

(2) Utilization of Head between Aqueduct and River Beneath

This idea would provide new diversion work near the existing aqueduct, and then utilize the head to the powerhouse to be constructed on the river bank beneath the aqueduct.

The aqueduct is located in Sungaiduo Village, which is about 0.5 km upstream of the diversion structure BBH11 in the main canal. The plan, profile and current condition of the aqueduct are shown in Figures 5.3.5 and 5.3.6.

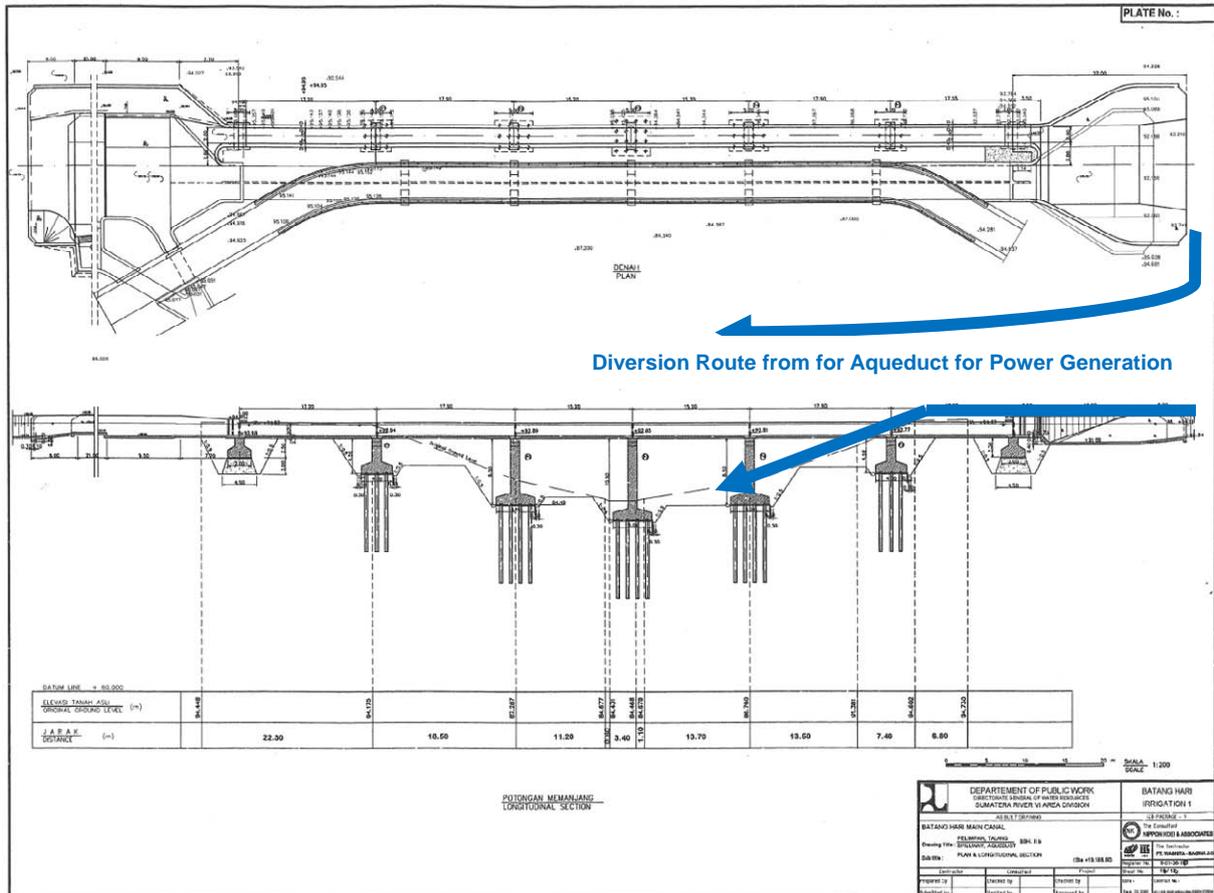


Figure 5.3.5 Plan and Profile of Existing Aqueduct

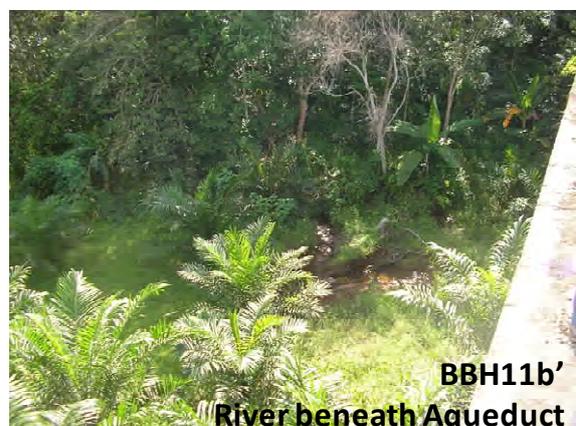


Figure 5.3.6 Existing Aqueduct

The gross head between the water surface in the main canal and the river bottom beneath the aqueduct is about 9.5 m, as shown in the as-built drawing and as confirmed at the site.

As shown in Table 5.3.1, surplus water available for power generation is calculated for the basic scenarios in the same way as for the case of BBH6. The annual average discharge is 6.06 m³/s.

Table 5.3.1 Surplus Water Available for Power Generation at BBH11b Site

Basic Scenario												Unit: m ³ /s
