

**STEP 7 Approval of the L/C Association  
[By Local Government]**

**1. Exhibition of Implementation Plan (Draft)**

Since one of the important characteristics of L/C projects is to be implemented democratically, the draft of implementation is exhibited at the local government office, and the concerned persons can submit opinion letters to the local government. If the opinion letters are submitted, the local government has to examine those contents and, if needed, advice to the team of promoters for the betterment of the L/C project maybe given. The dates/periods for the exhibition and acceptance of the letters shall be stipulated by the Land Consolidation Law/Regulation and its prescriptions.

**2. Approval of the Establishment of the L/C Association**

The local government has to approve the establishment of the L/C association after the examination of opinion letters except if serious problems are found in the application.

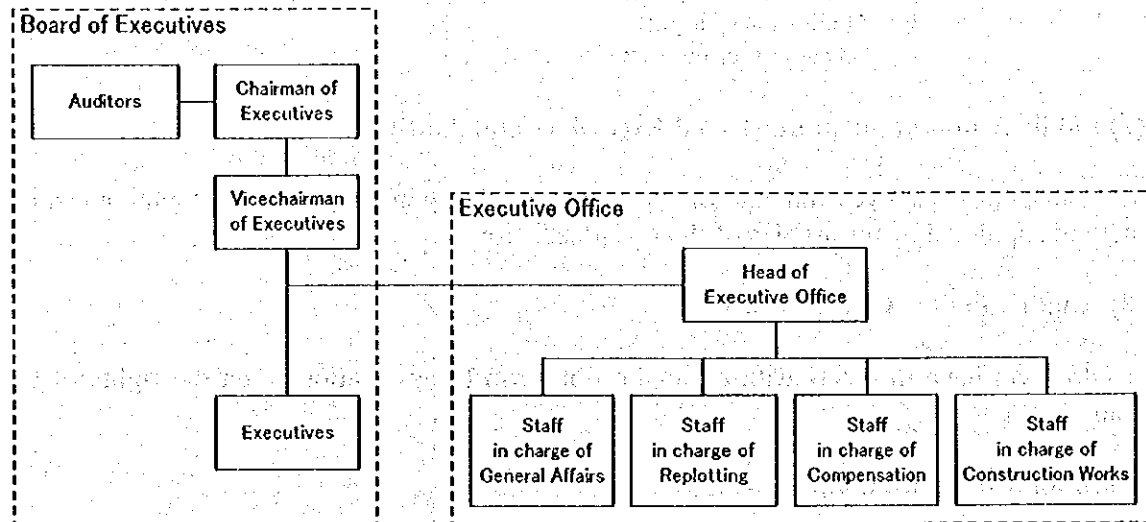
**3. Public Announcement of the L/C Project**

The local government has to announce the L/C project publicly, on the bulletin board at the government office or by other means. The date of the public announcement is the same as the approval of establishment of the L/C association.

## IMPLEMENTATION STAGE

**STEP 8** Set-up and Mobilization of the Association  
[By the L/C Association's Executing Unit]**1. Set-up of the L/C Association Office**

The L/C association office is set up at a place established in the L/C association articles. An example of the organization as executing unit, of which the number of staff depends on the magnitude of the project, is shown as follows:



**Figure 5 Example of the Executing Unit Organization**

The above example implies that the executive office carries out substantial works of L/C projects and the board of executives decides those activities. The members of the board of executives are the representatives of landowners officially approved by the first general meeting. And the staffs of the executive office shall be dispatched from the local government as a part of technical assistance or from the private sector on contract, because the executive office has to be organized by some specialists in fields such as: accounting, civil engineering, law and so on.

**2. Mobilization of Financial/Human Resources****(1) First General Meeting**

In order to mobilize the association, applicants of the establishment of the L/C association convoke the first general meeting. The general meeting is to be held after (within one month) the public announcement of the L/C project. An example of the agenda is shown as follows:

**Table 2 Agenda Example for the First General Meeting**

Items for Report	- Activities and expenditure in advance to establish the L/C association
Items for Decision	- Selection of Executives and Auditors - Detailed Regulation for Office, Auditing, Contract of Work, Account - Budget of the First Fiscal Year - Debt of the First Fiscal Year - Designation of Bank - Others
Items for Guidance	- System of L/C - Reassessment of Datum Area - Control of Building Activities - Application of Rights - Schedule after the First General Meeting

**(2) Public Announcement of Elected Executives and Auditors**

The names of executives and auditors elected at the first general meeting are announced by a method stipulated by the articles of the L/C association.

**(3) Application for Change of Rights**

Landowners have to report with an application form to association when the rights of their land are changed.

**(4) Mobilization of Financial Resources**

**a. Arrangements of commercial loans**

The executing unit of the L/C association must prepare the documentation for borrowing, assisted by the task force in the local government. When a guarantee by the local government is requested, the task force must make necessary arrangements to have an approval of the Regional House of Representatives.

**b. Issuance of bonds**

The task force in the local government must follow necessary procedures to have an approval from the Regional House of Representatives to issue medium- to long-term bonds and on-lend them to the L/C association. After the approval, the task force must make an agreement with the financial institution that underwrites the bonds, and with the L/C association on the terms of lending.

**c. Contribution by central / local government**

The task force in the local government must make a fiscal arrangement for the payment of the government's subsidies.

**STEP 9** Replotting Design/Provisional Replotting Plan  
[By the L/C Association's Executing Unit]

The replotting plan is to determine how to allocate blocks' replots after project. Before the disposition of replotting, the executing unit has to designate usable replots to landowners provisionally during construction of infrastructure, in accordance with the draft of replotting design. The replotting design has to be formulated based on the replotting design standard approved by the general meeting. The procedure to formulate the draft of replotting design after the first general meeting is outlined as follows:

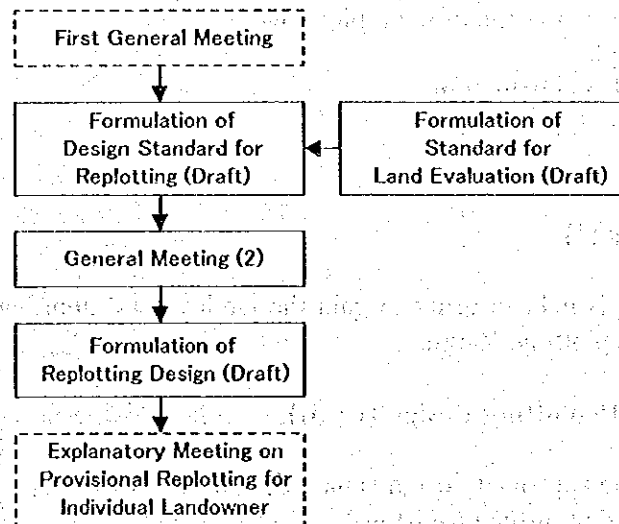


Figure 6 Procedure for Designation of Provisional Replotting

**1. Formulation of Standard for Land Evaluation (Draft)**

The significant character of land evaluation in L/C projects is to evaluate simultaneously a large number of land parcels both before and after project. Namely, the purpose of the land evaluation is to compare the two values of a land parcel, both before and after project, and to find the increased value of the land after project completion. The disposition of replotting and equity payments is carried out based on the land evaluation.

Since the land evaluation is a basis to treat equitably each landowner's property within the project area, accordingly, it is necessary to establish appropriate standards for land evaluation. There may be several methods for land evaluation: by zoning referring to actual market prices, by the distance from an important facility, by the assessment/experience of a specialist, by the street value and so on. Anyhow, from a L/C project, a method of land evaluation has to be formulated and approved in the general meeting. The standard has to show the calculation method and its factors for the land evaluation in detail.

**2. Formulation of Standard for Replotting (Draft)**

In order to carry out the replotting design, a design standard has to be formulated and approved in the general meeting. The methods of replotting are generally classified into areas of replotting design methods (which are furthermore divide into two methods by fixed contribution and by frontage contribution) and the (proportional) valuation replotting design method. Only the replotting area by fixed contribution is, at present, used for L/C projects in

Indonesia, while the valuation replotting design method is commonly used for those projects in Japan. The method for an L/C project shall be selected considering the technical applicability and possibility of landowners' acceptance.

The following items are the example of contents in the standard method:

- Definition of technical terms
- Determination of datum area
- Method of replotting design
- Location of replot
- Method for calculation of the replot area
- Shape of replot
- Method of land evaluation
- Items concerning land rights
- Others

### **3. General Meeting (2)**

This general meeting is held in order to gain the landowners' approval on both standards of land evaluation and replotting design.

### **4. Formulation of Replotting Design (Draft)**

In accordance with the approved design standards, the replotting design (draft) which is to be a basis for the disposition of the provisional replotting is prepared. This task is proceeded on maps of a scale of 1/1,000 to 1/500 based on the results of site survey (2) and (3), and the detailed procedure is shown in appendix.

Replotting design is the process of determining what replot should be exchanged for the original lot before project, in terms of the location, area and shape. The principle of replotting design is to guarantee the existing conditions of property's value and utility, and to treat every replot fairly. Namely, every replot has to correspond to those original lots in such factors as location, area, soil conditions, accessibility to water supply, state of land use and environment. However, it is often impossible to make all these factors correspond because of the infrastructures' improvement such as roads. In the replotting design process, therefore, it is required to seek the principle of correspondence as far as possible.

