. By building the sidewalks and bicycle paths this will allow the separation of bicycle from motor vehicle traffic. Also in order to have a beautiful industrial estate bushes, trees and shrubs will be planted. This will make the roads much more pleasant and attractive. Fig. V-33.

Fig. V-33 Design Standard of Road



(5) Factory lot plan

Arrangement of factories within the industrial estate will have to be planned according to a set of general rules, based on type of incoming industries, size of the factory, and period of construction.

i) Arrangement according to type of industry

A detailed forecast on the type of industries likely to enter the estate is given in Chapter III, but here we will outline their estimated period of construction and size of factory lots required. Discussions in Chapter III indicate that 149 hectares of land will be needed for factories, but in consideration of the constraints from land improvements, figure will have to be reduced to 137 hectares.

The figures for the first phase include 2. 5 hectares of lots for standard factories of textiles, apparel, leather goods, shoes, wood and bamboo handicrafts, rubbers, metal processing, plastics, office equipment and other industries. During the second phase this will increase to 3. 5 hectares.

When looking at the features of the types of industries and the size of lot that they will require, we find that those entering during the first phase will be ceramics, foods, wood products, and machines, those during the second phase will be metals, machines, food, and ceramics, and during the third phase machines.

Type	Products	I Phase	II Phase	III Phase	Total
Foods	provision, beverage, tobacco,	16.5 ha.	8.0 ha.	0.5 ha.	25.0 ha.
Texitile	texitile, apparel, leather goods, shoes	4.0	2.0	3.0	9.0
Wood	lumber, plywood, furniture, handicraft	9.0	2.5	3.5	15.0
Paper & printing	paper products, printing	3.0	1.5	-	4.5
Chemicals	farm chemicals, paint, rubber products	3.5	1.0	-	4.5
Ceramic	ceramic tile, glass products, concrete products	17.0	7.5	2.5	27.0
Metals	wire, bolts and nuts, tablewares	5.5	9.5	2.5	17.5
Machinery	engine, agricultural implements, automobile communication equipments	9.0	9.0	21.5	39.5
Others	plastic, office equipments, others	3.5	3.5	-	7.0
		71.0	44.5	33.5	149.0

A detailed examination of each type of industries according to their employment situation, scenic view, degree of dependence on major facilities, and types of pollution emitted reveals the following:

i. Group with high density of employee

This group, made up of such industries as beverages, clothing, leather products, shoes, furniture and printing, has plants that are almost always, of standard or small size and it would be most desirable that these factories be located close to the health and welfare facilities as well as the recreation areas. (See Fig. V-34)

ii. Group of factories that have beautiful outlook

This group consists of such types as communication instruments, autos, office equipment and printing, and because their brand image is very important they keep a clean factory building. These companies will keep their grounds in tip-top shape, so it is wise to set them closest to the Jl. Gowa Jaya and or to the industrial estate center. (See Fig. V-35.)

iii. Group of factories that have ugly outlook

This group of factories is made up of lumber, plywood, rubber products, ceramic tile, glass and glass products, concrete, and stone. These factories will have to pile up their raw materials and products outside, which are not pleasant to the passers by. So these factories are required to be located in the area where they can not be easily seen.
(See Fig. V-36)

iv. Group which relies heavily on distribution-related and commercial facilities

Industries such as food, furniture, ceramic tile, metal wire, bolts and nuts, kitchen utensils, cutlery, office equipment rely on distribution and commercial facilities for their raw materials or for their finished products. The former group consists of metal wire, bolts and nuts, kitchen utensils and cutlery, all products made from steel. The others, food, furnitures, ceramic tile, office equipment are types which do not have a very large production volume. Accordingly they require consignment transportation services to ship their products to various destinations. (See Fig. V-37)

v. Noise and vibration producing group

Examples of factories in this group are food, lumber, wood box, printing, stone, concrete products, rubber, metal wire, kitchen utensils, cutlery, casting, and can making which produce a great deal of noise vibration due to their use of presses, lathes, forges, blowers, compressors, crushers, screening machines, concrete mixers, saws, chippers, printing presses or molding machines. They will have to be placed in such areas where their effects are diminished on communities in the vicinity. (See Fig. V-38)

vi. Noxious gas group

Examples in this group are the food industry (particularly fish canning, and fish sausage) animal feed, leather products and the water disposal plant and garbage dump. The offensive smalls produced by these places come from hydrogen sulfide, ammonia, methy mucylputan methyl sulphide, and trimethyl amin. Consideration should be given to constant wind direction when allocating plant lots for these factories so that as little damage is done to the surrounding area as possible. (See Fig. V-39)

vii. Dust producing group

Factories in this group would be those involved in the production of animal feed, tile, earthenware or ceramic utensils, concrete goods, and stone articles. The movement of animal feeds, storing of stones and earth, the movement of sand and cement of belt or bucket conveyor, stone crushing and sieving are all operations that will produce dust and care has to be taken to place these factories in such a position that wind will not carry the dust and be a nuisance to other facilities and adjacent communities. (See Fig. V-40)

viii. Group of factories emitting polluted waste water (affecting BOD (Biochemical Oxygen Demand))

This group would consist of the food industry, the animal feed industry, the food preparation center and waste water from living quarters. These should be placed closer to the waste water treatment facilities. (See Fig. V-41)

ix. Group of factories emitting polluted waste water
(Suspended Solid Matter)

Examples of plants in this group would be the tile, ceramic, glass and concrete product factories. Their effluents can be treated jointly so that they should be located in the same area. (See Fig. V-42)

x. Group of factories emitting other pollutant liquids

Factories in this group would be those like leather products, lumber, paints, fertilizer, detergent, asphalt, rubber and metal products. There are a wide range of pollutant fluids that these plants emit, but they should be placed in an area which would be collective disposal of their effluents possible. (See Fig. V-43)

Taking all of this into consideration, as well as the location of the industrial estate center and sub-centers, distribution related and commercial facilities, utilities and green parks, the arrangement of factories will be as shown in Fig. V-44.

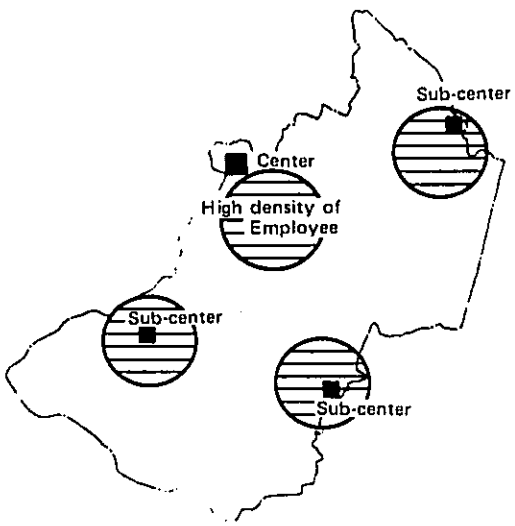


Fig. V-34 Arrangement of group of high density of Employee

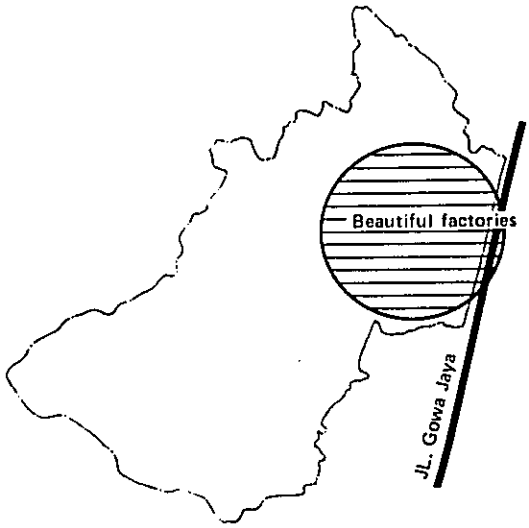


Fig. V-35 Arrangement of group of factories that have beautiful out look

Fig. V-36 Arrangement of group of factories that have ugly out look

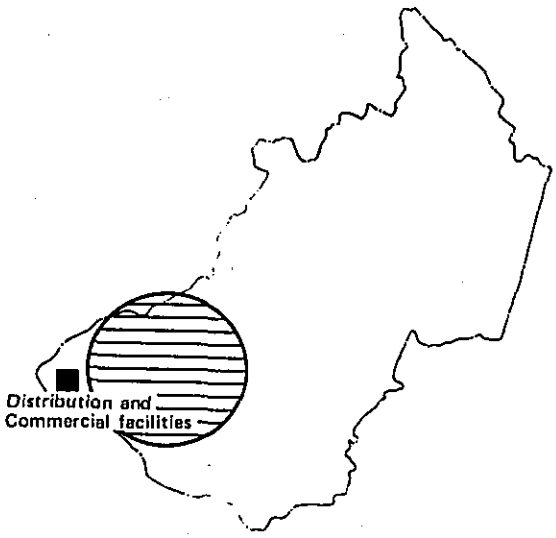


Fig. V-37 Arrangement of group which relies heavily on Distribution and Commercial facilities