	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
1 st half	2.03	7.36	5.76	7.14	4.48	2.99	10.87	16.42	17.06	7.57	3.95	0.00
2 nd half	4.05	0.75	0.85	1.60	0.53	5.22	13.11	15.99	0.00	8.64	2.45	6.72

Source: JICA Survey Team

The most possible layout of this plan is to construct a new diversion structure on the main canal at the immediate downstream of the existing aqueduct. An intake is provided at the right bank of the main canal, which will be connected to the steel penstock and powerhouse to be newly constructed on the left bank of the river beneath the aqueduct.

Comparison between this plan and the plan using the SEDASI pump station is presented in Table 5.3.2. As shown in this table, the plan using the SEDASI pump station is more suitable. As both these plans discharge surplus water outside the irrigation system, and thus mutually exclusive, the plan to utilize the head between the aqueduct and the river beneath is discarded from further examination.

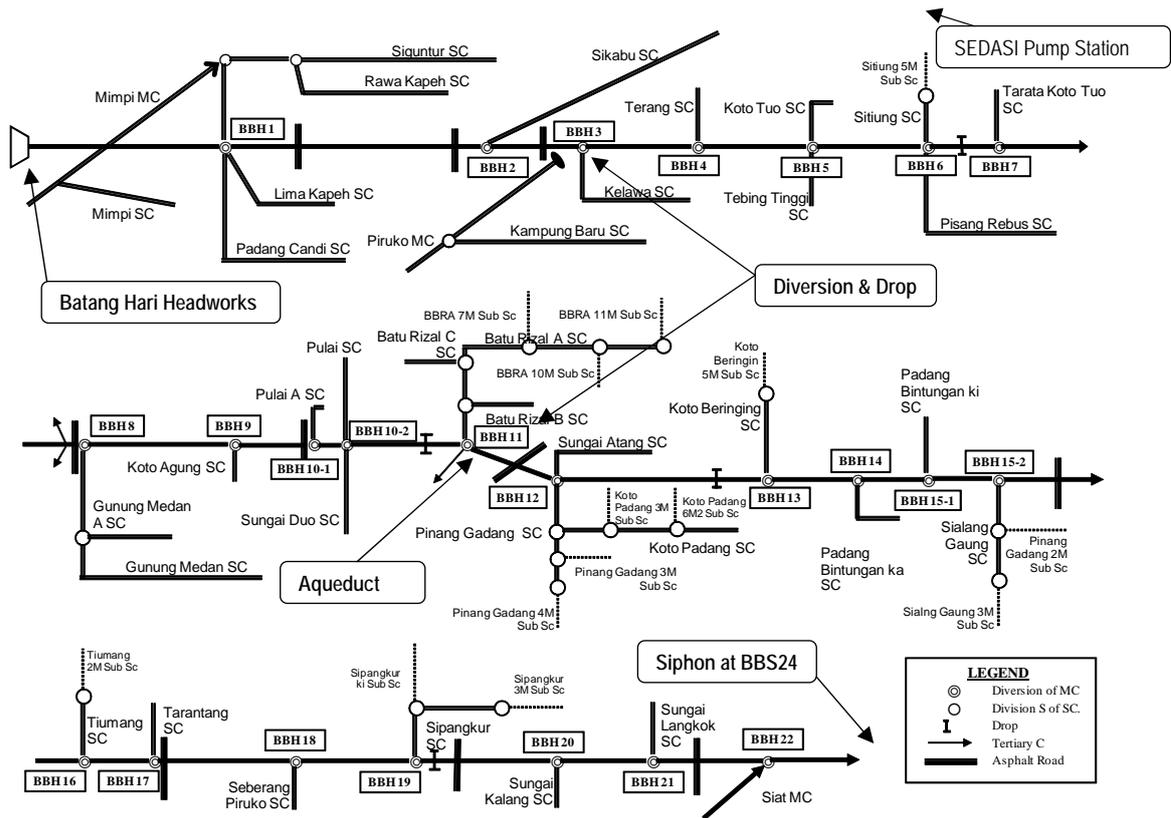
Table 5.3.2 Comparison of Plans Using Surplus Water in Main Canal