**STEP 10** Supervision/Control on Activities of the L/C Association  
[By Local Government]

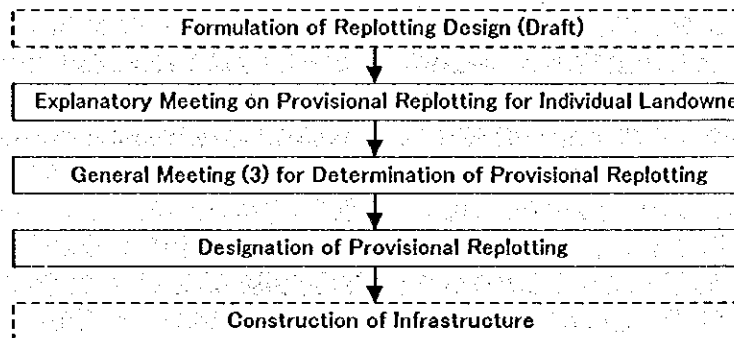
Throughout the implementation stage of an L/C project, the local government's major tasks are to supervise and control the association's activities on the land management and the infrastructure construction. The local government's tasks of are shown as follows:

**Table 3 Major Tasks of Local Government throughout Implementation Stage**

Land Management	Infrastructure Construction	Others
<ul style="list-style-type: none"> <li>- Supervision on replotting design and provisional replotting plan</li> <li>- Supervision /approval on replotting plan</li> <li>- Land tenure rearrangement</li> <li>- Registration of replots</li> </ul>	<ul style="list-style-type: none"> <li>- Supervision on construction plan and engineering</li> <li>- Monitoring on progress of construction work</li> <li>- Inspection on completed infrastructure</li> </ul>	<ul style="list-style-type: none"> <li>- Attendance to general meeting as observer</li> <li>- Approval on disposition of L/C association</li> </ul>

**STEP 11** Designation of Provisional Replotting  
[By the L/C Association's Executing Unit]

The provisional replotting is to designate a land area to substitute for the original lots during removal and construction work. The property rights are also designated to the land area. The procedure for the designation of provisional replotting is shown as follows:



**Figure 7 Procedure for designation of Provisional Replotting**

**1. Explanatory Meeting on Provisional Replotting for Individual Landowners**

It is necessary to explain the provisional replotting plan to individual landowners in order to proceed with the designation smoothly. In the explanatory meeting, the executing unit has to explain the provisional replotting plan to individual landowners, regarding the location and area of each replot, the expected schedule of the designation, and the overall schedule on the removal and construction works.

**2. General Meeting (3) for Determination of Provisional Replotting**

This general meeting is held in order to gain the landowners' approval on provisional

## **IMPLEMENTATION STAGE**

replotting plan. In addition, it is necessary to explain the meanings of the contribution ratio and equity payment to landowners in this meeting, because there are some differences between the planned area and finalized area due to the construction work.

### **3. Designation of Provisional Replotting**

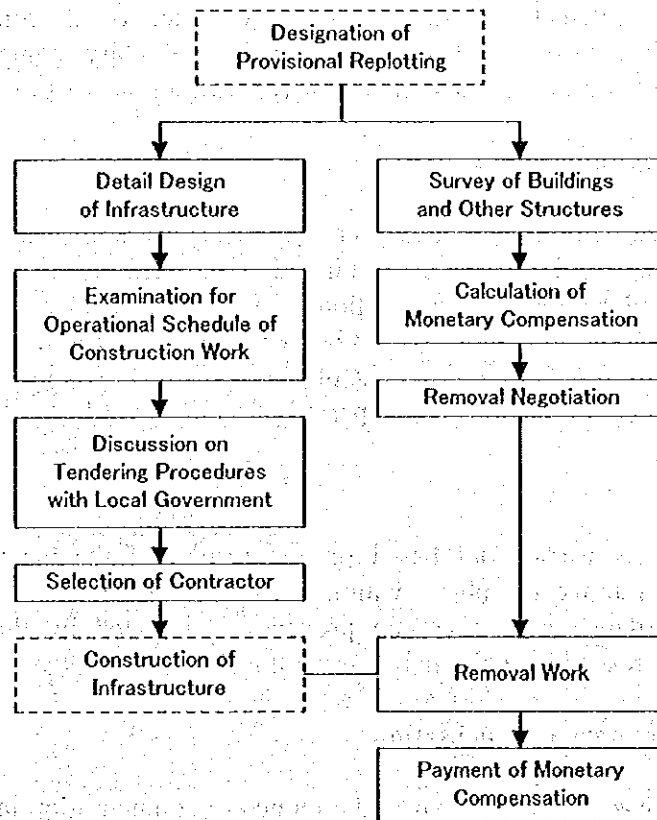
The designation of provisional replotting is carried out by mailing a notification on the designation of provisional replotting to each landowner. On the notification, the following items have to be clarified:

- Location and area of both original lots and provisional replots
- Date on which the designation of provisional replots become effective
- Possibility of differences between the area of provisional replots and the area found by final assurance survey

The disposition of reserve land becomes practically possible after the designation of provisional replotting, although it is described in the terminating stage on this manual.

**STEP 12** Preparation of Infrastructure Construction  
[By the L/C Association's Executing Unit]

After the designation of provisional replotting, removal work and construction work can be started. In advance to those works, the following preparations are systematically needed.



**Figure 8 Preparation of Infrastructure Construction**

Although the above tasks are systematically needed prior to the construction work, most of the preparation work should be practically completed before the designation of provisional replotting so as to shorten the project period and to minimize the project costs.

**1. Removal of Buildings and Other Structures**

The executing unit can remove buildings and other structures in case of need, after the designation of provisional replotting. Monetary compensation is paid to the owners of those removed buildings and other structures. The actual removal work is carried out according to the following procedure:

**(1) Survey of Buildings and Other Structures**

Buildings and other structures, which are needed to be removed for infrastructure construction, are surveyed in detail, based on site survey (3) and replotting design. Detailed reports of those buildings and other structures are respectively prepared in terms of structure, utility, ownership, years after construction and so on. These reports are used for the selection of the removal method and to make the work schedule, as well as for the calculation of monetary



compensations. There are several methods for the removal: hauling, rebuilding, partial removal.

### **(2) Calculation of Monetary Compensation**

Based on the reports of removal, the executing unit has to calculate the monetary compensation. The calculation is to estimate the cost not for the construction but for the reappearance of the existing status. Accordingly, monetary compensation has to be estimated from the condition and the numbers of years after construction.

### **(3) Removal Negotiation**

In order to proceed with the removal negotiations successfully, it is essential that the executing unit explains to the landowners with enthusiasm and sincerity about the necessity of the removal work and ask for their cooperation. First, the way for removal work, namely by landowners or by the executing unit, should be negotiated because the landowners often take advantage of this opportunity to improve the object beyond the existing status. And then the amount of monetary compensation and the period of removal work should be negotiated.

### **(4) Removal Work**

The removal work is carried out based on the results of the negotiations. In case a landowner did not remove the object within the agreed period, the executing unit has to remove it in accordance with a certain procedure stipulated by the land consolidation law/regulation, which shall be legislated in near future.

### **(5) Payment of Monetary Compensation**

The executing unit has to pay landowners the monetary compensation in accordance with the results of the negotiation if the removal work is completed.

## **2. Detail Design of Infrastructure**

In accordance with the implementation plan, the executing unit carries out the detail design of infrastructure. The characteristics of the infrastructure constructed by the L/C project is that each infrastructure is operated by a related agency when the project is completed, although those infrastructures are constructed by the L/C association. Accordingly, it is needed to negotiate with those related agencies about the scope of work for the construction in advance, in order to carry out the detail design. The detail design is carried out for the following contents of the construction work.

- Preparation work (temporary works such as temporary road and temporary waterway for construction work)
- Land arrangement (site preparation)
- Road work
- Drainage and flood protection work
- Waterworks
- Park and green work

Based on the detail design, it is necessary to estimate the detailed costs of the construction

works because of the tender.

### **3. Examination for Operational Schedules**

It is necessary to examine the operational schedules for the construction works, since the construction period affects the balance of the L/C project. Especially the operational schedules for the site preparation and the removal work should be carefully examined, because those works are carried out in turn.

It is desirable that the operational schedules are prepared by the removal negotiation described in the previous item, so as to explain clearly the removal work to the landowners.

### **4. Discussion on Tendering Procedures with the Local Government**

The L/C association, in general, is not familiar to the procedures of tendering, thus the association should ask the local government for technical assistance. The procedures, from preparation of tendering to contract of the construction work with successful bidders, are determined through the discussion with the executing unit and local government. The major items to be discussed/determined are as follows:

- Tendering method
- Tendering schedule
- Tender and contract documents
- Qualification of bidders
- Technical specifications
- Standard specifications
- Payment conditions

### **5. Selection of Contractor**

The contractor for the construction of infrastructures is selected by tendering of which procedures are determined with the local government's technical assistance.

**STEP 13 Construction of Infrastructure**  
**[By the L/C Association's Executing Unit]**

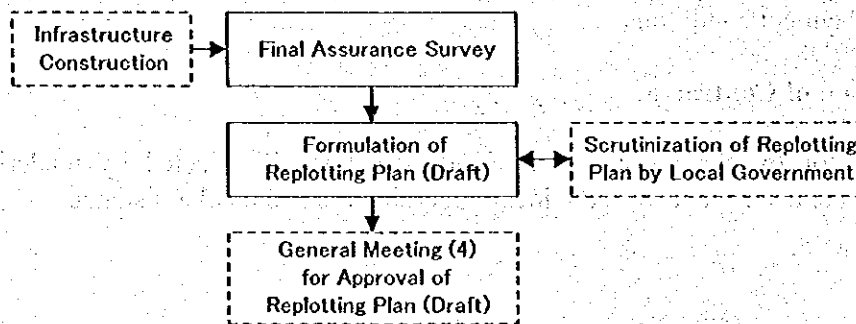
In accordance with the designated provisional replotting, construction works are carried out by the contractor. The main task of the executing unit, concerning the construction works, is the construction management under the technical assistance of the local government. The construction management consists of the following items:

- Schedule control
- Quality control and inspection
- Safety control
- Pollution control

Prior to the construction works, the engineering (layout) survey is carried out so as to mark the boundaries of blocks and roads on the actual site in accordance with the detail design and implementation plan. This engineering survey is the one of the tasks called final assurance survey.

