

7-3 Land Consolidation (L/C) Master Plan (300ha)

7-3-1 Existing Conditions of Master Plan Area

The study area consist of a part of 3 sub-districts (Desa: Jatiasih, Jatiluhur, Jatimekar) in Jatiasih, 11 RW, and 29 RT, with the area is about 323.87 hectares. However, the administrative area included all area of RT, which is a part of study area (RT in the northern part that is divided by a high voltage line and the east side of Jalan Raya Jatiluhur). Some parts of RT's in Desa Jatimekar and Jatiasih are include in this study.

(1) Physical Characteristic

1) Topography

Topographical land profile of Jatiasih Master Plan Area is a plain with slightly land slope. The range of altitude is 28.26 to 46.95m. The highest altitude of the plain is located in the south and it decreases towards the north.

2) Land Use

Existing land use have been dominated by mixed garden (mix crop), secondly is settlement, occupied along the street, especially along Jalan Raya Jatiluhur. Some houses are scattered, located in the mix crop plantation land. The present situation of the land use is shown in Table 7-3-1.

Table 7-3-1 Present Land Use of Master Plan Area in Jatiasih

	Category	Land Use	Area (ha)	Component Ratio (%)	
1	Private Land	Agriculture	Pond	10.76	3.32%
			Paddy Field	32.63	10.08%
			Dry Crop Land	37.33	11.53%
			Mixed Garden	114.60	35.38%
			<i>Sub Total</i>	195.32	60.31%
		Residential	Housing Estate	10.42	3.22%
			Village	81.89	25.28%
			Housing Under Construction	18.14	5.60%
			<i>Sub Total</i>	110.45	34.10%
		Total 1		305.77	94.41%
2	Public Land	Neighborhood Facility	Cemetery	1.92	0.59%
			Religious Facility	0.68	0.21%
			Education	0.90	0.28%
			Road	4.99	1.54%
			<i>Sub Total</i>	8.49	2.62%
		Others	Vacant Land	9.61	2.97%
			<i>Sub Total</i>	9.61	2.97%
Total 2		18.10	5.59%		
Total 1 +2			323.87	100.00%	

Source : Field Survey, October 1998.

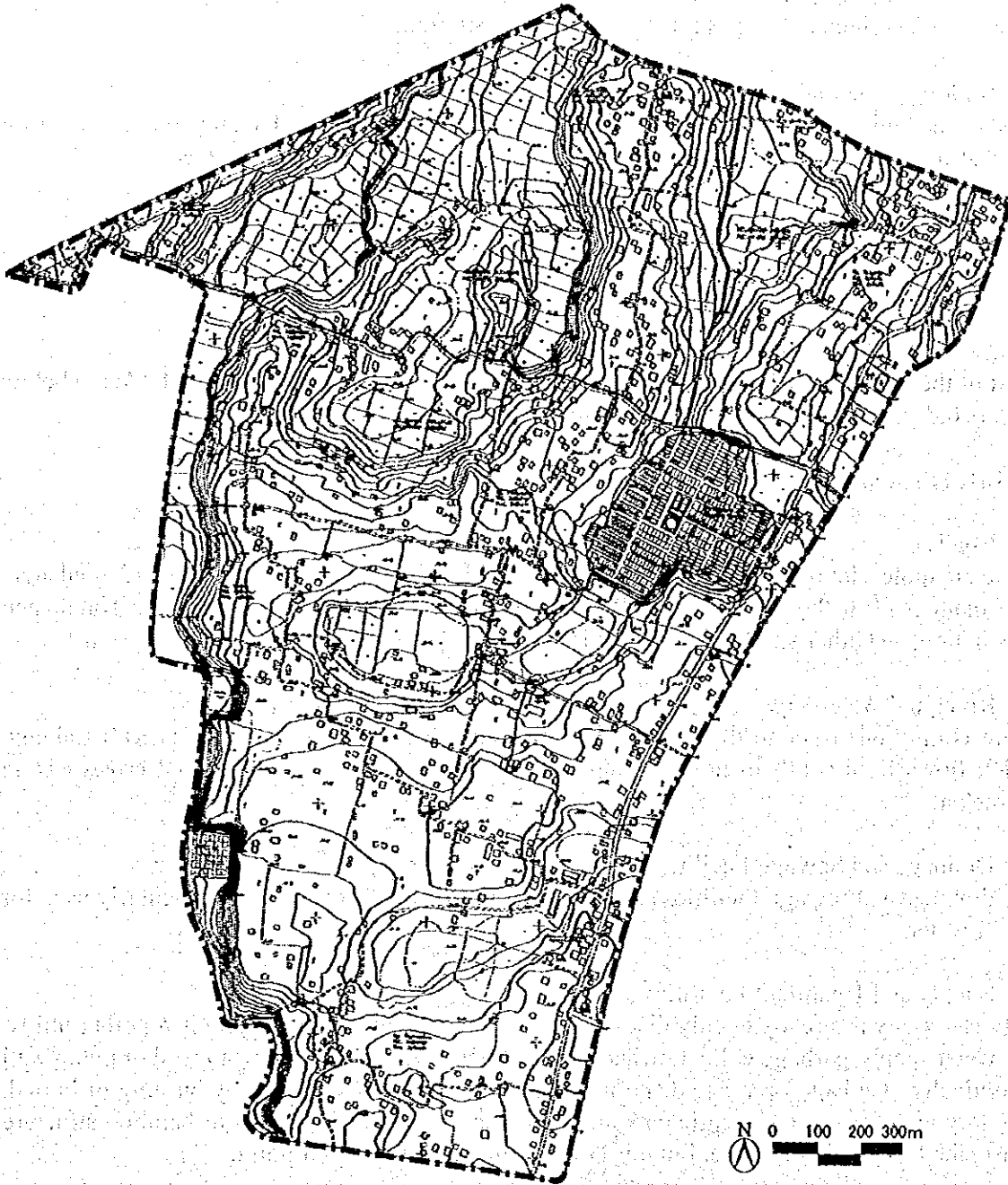


Figure 7-3-1 Map of L/C Master Plan Area

3) Building

a. Building Use

Most of the buildings, 1,518 (88.42%) are used as residences, secondly, 100 (5.82%) are mixed used, as residence + kiosks, residences + small shops, residences + beauty salons, and residences + workshops. Thirdly, others used are 35 buildings (2.04%), namely warehouses and chicken farms.

b. Building Coverage

Total number of buildings in the study area is 1,718. Most of the buildings, 917 (53.38%) are below 50m², secondly, 668 (38.88 %) are between 50-100m².

c. Building Structure

Most of the building structures, 1,221 (71.07%), are concrete and bricks, and 368 (21.42%) are wood structures. The 129 (7.51%) left are bamboo made and mixed structures.

d. Number of Floors

Most of the buildings, 1,700 (98.95%) are only one floor, while 17 (0.99%) have two floors, and only one building has 3 floors.

e. Years after Construction

Most of the buildings, 1,043 (60.71%) are between 5-20 years old and 660 (38.42%) are below 5 years old. They are not in so good condition.

4) Infrastructure

a. Roads

There are quite a lot of kinds of roads in the area, which connect each scattered residential area. One main road in the area is Jalan Raya Jatiluhur that is administrated by the Kabupaten jurisdiction, and other small roads are under Desa, Lingkungan and private jurisdiction.

b. River and Waterways

There is only one river in the master plan area, almost natural in type, that is Kali Cakung, which flows from south to north through Puri Gading Housing Complex and crosses Desa Jatimekar.

c. Drainage and Sewage Facilities

The drainage and sewage facilities are quite few, almost in bad condition, particularly used for runoff water.

d. Supply and Treatment Facilities

Only electricity is already evenly distributed in the master plan area. There is no other utility, like water supply, garbage collection and gas facilities. Water supply is from well or pump well individually. Garbage or waste disposal is treated by every household, by burning or buried. Lavatory are of two types, septic tank and in a hole. Especially in wood or bamboo structure house, the lavatory is in a hole, but this hole is connected to a small pond.

5) Public/Community Facilities

a. Educational/Cultural Facilities

There are 6 education facilities in the master plan area, 3 is public and 3 are under private jurisdiction, and almost all of them are concentrated in Dusun Wadas, Jatiluhur.

b. Commercial Facilities

Various commercial facilities are owned by personal, small in scale and concentrated in Dusun.

c. Medical Facilities (Wadas, Jatiluhur)

There is only one clinic in the master plan area run by private/personal. The other facilities are run by community support (Swadaya).

d. Religious Facilities

There are a lot of Islamic religious facilities, like mosques and small mosques. Facilities in the master plan area are almost all supported by the community for maintenance and operation.

e. Park/Sport Facilities

Some sport facilities with no jurisdiction are temporary utilized by the people, because the land is vacant for the time being.

f. Other Facilities

There are no other specified facilities except a security post and cemeteries.

(2) Social Characteristic

1) Population

The population of the Master Plan Area in 1998 is about 6,168, while number of households is 1,578. Population density of the area is quite low, only 20 persons per hectare.

2) Property Ownership

There are two kinds of property ownership in the master plan area, namely 'Hak Milik' (right ownership and certified by BPN Offices), and 'Girik' (right ownership but not certified by BPN Offices). The present situation of property ownership is summarized in Table 7-3-2.

Table 7-3-2 Present Property Ownership of Master Plan Area in Jatiasih

No	Land Category	Area (ha)	Component Ratio
1	Girik (not certified)	232.40	71.76%
2	Hak Milik (Held by Jakarta Citizen)	11.87	3.67%
3	HGB (a part already Hak Milik)	11.91	3.68%
4	Hak Milik	15.16	4.68%
5	HGB (Building Right)	52.53	16.22%
		323.87	100.00%

Source : Field Survey, October 1998.

3) Land Price

Land prices vary according to the distance from main road (Jalan Raya Jatiluhur) and the land use. The value along the main road is between Rp.100,000/m² to Rp.225,000/m², while in the inside it is around Rp.60,000/m² to Rp.80,000/m² in accordance with the hearing survey results. The average land price of the whole area is estimated in Rp.100,000/m².

7-3-2 Planning Framework

(1) Overall Land Use

Following the proposals in the previous concept development plan, the master plan area is roughly categorized into about 5-classified zones of land use. They are summarized as follows:

1. Medium-density residential zone: the area next to the regional sub-core extension zone is planned to provide a housing estate in rather high density, 100 to 200 inhabitants per hectare, reflecting its advantageous location near from the interchange of the toll road and the regional sub-core zone.
2. Low-density residential zone: this zone occupies most of the study area, approximate 2/3 of the total 300ha, and it forms a typical residential area in harmony with existing local settlements developed through land consolidation projects. The gross average population density is about 100 persons per hectare in this zone.
3. Town center zone: a new town center for the low-density residential zone is proposed near Jatiluhur Desa offices, together with a redevelopment of existing community center facilities such as schools and mosques adding newly developed local commercial facilities.
4. Regional sub-core extension zone: this zone is proposed in the northern fringe of the study area as a future extension of the regional center comprising of some complex functions together with commercial facilities, such as industries of logistics, goods distribution, communication & information, etc.
5. Green and open space: this area mainly located along the northern and western fringes of the area. The northern part is planned as an environmental buffer green from the Outer Ring toll road, and the western part is for greenery preservation of the slope along river Kali Cakung.

(2) Major Planning Directions

At the beginning of the master plan stage, following general planning directions are supposed in order to create a better living environment in the master plan area.