Location	SEDASI pump station	Aqueduct
Gross Head	19.0 m	9.5 m
Annual Average of Surplus Water Available	7.43 m ³ /s	6.06 m ³ /s
Project Component	Rehabilitation of: - Intake - Sitiung Secondary Canal - Powerhouse New construction of: - Penstock	New construction of: - Diversion structure - Intake - Penstock - Powerhouse
Connection with Transmission Line	200 m	800 m
Land Acquisition	Not required	Required

Source: JICA Survey Team

5.3.2 Power Generation Plan Using Drop Works, Diversion Works and Siphons

The Batang Hari main canal has drop works and diversion works, and surplus head is dissipated to the required head in the canal section there. Figure 5.3.7 shows a schematic diagram of the Batang Hari main irrigation system indicating locations of those drop works, diversion works and siphons.



Source: JICA Survey Team

Figure 5.3.7 Schematic Diagram of Batang Hari Irrigation System (BBH1-BBH22)

As listed in Table 5.3.3, the Batang Hari main canal has four drop works and 28 diversion works in total.

Table 5.3.3 List of Drop Works and Diversion Works of Main Canal

Drop Works	Discharge (m ³ /s)	Drop Height (m)				
BBH.7c	20.90	0.74				
BBH.11a	17.59	0.92				
BBH.13b	13.08	1.24				
BBH.23a	9.04	0.42				
Diversion Works	Discharge (m ³ /s)	Drop Height (m)	Diversion Works	Discharge (m ³ /s)	Drop Height (m)	
BBH.1	25.20	1.03	BBH.15	12.05	0.00	
BBH.2	23.81	1.26	BBH.16	11.53	1.10	
BBH.3	23.39	1.86	BBH.17	11.04	0.43	
BBH.4	22.11	0.00	BBH.18	10.67	0.00	
BBH.5	21.91	0.00	BBH.19	10.51	0.70	
BBH.6	21.52	1.23	BBH.20	9.80	0.00	
BBH.7	20.90	1.00	BBH.21	9.60	0.62	
BBH.8	20.54	0.92	BBH.22	9.16	0.38	
BBH.9	19.96	0.00	BBH.23	9.04	0.53	
BBH.10	19.64	0.93	BBH.24	8.49	0.38	
BBH.11	17.59	1.64	BBH.25	8.14	0.00	
BBH.12	15.20	1.17	BBH.26	7.96	0.00	
BBH.13	13.08	0.45	BBH.27	7.63	0.00	
BBH.14	12.38	0.00	BBH.28	7.29	0.00	

Source: Design Report of Irrigation and Drainage System- May 1996

In case that there is sufficient head at the drop works or diversion works, the power generation is enabled by providing a penstock for another passage and generating equipment at the terminal of the penstock. However, as shown above, all drop works and diversion works have low heads of less than 2 m.

As shown in Figure 5.3.8, the actual drop heights as built were also checked during the field survey and were confirmed to be the same as the designed.