**STEP 14 Formulation of Replotting Plan**  
**[By the L/C Association's Executing Unit]**

In the wake of the construction work, the formulation of the replotting plan is carried out as follows:



**Figure 9 Procedure of Formulation of the Replotting Plan**

**1. Final Assurance Survey**

At a certain stage of the construction work, the final assurance survey is carried out to confirm the locations, shapes and areas of public lands and replots as specified in the implementation plan and replotting design. The final assurance survey may be divided into the following three categories according to the contents:

**Block final assurance survey** : This survey is carried out to assure the boundaries of planned roads. The centerline and the width (right of way) of each planned road is calculated, and the layout of the roads (blocks) are marked on the actual site based on the results of this calculation.

**Replot final assurance survey** : This survey assures the boundaries of replots. When the features of planned roads appear on the site along the process of road construction, the shapes and areas of blocks surrounded by them are determined. Then the boundaries of replots are marked on the site based on the replotting design. It is necessary to maintain those marks properly, because they tend to be damaged by construction works and other reasons.

**Mapping of final assurance survey** : The map of the final assurance survey is prepared based on the assured blocks and replots. In this map, boundaries of the project area, boundaries of public land such as roads and parks, and boundaries of replots are shown with the street names and numbers of those replots. This map is generally drawn with a scale of 1/1,000 to 1/500, and becomes the basis of the land registration.

It is desirable that the final assurance survey be carried out by contracted qualified surveyors, because it requires accuracy and technical knowledge since it is to treat property rights.

## **2. Formulation of Replotting Plan (Draft)**

The draft of the replotting plan is prepared keeping up to the progress of construction works. This task to formulate the draft of replotting plan is proceeded with the assistance/scrutinization of the local government.

**Replotting map** : This map is drawn to overlay the lots map with the replots map; the former is already prepared by the site survey (3) and the latter is the result of the final assurance survey. Since the replotting map is to be exhibited for persons concerned, it is necessary to draw intelligible with administrative boundaries, numbers of lots and planned street names.

**Specification of each replot** : This is a form to mention the relationship with original lot and replot, and to be submitted to the local government as one of the documents for the application.

**Specification of equity payment** : This specification is prepared for each landowner with the amount of equity payment and the calculation of those entitled prices of original lots and replots.

**Specification of reserve land** : This specification is prepared as well as the specification of each replot.

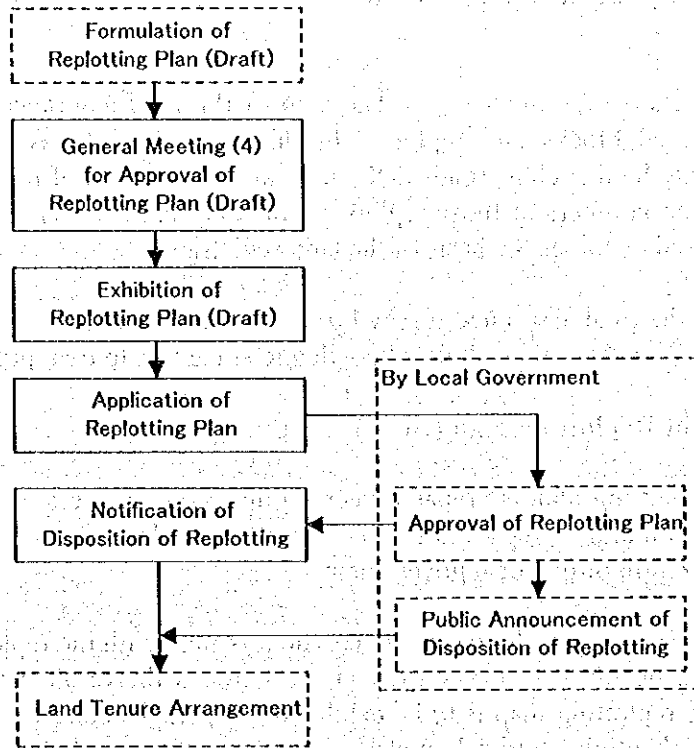
### **STEP 15** Scrutinization of the Replotting Plan [By Local Government]

The staffs in charge of land management in the local government assist the executing unit of the L/C association for the preparation of the replotting plan, and scrutinize the replotting plan draft from the following viewpoints:

- Conformity with implementation plan and articles of the L/C association
- Conformity with the principles of correspondence

**STEP 16 Disposition of Replotting**  
**[By the L/C Association's Executing Unit]**

Procedure of disposition of replotting is outlined as follows:



**Figure 10 Procedure of Disposition of Replotting**

**1. General Meeting (4)**

The draft of the replotting plan has to be approved in the general meeting. At the same time, the schedule on the disposition of replotting and its procedures are explained to landowners.

**2. Exhibition of the Replotting Plan (Draft)**

The draft of the replotting plan, approved by the general meeting, has to be exhibited for the persons concerned by the method stipulated on the articles of L/C association. Within the period of the exhibition, the persons concerned can submit opinion letters to the executing unit of the L/C association.

If the executing unit judges the propriety of an opinion letter, the replotting plan has to be modified. When an opinion letter cannot be adopted, the executing unit has to notify the reason to the sender.

**3. Application of Replotting Plan**

After the exhibition of the replotting plan (draft), the executing unit submits an application on the replotting plan with the related documents to the governor. The needed documents are:

- Minutes of general meeting (4)
- Results of exhibition attached opinion letters
- Draft of replotting plan
- Implementation plan including articles of the L/C association
- Standards on replotting design and land evaluation
- Circumstance on disposition of reserve land, if any
- Others related public lands and so on

#### 4. Notification of Disposition of Replotting

The executing unit has to send notifications on the disposition of replotting to landowners and collect the receipts, when the local government approves the replotting plan. Those receipts have to be collected from all landowners, and be submitted to the local government.

### **STEP 17** Approval of the Replotting Plan [By Local Government]

#### 1. Approval of the Replotting Plan

The local government has to quickly examine the application of the replotting plan and attached documents submitted by the L/C association. When there are not any significant problems in those documents, the local government notifies the approval to the L/C association.

#### 2. Public Announcement of Disposition of Replotting

The local government has to announce the disposition of replotting publicly when the receipts collected from all of landowners are submitted by the L/C association, on a bulletin board at the government office or by other means. The disposition of the replotting is completed by this public announcement.

### **STEP 18** Land Tenure Arrangement [By the L/C Association's Executing Unit]

After the public announcement, the executing unit has to complete the registration of those approved replots and buildings immediately.

In general, the land registration is applied by its landowner. Of L/C projects, however, the executing unit has to be applicant on behalf of the landowners within the project area so as to avoid mistakes and irregularities on the procedure of land registration. This method is called a "package registration", which shall be stipulated in the future land consolidation law/regulation.

The application form and its attached documents are prepared by the executing units in accordance with the local government's technical assistance (of land management), and submitted to the local land office. Land tenure arrangement is completed when the local land office finishes the issuance of land certificates for all of the landowners.

The first part of the document discusses the importance of maintaining accurate records of all transactions and activities. It emphasizes the need for transparency and accountability in financial reporting.

It is essential to ensure that all data is properly documented and stored in a secure manner. This includes maintaining backup copies and implementing robust security protocols.

The following table provides a summary of the key findings and recommendations from the audit process. It highlights areas of concern and offers practical solutions for improvement.

Overall, the audit identified several significant weaknesses in the current system. These include inadequate internal controls, insufficient training for staff, and a lack of clear communication channels.

To address these issues, it is recommended that management implement a comprehensive risk management framework. This should include regular audits, ongoing training, and improved reporting mechanisms.

The final section of the report provides a detailed action plan for the implementation of these recommendations. It outlines the responsibilities of each department and sets a timeline for completion.

TERMINATING STAGE

**STEP 19** Disposition of the Reserve Land  
[By the L/C Association's Executing Unit]

The reserve land is to be appropriate for the project cost, and stipulated in the articles of the L/C association. The area of the reserve land is estimated in the implementation plan based on its financial plan. The location of the reserve land is determined by the replotting plan, and it is theoretically under the administration of the L/C association without ownership when the provisional replotting is designated. And then the L/C association can acquire the reserve land by public announcement of the disposition of replotting, and dispose it by a method stipulated in the articles of the L/C association.

However, the reserve land can be practically disposed after the designation of provisional replotting. In this case, the buyer contracts with the L/C association to buy the reserve land under the conditions that the buyer can gain the right of use before the disposition of replotting and then can gain the ownership after the public announcement. It is desirable that the reserve land be disposed after the designation of provisional replotting as soon as possible so as to ease the financial condition of the L/C association.

**STEP 20** Equity Payment  
[By the L/C Association's Executing Unit]

When there are imbalances among replots in the replotting plan, or when no replots is given to an original lot, the difference is paid in monetary terms in order to maintain impartiality. The amount of equity payments, which is already calculated in the replotting plan as a specification of equity payments, becomes definite on the next day of the public announcement of the replotting disposition, and, rights and responsibilities of the landowners for equity payments become in force.