- Establishment of an integrated urban residential community as a whole.
- Total area consists of several residential clusters, where each sub-community organizes daily life activities.
- Each community has sufficient public facilities for health, education, culture, etc.
- Completion of the two roads, north-south Jl. Jatiluhur and east-west Jl. Pamahan, as regional arterial roads.
- Formulation of a hierarchical road network both for vehicles and pedestrians.
- Each housing lot should be faced by adequate collector road to receive necessary services for living and security.
- Provision of adequate drainage and sewerage system.
- Distribution of sufficient water and electricity.
- Provision of enough telecommunication lines.

(3) Planning Framework/Standard

Basic planning framework and design standard for the master plan is proposed as follows:

1) Population

Future population for the master plan was estimated, taking into consideration the existing condition, future land use and development image, so on.

Block A: this zone is the area for future extension of regional sub-core function similar to the northern neighbor zone. Since the detail function and contents for this block are not yet determined in this stage, the block is reserved as it is without any increase of new population

Block B: for this block, a rather higher population density is estimated comparing with block C, because of its advantageous location near from the regional center and toll road interchange.

Block C: this block will be able to represent a typical suburban residential area with a moderate population density of around 100 persons per hectare. They are summarized in the Table below.

Table 7-3-3 Proposed Future Population by Block

No.	Area (ha)	Major Land Use	Future Population	Development Priority
1	A	29.2 Future Regional Sub-core Extension Area	-	4
2	B1	25.7 Medium/high density Residential Area	3,500	3
3	B2	47.3 Residential Area planned by Private Sctor	5,000	depend on Developers
4	C1	26.6 Medium density Residential Area	3,500	Developed / 2
5	C2	28.1 Medium/Low density Residential Area	3,000	1
6	C3	31.5 Medium/Low density Residential Area	3,000	3
7	C4	34.3 Medium/Low density Residential Area	3,000	3
8	C5	53.8 Low density Residential Area	4,000	4
Total	276.5		25,000	

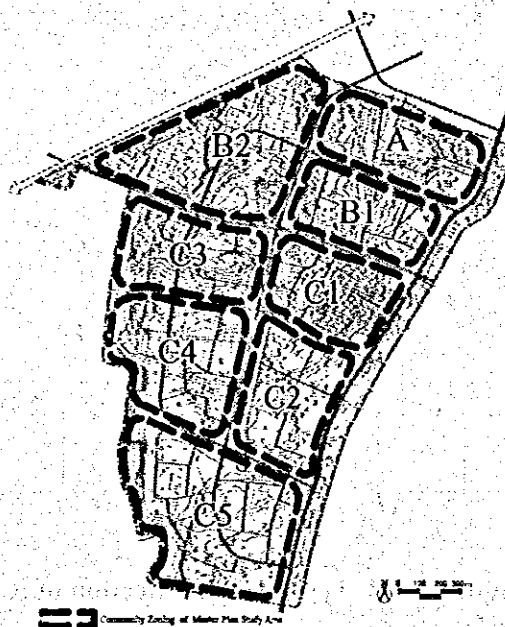


Figure 7-3-2 Community Block Zoning of Master Plan Area

2) Road System/Traffic Circulation Plan

The road network was planned in accordance with the hierarchical network configuration proposed in the concept plan.

Though the principal design standard of roads was determined as shown in Table 7-3-4 and Figure 7-3-3 some modifications were done in accordance with the actual and physical conditions in the area.

Table 7-3-4 Principal Design Standard of Road for Case Study Area

Classification	ROW (m)	No. of Lanes	Width of Lane (m)	Average Interval (m)
Regional Arterial Road	22-26	4	3.25	-
Arterial Road	16	2	3.00	500-1,000
Collector Road	12	2	3.00	200-500
Local Road	6-10	1-2	2.50-3.00	-

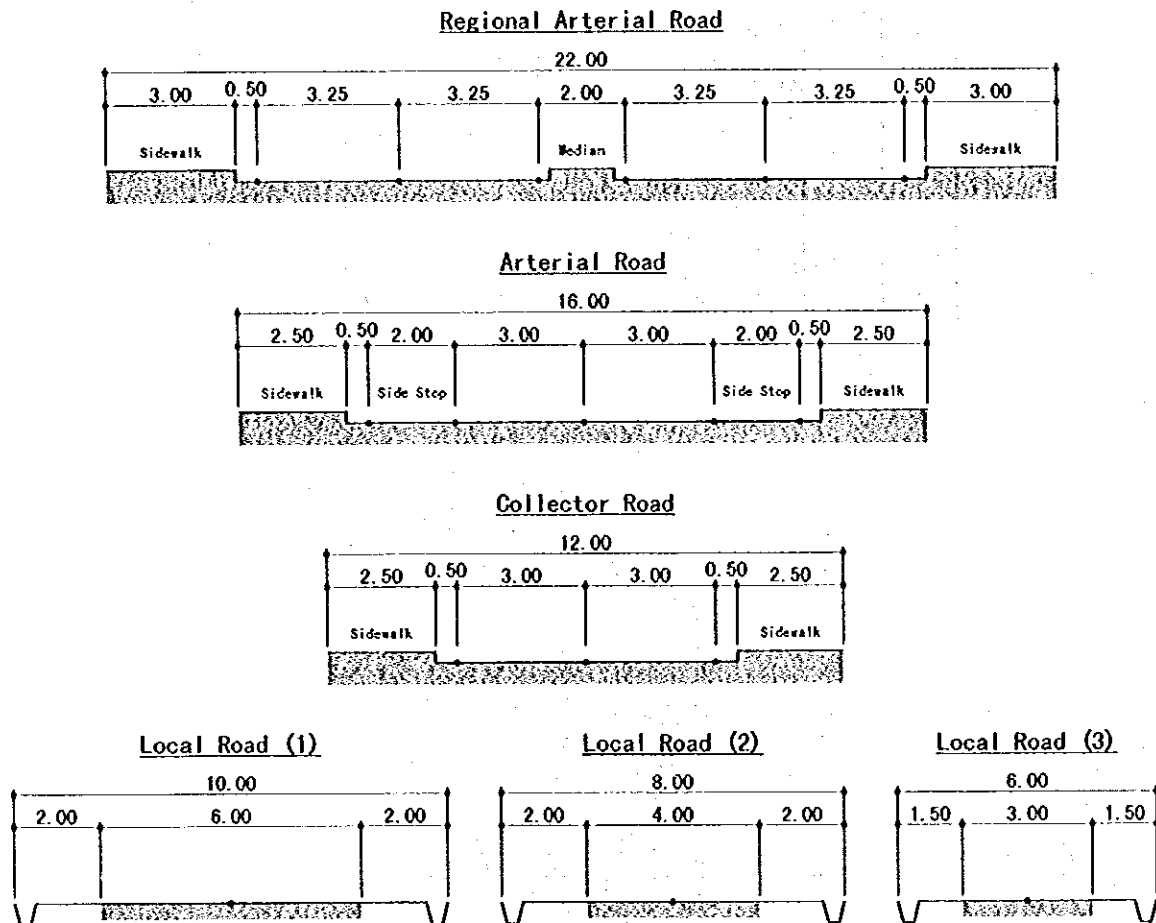


Figure 7-3-3 Typical Cross Section of Roads

3) Utility System

Regarding the water supply and wastewater treatment system in the study area, a gradual development system will be applied depending upon the grade of housing development: that is, from on-site individual system to off-site integrated system, as illustrated in Figure 7-3-4.

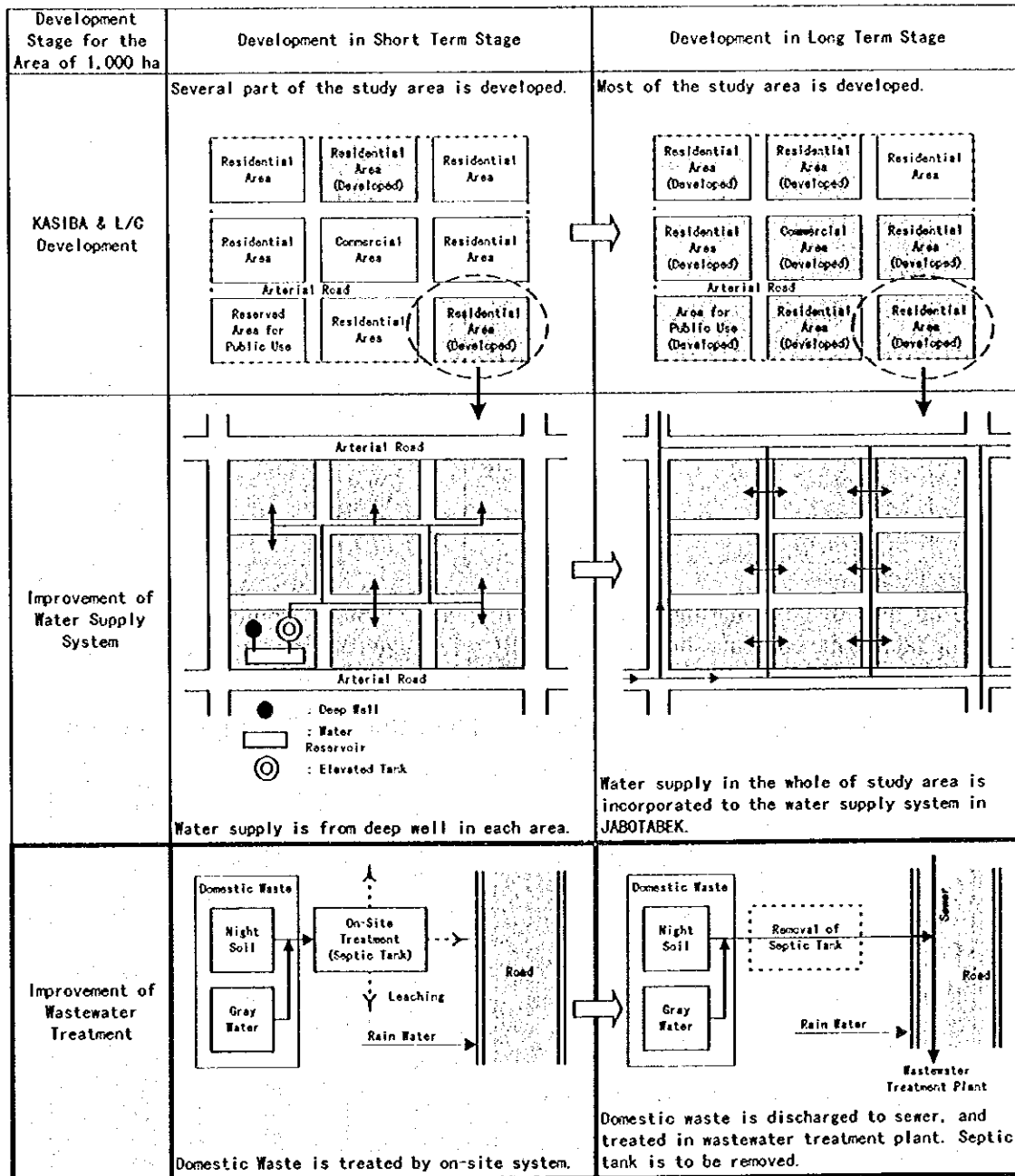


Figure 7-3-4 Phased Improvement for Water Supply & Wastewater System

4) Public and Social Facilities

The proposed planning standard of various public facilities for the residential area development is summarized after due consideration.