Figure 5.3.8 Diversion Structures (BBH3 and BBH11)

The types of turbines applicable to a head less than 2 m are limited to the following:

- Undershot water wheel;
- Archimedes screw; and
- Very Low Head (VLH) turbine.

The undershot water wheel is a simple system in which a water wheel is placed over a fast water flow. Generally, it is applicable for a head of 1.0-2.0 m. Such system had been widely used in power milling of flour as well as in other industries all over the world. However, its generating capacity is limited only to about 10 kW at the maximum.

The Archimedes screw is made up of helix-shaped blades mounted on a central shaft, which is put in a trough at an angle to pump water up. By reversing this pump, the Archimedes screw can also be used to generate electricity. Generally, it is applicable for a head of 1.0-4.0 m. Such system had been used mainly in European countries, and not yet in Indonesia. According to the result of a hearing survey with European manufacturers, the machine would cost US\$4,000/kW, excluding installation, transportation, and civil works. Such price level is not competitive to ensure viability of the projects in this Survey.

The VLH turbine is a brand-new design concept developed by a European company to increase the size of Kaplan turbine runner diameter and to integrate a self-supporting structure therein. It is applicable for a head of 1.5-2.5 m. This type of turbine is still in the industrialization phase limited only to European countries, and not yet ready to be exported to Asian countries.

Since all the three types of turbine are found not applicable, the plan using drop works and diversion works is discarded from further examination in this Survey.

In case of a siphon which is facilitated at one site on the downstream part of the main canal and six sites on secondary canals, each siphon has a head of less than 2.0 m. Citing the examination results on possibility of using drop works with a similar head, there is no potential siphon site from the technical and economical viewpoints.

5.3.3 Power Generation Plan Using Headworks

Power generation utilizing the head difference between the upstream and downstream of the Batang Hari headworks is also conceivable.

Such kind of power development was already implemented in Indonesia; at the Lodoyo Power Station in the East Java Province. The Lodoyo Power Station has an installed capacity of 4.5 MW by utilizing a head difference of 9.5 m and discharge of 57.5 m³/s

However, there are two specific problems in case of the Batang Hari headworks. One is the necessity of a sand trap basin due to heavy sedimentation in the Batang Hari River. The other is the topography on the left bank which requires a lot of excavation as shown in Figures 5.3.9 and 5.3.10..

Power output (P) in case that the Batang Hari headworks is used iscalculated from the following formula:

$$P = 9.8 \times H \times Q \times \eta_t \times \eta_g = 2,000 \text{ kW}$$

where,

- H: Effective head (=4.6m)
- Q: Discharge (=60 m³/s)
- η_t : Efficiency of turbine (=0.85)
- η_g : Efficiency of generator (=0.9)

The direct construction cost of this plan is roughly estimated at US\$9.6 million, from which the construction cost is US\$4,800/kW.

Such price level is not competitive to ensure viability of the projects in this Survey. Therefore, the plan to utilize the headworks is discarded from further examination.