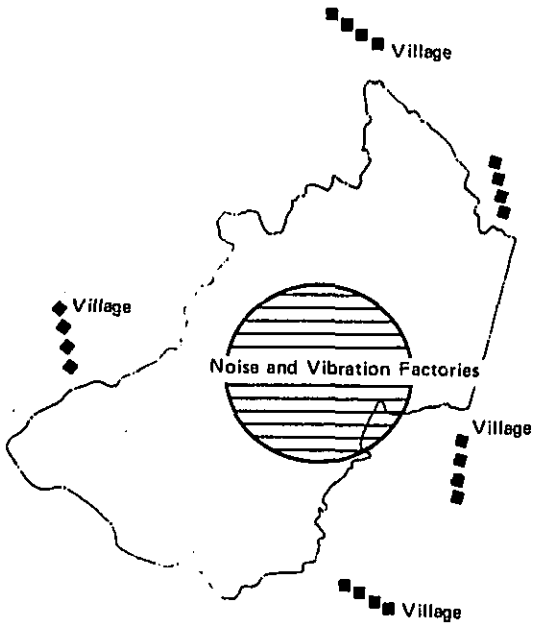


Fig. V-38 Arrangement of noise and vibration producing group

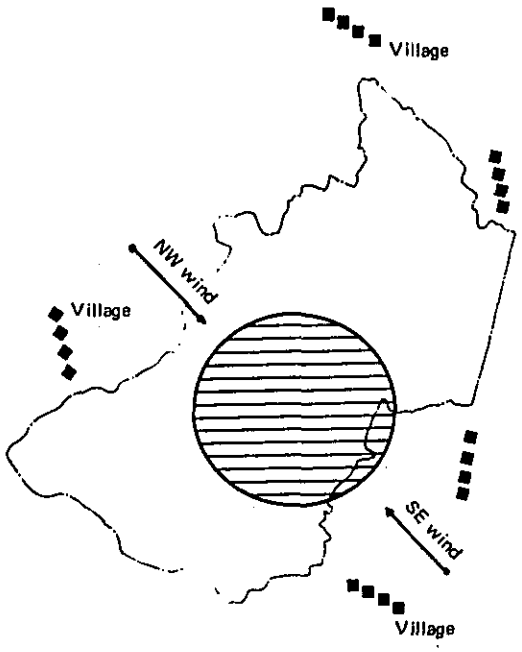


Fig. V-39 Arrangement of noxious gas group

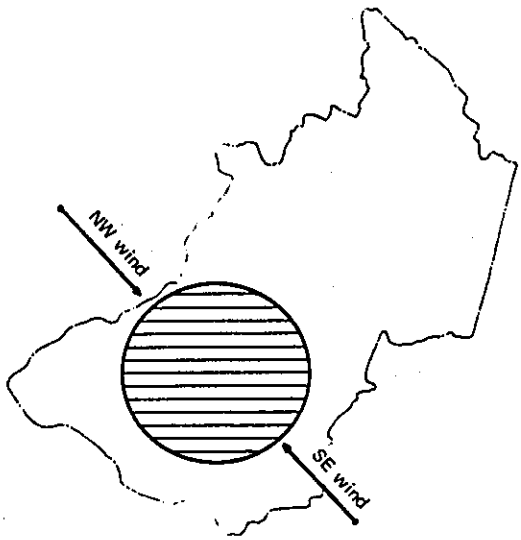


Fig. V-40 Arrangement of dust producing group

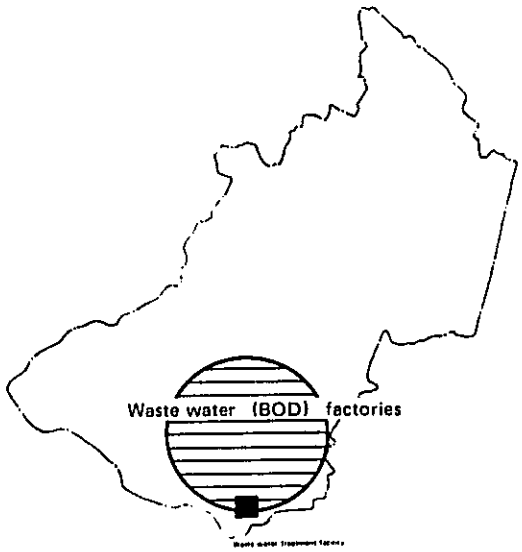


Fig. V-41 Arrangement of factories emitting polluted waste water (BOD)

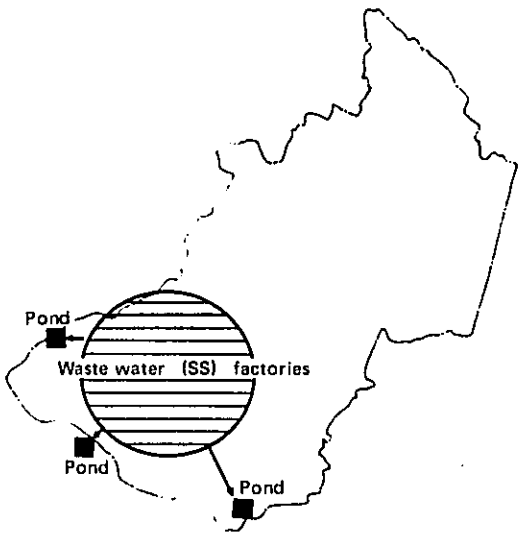


Fig. V-42 Arrangement of facilities emitting polluted waste water (SS)

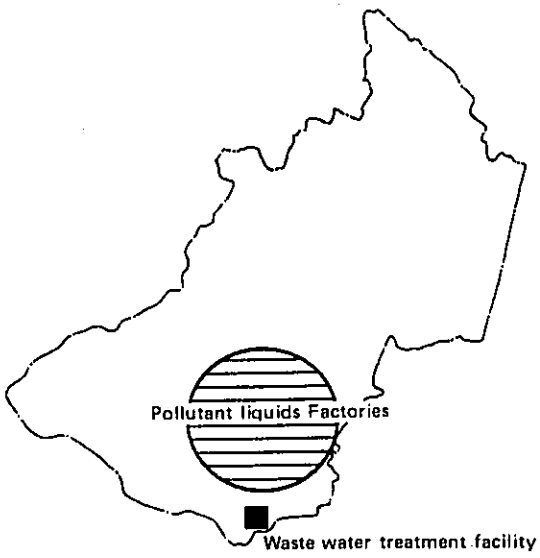


Fig. V-43 Arrangement of factories emitting of the pollutant liquids

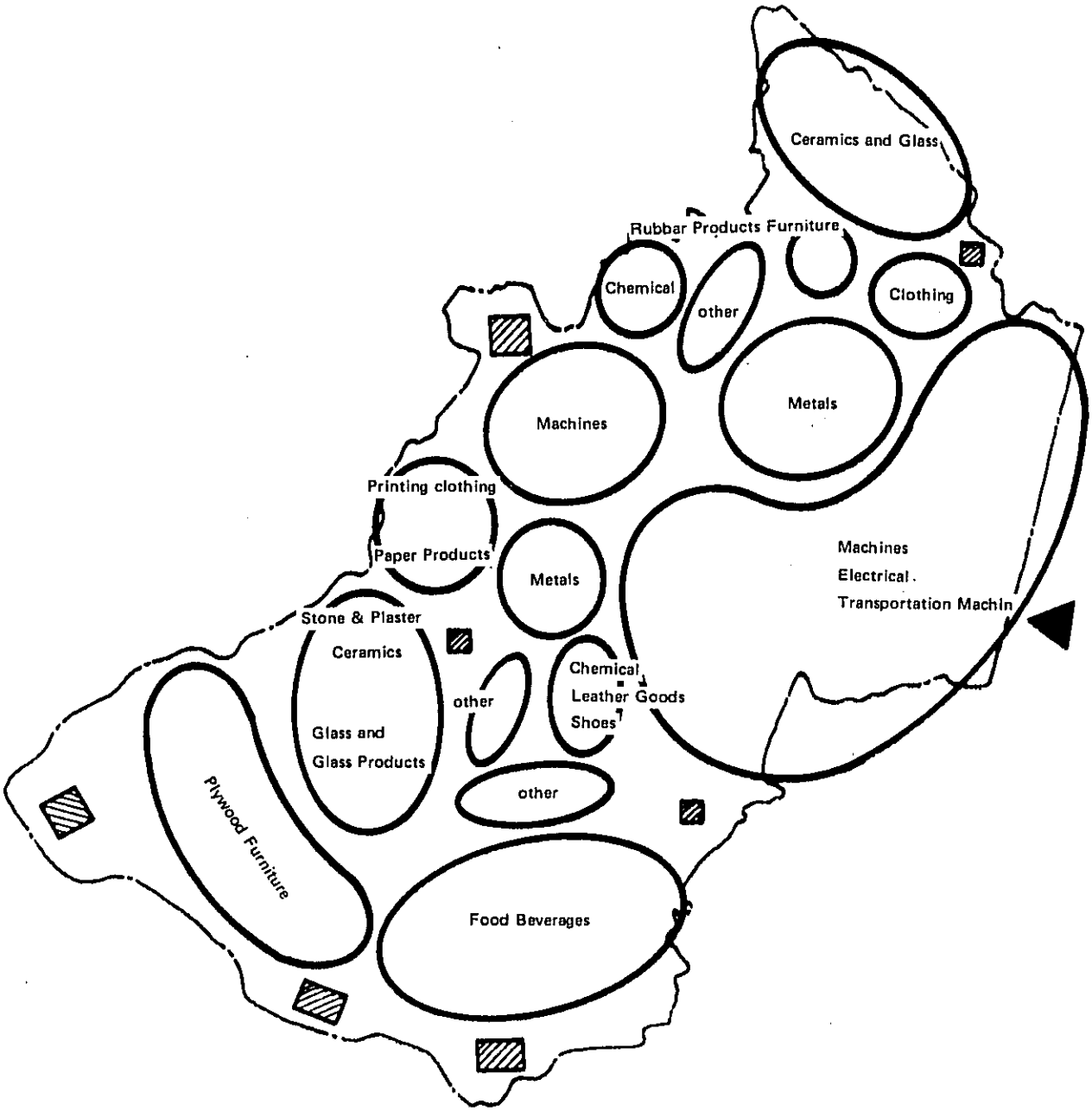


Fig. V-44 Arrangement according to type of industry

ii) Arrangement of factories according to lot size

The lot size of factories entering the industrial estate will vary, ranging from 0. 1 to 5. 50 hectares, and the number of factories and size of lot are listed below.