Table 7-3-5 Design Standards for Public and Social Facilities (Draft)

Facility	SNI/DKI Standard		Modified Standard	
	person/facility	sqm/facility	person/facility	sqm/facility
Educational Facility				
Kindergarten	1,000	1,200	5,000	800
Primary School	1,600	3,600	2,000	2,200
Junior High School	12,500	4,000	15,000	2,400
Senior High School	28,000	4,000	34,000	2,400
Medical Facility				
Clinic	30,000	500	36,000	300
Public Medical Center	30,000	1,200	36,000	1,000
Maternity Hospital	30,000	3,000	36,000	1,800
Commercial Facility				
Shops	30,000	400	36,000	240
Neighborhood Market	30,000	13,500	36,000	8,000
Other Facility				
RW Level	2,500		2,500	
Security Post, Public Telephone, etc.		300		200
Small Mosque (Musholla)		300		200
Play Ground, Park		1,250		1,000
Neighborhood Level	30,000		36,000	
Government Administration Office		500		300
Police Office		200		120
Post Office		100		60
Fire Station		200		200
Cinema		2,000		1,200
Multi Purpose Hall		1,000		600
Mosque		1,750		1,000
Sports Fields, Park		9,000		9,000

Though an idea of cost sharing in provision of public utilities/facilities is proposed in the following tables, the contents should be carefully scrutinized among the related agencies.

Table 7-3-6 Proposed Cost Sharing in Public Utility/Facility Provision in L/C

Category		Cost Sharing		Operation & Maintenance
		Land	Construction	
Road	Regional Arterial Road (W22)	IB	IB	LG
	Arterial Road (W16)	IB	IB	LG
	Collector Road (W12)	IB	IB	LG
	Local Road (W10)	IB	IB	LG
	Local Road (W8)	IB	IB	LG
	Local Road (W6)	IB	IB	LG
	Footpath (W4)	IB	IB	LG
Road Transport	Public Parking	LG	LG	LG
	Bus Terminal	LG	LG	LG
Waterway/Drainage	Retention Pond	LG	LG	LG
	Waterway	IB	IB	LG
	Drainage	IB	IB	LG
Park & Green	Desa Level	IB	IB	LG
	RW, RT Level	IB	IB	LG
Sewerage	Sewerage Treatment Plant	LG	LG	LG
	Sewer	-	IB	LG
Water Supply	Deep Well	IB	IB	PDAM
	Distribution Network	-	IB	PDAM
Power Supply	Substation	PLN	PLN	PLN
	Distribution Network	-	PLN	PLN
Telecommunication	Exchange Station	PTT	PTT	PTT
	Cable Network	-	PTT	PTT

- IB : Implementation Body (Landowners' Association)
- LG : Local Government
- PDAM : Local Government Water Supply Enterprise
- PLN : Perusahaan Umum Listrik Negara (State-owned Electricity Company)
- PTT : PT. TELKOM (National Telecommunication Company)

7-3-3 Proposed Block Plan

A basic block plan was proposed as the main result of the master plan for the case study area.

1) Traffic Circulation Plan

The basic road network pattern is formulated by 3 kinds of major roads as follows:

- Regional arterial roads: Jalan Raya Jatiluhur (North-south, ROW=22m) and Jalan Pamahan (East-west, ROW=16m). The main functions of these roads are to connect this area and outside and for the area's through traffics.
- Arterial road: the north-south road passing through the center of the area plays a role of arterial traffic flow within the area, connecting each collector road and regional arterial road, as a traffic distributor within this community (ROW=12m).
- Collector roads: these roads form each sub-community unit in the residential area connecting between the arterial road and the local roads with ROW=6 to 8m.

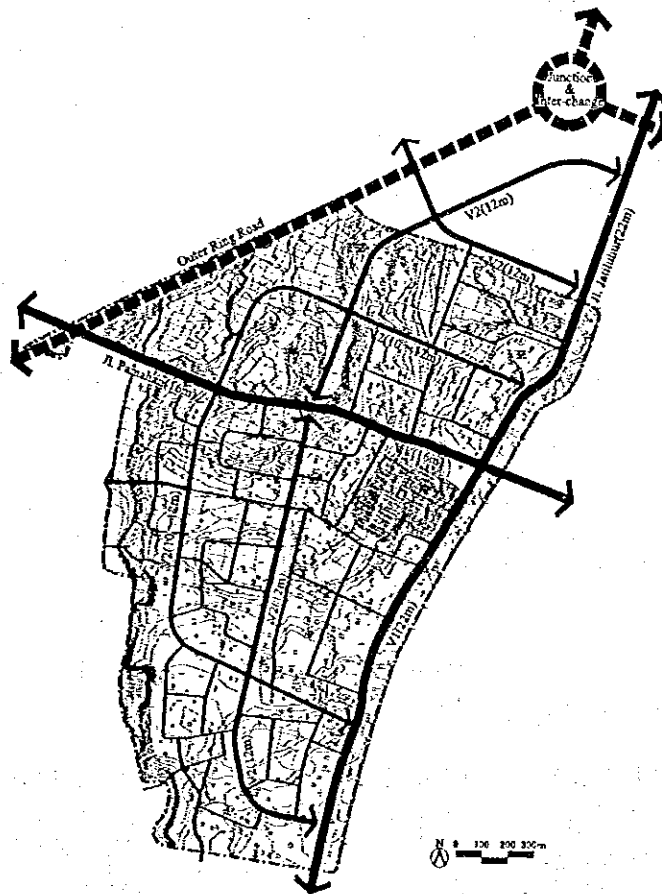


Figure 7-3-5 Traffic Circulation Plan

2) Basic Concept of Land Use and Development

The case study area is classified into three categories of land use and divided into 8 blocks as shown in Figure 7-3-2. The development directions of each block can be summarized as shown in Table 7-3-7.

Table 7-3-7 Development Directions by Block

Block	Area (ha)	Future Development Issue/Direction	Major Road Development	Development Status	Development Priority
A	29.2	Area for future extension of regional sub-core - Uncertainty of development function - Reservation for future development possibility	V1, V2		4
B1	25.7	Medium density residential area - Confirmation of developer's intention	V1, V2	Location Permit (16ha), Certain Hak Milik	3
B2	47.3	Medium density residential area - Intention of private developer - Pending development	V1, V2, V3	Location Permit (35ha),	depend on Developer
C1	26.6	Low/Medium density residential area - Rearrangement of existing village - Confirmation of landowners' development intention	V1, V2	Kopegtel cooperative L/C (502 H/H),	Developed 2
C2	28.1	Low density residential area - Rearrangement of existing village - Establishment of town center - Confirmation of landowners' dev. intention	V1, V2, V3	Large landownership Absentee landowners	1 Suitable for L/C
C3	31.5	Low density residential area - Rearrangement of existing village - Confirmation of landowners' dev. intention	V1, V2, V3	Large landownership	3
C4	34.3	Low density residential area - Rearrangement of existing village - Preservation of greenery along slope	V2, V3	Pri Gading (22ha)	3
C5	53.8	Low density residential area - Rearrangement of existing village - Preservation of greenery along slope	V1, V2, V3	Absentee landowners Large landownership	4

3) Land Use Plan

The land use of the proposed L/C master plan is summarized in the table comparing its land use composition with the existing one (Table 7-3-8).

Table 7-3-8 Land Use Comparison, L/C Master Plan

Land Use	Before Project		After Project	
	Area(ha)	Ratio(%)	Area(ha)	Ratio(%)
Public Land *1	Road		55.48	18.1
	River/Waterway		3.36	1.1
	Retention Pond		3.25	1.1
	Park/Green		22.87	7.5
	Public Service *1		7.66	2.5
Total	18.10	5.9	92.62	30.2
Private Land *2	Residential		186.50	60.9
	Business		12.15	4.0
	Commercial		15.14	4.9
	Total	288.31	94.1	213.79
Grand Total	306.41	100.0	306.41	100.0

Notes *1 : including lands for administration, education, health, power supply and so on.
*2 : excluding developed land and land under construction.

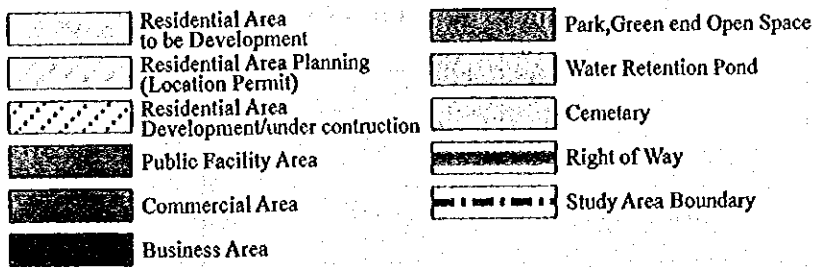
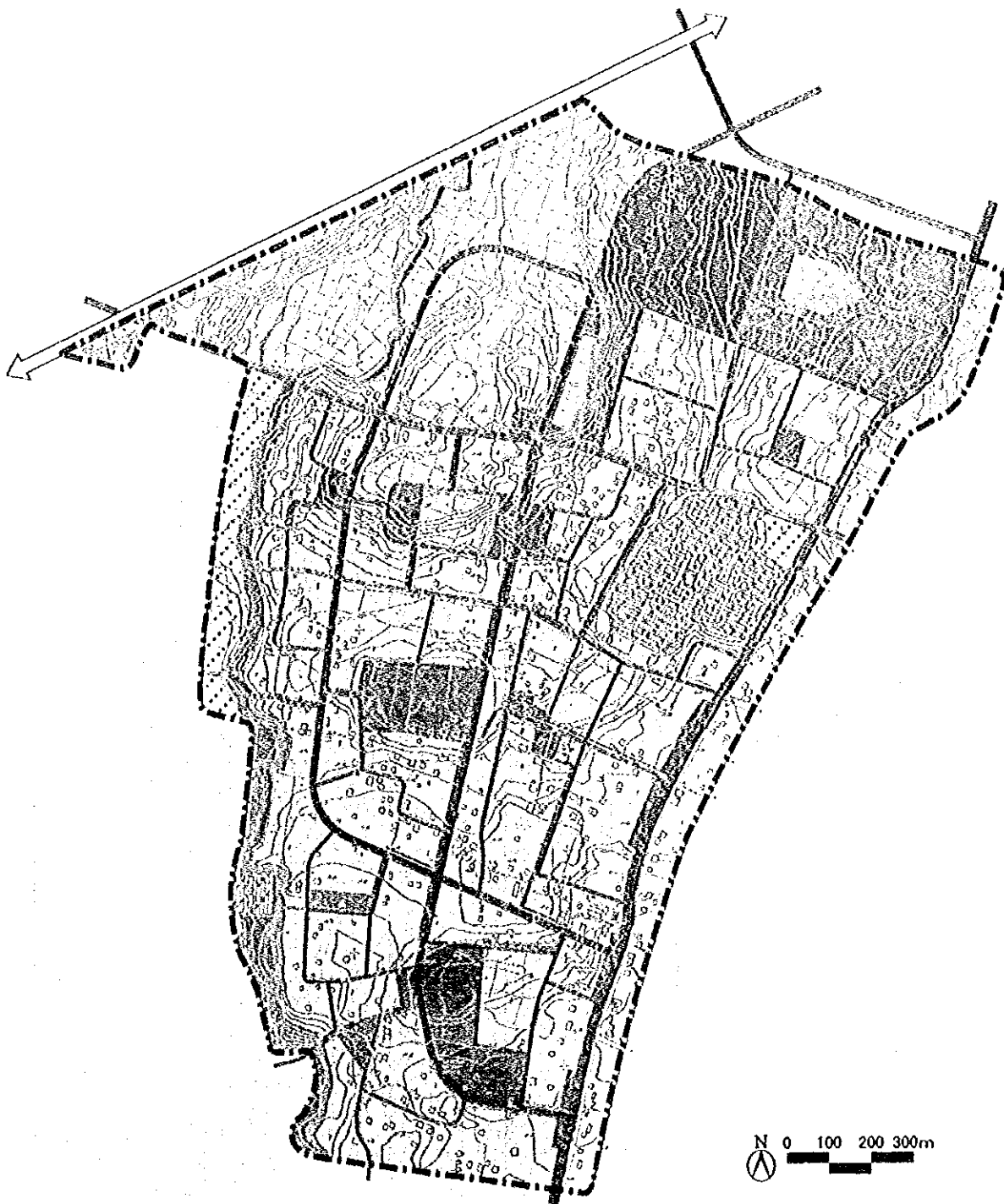


Figure 7-3-6 L/C Master Plan

4) Development Cost

Necessary costs for I/C project development mainly consist of construction costs, compensation costs, survey costs and other operation/administration costs. They were estimated in accordance with the examples of similar projects and some Purum Purumnus's projects after due consideration by study team.