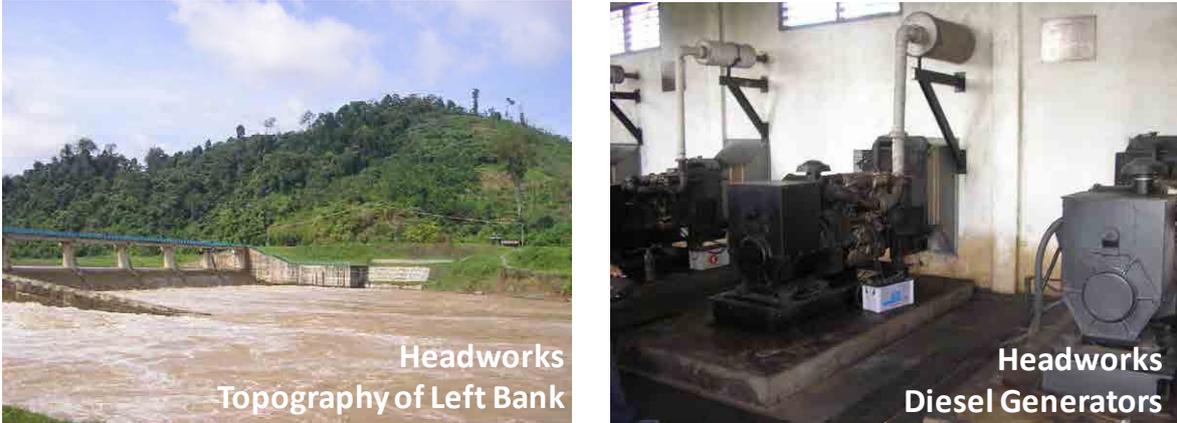
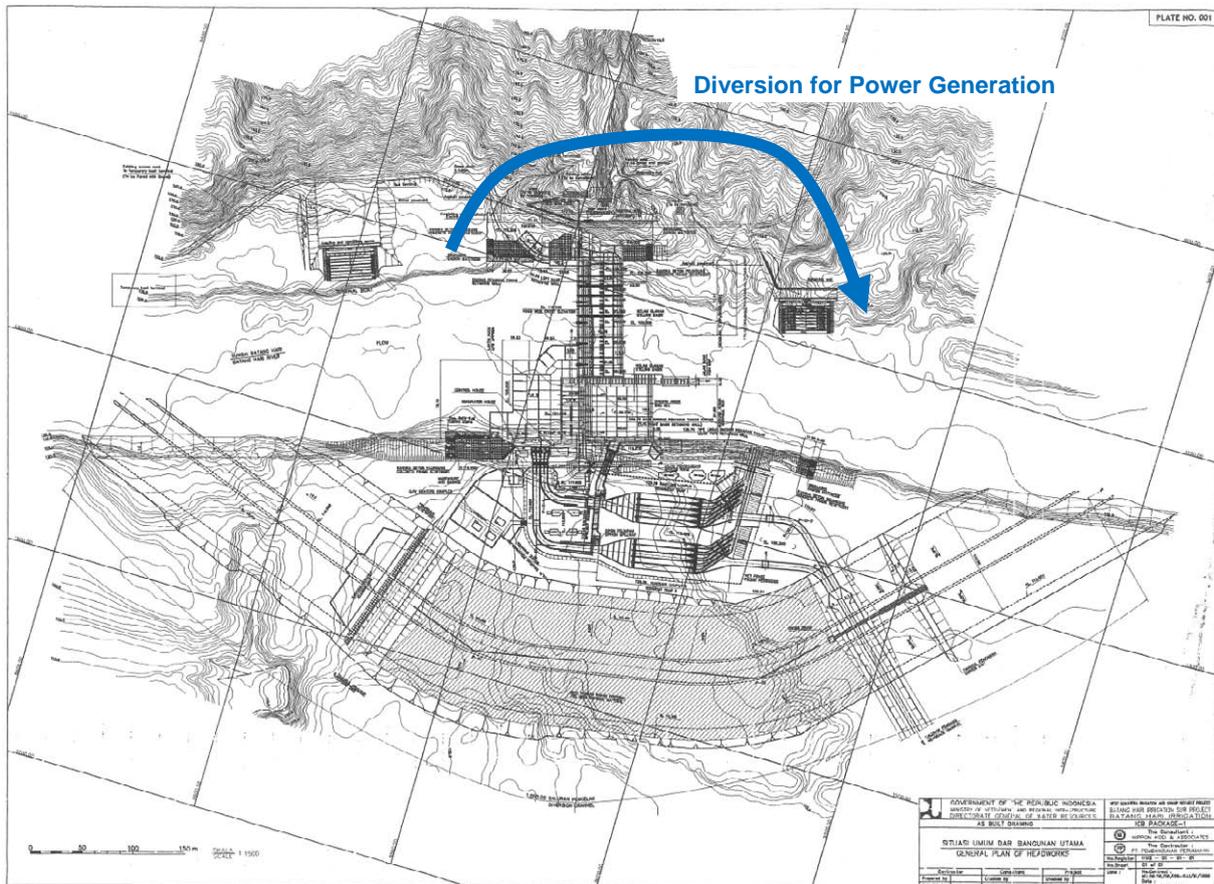