Factories with 0. 5 hectares or less 55
Factories with 1. 0 to 1. 5 hectares 31
Factories with 2. 0 to 2. 5 hectares 19
Factories with more than 3 hectares 14

i. Standard units and subdivision of factory sites

Area and shape of factory lots required should be calculated on the basis of a production plan. However, the standard unit of factory lots is often determined through reference to the production volume and work in a typical plant already in existence. For the present plan we have considered the problem in terms of lot sized and type of industry that have potentials to be located in this industrial estate. The relationship between the two can be explained as follows.

a. Plants requiring around 0. 1 hectares

Factories in this group would consist of those producing such items as coconut fibre, rope, netting, hats, carpets, towels, satin, leather goods, shoes, ebony handicrafts, wood handicrafts, hoses, belts, wood screws, doors, polyethylene foam, P. P yarnbag, PVC pipe, container boxes, plastic containers, polyester buttons, gold and silver ware, felt pens, ball-point pens, and sewing machine needles. The number and type of machines required for these industries are small and the production process is not very complicated.

b. Plants requiring around 0. 5 hectares

The plants in this category would be those engaged in food processing, fish sausage manufacture, banana flour milling, maize flour milling, rice milling, cookie and candy making, ice making, ice cream, soft drinks, markisa juice, agar-agar, socks, work clothes, cloth bags, special ply-woods, paper containers, tissue paper, notebooks, reclaimed rubber, asphalt, pharmaceuticals, agricultural use sprays, paints, adhesives,

detergents, glassware, steel cans, nail, steel mesh, wheel-tools, cooking range, kerosene lamps, boat fittings, castings, small generators, raidos, switchboards, general-use motors. These have different types of processing; the fish processing and flour milling are a continuous process type while the others are a synthetic process. The latter group, including tissue paper, notebooks, pharmaceuticals and glassware, requires packaging and warehousing because of the production process.

c. Factories requiring 0. 1 to 1. 5 hectares

This group is assumed to include fish canning, corn oil, citronella oil, rice oil, bread, soy sauce, fishing nets, shirts for men, women and children, wooden iceboxes, printing, corrugated cardboard boxes, kraft paper bags, beach sandals, tile, concrete blocks, asbestos concrete pipes, plaster board, paving material, stones, plaster, eternit pipe, bolts and nuts, aluminum household utensils, farm implements, light bulbs, fluorescent lamp, electric refrigerators, electric fans, transformers and auto repair. Cardboard boxes, kraft paper bags and beach sandals are made through a transformation process; oil refining is a vertical continuous process. Products made from concrete should preferably go through a constinuious process on a line. Almost all machines are made through an intermittent process.

d. Factories requiring 2. 0 to 2. 5 hectares

Industries in this category will produce Palm oil, peanut oil, wooden boxes, vitreous china wares, bricks, bottles, concrete piles, structural materials, small diesel engines, rice polishing machines, tape recorders, electric calculators, typewriters, bicycle parts and assembly. The oils are the same as those in the previous paragraph. Concrete piles are made by continuous process. Tape recorders, electric calculators, typewriters are assembled on a line. The others are of the intermittent process.

e. Factories requiring more than 3. 0 hectares

The factory types here consist of coconut processing, tobacco, woven cloth, lumber, laminated wood, wood and bamboo furniture, chinaware, insulators, asbestos boards, steel wire, electric wire, bicycle, and motorcycle assembly, small and large truck assembly. Coconut proces-

sing is a part of oil production and is a vertical continuous process. Plywood manufacturing and bicycle assembly are continuous process done on an assembly line basis. The majority of the others are intermittent process.

In addition to the above assumptions, we have given thoughts to transport and work place patterns in deciding the standard units and subdivision of factory sites, as shown in Fig. V-45.

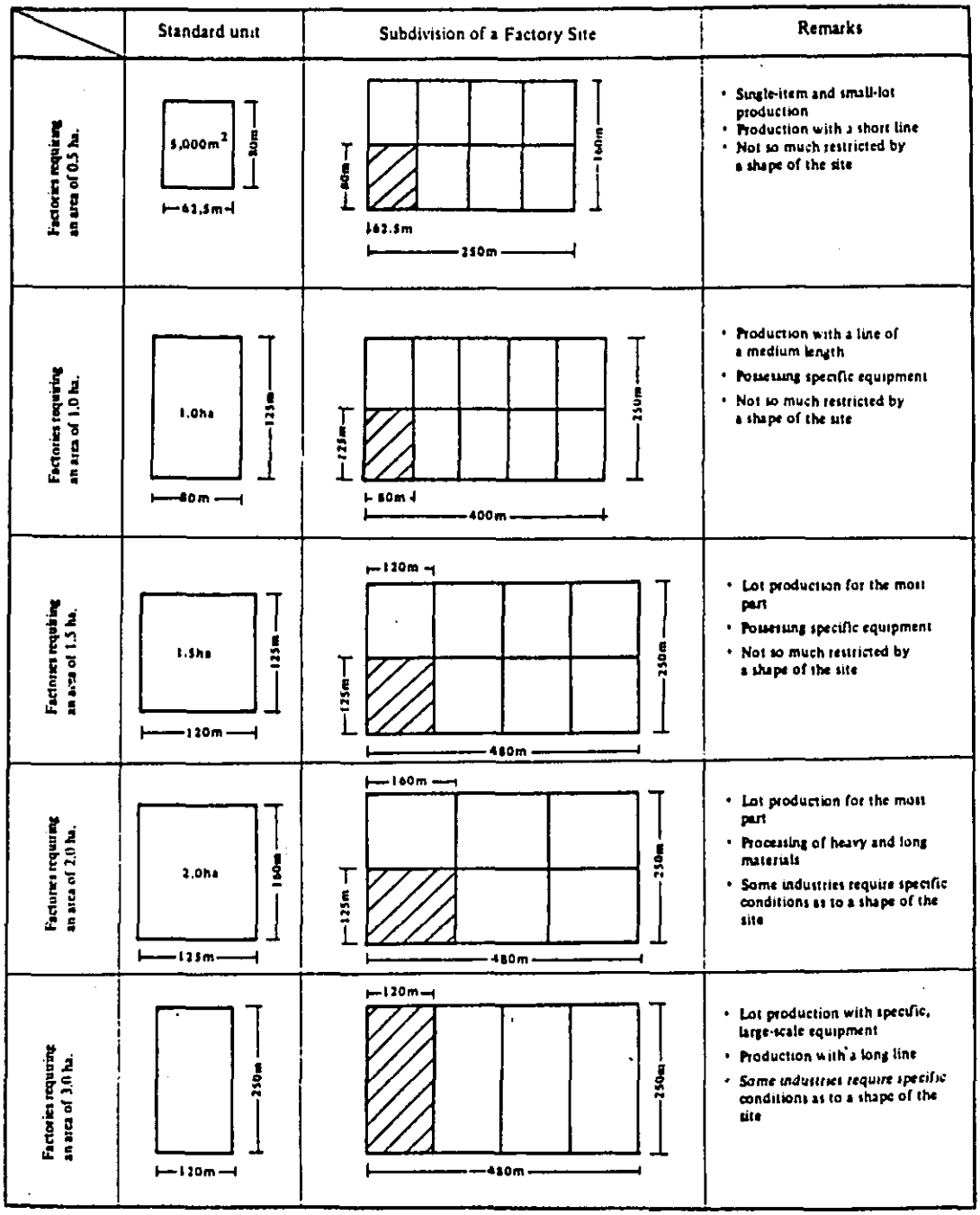


Fig. V-45 Standard units and lots of a factory site

ii. Factory arrangement by lot size

In view of the need to avoid unnecessary gaps between factories according to size, to maintain the beauty of the environment, and to ensure the universality of the industrial estate, it is desitable that when assigning land to the incoming factories, they be grouped by lot size as much as possible. The number of factories, by lot size and period of their entry, is listed in the table below.

Lot size	Phase I	Phase II	Phase III
0. 5 ha. or less	32 factories	20	3
1. 0 - 1. 5 ha.	20	10	1
2. 0 - 2. 5 ha.	6	5	8
3. 0 ha. or more	6	4	4

The 0. 5 and less hectare category includes 2. 5 hectares for the standard of 0. 1 ha. size factories for the first phase, and 3. 5 hectares for the second phase. The following plan for plant locations takes into account the previously mentioned arrangement according to industrial type.

a. Plant location in the first phase

A distinctive feature of this period is that most of the factories are of small size, 0. 5, 1. 0, and 1. 5 hectares. In locating factories it is necessary to give special consideration to the units of this size. The scale of business of these companies will be small so that very few of them will have adequate health and welfare facilities. Work environment in these companies will also be rather poor so that they should be aided by the common facilities of the sub-center, parks and green belts in the industrial estate. They will also probably vary greatly in size and their appearance from outside will not be very attractive so they are best located at the deeper portion of the estate where they will not be so conspicuous.

It is assumed that there will be six large-scale factories larger than 3. 0 hectars and they will be located along the main artery road. The locations for the first phase are shown in Fig. V-46.

b. Plant location in the second phase

There will be a large number of small-scale factories of 0.5, 1.0 and 1.5 ha. during this phase as well. The same considerations will apply to them as in phase I. The small factories will be located on the east side of the industrial estate center and on the west side of the sub-center in the southeast section. Large-scale factories will be located on both sides of the main artery road. Locations for phase II are shown in Fig. V-47.

c. Plant location in the third phase

Many of the factories entering the industrial estate during this phase will be large scale, requiring lots of 2.0, 2.5, 3.0 and 5.0 hectares. Of those, large-scale factories such as electrical machinery will be placed in the area facing the Jl. Gowa Jaya to aid in enhancing the appearance and image of the industrial park. Their locations are shown on Fig. V-48.