Table 7-3-9 Construction Costs, Master Plan

	Unit	Quantity	Unit Cost (Rp.)	Amount (Rp.)	Remarks
Infrastructure					
Preparation work	m ²	3,064,100	500	1,532,050,000	
Land arrangement	m ³	1,532,050	7,500	11,490,375,000	
Road					
Regional Arterial Road	m	2,240	750,000	1,680,000,000	w=22m
Arterial Road	m	1,690	460,000	777,400,000	w=16m
Collector Road	m	6,410	310,000	1,987,100,000	w=12m
Local Road	m	8,680	250,000	2,170,000,000	w=10m
Local Road	m	4,860	150,000	729,000,000	w=8m
Local Road	m	39,900	120,000	4,788,000,000	w=6m
Footpath	m	9,080	20,000	181,600,000	w=4m
sub-total				12,313,100,000	
Drainage					
Open drain (S1)	m	79,800	40,000	3,192,000,000	(1)
Open drain (S4)	m	27,080	84,000	2,274,720,000	(2)
Covered drain (S4)	m	20,680	168,000	3,474,240,000	(3)
Sump	unit	-	-	2,235,240,000	((1)+(2)+(3))*0.25
Waterway	m	3,350	800,000	2,680,000,000	
sub-total				13,856,200,000	
Park & Green	m ²	228,700	25,000	5,717,500,000	
Water supply					
Pipe (dia.100)	m	10,300	56,000	576,800,000	
Pipe (dia.50)	m	53,400	24,500	1,308,300,000	
Deep Well	unit	10	135,000,000	1,350,000,000	reservoir, tank, pump
sub-total				3,235,100,000	
Study & Design	m ²	3,064,100	800	2,451,280,000	
Sub-total				50,595,605,000	(3)
Others				7,589,340,750	(3)*0.15
Total				58,184,945,750	
Physical Contingency				5,818,494,575	10% of TOTAL
GRAND TOTAL				64,003,440,325	

Table 7-3-10 Summary of Project Costs

Item	Amount Rp. Mil.	Composition %
1. Construction Cost	64,003.4	79.10
2. Compensation Cost	6,400.3	7.91
3. Survey Cost	1,838.4	2.27
4. Overhead (Operation) Cost	8,669.1	10.71
Subtotal	80,911.2	100.00
5. Repayment of Interest*	8,293.4	
Total	89,204.6	

Note *: Calculated through cash flow analysis

7-3-4 Feasibility Analysis on L/C Master Plan

The following three items were examined to assess the feasibility of L/C master plan; Land contribution ratio and reserve land, Project cash flow and other economic effects.

(1) Contribution Rate and Reserve Land

Land contribution of L/C project is composed of two kinds: public land and reserve land contributions. The former is the necessary land for infrastructure and public facilities in the proposed master plan insufficient in the existing land use, and the latter is the land equivalent to the total expenditure of the project in case of self-finance L/C project. The master plan base case results are 74.5ha and 33.5ha respectively; the contribution rates to the original private land are 25.9% and 33.5%, accordingly the aggregated contribution accounts for 37.5%. This result of the contribution rate should be evaluated by the participants of the project, although it is 1/3 of the maximum area of reserve land which is rationally calculated in comparison with the total building value increase after L/C project implementation.

Table 7-3-11 Contribution Rate and Reserve Land, Master Plan

Contribution Rate

Building Lot Area before L/C (A)	Building Lot after L/R			Contribution			Contribution Rate (D/A)
	Replots (A-D)	Reserve Land	Total (E)	For Public Facilities	For Reserve Land	Total (D)	
ha 288.3	ha 180.3	ha 33.5	ha 213.8	ha 74.5	ha 33.5	ha 108.1	% 37.48

Building Lot Price

Building Lots before L/C (A)	Unit Price before L/C (a)	Total Amount before L/C ($V_1 = A \times a$)	Building Lots after L/C (E)	Unit Price after L/C (e)	Total Amount after L/C ($V_2 = E \times e$)	Land Value Increase	
						Total Amount ($V = V_2 - V_1$)	Increased Rate (e/a)
ha 288.3	Rp./m ² 100,000	Rp. Mill. 288,310.0	ha 213.8	Rp./m ² 256,700	Rp. Mill. 548,798.9	Rp. Mill. 260,488.9	2.57

Planned Area for Reserve Land

Total Value of Building Lots before L/C ($V_1 = A \times a$)	Total Value of Building Lots after L/C ($V_2 = E \times e$)	Increase in Total Value of Building Lots ($V = V_2 - V_1$)	Land Price per m ² before L/C (a)	Land Price per m ² after L/C (e)	Maximum Area for Reserve Land ($R_{max} = V/e$)	Planned Area for Reserve Land (R)	Comparison (R/R_{max})
Rp. Mill. 288,310.0	Rp. Mill. 548,798.9	Rp. Mill. 260,488.9	Rp./m ² 100,000	Rp./m ² 256,700	ha 101.48	ha 33.53	% 33.04

(2) Cash Flow Analysis

The cash flow analysis was conducted under the following assumptions:

Table 7-3-12 Assumptions for Cash Flow Analysis

Item	Assumption
Price level	August 1998
Construction period	Seven years (From Year 1 to Year 7)
Timing of sale of reserve land	From Year 3 to Year 7
Price of reserve land	Weighted average of the land prices of the housing area and the commercial area: Rp. 266,000 / m ²
Real interest rate	10%

Table 7-3-13 shows the expected cash flow of the 300ha land consolidation in Jatiasih. The land contribution ratio to balance the costs and revenues in Jatiasih proved to be 37.5% under the assumption that the real interest rate is 10%. Since the selling price of the commercial area used for this analysis, Rp.375,000/m², is rather conservative, the actual contribution ratio is expected to be lower.

Although the costs and revenues balance in the last year, how to mobilize the fund for the land development is one of the largest constraints in applying land consolidation at an area of 300ha in Jatiasih. During the first 6 years, the project account shows a negative position, where the debt is kept at Rp.17 billion for five years from Year 2. A long-term financing source must be sought for the land consolidation.

Table 7-3-13 Expected Cash Flow: Base Case (Rp million)

Year	1	2	3	4	5	6	7	Total
Expenditure excluding Interests	4,045.6	12,136.7	16,182.3	16,182.3	16,182.3	12,136.7	4,045.6	80,911.3
Interest payment (interest rate: 10%)	202.3	1,031.6	1,658.7	1,658.7	1,658.7	1,456.4	627.1	8,293.4
Revenue from Sale of Reserve Land	0.0	0.0	17,840.9	17,840.9	17,840.9	17,840.9	17,840.9	89,204.7
Balance	-4,247.8	-13,168.3	0.0	0.0	0.0	4,247.8	13,168.3	0.0

Since there is a time gap between expenditures and revenues, the land consolidation management body needs to borrow money from financial institutions such as commercial banks. The level of interest rate constitutes a critical factor that affects the viability of the project. On the other hand, considering that part of the infrastructure and public facilities, such as arterial roads, to be constructed in the case study area benefits not only the landowners of the project but also people living outside the project area, the introduction of a Government subsidy is justified, which will lead to the reduction of the landowners' land contribution requirement. From this perspective, the possible Government subsidy for the Jatiasih 300ha area is estimated at Rp.37,397 million.

In this Study, a sensitivity analysis was carried out by changing these two factors, the real interest rate and the Government subsidy. The summary of the analysis is presented in Table 7-3-14.

Table 7-3-14 Sensitivity Analysis: Comparison of Cases

Case	1 (Base Case)	2	3	4
Expenditures excluding Interests (Rp. million)	80,911.3	80,911.3	80,911.3	80,911.3
Real Interest Rate	10%	30%	10%	30%
Interest payment (Rp. million)	8,293.4	26,093.9	4,553.7	14,874.8
Government Subsidy (Rp. million)	0.0	0.0	37,397.0	37,397.0
Revenue from Sale of Reserve Land (Rp. million)	89,204.7	107,005.2	48,068.0	58,389.1
Land Contribution Ratio	37.5%	39.8%	32.1%	33.5%
R(max)*	16.5%	19.8%	8.9%	10.8%

* Ratio of planned reserve land over maximally allowable reserve land

When the real interest rate increases to 30%, the interest payment increases to 24% of the expenditures (Case 2). As a result, the land contribution ratio increases to 39.8%. On the other hand, when the Government subsidy is introduced, the interest payment decreases approximately to 5% of the total expenditures (Case 3), resulting in the land contribution ratio of 32.1%. When a 30% real interest rate is applied together with the Government subsidy (Case 4), the land contribution ratio increases to 33.5%.

Overall, the landowners will be greatly benefited from the land consolidation, since the R(max), which is the ratio of planned reserve land over maximally allowable reserve land, is less than 20% in each case. It would not be very difficult to attain an agreement from landowners on the land consolidation if the benefits of the project are fully explained to them.

(3) Economic Effects of Land Consolidation

The following economic effects are expected through the realization of land consolidation in Jatiasih.

- The housing environment is enhanced through the increase in public spaces including roads. Connection of water pipes and installment of septic tanks assures comfortable living conditions to the local people.
- Smooth traffic flow is attained through the realignment and/or the construction of arterial roads and feeder roads.
- Convenience in daily life is raised since the construction of schools and other public facilities will follow the land consolidation.
- The area's future development with the construction of higher-storied buildings is made possible through the improved allotment of houses and roads.
- A new housing area equipped with public facilities and services is provided to the Jakarta DKI residents.
- Unused lands are consolidated and turned productive, which in turn activates the area's economic activities.
- The realization of a new investment into the construction of houses and roads stimulates the productive sector.

7-4 Land Consolidation (L/C) Design

7-4-1 Existing Conditions of the Area for L/C Design

The study area consists of a part of 2RW and 4RT in Jatiluhur village, with the area of 26.48 hectares. The eastern boundary is defined on the centerline of Jalan Raya Jatiluhur, which is the only paved road in the surroundings, and the northern side is adjacent to Kopegtel's housing estate.

(1) Physical Conditions

1) Topography

The topographical features incline toward the north with the range of altitude from 45.7m to 36.4m. A part of northern lowlands in which several fishponds located is a swamp, and houses and farms lie scattered in the rest of the area.

2) Land Use

The existing land use is dominated by agricultural use at 73.9% of the whole area, mostly mixed croplands. A portion of public land, which consist of roads and mosques, is very small at 3.1% compared with private land.

Table 7-4-1 Present Land Use of L/C Design Area

Category		Area (m ²)	Ratio (%)	
Public Land		8,094	3.1	
	Road	Jl. Raya Jatiluhur	2,135	0.8
		Jl. Awi	1,742	0.7
		Others	1,992	0.8
		Mosque	2,225	0.8
Private Land	256,710	96.9		
Agriculture		195,564	73.9	
	Pond		16,365	6.2
		Dry Crop Land	43,196	16.3
		Mixed Crop Land	136,003	51.4
	Residential	24,509	9.3	
	Others		36,637	13.8
		Cemetery	9,112	3.4
Swamp	27,525	10.4		
Total		264,804	100.0	

Source: Field Survey, February 1999

3) Buildings

Buildings in the area are counted at 192, of which 138 are for residential use and the rest are for chicken farms, shop houses, private schools and so on. Most of the buildings were constructed in the past 10 years (85.4%) and by structure of concrete/brick (69.3%). Conditions of buildings in the area are summarized in Table 7-4-2.