L/C association can be dissolved when collection and payment of equities are completed.

**STEP 21** Transfer of Infrastructure  
[By the L/C Association's Executing Unit]

Infrastructures (such as roads, parks and waterways), which have been created/improved by the the L/C project, are generally transferred in terms of both management and land to the related agencies on the next day of the public announcement of the replotting disposition. Of the management, however, it is possible to set the date of transfer of the infrastructures before or after the next day of the public announcement depending on the progress of the construction work.



## TERMINATING STAGE

### **STEP 22** Liquidation Work [By the L/C Association's Executing Unit]

In order to accomplish the L/C association, the executing unit has to make a report of the prospect on the balance of accounts of the L/C association in the general meeting and then submit an application to the local government. The report on the prospect of balance consists of the following items:

- Results of equity payment
- Present conditions on assets and liabilities of association
- Present conditions on the disposition of reserve land
- Yearly settlements of accounts
- Prospects of balance
- Method for the disposition of association's assets

### **STEP 23** Dissolution of Association [By the L/C Association's Executing Unit]

Dissolution of the association is proceeded as follows:

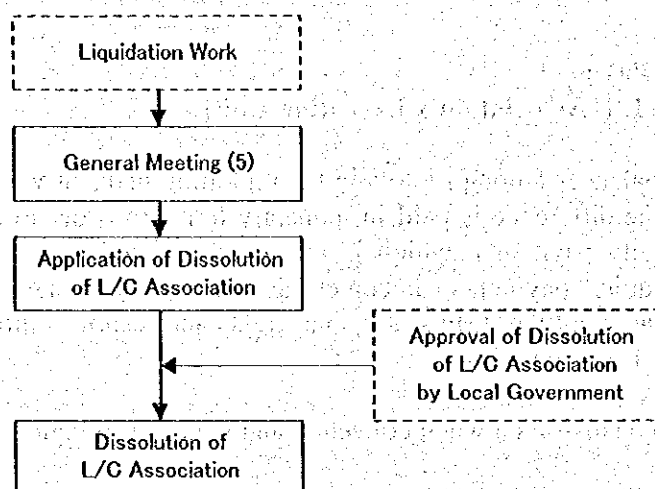


Figure 11 Procedure of Dissolution of the Association

#### (1) General Meeting (5)

The dissolution of the association has to be approved by landowners in this general meeting before the application to the local government. The prospect of balance is reported in this meeting.

#### (2) Application of Dissolution of the L/C Association

After the general meeting, the executing unit prepares the documents to apply the dissolution of association and submit the application to the local government. The needed documents consist of the following items:

- Duplication of public announcement of replotting disposition
- Duplication of land certificates
- Documents certifying transfer of infrastructures
- Documents certifying equity payments
- Minutes of general meeting for the dissolution of the association
- Documents of prospect of balance reported in general meeting
- Implementation plan including articles of the L/C association

**(3) Dissolution of the L/C Association**

When the local government approves the disposition of the L/C association, the executing unit has to submit the final settlement of accounts to the local government.

**STEP 24 Approval of the Association's Dissolution and Liquidation  
[By Local Government]**

The local government has to examine the documents for dissolution of the association applied by the L/C association. When there are not any significant problems in those documents, the local government notifies the approval to the L/C association and asks to submit the final settlement of accounts.

When the final settlement of accounts is submitted by the L/C association and approved by the local government, the dissolution of the L/C association is accomplished.

## **Appendix 1**

### **Environmental Consideration for Land Consolidation Project**

## Appendix 1 Environmental Consideration for Land Consolidation Project

### 1. Environmental Legislation

In the Republic of Indonesia, the basic law concerning the environment is the Government Act No. 23 of 1997 (amendment of Act No. 4 of 1982), regarding basic provisions for the management of the living environment. As stated in the introduction of the Act, the Basic Environmental Law makes an appeal for protection of the environment while making effective use of natural resources, as stated in the Constitution of 1945. This is in accordance with the increasing worldwide awareness of the environment and the responsibility of each country to carry out environmental management based upon an integrated and comprehensive national policy.

Based on Act No. 23 of 1997, the government has put forward various regulations and decrees on environment management. Table A1-1 shows the regulations/decrees related to housing development and its environment. These regulations/decrees will be used as guides for the environmental impact assessment of the study.

Act No. 23 of 1997 prescribes that every plan/project, which is considered likely to have a significant impact on the environment, must be accompanied with an environmental impact assessment (EIA/AMDAL: *analisa mengenai dampak lingkungan*). The environmental impact assessment system has been established accordingly to meet this requirement. Necessary processes of AMDAL are specified in the government regulation No. 27 of 1999, while the type of businesses and activities for which AMDAL is required are specified in the Decree of the State Minister of Environment No. KEP-39/MENLH/8/1996 according to the scale of the plan/project. Figure A1-1 shows the AMDAL screening process for a housing/settlements development project.

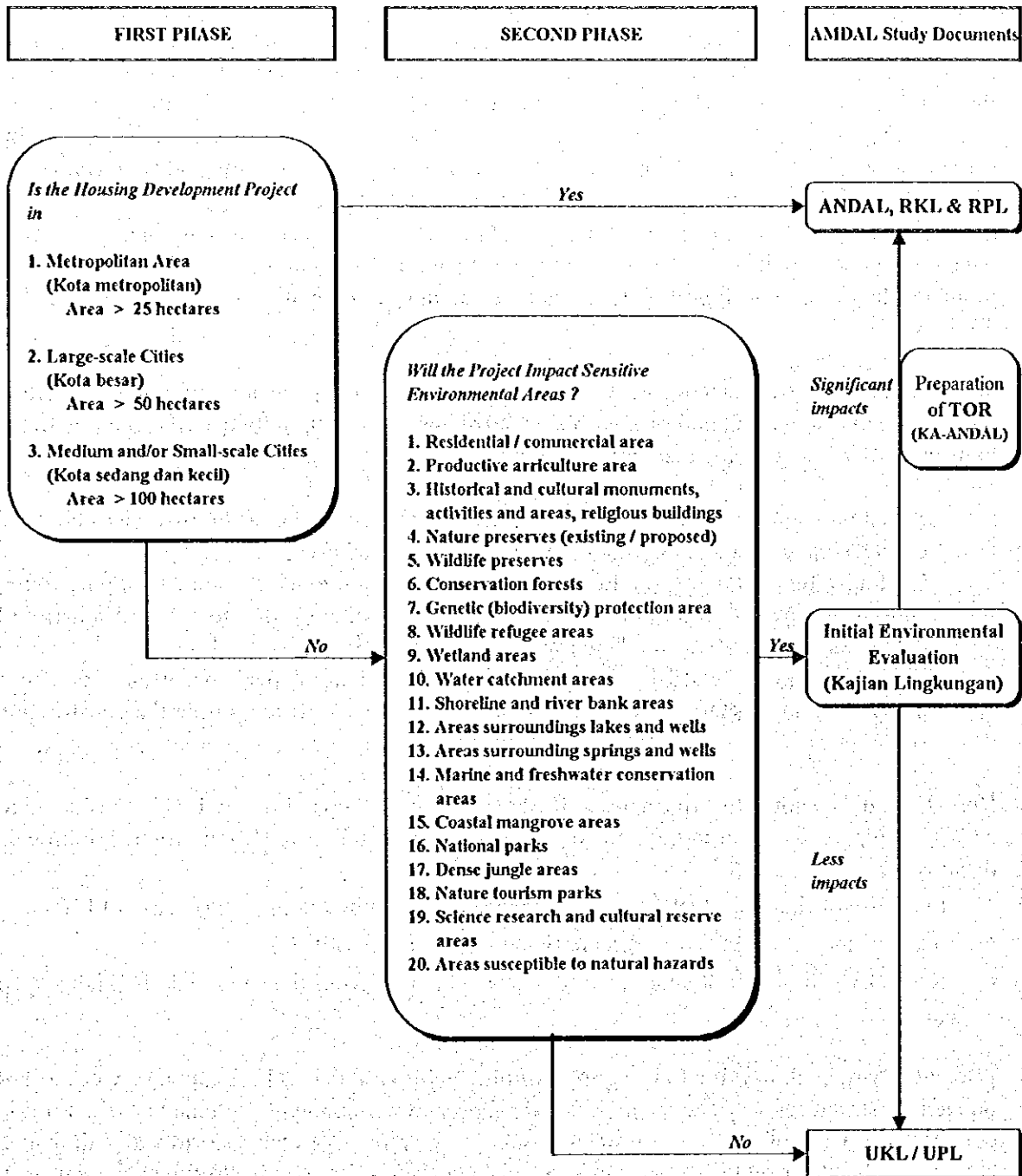
The objectives of the environmental impact assessment (EIA/AMDAL), stated in Government Regulation No. 27 of 1999, are as follows:

- to understand the present condition of the environment in the project area
- to identify the particular activities of the project, which may induce significant impact on the environment
- to predict the environmental impacts and evaluate their magnitudes
- to propose countermeasures for mitigation of the envisaged negative impacts
- to formulate plans for environmental management and monitoring

For a project, which requires the full scaled AMDAL, in accordance with the Indonesian Guidelines summarized in Figure A1-1, terms of reference of environmental impact statement (KA-ANDAL) is prepared and submitted for approval as a first step of the AMDAL study. The output of the AMDAL includes an environmental impact statement (ANDAL: *analisis dampak lingkungan*), an environmental management plan (RKL) and an environmental monitoring plan (RPL). On the other hand, regarding a project for which ANDAL, RKL and RPL are not necessary, some effort for environmental management (UKL) and environmental monitoring (UPL) may still be required in accordance with the project contents and its scale.