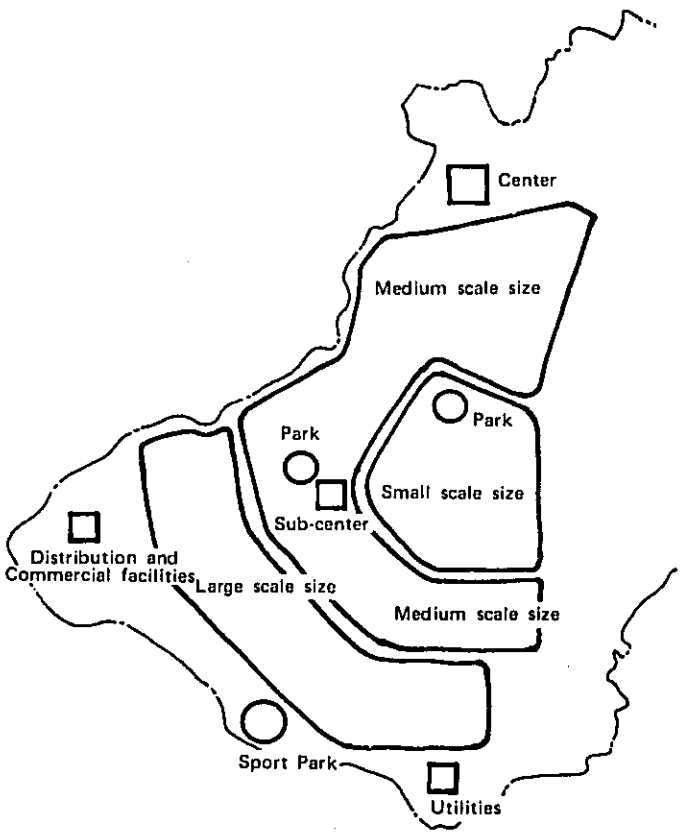


Fig. V-46 Factory arrangement by lot size in Phase I

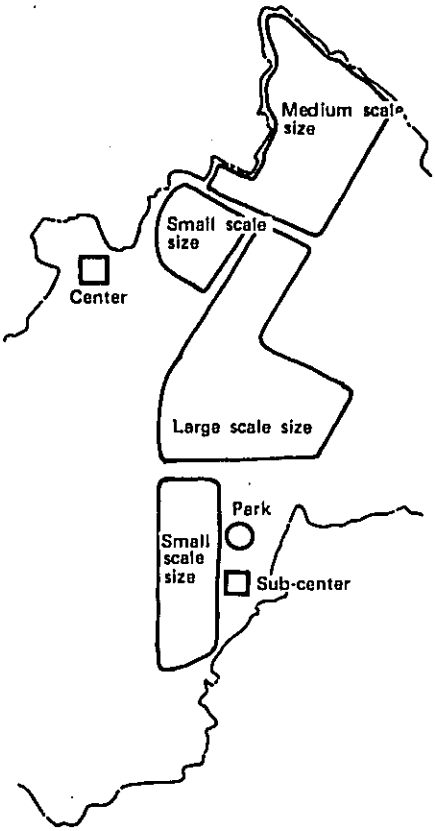


Fig. V-47 Factory arrangement by lot size in Phase II

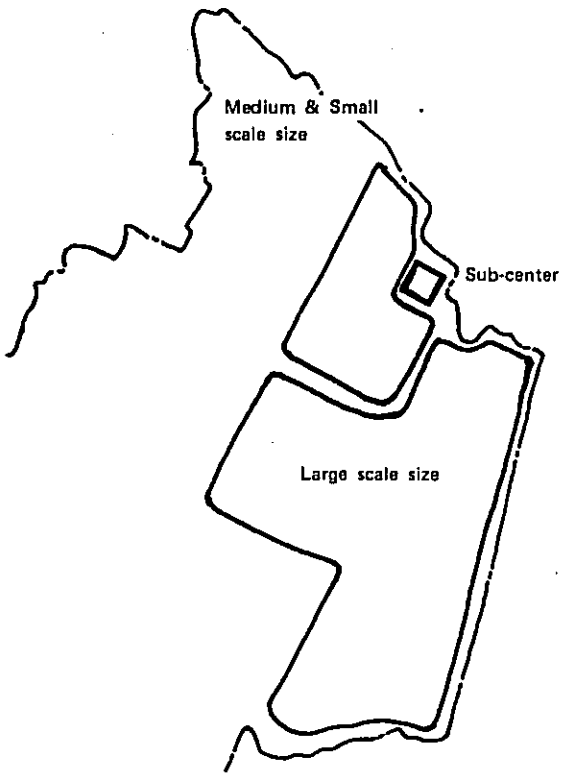


Fig. V-48 Factory arrangement by lot size in Phase III

iii. The standard factory

The standard factory that we are talking about here will be a leased factory with a lot of 1,000 m^2. Standard specifications will be made for the shape, the size of the land and architectural style of the buildings. These factories shall be equipped with electricity, water supply and disposal, lighting, illumination, ventilation and sanitation facilities. The purpose of this standard factory is to help develop small factories by providing the entrepreneurs the required space for factory on retal basis. In addition, leased warehouses and transport services will be set up for the standard factory, so that even a small-sized enterprise will be able to have a very carefully lied out set of facilities. For the employees as well there will be common welfare facilities. Thus, at the industrial estate the entrepreneurs will be able to operate in the most economical and rational way.

There are two types of standard factory as far as size is concerned: one the A type, and the other the B. The A type has a lot of 600 m^2 and the building space will be 300 m^2. The factory that will enter this A-type lot is designed for those presently has a working floor space of 50 to 100 square meters and that has neither warehouse or parking lot for its operations and are planning for extension. The B-type is somewhat larger than the A, with a total lot size of 1,000 m^2 and a building area of 500 m^2. The model plans for these two types are as follows. Fig. V-49.

(6) Major facilities plan

The major facilities of the industrial estate will have a direct and indirect influence on the incoming companies, their employees, visitors and people living in the surrounding area. They are chiefly designed to provide a broad range of services for the smooth operation of the estate, but ultimately, they are expected to make a contribution to the formation of regional communities. At this time we will discuss these required facilities as to their contents and scale.

① Examination of necessary facilities

The major facilities that will be examined here are those necessary for an enhanced image of Ujung Pandang city, those necessary for the operation of the industrial estate, those necessary for the maintenance and improvement of working conditions for the employees, and those necessary for increasing industrial productivity.

a. Facilities necessary for a better image for Ujung Pandang

As a facility for people to get an overall view of the industrial park, an observation platform will be set up. We would like to have this observation platform equipped with a room where the construction and operation of the industrial park can be explain to visitors and the general public. Since this structure will be a landmark and symbol of the industrial estate, it will have to be constructed well fitting with that purpose.

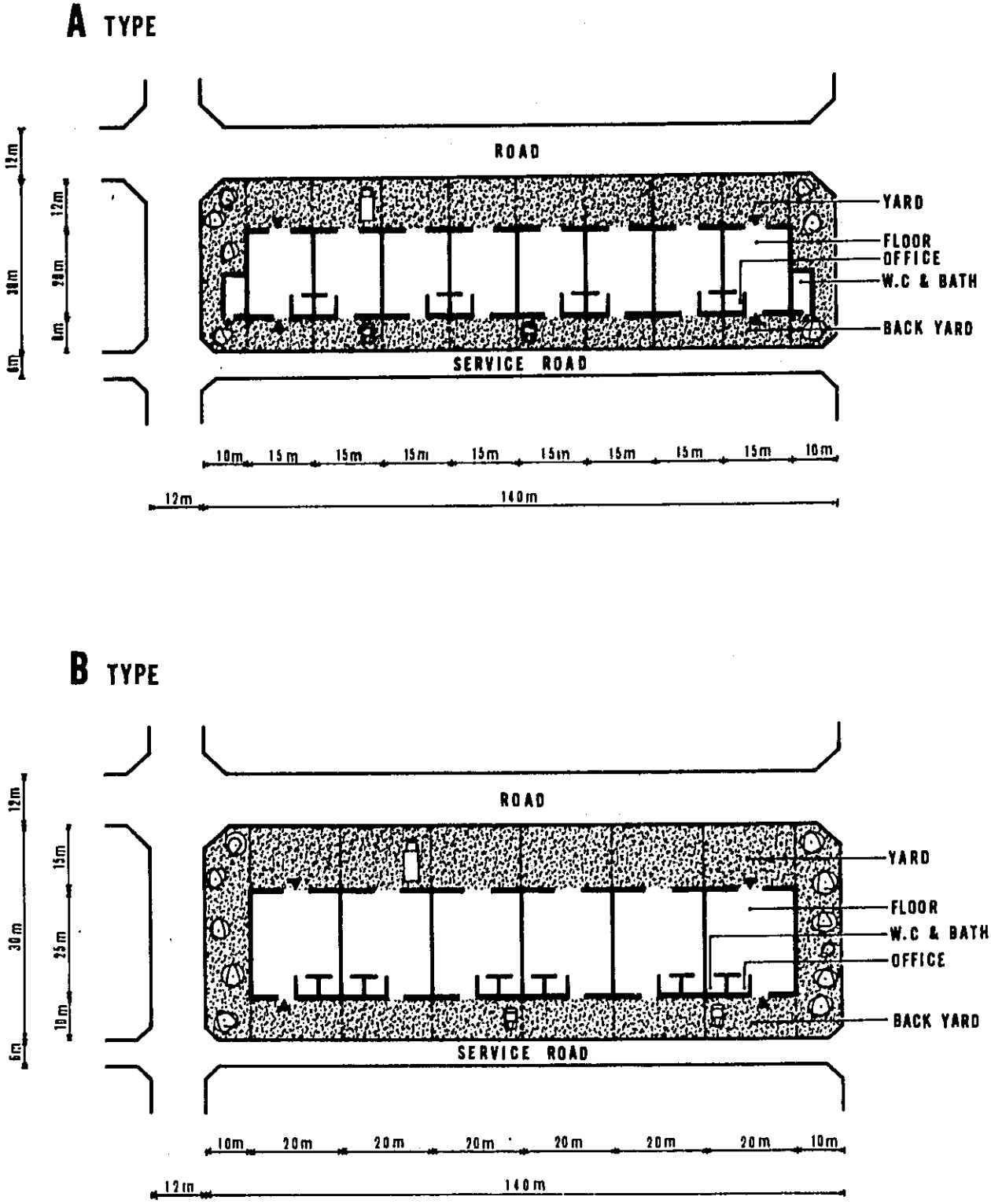


Fig. V-49 A model of the Standard Factory

b. Facilities necessary for estate operations

These facilities will provide necessary public services for the industrial estate such as a branch office of the city hall, a police station, fire station and post office. An administrative office will be set up to control management and operational practices within the industrial park.

c. Facilities necessary for the maintenance and improvement of working conditions for employees

A shopping service center and a food preparation center shall be set up to meet the ordinary living needs of employees. A clinic will also be installed for the health care of employees. Training room will also be built for the education and training of the work force so that their level be improved. In order to maintain adequate communication between employers and employees, large and small auditoriums will be installed.

d. Facilities necessary for improvement of the industrial productivity

As facilities that will improve the overall distribution system, there will be a truck terminal, leased warehouses, auto repair garage, and gas filling stations. Trading firms will also be put in the industrial estate so that factories can jointly purchase their lumber and steel.

② Outline and size of major facilities

a. Industrial estate center

The following facilities will be incorporated into the center. The size of the land will be 2 hectares.

* Administration Office

About 50 people will work here and be in charge of the management and administration, planning and arrangement of enterprises in the industrial estate. The total floor space of the building will be 500 m^2.

* City Hall Branch Office

About 3 people from the city hall will station at the industrial estate to handle administrative services for employees. The floor space of the

building will be 45 square meters.

* Clinic

It is estimated that there will be about 50 patients per day out of the 25,000 working at the industrial park in consideration of periodical health check, regular care and emergency care. The clinic will have examination rooms, infirmary and X-ray rooms. The floor space will be 300 m^2.

* Police sub-station

The station will have two policemen on duty, and it will be equipped with an office and rest room. The total floor space will be 50 m^2.

* Fire station

The fire station will be organized so that the firemen will be employees of the industrial estate. There will be two fire-trucks (one will have chemical fire-fighting apparatus). The station will have an equipment storage room and ready room. The building space will be 200 m^2.