Figure 5.3.9 Headworks



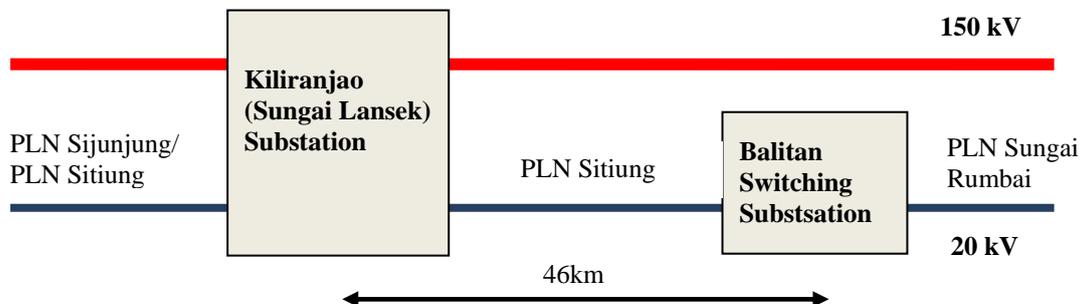
Source: As-built Drawings

Figure 5.3.10 Plan of Batang Hari Intake Headworks

5.4 Relevant Conditions

5.4.1 Existing Transmission and Distribution Lines

Near the Batang Hari Irrigation System, there exists the Kiliranjao (Sungai Lansek) Substation which is connecting to the Omblin Substation in West Sumatra Province and the Teluk Kuantan Substation in Riau Province by 150 kV transmission lines. The 20 kV distribution lines are extended from the Kiliranjao Substation to its surrounding areas along the Trans-Sumatra Highway. A schematic plan of the existing power supply is presented in Figure 5.4.1.



Source: PLN Sitiung branch office

Figure 5.4.1 Schematic Plan of Existing Power Supply

The potential sites for the micro hydroelectric power generations in the Batang Hari main irrigation area are located between the Kiliranjao Substation and the Balitan Switching Substation, which PLN Sitiung Branch Office serves for power supply.

The route of the existing 20 kV distribution lines nearby the hydropower potential sites is presented in Figure 5.4.2. Meanwhile, the single line diagram is presented in Figure 5.4.3.

The Ministerial Regulation (*Permen ESDM* No. 31/2009) sets forth two different tariffs for electricity, one for medium voltage (20 kV) interconnection and the other for low voltage (380 V/220 V) interconnection. The PLN regional office of West Sumatra has a policy stating that power generated by power plants of less than 10 MW within the system will be basically transmitted through the medium voltage interconnection.

Since the hydropower potential sites are located relatively far from both the Kiliranjao Substation and Balitan Switching Substation, it was assumed that these potential sites will be directly connected with the existing 20 kV distribution lines at the nearest points. The required length of the new 20 kV distribution line that would connect the power plants and the existing lines was estimated as shown in Table 5.4.1..

Table 5.4.1 Required Length of New 20 kV Distribution Line

Plan	Location	Required Length of 20 kV Line (m)
Using Surplus Water in Main Canal	SEDASI Pump Station	200
	BBH 11b	800
Using Drop Works and Diversion Works	BBH 3	200
	BBH 11	800
Using Headworks	Batang Hari headworks	0

Source: JICA Survey Team

Table 5.4.2 shows the demand growth of the power supply system which the PLN Sitiung Branch Office serves.

Table 5.4.2 Demand Growth of Power Supply System (PLN Sitiung)

Item	Unit	Jan-09	Jul-09	Jan-10	Jul-10	Jan-11	Jul-11	Oct-11
No. of Customers	nos.	19,679	20,167	20,412	21,085	22,457	24,046	24,508
Connected Capacity	kVA	18,295	18,976	19,499	20,460	21,965	24,264	25,063
Peak Load*	MW	16.90	16.98	17.02	18.10	18.80	19.20	19.50
Electricity*	MWh	7,765	7,768	7,774	8,673	9,002	9,985	10,106

*: measured at Sungai Lansek substation, including for PLN Sungai Rumbai and Sijunjung