Table 7-4-2 Present Situation of Buildings

No. of Buildings by Type of Use			No. of Buildings by Years after Construction			No. of Buildings by Type of Structure			No. of Buildings by Building Coverage		
Type	No.	Ratio (%)	Years	No.	Ratio (%)	Type	No.	Ratio (%)	Coverage (m ²)	No.	Ratio (%)
Residence	138	71.9	less than 5	36	18.8	Concrete/Brick	133	69.3	less than 51	72	37.5
Education	7	3.6	5-10	113	58.9	Wood	15	7.8	51-100	92	47.9
Commerce	12	6.3	10-15	26	13.5	Bamboo	20	10.4	101-150	16	8.3
Industry	1	0.5	15-20	17	8.9	Mixed	24	12.5	151-200	4	2.1
Religion	5	2.6	-	-	-	-	-	-	more than 200	8	4.2
Mixed	8	4.2	-	-	-	-	-	-	-	-	-
Chicken Farm	21	10.9	-	-	-	-	-	-	-	-	-
Total	192	100.0	Total	192	100.0	Total	192	100.0	Total	192	100.0

Source: Field Survey, February 1999

4) Infrastructure

Present situations of the infrastructure in the area are briefly described as follows.

1. Road

The road network in the area is very poor, with only 3 sections of public roads. Jalan Raya Jatiluhur (width of 7m with pavement) along the eastern boundary of the area can be defined as a main road in this surrounding, while Jalan Awi and Jalan Tekel of which the widths amount to 4m and 3m respectively are the access roads to the main road. Those access roads are not paved. Most of the houses, excepting houses adjacent to the public roads, use private footpaths as their access.

2. Drainage

Drainage facilities are also very poor. Unsupported street drains are installed along Jalan Raya Jatiluhur, only for the drainage of road surface. Some flood-prone buildings are located in the internal lowland of which the run-off discharge is intercepted by a wall constructed by the project of Kopegtel's housing estate.

3. Water Supply and Sanitation

There is not any reticulated water supply system in this area. Water for domestic use, agricultural use and fishponds are extracted from shallow wells of which depths are less than 10m. On the other hand, the sanitation in this area is an on-site system such as pit latrine and septic tank. It is deemed that the quality of shallow groundwater is jeopardized by both the groundwater extraction and the sanitation, especially in this kind of area as the fringe of DKI Jakarta in which rapid urbanization is recently occurred.

5) Public/Community Facilities

The public/community facilities found in this area are schools and mosques. All of the schools, 2 secondary schools and a religious school, are privately operated. The mosques are owned by the local government or private persons.

(2) Social Characteristic

1) Population

From the site survey implemented in February 1999, it is identified that the number of households in the area is at 149. It is estimated that the habitants in the area are 745 persons, multiplying the number of households by 5 to obtain an average number of persons per household. And the present population density is also estimated at 28.1 persons per hectare.

2) Property Ownership

From the site survey, the present situation of the property ownership, classified by land ownership and building ownership, is described as follows.

1. Land Ownership

From topographic survey, the total area for L/C design is calculated at 264,804m², of which public land (roads and mosques) is 8,094m² and private land is 256,710m². As for the private land, the number of lots is identified at 345, of which 302 (87.5%) are classified as Girik (right ownership but not certified by BPN offices). Hak Milik (right ownership and certified by BPN offices) is counted at 43, most of those lots is owned by Jakarta citizens. The present situation of land ownership is summarized in Table 7-4-3.

Table 7-4-3 Present Situation of Land Ownership

Land Tenure	No. of Lots	Component Ratio (%)	Area (m ²)
Girik	302	87.5	202,621
Hak Milik (held by Jakarta citizen)	38	11.0	47,434
Hak Milik	5	1.4	6,655
Total	345	100.0	256,710

Source: Field Survey, February 1999.

The area of a private lot is officially registered, namely, in SPPT (notify of tax payment of which lot area can be modified by allegation of the owner) and/or in PBB (land and building tax). However, those registered areas have not been accurately measured. In this study, the area of each lot in the area for L/C design was estimated from modification of the figures in SPPT and PBB adjusting the results of the site survey and the calculated total area by topographic survey, in order to practice a model of replotting design in next stage. From the estimation of lot sizes, half of the landowners own land exceeding 300m². The lot size of those private lands is summarized in Table 7-4-4.

Table 7-4-4 Number of Landowners by Lot Size

Lot Size (m ²)	No. of Landowners	Component Ratio (%)
less than 100	20	5.7
100-200	93	26.6
200-300	67	19.1
more than 300	170	48.6
Total *	350	100

Note: *including mosques

Source: Field Survey, February 1999.

2. Building Ownership

There are 192 of buildings and classified into 4 types as shown in Table 7-4-5.

Table 7-4-5 Number of Buildings by Ownership Type

Type of Building Ownership	Number of Buildings	Component Ratio (%)
Land Owner = Building Owner = Building Occupant	130	67.7
Land Owner = Building Owner = not Building Occupant (rental house)	13	6.8
Land Owner = not Building Owner = not Building Occupant (rental land)	28	14.6
Chicken Farm	21	10.9
Total	192	100.0

Source: Field Survey, February 1999.

3) Land Price

Through the site survey, data of land price in the area for L/C design is obtained by documents of the PBB, Jatiluhur Village Office and interview from residents. The land price varies according to the distance from road and its location. Along the Jalan Raya Jatiluhur is the highest, around Rp.223,000 – Rp.262,000 per square meter, while inner land without road is approximately Rp.100,000 per square meter.

7-4-2 Basic Conditions for L/C Design

L/C design is to establish a detail plan of infrastructure/public facility and a block development plan for the selected project implementation area in order to realize development policies proposed in the master plan. At the beginning of L/C design, the detailed area of the project implementation was examined from various viewpoints and determined, and general design policies were considered.

(1) Definition of the Boundary of Project Area

Though a candidate area of approximately 30ha for L/C project implementation was selected from the southern part of master plan area, the detailed boundary was defined as follows:

- 1) Eastern boundary: the centerline of regional trunk road, Jalan Raya Jatiluhur.
- 2) Southern boundary: the borders between a Desa road, Jl. H. Tekel and private lands.
- 3) Western and northern boundary: the borders of private lands and small Desa road.

Since Jalan Raya Jatiluhur is planned to widen both of its sides to a width of 22m, a half portion in this site is constructed by this project and another is to be developed by other project in future, from the viewpoint of equal burden.

The result of the boundary of the L/C project implementation area is illustrated in Figure 7-4-1.

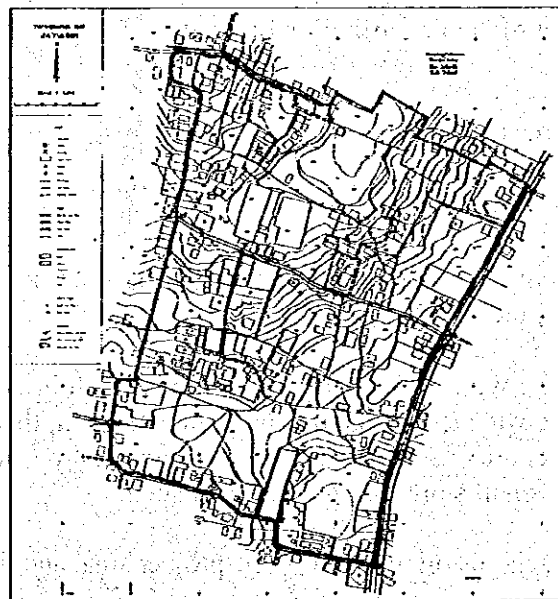


Figure 7-4-1 Project Area, L/C Implementation Plan in Jatiasih

(2) Basic Policies for Land Consolidation Design

Since this L/C project would be the first example of substantial urban land consolidation projects in the Jabotabek area, developing sufficient infrastructure and public facilities for urban living through a financially sustainable system, basic policies for L/C design were considered to make the project successful as much as possible.

As L/C projects basically aim at increasing the use of building lots through the development of infrastructure and public facilities, following common design policies are also applied to this area.

- To create a better residential environment satisfied by necessary services such as accessibility, water supply system, drainage system, etc.
- To secure the social/economic activities in the existing community from the development as much as possible.
- To reserve the existing good natural environment, if any.
- To keep the safety of pedestrians within the area from the traffic which will be increased by the development.

Moreover, the following design directions were prepared, when the existing characteristics of the case study area were examined.

- One of the most important items of design is road network/road design in conjunction with drainage system.
- Land arrangement work can be minimized to preserve the existing physical condition, except for the swamp area in the northern part of the area.
- Though a drastic road improvement is necessary because of the existing very little and poor footpaths in the area, alignment of proposed roads avoid crossing the existing social/public facilities as much as possible.
- Some public facilities able to be planned in the vicinity area will be located out of the area, taking into consideration the wider community development plan, because of a certain amount of land contribution by roads.

7-4-3 Proposed L/C Design

(1) Proposed Structure for Project Area

Based on the above-mentioned planning policies, the basic structure for the project area is proposed as shown in Figure 7-4-2.

The project area is on the west of Jalan Raya Jatiluhur which has only one main road in the surroundings and will be widened as planned in the master plan, therefore the road will be the main frame of the project area. A certain area for commercial/business use is proposed along the road on which some small stores are presently situated.

There are mosques and schools on the west of the project area, and these facilities will be used for the same purpose after the project. A certain area of parks is proposed adjacent to the mosques and schools. These set of facilities will form as social center of the project area.

The commercial/business area and the social center must be connected by a pedestrian network as well as roads, in order to secure the safety of the residents from increased vehicular traffic by road improvement.

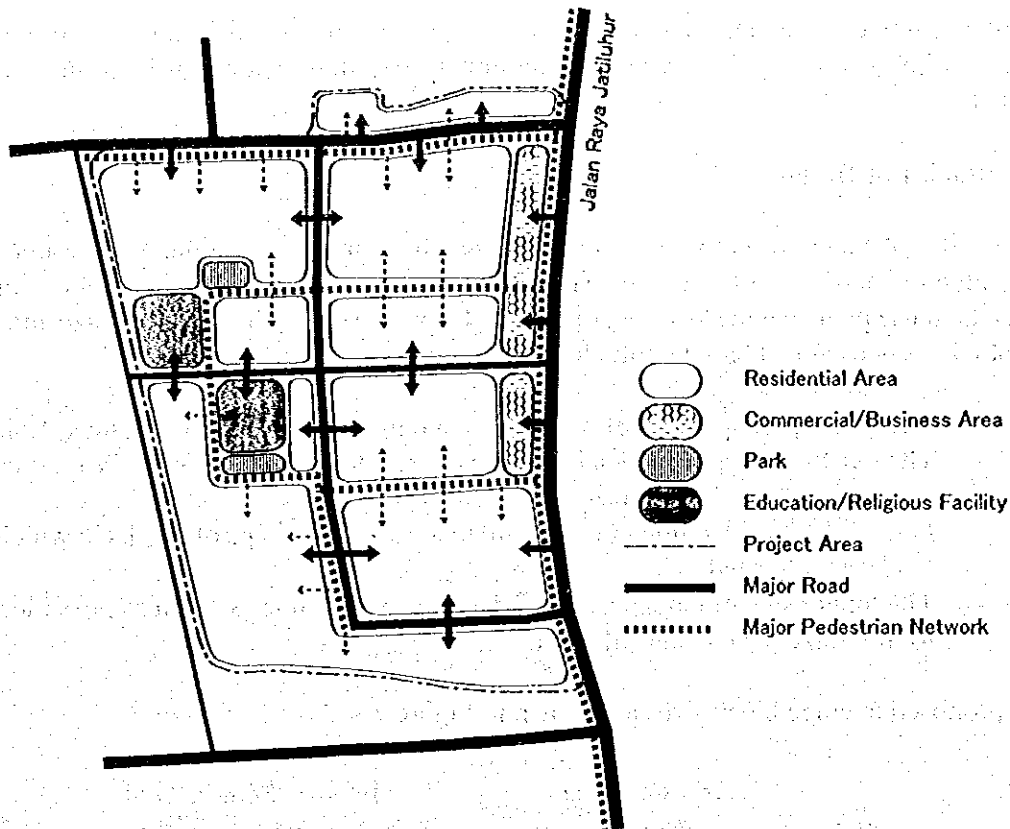


Figure 7-4-2 Basic Structure of the Project Area

(2) Land Use and Density

The land use in the project area should not be drastically changed from the present conditions so as to maintain existing social/economic activities of households in the project area, and this policy is indeed in accordance with the L/C system.