**Table A1-1 Environmental Regulations Related to the Housing Development**

Number	Content/Description
<b>(1) Government Act</b>	
No. 5 of 1960	Principles for the Agrarian
No. 5 of 1990	Principles for the Conservation of Ecosystem and Natural Resources
No. 4 of 1992	Housing and Settlement
No. 14 of 1992	Traffic and Transportation
No. 24 of 1992	Spatial Arrangement
No. 23 of 1997	Principles for the Management of Living Environment (amendment of No.4 of 1982)
<b>(2) Government Regulation</b>	
No. 12 of 1988	Perum Perumnas
No. 20 of 1990	Water Pollution Control
No. 27 of 1999	Environment Impact Analysis (AMDAL)
<b>(3) Presidential Decree</b>	
No. 32 of 1990	Conservation Area Management
No. 55 of 1993	Acquisition of Land for Development in the Public Interest
No. 34 of 1994	Institution of Policy and National Housing and Settlement Development Control
<b>(4) State Minister of Environment Decree</b>	
No. KEP-49/MENKLH/1/1987	Guidelines for the Determination of Significant Quality
No. KEP-50/MENKLH/1/1987	Guidelines for the Analysis of Environmental Impacts of Proposed Projects
No. KEP-02/MENKLH/1/1988	Manual on Determining Standard Environmental Quality
No. KEP-12/MENLH/3/1994	General Guidelines on UKL and UPL
No. KEP-14/MENLH/3/1994	General Guidelines on AMDAL
No. KEP-57/MENLH/12/1995	AMDAL for Integrated or Multi-sector Activities
No. KEP-14/MENLH/8/1996	AMDAL Screening
No. KEP-39/MENLH/8/1996	Types of Businesses or Activities Required for AMDAL
No. KEP-55/MENLH/11/1996	Regional AMDAL
No. KEP-299/MENLH/11/1996	Technical Guidelines on Social Aspect Assessment of AMDAL
<b>(5) Head of the Environmental Impact Management Agency Decree</b>	
No. KEP-056/1994	Guidelines for the Determination of Significant Impact
<b>(6) Ministry of Public Works Regulation</b>	
No. 46/PRT/1990	Technical Manual on Environmental Impact Assessment
No. 69/PRT/1995	Technical Guidelines of AMDAL for Public Works Projects
<b>(7) Ministry of Public Works Decree</b>	
No. 531/KPTS/1989	Criteria for Settlement Project where AMDAL is necessary
No. 126/KPTS/1990	Determination of Projects in Public Work Department where AMDAL is necessary
No. 506/KPTS/1992	Guidelines of AMDAL, Department of Public Works (DPU)
No. 211/KPTS/1994	Organization and Working Procedures of DPU
No. 04/KPTS/1995	Formation of AMDAL Central Committee in DPU
No. 58/KPTS/1995	AMDAL Approval Guidelines
No. 69/KPTS/1995	Technical Guidelines of AMDAL for Public Works Projects
No. 147/KPTS/1995	Technical Guidelines of KA-ANDAL for Public Works Projects
No. 148/KPTS/1995	Technical Guidelines of RKL and RPL
No. 296/KPTS/1996	Technical Guidelines of UKL and UPL
No. 39/KPTS/1997	Technical Guidelines of AMDAL for Irrigation Project (related to Groundwater and Surface-water)
No. 41/KPTS/1997	Technical Guidelines of AMDAL for Water Supply Project
No. /KPTS/1997	Technical Guidelines of AMDAL for Housing and Settlement Project
<b>(8) Minister of Agriculture / Head of National Land Agency Regulation</b>	
No. 4 of 1991	Concerning Land Consolidation
No. 2 of 1993	Guidelines for Land Concession
No. 1 of 1994	Land Acquisition
<b>(9) Environmental Management Agency Decree</b>	
No. KEP-56 of 1994	Guidelines for Determination of Important Impact
<b>(10) Perum Perumnas Guideline</b>	
1997	Technical Guideline for AMDAL
<b>(11) Local Regulations/Rules (if any)</b>	



**Legends :**

*KA : Terms of Reference*

*ANDAL : Environmental Impact Statement*

*AMDAL : Environmental Impact Analysis*

*RKL/UKL : Environmental Management Plan*

*RPL/UPL : Environmental Monitoring Plan*

*Source: Analysis from: - State Minister of Environment Decree No.KEP.39/MENLH/8/1996  
- State Minister of Environment Decree No.KEP-11/MENLH/3/1994  
- State Minister of Environment Decree No.KEP-12/MENLH/3/1994*

**Figure A1-1 AMDAL Screening Process for Housing/Settlements Development Project**

## 2. Potential Environmental Impacts and Mitigation Measures

Basic understanding of the potential environmental issues/impacts and their proposed mitigation measures, which might be considered/predicted/evaluated/mitigated in the environmental impact assessment (EIA/ANDAL), in general, due to the housing/settlements development activities through land consolidation (L/C) are shown in Table A1-2. It should be carefully verified in the stage of an initial environmental evaluation (*Kajian Lingkungan*) and/or on preparation of terms of reference of ANDAL, (which is KA-ANDAL), of the housing/settlements development project, in accordance with the contents of a column of "potential environmental impacts" described in Table A1-2. Further, in the stage of the ANDAL process, the environmental items, which have been predicted to have potential negative impacts, shall be carefully evaluated and mitigated taking into account the contents of a column of "mitigation measures" described in Table A1-2.

While, among the environmental items described in Table A1-2, the major environmental factors where potential significant and/or possible negative impacts are commonly envisaged due to the housing/settlements development are as follows:

- i. Social unrest/jealousy due to the gap of service level of public facilities/services between the developed area and existing communities/residential areas
- ii. Groundwater contamination due to a densely usage of *cubluk* (traditional digging toilet) and an outflow of septic tanks, and surface water pollution due to a free discharge of untreated waste-waters and illegal waste dumping to the ditches and rivers
- iii. Flood/inundation caused by an increased runoff and flood peak occurrence due to a pavement and vegetation removal in large-scale, and soil erosion during the construction stage

Here, it should be noted that the magnitude of environmental impacts due to L/C is considered to be less compare with the large-scale housing development like KASIBA, for the following reasons:

- Land-use of the project site does not drastically change by the project (in case of L/C)
- Scale of the development is comparatively small (in case of L/C)
- KASIBA is basically driving existing inhabitants away from the site, while L/C is to keep them on.

**[ Social unrest/jealousy due to the gap of public facilities/services ]** : A gap of service level of public infrastructures/services, such as electric supply, water supply, telephone line, road/traffic conditions, waste collection/transport/disposal, waste-water treatment, storm-water drainage, etc., between L/C developed areas and surrounding existing communities/residential areas, may have potency of social and economic unrest and/or jealousy of the surrounding people. Distribution and/or upgrade the existing public facilities/services to the surrounding communities/residents with the close corporation of the local government concerned or implementation agencies, in connection with regional planing policies, shall be taken into consideration.

**[ Groundwater Contamination and Surface Water Pollution ]** : Further groundwater contamination, caused by the usage of *cubluk* and/or outflow of septic tanks in large numbers, may be occurring. In addition, a degradation of the surface water quality may also be occurring

due to the free discharge of untreated waste-water, which may contain chemicals and bacteria, and illegal waste dumping to ditches and rivers. People in the local regions are fairly much relying on shallow-well water for drinking and commonly use river water for living activities. Therefore, as a basic human need, special attention should be paid on these potential environmental impacts in order to retain the quality of domestic water that is sine qua non to public health and the safety human lives. As mitigation measures on this issue, technical options, such as, deep wells with a water piping distribution network, sewerage treatment system, periodical discharging/emptying of septic tanks, proper settlement/location of septic tanks, etc., are proposed.

**[ Flood/Inundation and Soil Erosion ]** : An increased runoff coefficient and hastening of the flood peak occurrence, due to the large-scale pavement and vegetation removal, an improved storm-water collection/removal and a disruption of natural drainage patterns, may have the potency to cause floods at the surroundings of the project site and down stream of the region, especially in the rainy season. As a mitigation to prevent this occurrence, flood control measures, such as retention-pond facilities and water-flow retention devices, shall be taken into account for the project plan.

During the construction period, it will be problematic that large exposed parcels of land will remain without any construction activities for a long time. In the rainy season, a disturbance of the present natural hydrology/drainage system may happen and may cause the project sites' soil erosion and floods in the down stream area of the region. Therefore, it is necessary to plan for and organize the proper construction plan/process to mitigate this issue, such as: to keep the construction area minimum and/or divided into phases, considering the rainfall pattern of the region, compaction or turfed/re-vegetation of exposed land sooner, etc.

### 3. Environmental Management and Monitoring

Environmental management and monitoring are indispensable in each stage of the project, i.e. pre-construction, construction and post-construction stage. This includes not only the management/monitoring of environmental issues related to the project, but also those related to environmental improvement in the surrounding region. Items, which shall be taken into consideration for the environmental management/monitoring plan, are shown as follows:

#### a. Environmental management plan

Organization for environmental management Management of land consolidation/relocation Environmental surveillance of construction work Environmental education Others (if any)
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#### b. Environmental monitoring plan

Traffic volume monitoring Groundwater level and quality monitoring Hydrological situation related to flood/ soil erosion Post relocation survey Others (if any)
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### 4. Past Housing Development Experiences and Environmental Issues

In order to find/identify the environmental issues/impacts due to the housing/settlements development, verification of environmental issues for the selected eleven (11) housing development experiences in Indonesia, which AMDAL had been performed, have been carried out in the study. Table A1-3 shows the list of selected projects, and the overall environmental issues in each housing project are shown in Table A1-4.