Source: PLN Sitiung branch office

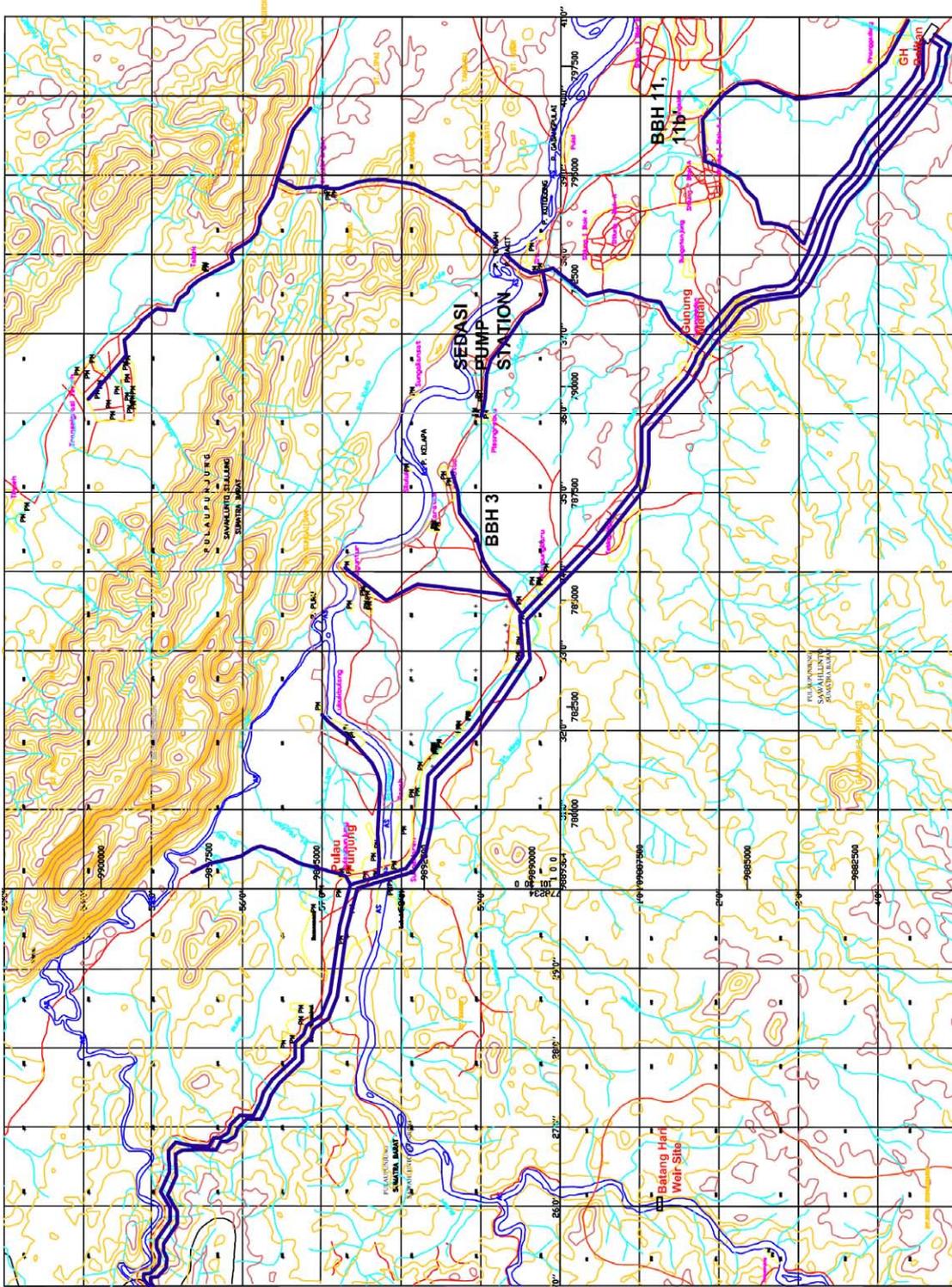


Figure 5.4.2 General Layout of 20 kV Distribution

Source: PLN Siting Branch Office

5.4.2 Environmental and Social Considerations

(1) Land Ownership

The micro hydroelectric power generation plans proposed in this Survey would utilize the existing irrigation facilities and the surrounding land owned by the Government of Indonesia. Since the facilities and land are registered as the asset of the state, the project executing organization should obtain a permission from the Ministry of Finance for the use of such assets. The process for issuing such permission will take about two months in general.