Though the land use of the project area, at present, is mostly defined as agriculture, it is planned as residential use by the above-mentioned basic structure. The reason is that the area and the environs will be urbanized in near future due to the expansion of the Jakarta metropolitan area and construction of the outer-ring road. However, it is deemed that the existing social/economic activities of those households will continue alike even after the project implementation for a certain duration. Thus it is practical that the residential area is planned as relatively low density in order to secure the continuation of social/economic activities as agricultural area.

As for commercial area, area for small shops and/or shop houses is allocated along Jalan Raya Jatiluhur so as to provide daily necessities for the neighborhood, while a regional commercial center was planned on the north of the project area in the master plan. In addition, other public facilities such as clinics and private-owned kindergartens are to be invited within this commercial area.

The population density of the project area is assumed at around 100 persons per hectare based on the master plan. The future population of the area is estimated at 2,600 under the this assumption.

In order to guide the planned land use into the project area practically, some sort of regulations, such as administrative guidance and/or community-based agreement of building control, are needed.

(3) Block/Lot Design

The design of block/lot is to determine the size, shape and disposition, at the same time, to determine the network of local road. The primary consideration in the block/lot design should be the land use plan, and the location, lot size and type of existing houses. The size and shape of the blocks is determined based on the following factors.

- The size and shape of existing lots is taken into consideration for block design.
- The existing economic/social activities of residents in the project area are taken into consideration for block design as much as possible.
- Economic consideration must be paid to the size and shape of blocks in which reserve lands are allocated.
- The longer side of block is allocated along contour line as much as possible, in order to minimize the cut and fill work.

The proposed average block sizes are shown in Figure 7-4-3.

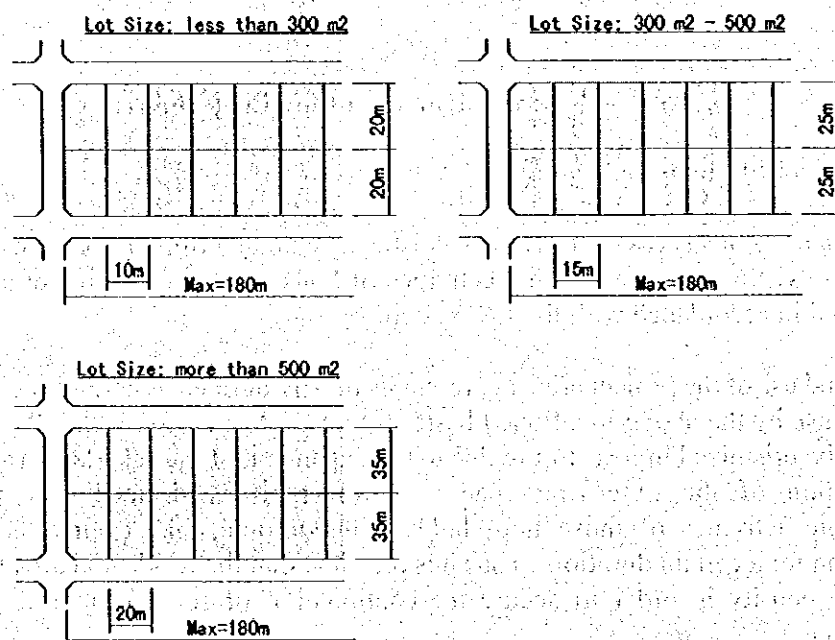


Figure 7-4-3 Proposed Average Block Size by Magnitude of Lot

(4) Design of Public Utilities

1) Road Network

Road network in the project area is hierarchically planned in accordance with the master plan in

which the network of main roads is proposed. Of the project area, a regional road of 22m width and a collector road of 12m constitute the skeletal structure of the road network. The types of roads that are aligned in the project area are outlined as follows:

Table 7-4-6 Proposed Standard of Road Network in Project Area

Classification	ROW (m)	No. of Lanes	Width of Lane (m)	Interval (m)
Regional Arterial Road	22	4	3.25	-
Collector Road	12	2	3.00	-
Local Road (1)	10	2	3.00	-
Local Road (2)	8	1	3.00	-
Local Road (3)	6	1	2.50	40-70

In principle, local road (1) and (2) are aligned for the supplements of collector road, and local road (3) forms blocks. The interval of local road (3) is subject to block size.

On the other hand, footpaths are allocated to connect the project area and surroundings for the passing, in case of need. In principle, footpaths are graveled.

2) Park/Green

Adjacent to the educational/religious area, parks are allocated to improve those amenities. Parks and the planned commercial area along Jalan Raya Jatiluhur are connected with green ways, which are facilitated by greenery and footpaths. The principal function of the green ways is to secure the safety of pedestrians from the increased vehicular traffic generated by the development.

3) Drainage and Flood Protection System

i) Hydrological Design Standard

Urbanization decreases the natural function of detaining rainwater on land. If there are no measures in an urban development, an area along the downstream will be jeopardized by the flood caused from the development. Thus an appropriate flood protection system has to be planned in the case study area.

ii) Waterway Improvement

For the improvement of waterway in the project area, the sectional plan is to be prepared with consideration of the whole upstream area in order to provide for the future development as the master plan of 300ha.

4) Water Supply

At present, there are not any piped water supply systems in/around the project area, therefore, most of the households use water from individual shallow wells (approx. 10m in depth), even in the areas of both private and public housing development. As urbanization progresses, this manner will lead to pollution of groundwater and land subsidence in near future, causing from household waste and excessive extraction. However, the project area has no appropriate surface water resources nearby. Thus, as stated in L/C Master Plan, the gradual development of the water supply is applicable in the project area.

Namely, house connection as the piped water supply system is introduced using centralized deep well (it is reported that the shallow aquifer around Jatiasih is gradually polluted) in the first stages. Then the reticulated system will be finally incorporated into a broader water supply network of Jabotabek.

5) Sanitary System

In the short-term of the development for the master plan area, on-site treatment was proposed as the sanitary system. Thus wastewater will be treated by septic tank of each household for a while, however, it will be treated by off-site system in long term stage as the proposed master plan.

6) Electricity and Telecommunication

Electricity and Telecommunication services are served by the National Electricity Company (PLN) and National Telecommunication Company (PT. TELKOM) respectively.

(5) Proposed L/C Design of the Project Area

Based on aforementioned design policies and standards, the land use plan of the project area is shown in Figure 7-4-4 and Table 7-4-7.

Table 7-4-7 Land Use Plan of Project Implementation Area

Land Use			Before Project		After Project	
			Area(m ²)	Ratio(%)	Area(m ²)	Ratio(%)
Public Land Use	Road		5,869	2.2		
		W=22m			6,693	2.5
		W=12m			5,151	1.9
		W=10m			7,449	2.8
		W=8m			3,360	1.3
		W=6m			20,687	7.8
	Foot Path	W=4m	348	0.1		
		W=2m	173	0.1		
	Green Way		2,611	1.0		
		Sub-total	5,869	2.2	46,473	17.6
	Public Facilities	Mosque	2,225	0.8	2,225	0.8
		Park			3,197	1.2
		Water Way			1,679	0.6
		Public Service			413	0.2
Sub-total		2,225	0.8	7,514	2.8	
	Sub-total(1)	8,094	3.1	53,987	20.4	
Private Land Use	Residential			190,229	71.8	
	Commercial			11,234	4.2	
	School, Kindergarden, etc.			9,354	3.5	
	Sub-total(2)	256,710	96.9	210,817	79.6	
TOTAL			264,804	100.0	264,804	100.0

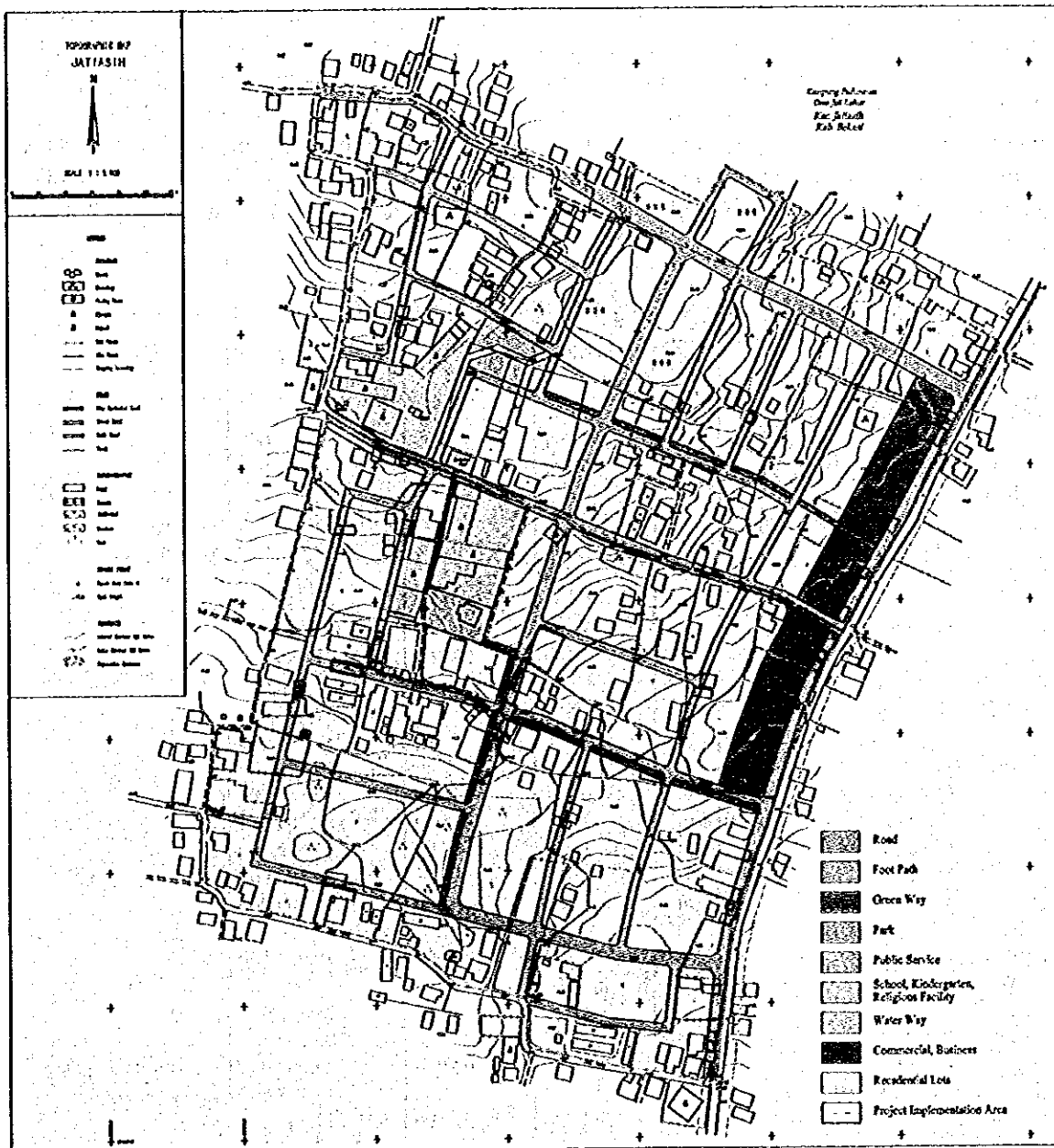


Figure 7-4-4 Land Use Plan of Project Implementation Area

7-4-4 Cost Analysis

(1) Infrastructure Construction Cost

The infrastructure construction cost of the case study area is estimated in accordance with the examples of Kopegtel project (land consolidation by a cooperative in Jatiluhur), some Perum Purummus's projects and interviews with local contractors and engineering consultants after due consideration by JICA experts. The level of the basic system of necessary public utilities for housing development is referred to land consolidation design what is examined in the

preceding paragraphs. In the first stage of the project, regarding public utility, house connection as the piped water supply system will be introduced using centralized deep well. As for the facilities of power supply and telecommunications, they are installed by PLN and PT. TELKOM respectively. Therefore the infrastructure construction cost is estimated except for the cost of power supply and telecommunications installation. A contingency allowance has been included in the total cost to allow for unexpected cost identified through the detail design and construction stage, 10% of the total construction cost is assumed as physical contingency. A total infrastructure construction cost at a medium level of infrastructure development is tabulated in Table 7-4-8. It is Rp.3,526 million for 26.48ha development, that is Rp.13,300 per sq. meter.