**Table A1-2 Potential Environmental Impacts and Mitigation Measures for Housing and Settlements Development Through Land Consolidation (I/C)**

No	Environmental Items	Potential Environmental Impacts	Mitigation Measures
<b>A. Social Environment</b>			
A-1	Urbanization	<ul style="list-style-type: none"> <li>• Social friction/unrest between the rural and urban communities in the transitional period of urbanization due to <i>project-led urbanization</i> (The rural area/communities neighboring to the project site will socially and/or economically influenced by the adjacent urbanized housing estates.)</li> </ul>	<ul style="list-style-type: none"> <li>• In the surroundings of large-scale cities, how to smoothen the rural communities neighboring to the housing/settlements project site to convert them from rural to urban shall be taken into considered, in connection with the regional planning policies</li> </ul>
A-2	Relocation	<ul style="list-style-type: none"> <li>• Social unrest due to the adoption of unfair land consolidation and sometimes inflicting reduction or loss of living foundations of the inhabitants</li> </ul>	<ul style="list-style-type: none"> <li>• Any involuntary land consolidation shall be carried out in accordance with the proper standards/legislation</li> <li>• Sufficient compensation for the affected people shall be provided, and it should be performed in fair and in mutual agreement base</li> <li>• Extension of the project benefit, which brings about the regional development; i.e. increasing of goods flow, public services, working opportunities, etc. shall be taken into account for the positive impact (plus factors) caused by the project</li> </ul>
A-3	Economic Activities	<ul style="list-style-type: none"> <li>• Social unrest due to reduction or loss of bases of economic activities caused by land consolidation and/or reduction or loss of prime-agricultural land</li> <li>• Social jealous/friction/gap/conflict between inhabitants in the land consolidated area and surrounding local residents</li> </ul>	<ul style="list-style-type: none"> <li>• Giving extension to local people/communities/societies concerning the planned activities of land consolidation development in connection with a regional planning policies</li> <li>• Examine the practical use of existing economic activities in the region</li> <li>• Guarantee or compensate for the reduction or loss of bases of economic activities</li> </ul>
A-4	Public Facilities and Traffic	<ul style="list-style-type: none"> <li>• Gap of service level of public infrastructures/services, such as electricity supply, water supply, telephone line, road/traffic condition, waste collection/transport/disposal, waste-water treatment, storm-water drainage, etc., between the land consolidation development area and surrounding existing community/residents, which may have potential social and economic unrest and/or jealousy of the surrounding communities/residents</li> </ul>	<ul style="list-style-type: none"> <li>• Distribution of public infrastructure/services to the surrounding residential area/communities shall be taken into considered to prevent the potential social unrest due to gap of its service level between land consolidated area and surroundings</li> <li>• Upgrade the existing public facilities/services and infrastructure of surroundings with the close corporation of the local government concerned, in connection with a regional planing policies</li> <li>• Coordination with other planning goals and objectives for the region</li> </ul>
A-5	Cultural Property	<ul style="list-style-type: none"> <li>• Damage to or loss of the value of mosque, archaeological remains or other cultural assets</li> </ul>	<ul style="list-style-type: none"> <li>• Preservation or relocation of the archaeological, cultural or religious assets</li> </ul>
A-7	Waste	<ul style="list-style-type: none"> <li>• Should the generated waste volume</li> </ul>	Proper solid waste management (SWM) shall

No	Environmental Items	Potential Environmental Impacts	Mitigation Measures
	(Solid waste)	<p>exceed the capacity of waste collection, transport and disposal services provided by the local government, the uncollected waste might be illegally dumped into ditches, rivers, etc. The illegally dumped waste which contains high BOD load and bacteria as <i>leachate</i> form may cause water contamination, offensive odor, vector generation, etc. and create a negative impact on the health and sanitation conditions in the region</p> <ul style="list-style-type: none"> <li>● Generation of surplus soil, construction/demolition wastes due to the construction activities</li> </ul> <p>[ Excavated soil (surplus soil) should not be dumped or left as it is, to prevent it flow into surrounding rivers, which may cause interruption of its flow and flood ]</p> <p>(Regarding to "wastewater", refer to the following article of C-2 Water pollution)</p>	<p>be introduced and carried out by the responsible local government (<i>Dinas Kebersihan</i>) in the project area or other agencies, including its surroundings, taking into account the following aspects:</p> <ul style="list-style-type: none"> <li>● Primary waste collection system from households</li> <li>● Setting of temporary storage site of waste (TPS: <i>tempat pembuangan sementara</i>), if necessary</li> <li>● Waste transport and discharge to final disposal site (TPA: <i>tempat pembuangan akhir</i>)</li> <li>● Institutional/organizational and financial strength of local authorities, which response to serve SWM in the project area and surroundings</li> <li>● Publicity and promotional activities in order to reduce/recycle the waste</li> <li>● Social education on the environmental awareness</li> <li>● Dump sites of the surplus soil and demolished waste shall be properly settled in the construction plan and properly discharged</li> </ul>
A-9	Hazards (Risk)	<ul style="list-style-type: none"> <li>● In case the project site is located at hilly area, landslides or failure of cut or filled slopes which may cause damage to residents' land and houses</li> </ul> <p>(Regarding to "flood/inundation", refer to the following article of B-3 Hydrological situation)</p>	<ul style="list-style-type: none"> <li>● Examination of construction plan, such as construction period, method, etc.</li> <li>● Slope protection measures, such as retaining wall, concrete frame work with vegetation, etc. shall be introduced at the filled and/or cut slopes</li> </ul>
<b>B. Natural Environment</b>			
B-1	Soil Erosion	<ul style="list-style-type: none"> <li>● Large-scale exposure of topsoil due to the land reclamation and vegetation removal may cause river pollution resulting in soil erosion and siltation by heavy-rain</li> </ul>	<ul style="list-style-type: none"> <li>● Soil erosion control, such as reforestation, slope protection work, etc. in both temporary (construction stage) and permanent base</li> <li>● Examination of construction plan, such as construction period, method, etc.</li> </ul>
B-2	Groundwater	<ul style="list-style-type: none"> <li>● Depletion of groundwater resources and drying up of wells may happen due to the over-drafting of groundwater resources in accordance with population increase and commercial/industrial development at the region and surroundings by the housing/settlements development</li> <li>● Large-scale pavement of ground surface causes less rain water seepage, resulting in the lowering of the groundwater table</li> </ul>	<ul style="list-style-type: none"> <li>● Planning of groundwater usage by the regional level with a regional planning policies</li> <li>● Ensure that projected usage of groundwater is within capacity of natural groundwater system to replenish itself</li> <li>● Improvement of water supply system based on alternative water sources</li> </ul>
B-3	Hydrological Situation	<ul style="list-style-type: none"> <li>● Increase of runoff coefficient and</li> </ul>	[ Planning stage ]

No	Environmental Items	Potential Environmental Impacts	Mitigation Measures
		<p>shortening of the flood peak reaching time due to the increased impervious area by pavement, removal of trees/vegetation, improved storm-water collection/removal and disruption of natural hydrology/drainage patterns may have the potency to cause the flood and/or inundation at the objected region and down stream of the region, especially in rainy season</p> <ul style="list-style-type: none"> <li>Change of river-bed condition due to inflow of large amount of soil following the landfill work of housing development may cause the flood and/or inundation in the region</li> </ul> <p>[ Planning stage ] In case, 1<sup>st</sup>: the river receiving the outflow from the development area does not have enough capacity to absorb the increased run-off discharge, or 2<sup>nd</sup>: the river has potential impacts on flood of downstream area, flood control measures shall be taken into account for the project plan.</p> <p>[ Construction stage ] In general, housing/settlements projects are to be developed for the period of several years or more. During this period, it will be feared that the exposed land will be kept remained for a long time, which may cause the soil erosion. Therefore, it is necessary to plan for and organize a proper implementation plan.</p>	<ul style="list-style-type: none"> <li>Preserve existing stable drainage patterns on site</li> <li>Proper storm-water management plan shall be instituted in the region including surrounding area</li> <li>Improvement of existing drainage system</li> <li>Retention pond facilities at the outlet point of storm-water collected from the project area to rivers</li> <li>Water-flow retention devices along with the storm-water drainage</li> </ul> <p>[ Construction stage ]</p> <ul style="list-style-type: none"> <li>The working area for construction shall be kept to a minimum and/or divided in phases to avoid excessive soil erosion and sedimentation</li> <li>The timing of construction activities has to take into account the rainfall pattern so as to reduce exposed land to erosion consequences</li> <li>During construction, compaction of exposed land shall be carried out sooner after land clearance</li> <li>Exposed cleared lands should be worked and/or recommended to be turfed/re-vegetated within the shortest practical time</li> <li>Sediment traps are recommended to be constructed to prevent sediments getting into surrounding river or drain</li> </ul>
B-4	Fauna and Flora	<ul style="list-style-type: none"> <li>Obstruction of breeding and extinction of species due to change of habitat conditions caused by housing/settlements development; such as inflow of people, generation of noise, vibration, and water/air pollution</li> </ul> <p>(Careful consideration should be given in case the endemic species designated by PHPA are found and/or vulnerable ecological system, such as forest, wet-lands, mangroves, etc. are exist in the project site or surroundings.)</p>	<ul style="list-style-type: none"> <li>Ensure that regional critical natural environment sites such as major forested area, water bodies and wet-land habitats containing endemic fauna and flora, etc., are identified and not threatened by housing/settlements development</li> <li>Protection measures for endemic fauna and flora</li> <li>Careful attention for the construction plan and management of the housing/settlements development</li> <li>Adequate regional planning policies, mentioned in No. A-3 of this table, shall be taking into considered</li> </ul> <p>(Special attention should be paid to the valuable aquatic life in the area or in the downstream region.)</p>
B-5	Landscape	<ul style="list-style-type: none"> <li>Change of topography and vegetation due to reclamation, cut and fill for the housing/settlements development</li> <li>Deterioration of aesthetic harmony by</li> </ul>	<ul style="list-style-type: none"> <li>Examination of planning contents of housing/settlements development</li> </ul>