* Post office, telephone, telegraph and telex office

This office will receive communications in the industrial estate. The building will have a ground area of 150 m^2.

* Restaurant

This restaurant will serve 400 people (turnover ratio 1:2). The total area for construction will be 400 m^2.

* Shopping service center

Five stores shall be built handling such goods as food, clothing, stationery, and miscellaneous articles. The total floor space of the building will be 75 square meters.

* Training rooms

Two rooms (50 m^2 each) with the capacity of 10 - 15 people will be installed. The total floor space of the building is 100 m^2.

* Assembly auditorium

The capacity of the auditorium will be such that 500 people can be seated. It will be a hall for lectures, movies and stage performances. The size of the building area is 500 m^2.

* Small auditorium

This auditorium will have a seating capacity of 50 people, and will also have areas for discussion, exhibitions and practical training. The size of the building area is 100 m^2.

* Religious facilities

This will be a mosque with a seating capacity of 500. The total area of the building will be 600 m^2.

If all the people who can occupy these facilities are assembled at one time, there will be 1,300 accommodated. In calculating the space required for a parking lot for these people, it is estimated that 5 percent of them will be driving private cars, 40 percent will come by small bus, 40 percent by passenger bus and 15 percent by bicycle and on foot. The parking space required for the private cars is 2,600 m^2, that for the small buses is 1,750 m^2, and for the bicycles about 100 m^2. This means that a parking lot of 4,450 m^2 will have to be provided. With a total of 3,020 m^2 for the buildings themselves, the lot area required will be a total of 15,100 m^2. With the parking lot and building lot areas put together the total will be 19,550 m^2, so that we will assign 20,000 m^2 for the entire industrial estate center.

b. Sub-centers

The following facilities comprise the sub-center. All sub-centers will have about the same type of operations and there will be three in all. The size of the land for one sub-center is 0.5 hectares, for a total of 1.5 hectares for all three.

* Shopping service center

There will be five shops here and the total space required is 75 m^2.

* Restaurant

This restaurant will be able to serve 400 people at one time (1 : 2 turn over ratio). The area for the building will be 400 square meters.

* Training room

Ten to fifteen people can be seated in this room, the total area is 50 m^2.

* Small meeting room

The meeting room has a seating capacity of 50 people and the total area of the building is 100 m^2.

* Gasoline filling station

This station is a small-scale occupying 150 m^2.

* Parking lot

1,200 m^2.

c. Distribution-related facilities

The following facilities are those which may be categorized as distribution-related. The total land area required is 3.2 hectares.

* Truck terminal

The chief function of the truck terminal is to make distribution of goods operate just that much more smoothly. Trucks will arrive here bringing loads of raw materials from other areas and these will then be delivered by smaller trucks to various factories in the complex. The reverse will also be true; finished products will be carried by small trucks from the factories, reloaded into larger trucks according to their routes and destinations. There will be about 1,350 trucks going in and out of the estate each day. Assuming that about one-fourth of these trucks will be using the truck terminal as their point of arrival and departure, a total of 312 trucks will be engaged. Given a turnover rate of 4 times per day in these trucks, we estimate that about 80 trucks will be in the terminal at any one time. Since the required dock space for each of these trucks is

5 meters, the total dock length will be 400 meters. Thus, two docks of 10 x 300 meters will be built. The total area for the truck terminal is 30,000 m^2.

* Repair shop for autos and other transportation machinery

Calculating the number of automobiles that each company in the industrial park will be operating at an average of 2, these will be a total of 300 vehicles for the 150 companies. A total of 300 forklift trucks, tractors and lift trucks will be in operation for the material handling at the entire factories. Calculating approximately 30 m^2 sqaure for each repair stall, the shop should have enough space for 10 vehicles, or 300 m^2 with the 1,200 m^2 of parking lots. A total land area of 1,500 m^2 is necessary.

* Gas filling station

This will be large in size at 500 m^2.

d. Commercial and service facilities

The following facilities fall under the category of commercial and service. The total area is 8,000 m^2.

* Raw materials dealers

Ten dealers that handle the raw materials for food, clothing ceramic, metal and plastic industries will be introduced into the estate. The size of office space for each of the 10 companies will be 400 m^2, for a total of 4,000 m^2.

* Banks and financial institutions

To facilitate commercial transactions, financial institutions consisting of banks and others will be set up. The total land required will be on the order of 1,000 m^2.

* Food preparation center

This center will supply food to about 25 percent of the 25,000 employees and 5,000 visitors, or to 7,500 people. This will require a space

of 0.3 meters per each person for a total building space of 2,250 m^2. In addition, a parking lot will be constructed requiring a total of 3,000 m^2 for this facility.

(7) Plan for green belts and parks

1. The function of green belts and park space

There are three points to consider in regard to the function of green belts and parks that will be haid out both borders and inside of the estate.

The first is to function as a buffer between the productive area of the factories and the living area of external cities and villages.

Second is to provide a much more comfortable and attractive area for the employees to work in and furthermore provide an excellent recreation space for both employees and the citizens living in the surrounding area.

The third point is that these are areas which will add to the beautification of the entire industrial park and by making the area into a scenic spot, they will heighten the image of the estate as a place for modern industry.

2. Planning policy

Each one of the green belts and park areas has a specific function that it will perform. In order to perform these roles, the following basic policy has been made.

i. Buffer green belts

These are designed as space in belt from which will aid in the purification of air, the absorption of noise, and to enhance the feeling of mental security to the people in the vicinity.

ii. Recreation space

These parks will be built chiefly for the employees of the industrial estate but they will also serve the citizenes of young and old of the adjacent communities for resting, walking and sporting.

iii. Green areas for landscaping

The dirty look would be a definite dis-advantage for the industrial estate. In order to prevent this and have peaceful and pleasant surroundings and view, these green areas will be set up throughout the site so that green space may be viewed by anyone at any location. These green space will be placed at and around the communal facilities such as parks, green belt, walkways, they will line the streets and provide the green foliage surrounding public buildings and facilities. They will of course be also placed at an individual factory area.

3. Park and green belt plan

i. Park plan

a. A large quiet park

To enhance the natural environment of the hill area that surrounds the industrial estate center, the theme of park should be serenity. This park will serve as one of the important landmarks symbolizing the park and it will prove a place from which all of the industrial complex can be seen, as well as for rest and walk.

b. The small, quiet park

These parks will be located adjacent to the three sub-centers as well as close to the small and standard factories clustered at the central area of the southern section. The latter will function to augment the welfare facilities for these factories. Their chief function will be to provide a rest area for employees where they can take a break and enjoy a change of space.

c. Large sports park

The purposes of this park are to provide a place for the inter-company games at the industrial estate and for the athletic meetings of people in the surrounding communities. They will also be used for sports club activities every day.

ii. Green belt plan

a. Buffer green zone

A green belt buffer zone of 20-50 meters wide will be placed around the entire industrial estate. This belt will have trees as thick as can possibly be planned. In those places where the topography permits rest areas and walkways will be provided.

b. Green belt for landscaping

On the northeast edge of the industrial estate which faces the Jl. Gowa Jaya a green belt of 50 meters wide will be set up. The purpose is to enhance the scenic beauty of industrial estate from that road. There should be ample greens but not too many trees will be planted in order to give a feeling of openness to the view. The image of the area will be a composite of a few trees, some shrubsery and a wide area of grass lawns.

c. Green belts along roads

A ten-meter wide green belt will be emplaced along both sides of the main artery road. This belt will aid in demarcating the road and it will add to the feeling of safety by motorists and truckers using the road.

d. Green paths

This is a path with a different function from that of the bicycle road and it will be a walkway connecting the major facilities within the industrial estate. It will be about ten-meters in width and have a paved path of about 1 - 2 meters in width. The area except for the paved portion will have tree densely planted.

(8) Land improvement

i. Basic points of consideration

In this plan full considerations were taken to preserve the environment of surrounding villages and towns in the course of land development. More specifically, efforts were made to keep a balance between cut and fill within the project site. From the patterns of land use and the area's topography, the following items were taken into special consideration in the land development

planning.

* There are a number of places in the hill areas where rocks appear on the surface. In those areas where rocks do not appear, we assume that the bed rock is down about 3 - 5 meters below the surface. Thus, excavation will have to be limited to a depth of three meters.

* For reasons of water disposal it would be desirable to have ground elevation of at least eight meters in those areas adjacent to the arterial road.

* In order to avoid risk of flood during the rainy season at the area southeast of the center, where is used as paddy field it will be necessary to fill to the ground elevation of at least eight meters high.

ii. Outline of land improvement

Land improvement involved here is basically to cut the hill areas running from northwest to southwest and transfer the excavated earth to the wet rice paddies and dry fields of the low areas spreading from the southeast to the south sections of the site. This is shown in Fig. V-50. Total amount of earth to be moved is estimated at the order of 1,500,000 to 1,600,000 m^3.

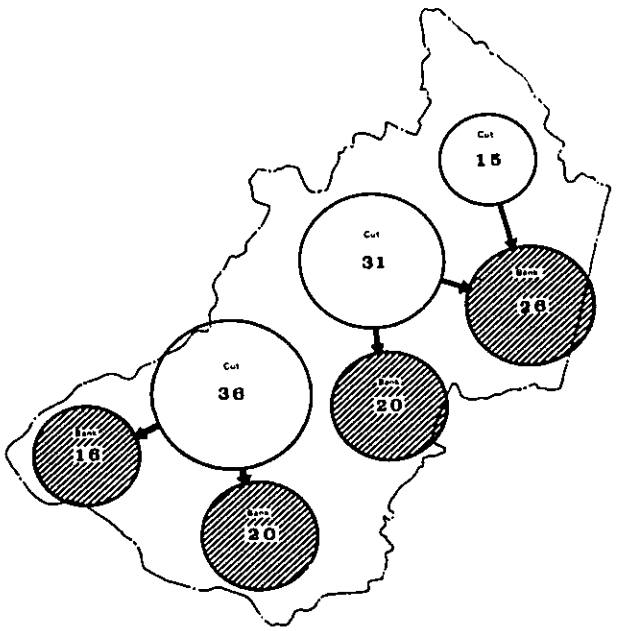


Fig. V-50 Outline of land improvement (0,000 m^3)

(9) Plans for utilities

1. Water supply plan

i. Estimate of planned water supply

Taking into account that industrial water will be required for boilers, raw materials, product cleaning, cooling and heating, calculations have been made on the necessary volume of water by multiplying the basic units of supply water (fresh water) for each plant size, classified according to type of industry. The basic unit of water has been determined on the basis of 1973 Japanese data, also taking into account data from factories in operation in Southeast Asia, the water use needs for small and medium-size factories in the region, and the kind of facilities that factories in the industrial estate would use. Also city water is used for drinking, shower and others. According to information from the Water Treatment authorities in Ujung Pandang, water use per person per day was estimated at 70 liters. For the basic units, see the table below.

	a Industrial water supply	b Drinking water supply	c Total supply (a + b)
Food	3,400 m^3/day	280 m^3/day	3,680 m^3/day
Texitile	170	310	480
Wood	150	270	420
Paper & Printing	90	70	160
Chemical	500	110	610
Ceramic	1,160	140	1,300
Metal	1,280	160	1,440
Machinery	1,280	620	1,900
Others	50	150	200
Total	8,080	2,110	10,190

ii. Method of supply

Factory use water and drinking water will come from the water treatment facility at Ujung Pandang, piped along the Jl. Gowa Jaya route to the utilities facilities at the south section of the industrial estate. Water received at the utilities site willed be pumped into a 24-meter high tower on the hill in the estate from where it can be distributed to the entire site by gravity.