Table 7-4-8 Infrastructure Construction Cost, Project Implementation Area

	Unit	Quantity	Unit Cost (Rp.)	Amount (Rp.)	Remarks
Infrastructure					
Preparation work	m ²	264,804	500	132,402,000	
Land arrangement	m ³	26,480	7,500	198,600,000	
Road					
Regional Arterial Road	m	598	375,000	224,250,000	w=22m
Collector Road	m	548	310,000	169,880,000	w=12m
Local Road	m	728	250,000	182,000,000	w=10m
Local Road	m	405	150,000	60,750,000	w=8m
Local Road	m	3,322	120,000	398,640,000	w=6m
Foot path	m	89	20,000	1,780,000	w=4m
Foot path	m	82	15,000	1,230,000	w=2m
Greenway	m	653	65,000	42,445,000	w=4m
sub-total				1,080,975,000	
Drainage					
Open drain (S1)	m	6,734	40,000	269,360,000	(1)
Open drain (S4)	m	2,176	84,000	182,784,000	(2)
Covered drain (S4)	m	1,694	168,000	284,592,000	(3)
Sump	-	-	-	184,184,000	((1)+(2)+(3))*0.25
Waterway	m	335	800,000	268,000,000	
sub-total				1,188,920,000	
Park & Green	m ²	3,197	25,000	79,927,500	
Water supply					
Pipe (dia.100)	m	1,276	56,000	71,456,000	
Pipe (dia.50)	m	4,325	24,500	105,962,500	
Deep Well	unit	1	135,000,000	135,000,000	reservoir, tank, pump
sub-total				312,418,500	
Study & Design	m ²	264,804	800	211,843,200	
Total				3,205,086,200	
Physical Contingency				320,508,620	10% of Total
GRAND TOTAL				3,525,594,820	

(2) Compensation Cost

In land consolidation project, losses to be caused by the implementation of a project must be fairly compensated. In case of Jatiasih L/R project, a lot of houses are located in the project area, and 40 houses and 1 poultry farm have to relocate because of the construction of roads and public facilities. The reconstruction cost is classified by the structure of a house. The unit cost is determined by analyzing the Perumnas's housing construction cost and interviews from local contractors, this is shown as below:

Table 7-4-9 Unit Cost of House Construction by Type

Type of Construction	Construction Cost (Rp. / m ²)
House (Concrete)	550,000
House (Wood)	400,000
Poultry farm	200,000

On the other hand, compensation costs for agricultural property as fruits trees will be calculated by detailed survey on the implementation stage, therefore 10% of reconstruction cost is assumed as physical contingency in order to compensate this.

(3) Others

Other necessary costs such as the survey cost and the project administration cost are estimated based on the experts' experiences.

For example, the survey cost consists of topo-maps, confirmation of boundaries, cadastral maps, determination of original lots and finalization of block plans. The administration cost includes L/C association administration, supervision of study and survey and replotting design.

Accordingly, the total L/C project cost, excluding interest on necessary loan, is Rp.5,848.4 million as summarized Table 7-4-10.

Table 7-4-10 Summary of Project Cost, Project Implementation Area

Item	Amount Rp. Mil.	Composition %
1. Construction Cost	3,525.6	60.28
2. Compensation Cost	1,537.3	26.29
3. Survey Cost	158.9	2.72
4. Overhead (Operation) Cost	626.6	10.71
Subtotal	5,848.4	100.00

7-5 Land Consolidation (L/C) Implementation Plan

7-5-1 Implementation Planning

(1) Contents of Implementation Plan

The implementation planning provides various frameworks for the L/C project implementation based on the planning works already conducted in the previous stage. The contents of L/C implementation plan consist of four major items:

- 1) Location and boundary of the project area,
- 2) Outline of L/C design,
- 3) Implementation schedule and
- 4) Financial plan.

The contents of the implementation plan will be composed in the form of the legal documents stipulated by Land Consolidation law/regulation and its prescriptions to be legislated in the near future. An example of detailed contents of the L/C implementation plan is proposed as follows:

Land Consolidation Project Implementation Plan	
1. Project and Implementation Body	
1.1 Project Name	
1.2 Implementation Body	
2. Project Area	
2.1 Location of Project Area	
2.2 Map of Area Boundary	
2.3 Project Area Zoning	
3. Outline of L/C Design	
3.1 Objectives of Project	
3.2 Present Condition of Project Area	
3.3 Design Policies	
3.4 Comparison of Land Use before and after Project	
3.5 Calculation of Reserve Land	
3.6 Development and Improvement Plan of Public Facilities	
3.7 L/C Plan	
4. Project Implementation Schedule	
5. Financial Plan	
5.1 Revenue	
5.2 Expenditure	
5.3 Annual Financial Plan	
6. Reference Materials	
6.1 Rules on L/C Implementation	
6.2 Drawing of Present Condition: Use of land and buildings	
6.3 Land Use Plan	

As the project area and the outline of L/C design are already examined in the previous section, the financial plan is mainly analyzed in this section to complete the implementation plan.

(2) Assumptions for the Implementation Plan

First of all, some necessary preconditions were assumed for the implementation planning.

1) Association type L/C project

There might be various types of L/C projects in Indonesia possible to be implemented in future as discussed and proposed in Chapter 4-4 of Volume I. Application of a typical association type of L/C project can be basically examined for this case study in Jatiasih, because of its purpose, characteristics and scale.

2) Implementation Period

Ordinary L/C projects conducted by the BPN, though they are not the same as this proposed L/C project both in quality and quantity, are usually completed within two fiscal years. Taking into consideration this condition and the amount of work volume estimated in the previous section, the project period is set to four years from the commencement to the completion of the project, including construction of major infrastructure and disposition of reserve land, etc. It consists of one year of beginning stage, two years of full implementation stage and one year of completion stage.

3) Land Price

The existing land price in the area was calculated as Rp.100,000 per m² in average, based on the result of site survey. Meanwhile, the land price after the L/C project is estimated from the actual example of selling price of developed estates in adjoining areas, such as the Kopegtel project and so on, where the unit price of land is Rp.250,000/m² for residential land and Rp.375,000/m² for commercial, respectively.

4) Interest of Loan

Because the present economic situation in Indonesia is not stable and it is not easy to forecast future bank loan interest rates even in near future. A substantial 10% per year of interest rate is applied for the basic case analysis without price escalation. Another high interest rate of 30% per annum is also analyzed for sensitivity comparison purpose.

5) Subsidy

The basic case of the financial analysis on the proposed L/C project is examined without any subsidy, that is, as a self-financed/financially independent project. An alternative case is also tested with an introduction of a local government subsidy to some portion of infrastructure development cost, which is usually financed and constructed by the government itself.

(3) Cost and Revenue

1) Project Cost

The total project cost is estimated at Rp.5,848.4million, including the construction cost, compensation cost, survey cost and overhead cost for project operation. In addition, the total amount of interest on loan should be included. However, the interest is calculated in accordance with the implementation condition such as project schedule and revenue source, so that the actual total project cost is calculated and determined in the course of financial planning.

Table 7-5-1 Summary of Project Cost, Project Implementation Area

Item	Amount Rp. Mil.	Composition %	Remark
1. Construction Cost	3525.6	60.28	Refer to Table 7-4-8
2. Compensation Cost	1537.3	26.29	Refer to Table 7-4-9
3. Survey Cost	158.9	2.72	Rp. 8 Mil. per ha
4. Overhead (Operation) Cost	626.6	10.71	12% of item (1+2+3)
Subtotal	5848.4	100.00	
5. Repayment of Interest			To be estimated by financial plan
Total			

2) Project Revenue

Meanwhile, project revenue is simply estimated as the income by disposition of reserve land to recover all the necessary costs, including the interest in the case without subsidy (complete self-finance). The timing of disposition of reserve land is assumed as next year after completion of construction work.

(4) Implementation Schedule

An implementation schedule of the project is assumed as shown in Figure 7-5-1.

In the beginning year, most of preparatory works and initial phase of the project implementation stage will be carried out: consensus between landowners and related government/public agencies, survey to confirm land titles for replotting design, finalization of the implementation plan, the replotting design, a part of detailed engineering design, so on. Actual construction works will be started from the second year and continue until the third year.

Disposition of the reserve land will be executed from the early period of the third year, depending on the completion of the construction works, in order to collect possible revenues for reduction of repayment of interests on the loan.

The forth year is for the final work stage of the project such as registration of replotted assets, transfer of public facilities to responsible entities and collection/payment of equity, if necessary.

Items	Preparatory Period	1st Year	2nd Year	3rd Year	4th Year
1. Project Preparation/Planning Stage 1.1 Formulation of Master Plan 1.2 Surveys 1.3 Formulation of Implementation Plan and Consensus with Landowners & Related Government Agencies	■■■■■■ ■■■■■■				
2. Project Implementation Stage 2.1 Preparation & Establishment of Association 2.2 Replotting Design 2.3 Detail Design of Infrastructure 2.4 Relocation of Building 2.5 Construction of Infrastructure 2.6 Final Assurance Survey					
3. Project Completion Stage 3.1 Enforcement of Replotting 3.2 Registration 3.3 Transfer of Public Facilities 3.4 Collection/Payment of Equity 3.5 Dissolution of Association					

Figure 7-5-1 Proposed Implementation Schedule

(5) Annual Financial Program

The result of cash flow analysis on the base case is tabulated as follows.

Table 7-5-2 Annual Cash Flow, Base Case

(Rp. Mil.)

Year	1st	2nd	3rd	4th	Total
Expenditure					
Construction	0.0	2,115.4	1,410.2	0.0	3,525.6
Compensation	153.7	768.7	614.9	0.0	1,537.3
Survey	63.6	47.7	31.8	15.9	158.9
Administration	125.3	188.0	188.0	125.3	626.6
Subtotal	342.6	3,119.7	2,244.9	141.2	5,848.4
Interest	17.1	192.0	285.8	110.9	605.8
Total	359.7	3,311.6	2,530.7	252.1	6,454.2
Revenue					
Disposition of Reserve Land	0.0	0.0	3,872.5	2,581.7	6,454.2
Balance (Annual)	-359.7	-3,311.6	1,341.8	2,329.5	0.0
Cumulative Balance	-359.7	-3,671.4	-2,329.5	0.0	

Total amount of the project cost accounts for Rp.6,454 million including interest of Rp.606million (9.4% to the total) and maximum debt reaches to Rp.3,671 million in the second year.