No	Environmental Items	Potential Environmental Impacts	Mitigation Measures
		<p>structures</p> <p>(Special attention should be paid in case the landscape has special values for the religion, tourism, etc.)</p>	
<b>C. Environmental Pollution</b>			
C-1	Air Pollution	<ul style="list-style-type: none"> <li>● Traffic increase due to activation of the living/economic activities in the region may cause the negative effects on the public health of inhabitants, and on fauna and flora in the region and surroundings by the exhaust gas and dust from vehicles</li> <li>● Exhaust gas and dust produced by construction equipment and vehicles used for land reclamation and facility construction may cause the negative effects mentioned above</li> </ul> <p>(The impact may be greater in the dry season.)</p>	<ul style="list-style-type: none"> <li>● Restriction for the exhaust gas from vehicles</li> <li>● Restriction of the speed of transportation vehicles/trucks in order to prevent and minimize the dust production during the construction</li> <li>● Transportation trucks to carry soil and/or demolished waste shall be covered by canvas, etc.</li> <li>● Dust control by spring water during the construction</li> <li>● Examination of construction method and schedule</li> </ul>
C-2	Water Pollution (Human waste and Wastewater)	<ul style="list-style-type: none"> <li>● Groundwater contamination caused by the usage of <i>cubluk</i> (traditional digging toilet) and/or outflow of septic tanks which used for toilets in large numbers. In a densely populated area where inhabitants are fairly much reliant on shallow-wells for drinking, the usage of <i>cubluk</i> may have the potency to lead a generalized contamination of soil and groundwater and further to negative impact on public health of local/surrounding inhabitants</li> <li>● Groundwater and/or river water pollution due to free discharge of untreated wastewater/gray water mainly produced at MCK (bathing, laundry, kitchen, etc.) which may contain chemicals and bacteria</li> <li>● River water pollution due to illegal dumping of the solid waste to the river may cause the negative effects on the public health and/or water usage of the region/inhabitants</li> </ul> <p>(Special attention shall be paid on this issue, in case people in the region are using shallow well water and/or river water for living activities, especially for drinking.)</p> <ul style="list-style-type: none"> <li>● Washing out of top-soil by rain following the cut down of trees and earth cut/filling work will create turbid water flow into river and lakes, which cause the negative impacts on growth of aquatic lives</li> </ul> <p>[ Taking into account the securing of safety domestic water, especially for drinking</p>	<p>[ Treatment of human waste/ night soil ]</p> <ul style="list-style-type: none"> <li>● <i>Cubluk</i> shall not be installed anymore</li> <li>● Distance between shallow well and septic tank shall be more than 10m and depth of the well shall be more than 12m (recommended by World Bank report)</li> <li>● Septic tank needed to be de-sludged/emptied once every two years to prevent the outflow</li> <li>● Proper type of septic tank shall be selected : i.e. equipped with out-flow filter, two-compartment tank, etc. for its introduction for the project</li> <li>● Water distribution system shall be introduced in corporation with PDAM or PDM (drinking water company/ <i>perusahaan daerah air minum</i>), if any.</li> <li>● Installation of deep well with piping distribution network/system is recommended</li> </ul> <p>[ Treatment of wastewater/ gray water ]</p> <ul style="list-style-type: none"> <li>● Usage of septic tank (on-site system) in each dwelling and/or communal level, for the combined treatment of both night soil and gray water</li> <li>● Usage of sewage collection pipe network and/or covered ditches conveying the wastewater into sewage treatment plant before releasing it into the river (off-site system/separate sewer system)</li> <li>● Usage of sewage collection pipe network and/or covered ditches conveying both wastewater and storm-water into a sewage</li> </ul>

No	Environmental Items	Potential Environmental Impacts	Mitigation Measures
		purpose, and to keep the safety life and human health, the treatment of human waste and wastewater shall be properly handled/planned/treated. ]	treatment plant (off-site system/combined sewage system)  (Special attention should be paid to the water-usage or water basin-usage of residents/communities in the surrounding area or in the downstream region.)
C-3	Noise and Vibration	<ul style="list-style-type: none"> <li>● Noise and vibration due to operation of heavy equipment and vehicles for land reclamation work may cause the negative effects on the living environment of residents and/or valuable wildlife habitats</li> <li>● In accordance with the housing development following the road improvement, noise and vibration issues may cause and negative effects on the living environment of residents and/or valuable wildlife habitats</li> </ul>	<ul style="list-style-type: none"> <li>● Examination of construction schedule and working hours, and careful construction planning and management</li> <li>● Construction work shall not be carried out at night time</li> <li>● Provide buffer zones with trees between residential area/public facilities (such as school, hospital, etc.) and sources of noise and vibration (i.e. along the main road)</li> </ul>
C-4	Land Subsidence	<ul style="list-style-type: none"> <li>● Land subsidence/sedimentation may sometimes be occurred at the alluvial and clay soil areas due to the lowering of the groundwater table, and/or former swamp/lower-land areas</li> <li>● Flood/inundation may sometimes occurred due to land subsidence/sedimentation</li> </ul> <p>(Special attention should be paid in case the lowering of the groundwater table and land subsidence has already progressed in the objected region.)</p>	<ul style="list-style-type: none"> <li>● Planning of groundwater usage by the regional level with a regional planning policies and ensure that projected usage of groundwater is within capacity of natural groundwater system</li> <li>● Improvement of water supply system based on alternative water sources</li> <li>● Proper storm-water management plan, i.e. to prevent the storm-water flow into the project site, shall be introduced in case the site is located at low-land or former flood area</li> <li>● Embankment shall be introduced in order to high-up the ground-level of the project site taking into account the predicted natural sedimentation</li> </ul>
C-5	Offensive Odor	<ul style="list-style-type: none"> <li>● Operation of waste depot, waste transfer station, disposal site, sewage treatment plant, etc. may cause offensive odor, and negative effects on the living environment of residents may happened</li> </ul>	<ul style="list-style-type: none"> <li>● Location of public facilities and/or resident distribution shall be taking into considered for the facility plan which create offensive odor</li> </ul>