2. Plan for waste water drainage

Water from the industrial estate will be divided into two categories: that of waste water from human use and that from factory use. Factory waste water here means that portion of water used for such things as product treatment and cleaning. The proportion of factory use water that will go into product treatment and cleaning will vary according to type of industry, but calculations were made for each type according to precedents that have been set elsewhere. Water supplied for human use, will be considered that all of them will be as waste water.

	d Waste water (human use)	e Waste water (industrial use)	f Total (d + e)
Food	280 m^3/day	1,080 m^3/day	1,360 m^3/day
Texitile	310	10	320
Wood	270	50	320
Paper & Printing	70	20	90
Chemical	110	30	140
Ceramic	140	240	380
Metal	160	310	470
Machinery	620	290	910
Others	150	20	170
Total	2,110	2,050	4,160

i. Waste water disposal plan

Since it is estimated that the waste water from food and textile plants will have a high BOD content. One of the basic ideas is to have this water disposed at the treatment plant along with the human use water. Water from other factories may contain oil, acid, alkali, suspended solids, chrome, copper, lead, nickel, and dyes. These wastes will have to be cleaned at the individual factory or by the factory group and discharged into the gutters.

There are two routes for drainage of waste water. The one will go along the hill ridge in the south and southwest section of the site and another will go along the valley in the northeast. These two routes will carry the water by gravity where they will be collected at a disposal plant in the southeast section of the estate.

3. Rain water drainage plan

i. Basics of rain water disposal

The principle to be followed in planning for rain water drainage is to make as little change as possible in the areas of water catchment before and after construction has been completed. At present the site may be said to have six large such areas but since three of them are located in the valley to the east, they may be combined into one. This means that there are four routes of rain water run-off after consturction of the industrial estate is complete. Rain-fall within the estate can be led off by L-shaped and U-shaped ditches along the roads. These will then go to a main canal which from the disaster prevention point of view will be an open ditch. The reasons for this will be discussed at the disaster prevention ponds.

ii. Disaster prevention ponds

The reason for having these ponds is that they will be necessary if a gas or oil carrying truck or a truck carrying chemical should turn over on the roads inside the east, these materials might get into the ditches and then pollute neighboring fields and rivers. The disaster prevention ponds will function to deter this collecting any such contaminated flow. The reason for having the ditches at the side of the road open is that if such an accident is not extensive, the flow can be stopped right away. Accordingly the diaster prevention ponds are required to be made at the end of the drainage system. It is hoped that they will be designed to hold at least 1,000 cubic meters.

4. Plan for electricity demand

The estimated power used by factories on the industrial estate can be inferred from Japanese data where the basic unit of use is from 0.01 to 0.03 kilowatt per square meter. The size of the plants at the industrial estate are such that a factory will occupy from 0.5 to 5.0 hectares and since any of these factories will not consume so much amounts of electricity, the unit of power use in question would be on the low side. Since the net area for factory use is 140 ha, this means that power demand should be on the order of 14,250 KW.

Assuming that the factories are operative with hourly use calculated on eight-hours a day with extra one hour before and after, the total demand would be about 114,000 kwh per day. This electricity can be obtained from the power lines passing nearby the estate.

5. Plan for heavy oil demand

Energy other than electricity will depend on heavy oil. Referring again to Japanese industrial use of heavy oil and considering meteorological factors and degree of facilities that the plants in the industrial estate will use, the total demand for the industries planned will be about 200 cubic meters. The supply will come from tanks at Ujung Pandang port and be delivered directly to each factory.

6. Plan for industrial waste disposal

When the plants are in operation the industrial wastes are automatically produced. The following is a summary of the wastes that will be emitted according to type of industry that will enter the estate.

Food -- sludge, waste acids, alkalis, animal and vegetable matter
Textile -- wastes of textile and paper
Lumber -- wood scraps, sludge
Paper, printing -- sludge, scrap paper, ashes
Chemicals -- waste acid, sludge, alkali, rubber scrap
Ceramics -- dust, sludge, glass and porcelain wastes
Metals -- acids, scrap metal, alkali
Machines -- acids, alkali, ashes
Others -- sludge, acids, alkalis, plastic

Excluding scrap metal, paper and cloth from the above group it is estimated that the total amount of waste disposal, consisting chiefly of sludges and ashes, will be from 60 to 80 tons per day. It will be necessary to have a burial disposal place for all this garbage when the factories are in operation.

(10) Principles of lot use and building construction

In order to have an industrial estate that the people of Ujung Pandang will be proud of, it is necessary to put the following measures into practice.

i. Set back

* When building factories and administration units they shall be set back from the roads at least 10 meters. When setting up green areas in this dividing space, various trees, shrubs must be planted in order to have the maximum enhancement of the ecology.

* The set back requirement for the factory building from road in other instances will be greater than five meters. When two factories are placed adjacent to each other, they each can take a 5-meter space to fulfill the above requirements, which allows to have green area throughout the industrial estate.

ii. Scenic view

* Greens will be planted in the set back area around the arterial and sub-arterial roads, and that from the neighboring factories.

* When construction starts in the industrial estate, utmost care will be taken to preserve and maintain all existing trees and shrubs.

* Attention should be equally given to having green in all open areas with the exception of those for parking and material storage.

iii. Parking

In order to prevent parking on the roads, each factory and facility will have adequate parking facilities on its land.

* Entrance and exit to the parking lot will be provided through not more than two driveways and the width of these driveways shall be adequate for the vehicles to pass through.

iv. Places for storage of raw materials and finished products

Those areas to be used for the open stage of raw materials and finished products should be adequately protected by planting trees.

* These areas and those where trucks are loaded and unload shall be paved to prevent dust and full attention will be paid to water drainage.

2. Principles of building construction

i. Limits on building coverage and on height of buildings

* The building coverage should be less than 30 percent and the height of buildings will be restricted to 15 meters.

* These restrictions do not apply to smokestacks or similar constructions.

ii. Signs and billboards

Signs indicating the name of the company shall be limited to those attached to the exterior wall of the building.

Traffic signs and road guides will be handled separately.

Size and design of these signs shall be uniform throughout the industrial estate.

2) Results of comparison between L-type plan and the Garuda plan

An examination was made of the L-type plan similar to that for the Garuda plan. Comparing the two on various items such as patterns of land use, preparatory work land development, roads building, water disposal, green works for slope protection, green areas and parks, the L-type requires a much greater amounts of work than that for the Garuda. One of the most decisive points against the L-type plan is imbalance of cut and fill. The L-type plan does not achieve a balance here, it would require some 490,000 cubic meters of earth be hauled in from elsewhere.

Taking all of these factors into account, it is our conclusion that the Garuda plan is the superior to L-type plan. (See Fig. V-51, Fig. V-52, Fig. V-53, Fig. V-54, Fig. V-55, Fig. V-56.)