(6) Land Contribution

Some important indicators, such as 'contribution ratio' and ' R/R_{max} ', to judge a feasibility of the L/C implementation plan are calculated in this final stage.

The total project cost of Rp.6,454.2 million is supplied by disposition of reserve land, the necessary land area for reserve land contribution is calculated:

$$\text{Rp.6,454.2 million/Rp.256.7 thousand per m}^2 = 25,143 \text{ m}^2$$

The aggregated contribution comprising the public contribution (45,893m²) and the reserve land contribution (25,143m²) accounts for 71,036m², and the aggregated contribution ratio is calculated at 27.7% to the total building lot area before the project of 256,710m².

Meanwhile, the proposed reserve land area is rated only at 22.7% of maximum allowable reserve land area that is rationally calculated from the increased amount of land value after the project.

All the necessary data for these calculation is tabulated in the tables below:

Table 7-5-3 Contribution and Reserve Land

Contribution Rate

Building Lot Area before L/C (A)	Building Lot after L/R			Contribution			Contribution Rate (D/A)
	Replots (A-D)	Reserve Land	Total (E)	For Public Facilities	For Reserve Land	Total (D)	
m ² 256,710	m ² 185,674	m ² 25,143	m ² 210,817	m ² 45,893	m ² 25,143	m ² 71,036	% 27.67

Building Lot Price

Building Lots before L/C (A)	Unit Price before L/C (a)	Total Amount before L/C (V ₁ = A x a)	Building Lots after L/C (E)	Unit Price after L/C (e)	Total Amount after L/C (V ₂ = E x e)	Land Value Increase	
						Total Amount (V = V ₂ - V ₁)	Increased Rate (e/a)
m ² 256,710	Rp./m ² 100,000	Rp. Mill. 25,671.0	m ² 210,817	Rp./m ² 256,700	Rp. Mill. 54,108.5	Rp. Mill. 28,437.5	2.57

Planned Area for Reserve Land

Total Value of Building Lots before L/C (V ₁ = A x a)	Total Value of Building Lots after L/C (V ₂ = E x e)	Increase in Total Value of Building Lots (V = V ₂ - V ₁)	Land Price per m ² before L/C (a)	Land Price per m ² after L/C (e)	Maximum Area for Reserve Land (R _{max} = V/e)	Planned Area for Reserve Land (R)	Comparison (R/R _{max})
Rp. Mill. 25,671.0	Rp. Mill. 54,108.5	Rp. Mill. 28,437.5	Rp./m ² 100,000	Rp./m ² 256,700	m ² 110,781	m ² 25,143	% 22.70

7-5-2 Financial Examination of Alternative Cases

Some alternative cases were tested for comparison with the before-mentioned base case. Valuable factors are:

- Interest rate, and
- Introduction of government subsidy.

(1) Higher Interest Rate

When the real interest rate increases to 30%, the interest payment triples, accounting for 24% of the total expenditures (Table 7-5-4). As a result, the land contribution ratio increases to 29.6% in comparison with 27.7% in base case.

Table 7-5-4 Cash Flow with 30% Interest Rate and without Government Subsidy

Year	1	2	3	4	Total
Sales Amount of Reserve Land	0.0	0.0	4,619.3	3,079.5	7,698.8
Interest payment (interest rate: 30%)	51.4	586.1	873.8	339.0	1,850.4
Balance between Revenues and Expenditures	(394.0)	(3,705.8)	1,500.6	2,599.3	0.0

(Source: JICA Study Team)

(2) With Subsidy

As discussed in Section 7-3-4, the introduction of a Government subsidy is justified since the infrastructure is to be constructed not only for the benefits in the project area but for the people outside of the project area as well. From this perspective, the Government subsidy is estimated to be Rp.1,419.2 million for the L/C implementation area. This amount is calculated by construction and land acquisition costs of a 22m-wide regional arterial road and the major drainage facility planned in the project. With the Local Government subsidy, the sale of reserve land needed, decreases to Rp.4,907.8 million, thus the land contribution ratio decreases to 25.3%.

Table 7-5-5 Cash Flow with 10% Interest Rate and with Government Subsidy

	(Rp. Million)				
Year	1	2	3	4	Total
Total Revenue	0.0	709.6	3,654.3	1,963.1	6,327.0
Sales of Reserve Land	0.0	0.0	2,944.7	1,963.1	4,907.8
Government Subsidy	0.0	709.6	709.6	0.0	1,419.2
Interest	17.1	156.5	222.2	82.8	478.6
Balance	(359.7)	(2,566.5)	1,187.2	1,739.1	0.0

(Source: JICA Study Team)

(3) With Subsidy and Higher Interest Rate

The land contribution ratio is estimated at 26.8%, when the project receives a Rp.1,419.2 million Government subsidy while a 30% real interest rate is applied. The expected cash flow is shown in the table below.

Table 7-5-6 Cash Flow with 30% Interest Rate and with Government Subsidy

	(Rp. Million)				
Year	1	2	3	4	Total
Total Revenue	0.0	709.6	4,250.1	2,360.3	7,320.0
Sale of Reserve Land	0.0	0.0	3,540.5	2,360.3	5,900.8
Government Subsidy	0.0	709.6	709.6	0.0	1,419.2
Interest	51.4	479.7	684.4	256.0	1,471.5
Balance	(394.0)	(2,889.8)	1,320.8	1,963.1	0.0

(Source: JICA Study Team)

7-5-3 Action Plan

A general implementation procedure of association type L/C project is summarized as illustrated in the following chart. Though necessary activities and considerations in each stage will be confirmed after discussion with counterparts during next stage of the study, some significant points are listed as follows:

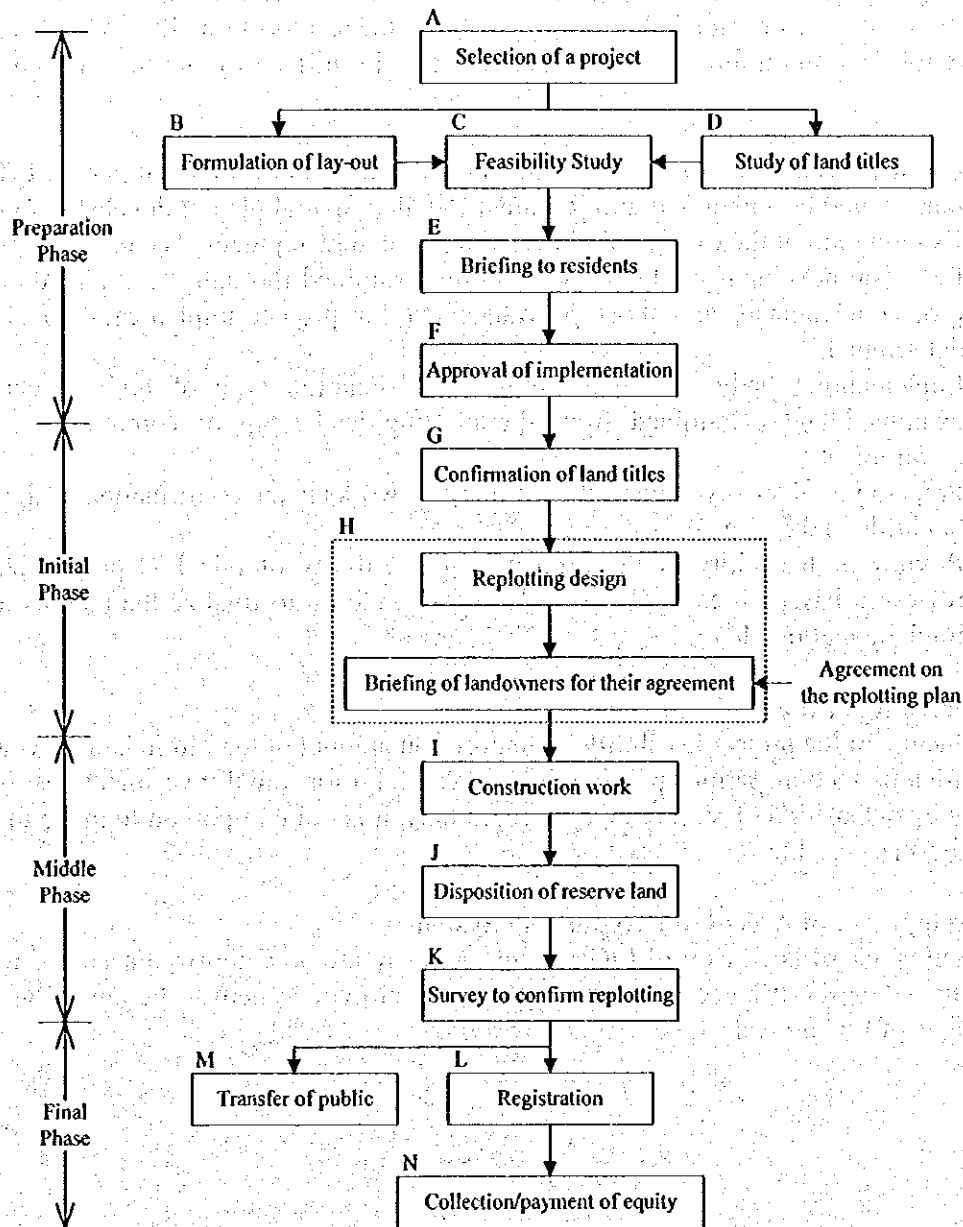


Figure 7-5-2 General Procedure of L/C Project Implementation

In general, followings are taken into consideration through overall project implementation.

1) Initial Pilot Project of Innovative L/C Project in Jakarta Metropolitan Area

There are very few L/C projects, even ordinary L/C, implemented within Jakarta Metropolitan Area, although there are huge potential demand of housing estates. Since this L/C project in

Jatiasih will be a model/pilot project of the innovative L/C, relevant government officials as well as residents in Jatiasih, Bekasi, should completely understand the project concept. A series of presentation and explanation on the significance and detailed contents/procedure should be conducted until the complete consensus is obtained.

2) Importance of Preparatory Stage

In the preparatory stage until finalization of the actual L/C project implementation plan, so many important activities should be performed. Since the results of this JICA study can provide many useful data and information, they should be fully utilized by the relevant government staff.

- i) Consistency with regional development plan: Concept development plan or L/C master plan should be authorized into Regional Detailed Spatial plan or development plan.
- ii) Examination of the Community's view on urban development: The residents' intention for urban development should be carefully examined through the explanation of L/C project advantage, and most provable area for project implementation should be determined.
- iii) Implementing body: An applicability of association type of L/C project is also examined and determined from the existing leadership of community and local government.
- iv) Preparation of survey: One of the most urgent works is the confirmation of the existing land title in the area.
- v) Review of feasibility of the project: The feasibility of this L/C project should be reviewed based on confirmed detailed data/condition to finalize the plan as an actual implementation plan.

3) Shortening of the Project Period

One of factors of the project feasibility is supposed an amount of loan from bank. As analyzed in the previous section, serious problem is available fund for initial investment cost until cost recovery by disposition of reserve land. Accordingly, it is quite important to make the project period short as possible.

4) Development of Acceptable Replotting System

Replotting is one of key factor of L/C project. As there are no authorized/accepted replotting system in Indonesia, it's necessary to develop an prototype system to be agreed among the participants of L/C project.