**Table A1-3 List of Represented Past Housing Development with ANDAL in Indonesia**

No	Project Name & Implementation Agency	Year	Location	Project Description	Data Source
A	Bukit Semarang Baru Housing Estate - PT. Karyadeka Alam Lestari	1998	Semarang, Central Java	<ul style="list-style-type: none"> <li>▪ Area: 1000 ha, covering 6 villages housing, commercial, recreation, techno-park, public &amp; social facilities.</li> <li>▪ Housing type :                             <ul style="list-style-type: none"> <li>- Modest : 8,959 units</li> <li>- Medium : 4,111 units</li> <li>- Luxurious : 1,568 units</li> </ul> </li> </ul>	Study EIA, RKL/RPL on New City Development new Semarang still on Semarang Municipal Central Java 1998.
B	Kapuk Housing Estate - PT. Bumi Serpong Damai	1995	Kapuk village, North Jakarta	<ul style="list-style-type: none"> <li>▪ Total area : 906 ha</li> <li>- Housing : 457 ha</li> <li>- Recreation and sport : 243 ha</li> <li>Commerce, environment centre facilities: 131 ha</li> <li>- Own houses : 10,000 units</li> <li>- Shop Office : 29 ha</li> <li>- Hotel, cottage, apartment : 23 ha</li> <li>- Warehouse : 23 ha</li> </ul>	Study EIA, RKL, RPL on Development Phase I & II for tourism estate and housing Kapuk, Northern Jakarta, April 1995.
C	Bumi Serpong Damai Housing Estate - PT. Bumi Serpong Damai	1992	Kabupaten Tangerang, Serpong village, West Java Province	<ul style="list-style-type: none"> <li>▪ Area : 6,000 ha</li> <li>- Housing : 137,900 units</li> <li>- House, office, shops, public &amp; Social facilities.</li> </ul>	Summary Study EIA, RKL & RPL, technical guidance for AMDAL on housing / settlement Perum Perumnas 1997.
D	Perumnas Cengkareng housing - PT. Perumnas	1992	Cengkareng Village, West Jakarta	<ul style="list-style-type: none"> <li>▪ Area : 96 ha</li> <li>- Four stories housing</li> </ul>	Summary Study EIA, RKL & RPL, technical guidance for AMDAL on housing / settlement Perum Perumnas 1997.
E	Kota Wisata Housing Estate - PT. Mekanusa Cipta	1998	Gunung Putri village, Kabupaten Bogor, West Java Province	<ul style="list-style-type: none"> <li>▪ Area : 493 ha</li> <li>- Housing Type :                             <ul style="list-style-type: none"> <li>- Small</li> <li>- Medium</li> <li>- Large</li> </ul> </li> <li>- Public facilities &amp; Social facilities</li> </ul>	Study EIA, RKL, RPL on Kota Wisata housing estate development Desa Ciangsana & Nagrek, Gunung Putri village, Kabupaten Bogor West Java Province 1998.
F	Arga Bajapura Housing Estate - PT. Cipta Sarana Usaha	1998	Pulo Merak village, Kabupaten Serang, West Java Province	<ul style="list-style-type: none"> <li>▪ Area : 300 ha</li> <li>- Housing Type :                             <ul style="list-style-type: none"> <li>- Small : 1,932 units</li> <li>- Medium : 2,220 units</li> <li>- Large : 235 units</li> </ul> </li> </ul>	Study EIA, RKL, RPL. Housing Estate Arga Bajapura, Desa Grogol, Kotasari, Rawa Arum, Pulo Merak village, Kabupaten Serang West Java Province
G	Perumnas Klender Housing - PT. Perumnas	1990	Klender village, East Jakarta	<ul style="list-style-type: none"> <li>▪ Area : 204 ha</li> <li>- House type : simple, flats, middle</li> <li>- Facilities: Schools, mosque, church, market, clinic.</li> </ul>	Evaluation study on housing project in Jabotabek, 1990.
H	The Ciledug Indah Housing Estate	1990	Ciledug village, Kabupaten Tangerang, West Java Province	<ul style="list-style-type: none"> <li>▪ Area : 22.3 ha</li> <li>▪ Housing type :                             <ul style="list-style-type: none"> <li>- 21/60 : 4.2 ha</li> <li>- 36/81 : 7.8 ha</li> <li>- 36/102 : 2.5 ha</li> </ul> </li> <li>▪ Road &amp; infrastructure: 7.8 ha</li> </ul>	Evaluation study on housing project in Jabotabek, 1990.
I	Antilop Maju Legok housing Estate - PT. Antilop Maju	1998	Legok village, Kabupaten Tangerang, West Java Province	<ul style="list-style-type: none"> <li>▪ Area : 240 ha</li> <li>▪ Housing type :                             <ul style="list-style-type: none"> <li>- Luxury : 884 units</li> <li>- Medium : 2532 units</li> <li>- Simple : 1720 units</li> </ul> </li> <li>▪ Commercial &amp; Facilities</li> </ul>	Study EIA, RKL, RPL Legok housing estate, 1998.
J	Bukit Sentosa Housing Estate - PT. Duta Mas Graha Nusantara	1998	Ciwandan village, Kabupaten Serang, West Java Province	<ul style="list-style-type: none"> <li>▪ Area : 200 ha</li> <li>▪ Housing type :                             <ul style="list-style-type: none"> <li>- Very simple housing (RSS):                                     <ul style="list-style-type: none"> <li>- 4,765 units / 38 ha</li> </ul> </li> <li>- Simple housing :                                     <ul style="list-style-type: none"> <li>- 5,987 units / 50 ha</li> </ul> </li> <li>- Medium &amp; Luxury:                                     <ul style="list-style-type: none"> <li>- 368 units / 12 ha</li> </ul> </li> <li>- Commercial, public facilities</li> </ul> </li> </ul>	Study EIA, RKL, RPL Bukit Sentosa Housing Development Kecamatan Ciwandan Kabupaten Serang.
K	Alam Indah Kencana Agung Housing - PT. Alam Indah Kencana Agung	1995	Cidadap village, Bandung Municipal and Kecamatan Lembang, Kabupaten Bandung, West Java Province	<ul style="list-style-type: none"> <li>▪ Area : 284 ha</li> <li>▪ Housing : 165 units / 18 ha</li> <li>▪ Facilities: garden, road, drainage, sport center / 15 ha</li> </ul>	Study EIA, RKL, RPL, Alam Indah Kencana Agung Housing Plan, 1995.

**Table A1-4 Overall Environmental Issues on the Past Housing Development Projects in Indonesia**

No.	Project Phases	Project Activities with Potential Impact	Environmental Item /Component	Types of Environmental Impact	A	B	C	D	E	F	G	H	I	J	K				
1.	Pre-Construction	Determination of development site Survey and investigation Land acquisition	Social-economic Social-economic Social environment	Speculation on the land price	NP					NP		4							
				Change of spatial structure			XXX	XX						1		NTP	NTP		
				Speculation on the land price			XXX	XX											
				Social unrest															
				Change of land ownership			NP					NP	-BP	3	3	NP	NP	NTP	NTP
2.	Construction	Relocation of Population Mobilization of heavy equipment Mobilization of labor Land clearing Cut & Fill Transportation and storage of materials Construction of housing / building and infrastructures	Demography Road and bridge Economic activities Fauna and Flora Air quality Hazard (Risk) Landscape Hydrological situation Road and bridge Air quality Noise and vibration Landscape Traffic Security	Usage of compensated money								3	3	NP	NP	NTP	NTP		
				Change of loss of livelihood										3	3	NP	NP	NTP	NTP
				Disturbance to security/order										3	3	NP	NP	NTP	NTP
				Decreasing of agricultural product (dryland, ricefields)										3	3	NP	NP	NTP	NTP
				Change of population structure										3	3	NP	NP	NTP	NTP
				Road and bridge damages								NP		3	3	NP	NP	NTP	NTP
				Traffic congestion								NP		4	4	NP	NP	NTP	NTP
				Increase of income				PP	4/5			PP	+BP	4	4	PP	PP	PP	PP
				Social envy/unrest				NP				NP	-KP	2	2	NP	NP	NTP	NTP
				Loss of habitat								NP		4	4	NP	NP	NTP	NTP
				Change of micro-climate				NP	5/5			NP	-BP	3	3	NP	NP	NTP	NTP
				Erosion								NP		2	2	NP	NP	NTP	NTP
				Change of landscape								NP		4	4	NP	NP	NTP	NTP
				Disturbance to drainage system								NP	-BTP	4	4	NP	NP	NTP	NTP
				Road & bridge damages								NP		2	2	NP	NP	NTP	NTP
Dust								NP		3	3	NP	NP	NTP	NTP				
Noise								NP	-KTP	3	3	NP	NP	NTP	NTP				
Spill of earth/material								NP	-KTP	3	3	NP	NP	NTP	NTP				
Traffic congestion								NP		1	1	NP	NP	NTP	NTP				
Theft of materials								NP		3	3	NP	NP	NTP	NTP				
People's perception								NP											
3.	Post-Construction	Occupation/Utilization of: a. Houses b. Commercial facilities c. Sports facilities d. Office facilities e. Infrastructure f. Clean water g. Waste water h. Garbage etc.	Ground water Hydrological situation Air quality Landscape Ground water Social-economic Social-culture	Decreasing of rainwater seepage	NP					NP	-BP	3	3	NP	NP	NTP	NTP		
				Increasing of water run off							NP	-BP	3	3	NP	NP	NTP	NTP	
				Change of micro climate								NP	-KTP	2	2	NP	NP	NTP	NTP
				Disturbance on amenity and decreasing of environmental aesthetics and increasing of embase amount								NP		4	4	NP	NP	NTP	NTP
				Depletion of ground water							NP	-BP	4	4	NP	NP	NTP	NTP	
				Change of livelihood of the surrounding communities							PP	-BP	3	3	NP	NP	NP	NP	
				Social envy/unrest							NP		-KTP	3	3	NP	NP	NTP	NTP
				Acculturation between the occupants and surrounding communities							PP		+KP	3	3				
				Assimilation between the occupants and surrounding communities.							PP		+KP	4	4	PP	PP	PP	PP

(Source: Data Source are shown in Table A-3)

**Note:**

**Names of Housing Development Project:**

- A : Bukit Senawang Baru Housing Estate
- B : Kapuk Housing Estate
- C : Bumi Serpong Damai Housing Estate
- D : Perumahan Cempurans
- E : Kota Wisata Housing Estate
- F : Arga Majapahit Housing Estate
- G : Perumahan Kencana
- H : The C'edong Indah Housing Estate
- I : Layak Housing Estate
- J : Bukit Senawa Housing Estate
- K : Alam Indah Kencana Agung Housing Estate

**Impact Evaluation - Magnitude:**

1	Small Impact	-BP	Large Important Negative
2	Medium Impact	-KTP	Important Negative
3	Medium	-KTP	Medium Important Negative
4	Large	BP	Large Important Positive
5	Very Important	KP	Not Important Positive

**Impact Evaluation - Magnitude:**

NP	Small Impact	1	Small Impact
PP	Important Negative	2	Medium Impact
XX	Important Positive	3	Medium Impact
XXX	Small Impact	4	Large Impact
XXX	Medium Impact	4	Large Impact

**Impact Evaluation - Magnitude:**

NP	Small Impact	1	Small Impact
PP	Important Negative	2	Medium Impact
XX	Important Positive	3	Medium Impact
XXX	Small Impact	4	Large Impact
XXX	Medium Impact	4	Large Impact

**Impact Evaluation - Magnitude:**

NP	Small Impact	1	Small Impact
PP	Important Negative	2	Medium Impact
XX	Important Positive	3	Medium Impact
XXX	Small Impact	4	Large Impact
XXX	Medium Impact	4	Large Impact

**Impact Evaluation - Magnitude:**

NP	Small Impact	1	Small Impact
PP	Important Negative	2	Medium Impact
XX	Important Positive	3	Medium Impact
XXX	Small Impact	4	Large Impact
XXX	Medium Impact	4	Large Impact