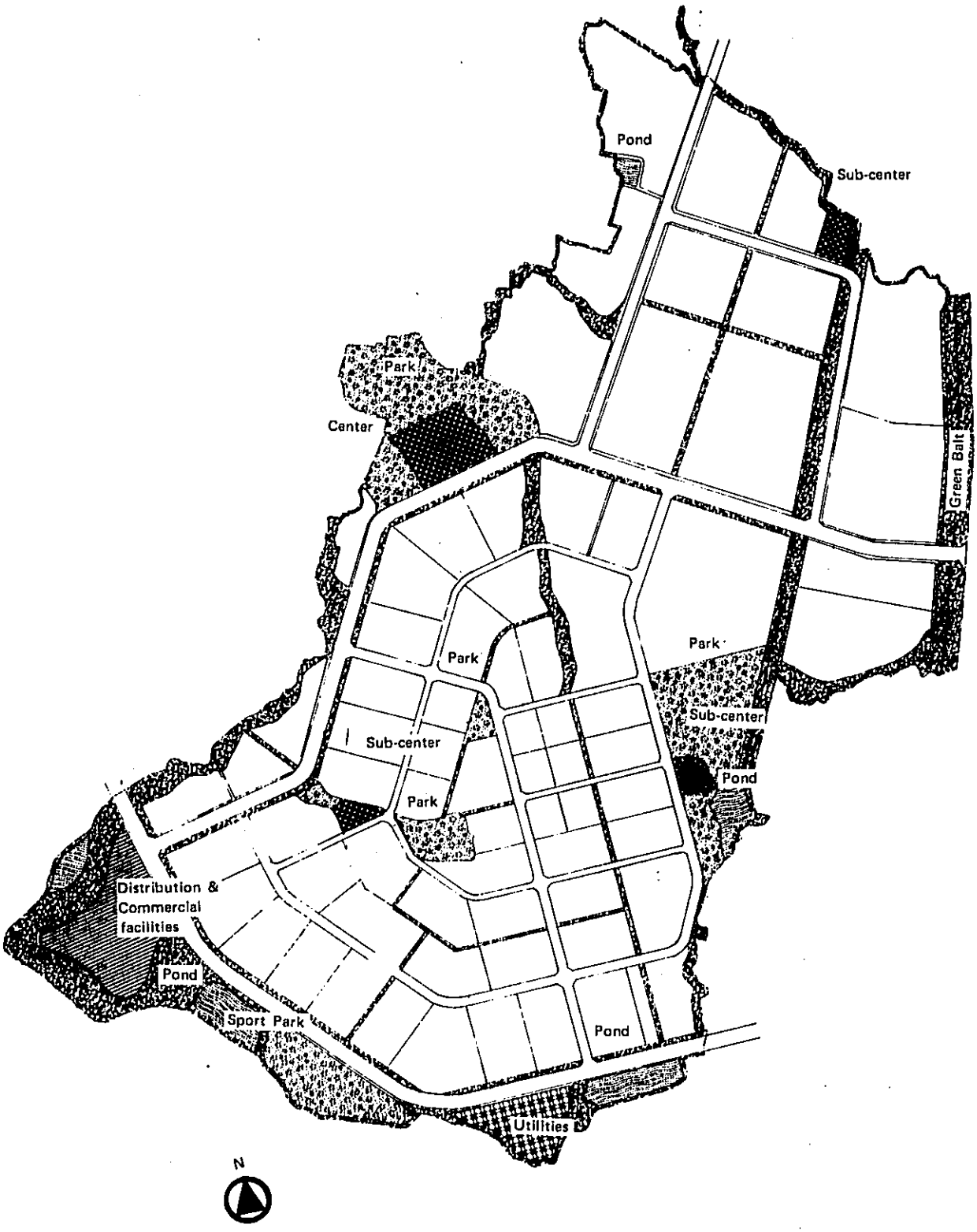


Fig. V-51 Development Plan of the Garuda Type

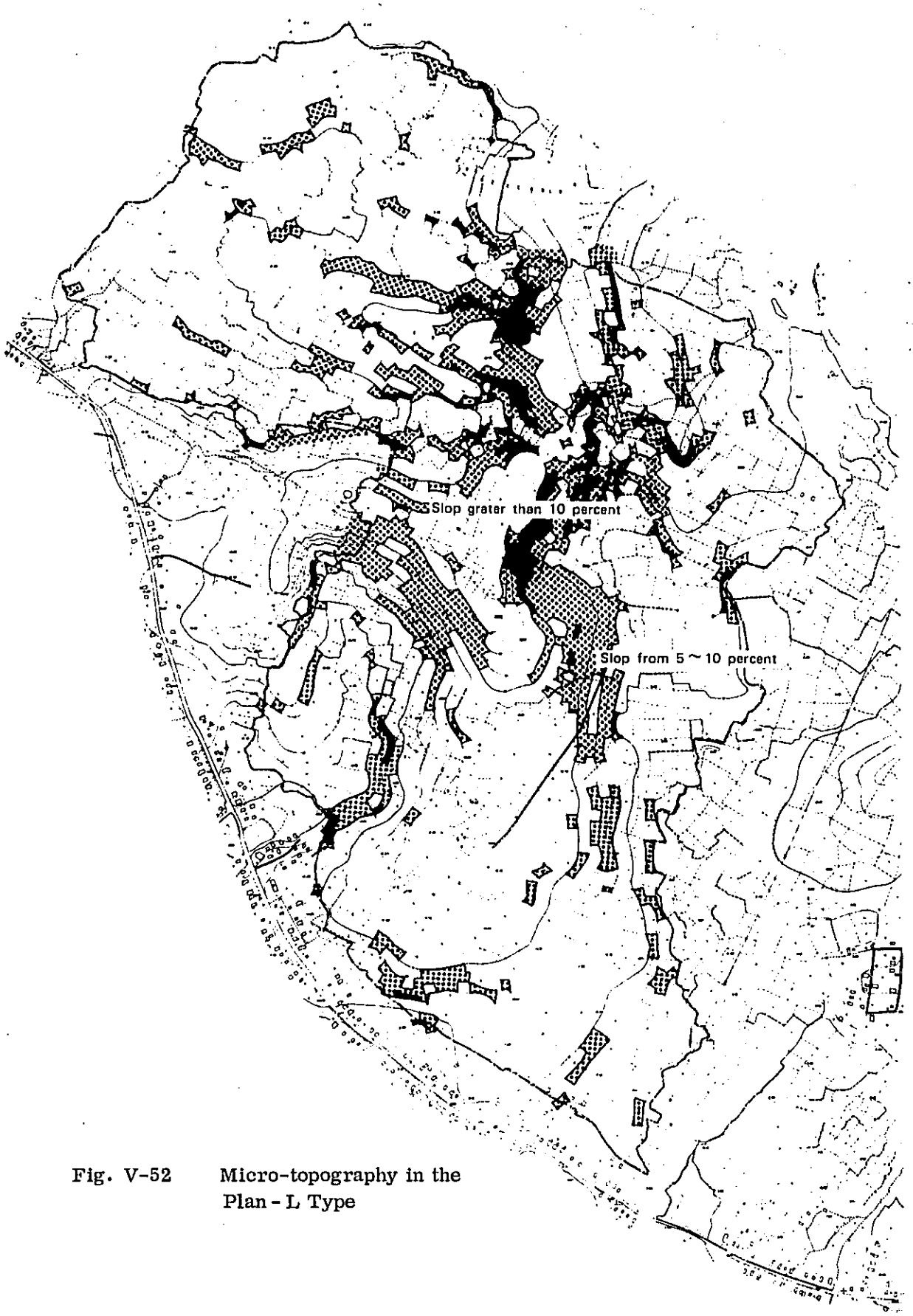


Fig. V-52 Micro-topography in the Plan - L Type

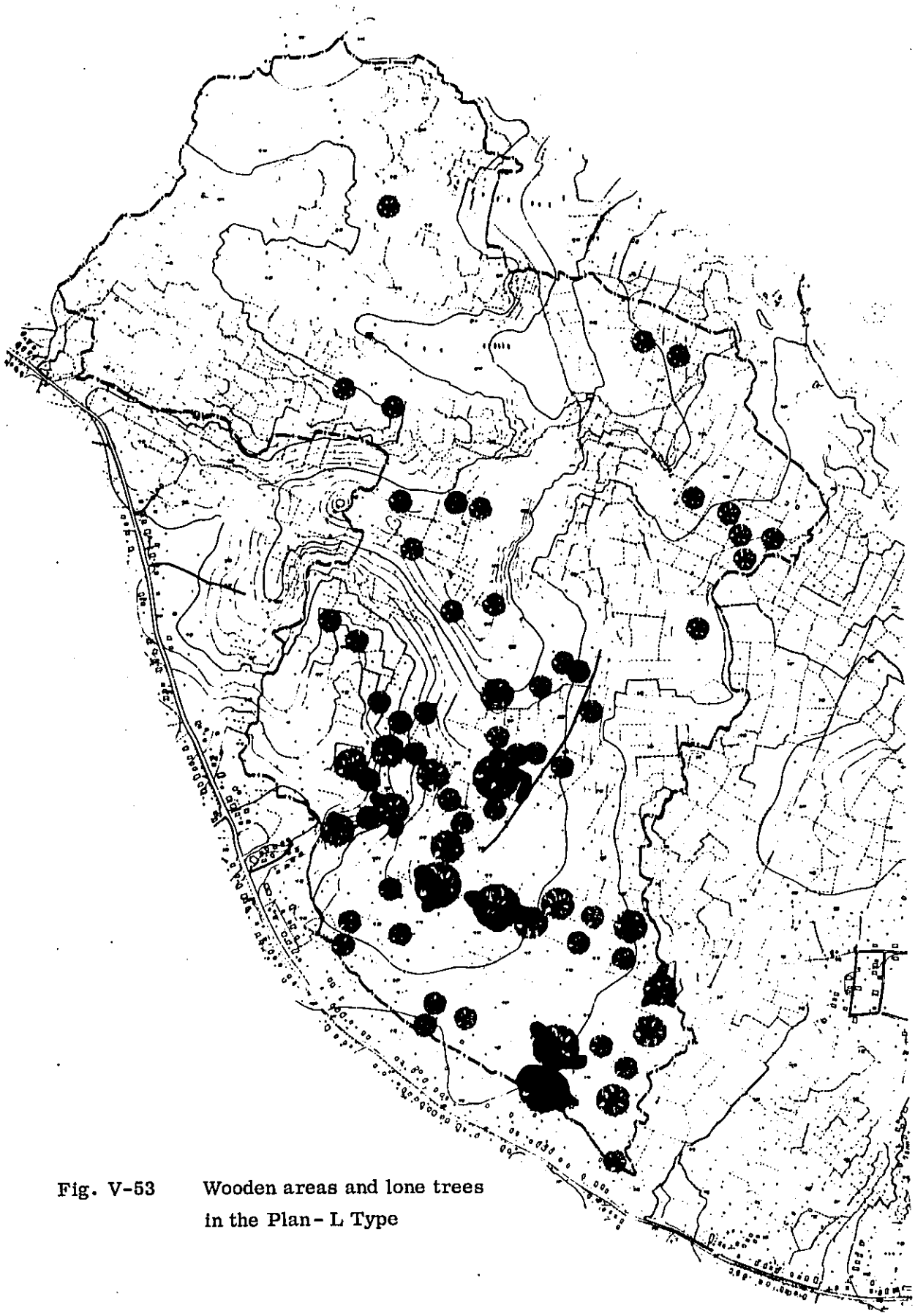


Fig. V-53 Wooden areas and lone trees in the Plan-L Type

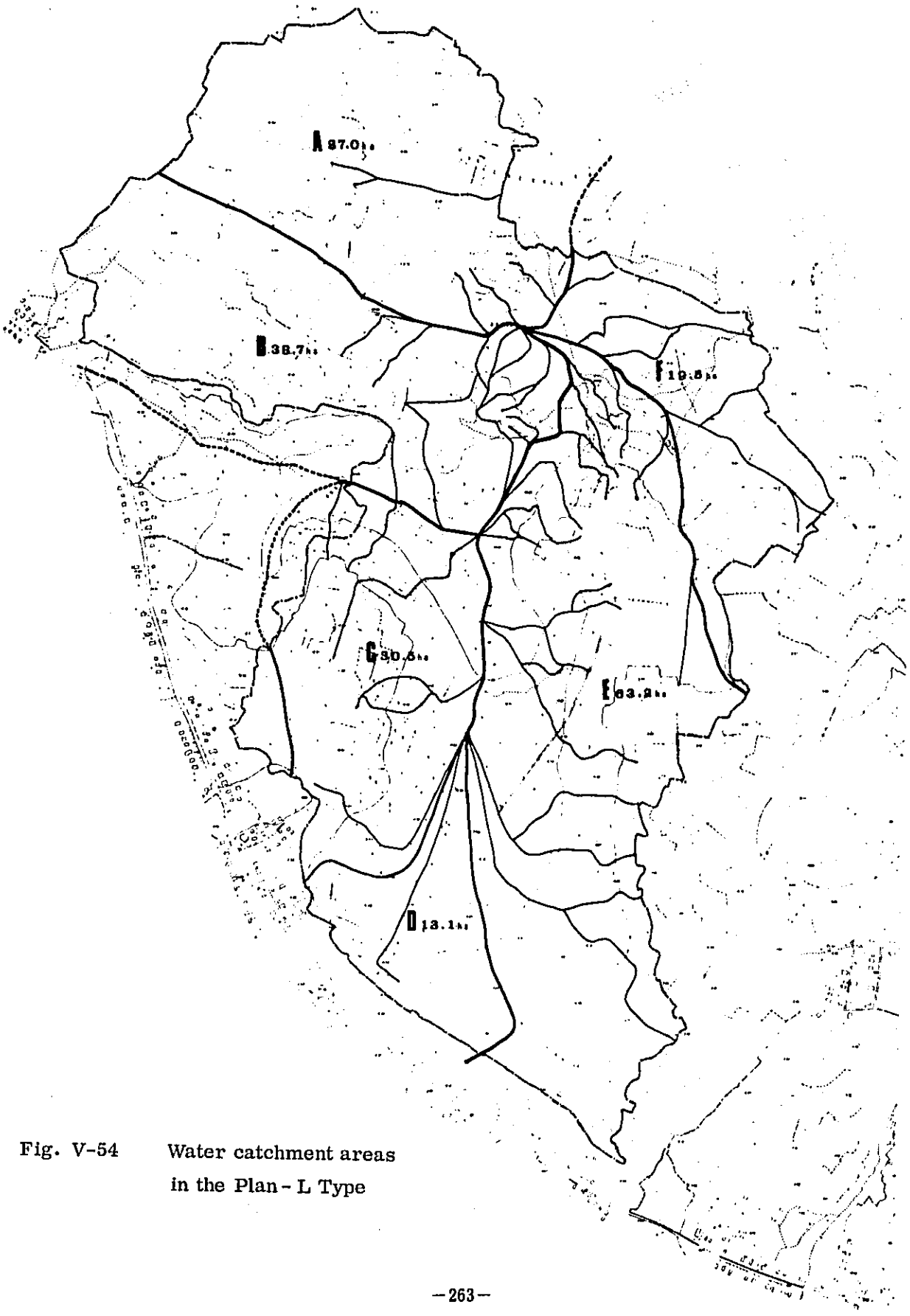


Fig. V-54 Water catchment areas in the Plan - L Type

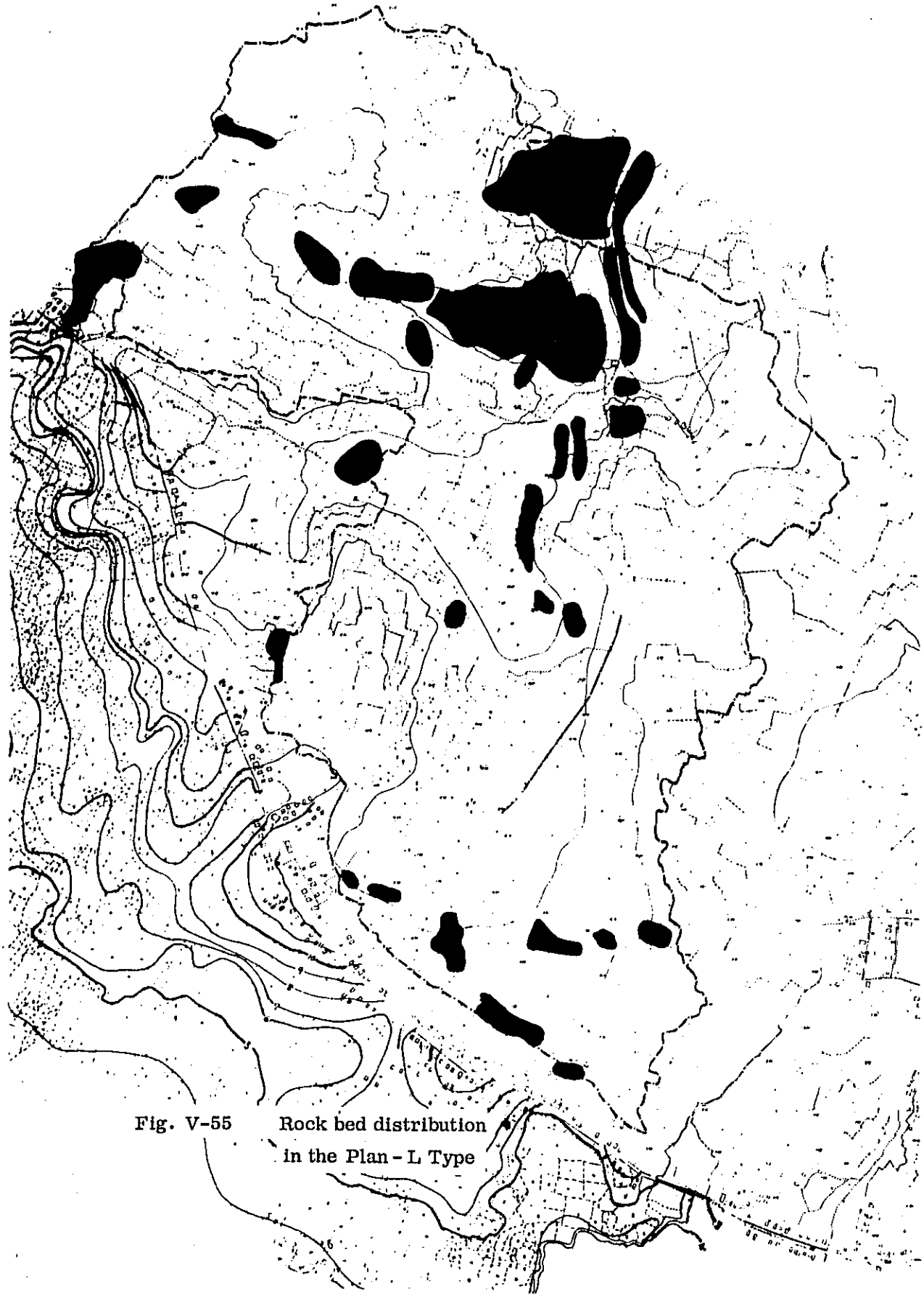


Fig. V-55 Rock bed distribution in the Plan - L Type

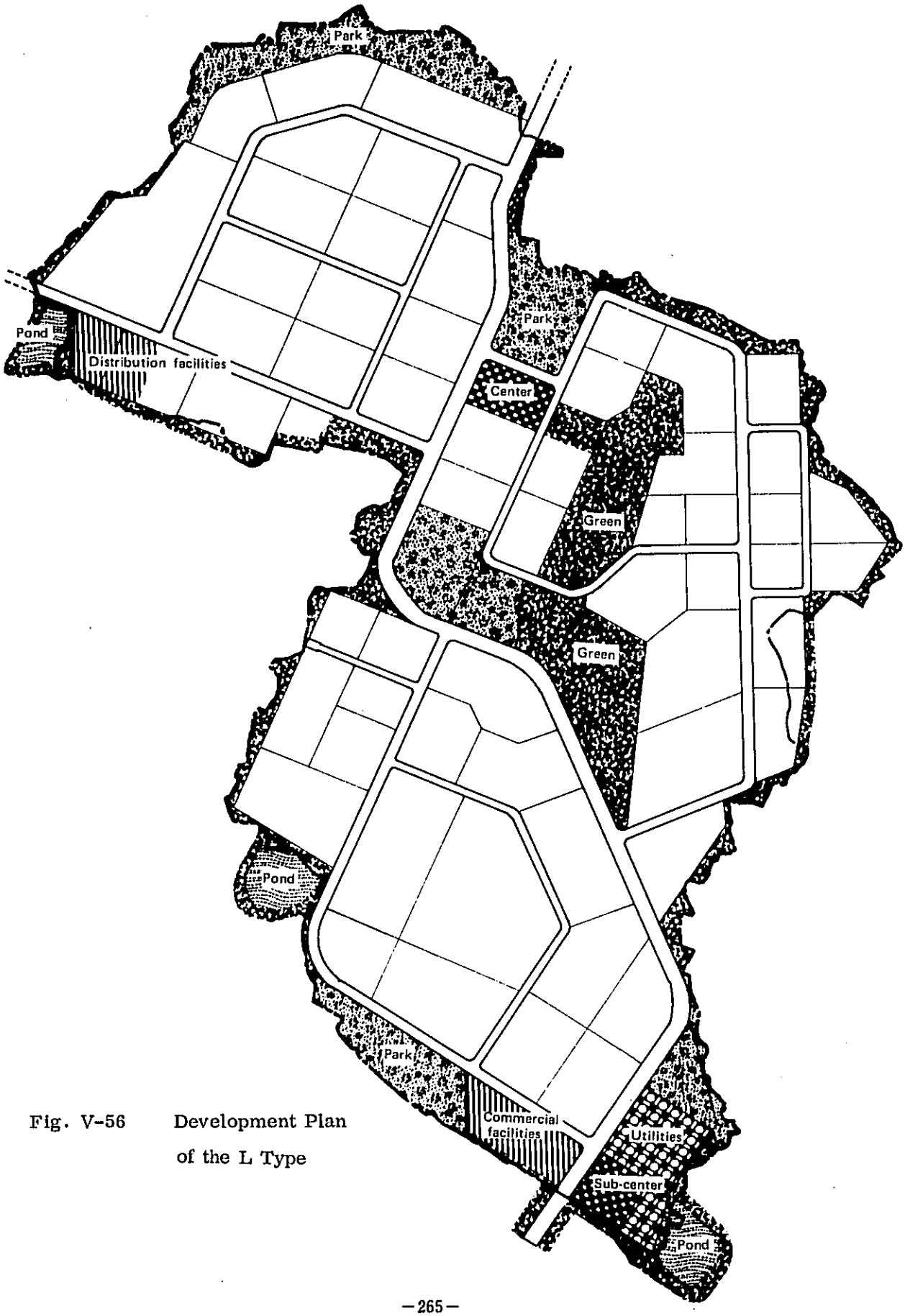


Fig. V-56 Development Plan of the L Type