(2) Category of Environmental and Social Considerations

Based on the findings obtained during the field survey, the Survey Team prepared the screening format of the JICA Guidelines for Environmental and Social Considerations (April 2010) and the environmental check-list as shown in Tables 5.4.3 and 5.4.4.

The project has only minimal or little adverse affect to the environment and society. It is possible to prevent or mitigate environmental impact by adopting adequate countermeasures.

Table 5.4.3 Screening Format of JICA Guidelines for Environmental and Social Considerations

Name of Project	Micro Hydroelectric Power Generation Plan in Batang Hari Irrigation Area
Project Executing Organization	To be advised

Question	Answer
Question 1: Address of project site	Pisangrebus Village, Dharmasraya District, West Sumatra Province
Question 2: Scale and contents of the project	
2-1. Project profile	Installed capacity: 420 kW
2-2. How was the necessity of the project confirmed? Is the project consistent with higher program/policy?	<input checked="" type="checkbox"/> YES: Presidential Regulation No.5/2006 on National Energy Policy
2-3. Did the proponent consider alternatives?	<input checked="" type="checkbox"/> YES: Alternative potential sites
2-4. Did the proponent implement meetings with the related stakeholders?	<input checked="" type="checkbox"/> YES: Administrative body, such as DGWR, BWS VI, Dharmasraya District
Question 3: Is the project a new one or an ongoing one? In case of an ongoing project, have you received strong complaints or other comments from local residents?	<input checked="" type="checkbox"/> New
Question 4: Is an Environmental Impct Assessment (EIA), including an Initial Environmental Examination (IEE) is required for the project according to a law or guidelines of a host country? If yes, is EIA implemented or planned? If necessary, please fill in the reason why EIA is required.	<input checked="" type="checkbox"/> Not necessary: According to the regulation in Indonesia, preparation of EIA is required for hydroelectric power development with a high dam of more than 15m, inundation area of more than 200ha or installed capacity of 50 MW. Power generation plan proposed in this Survey is of small scale utilizing the existing irrigation facilities, and thus preparation of EIA will not be required.
Question 5: In case these steps were taken for an EIA, was the EIA approved by the relevant laws of the host country? If yes, please note the date of approval and the competent authority.	N/A

Question	Answer
Question 6: If the project requires a certificate regarding the environment and society other than an EIA, please indicate the title of said certificate. Was it approved?	Preparation of UKL (activities for environmental management) and UPL (activities for environmental monitoring) are required. <input type="checkbox"/> Not yet approved
Question 7: Are any of the following area presents either inside or surrounding the project sites? National parks, protection areas designated by the government/Primeval forests, tropical natural forests/Ecologically important habitats/Habitats of endangered species for which protection is required under local laws or international treaties/Areas that run the risk of a large scale increase of soil salinity or soil erosion/Remarkable desertification areas/Areas with special values from an archaeological, historical or cultural points of view/Habitats of minorities, indigenous people or nomadic people with a traditional lifestyle, or areas with special social value	<input type="checkbox"/> No
Question 8: Does the project include any of the following items? Involuntary resettlement/Groundwater pumping/Land reclamation, land development, and/or land clearing/Logging	<input type="checkbox"/> No
Question 9: Please mark related environmental and social impacts, and describe their outlines.	<input type="checkbox"/> Water usage: Strict water management in the Batang Hari main canal will be required.
Question 10: In the case of a loan project such as a two-step loan or sector loan, can sub-projects be specified at the present time?	N/A
Question 11: Regarding information disclosure and meetings with stakeholder, if JICA's environmental and social considerations are required, does the proponent agree to information disclosure and meetings with stakeholders through these guidelines.	To be advised

Source: JICA Survey Team

Table 5.4.4 Environmental Check List

Environmental Item	Check Items	Check Results
1 Permission and Consultation		
(1) EIA	(a) Was EIA already prepared? (b) Was EIA already approved? (c) Was EIA approved with supplementary condition?	(a) <input type="checkbox"/> No: UKL/UPL (b) <input type="checkbox"/> No: UKL/UPL (c) N/A
(2) Consultation	(a) Was the stakeholder meetings held? (b) Were opinions of local stakeholders taken into account in the planning?	(a) <input checked="" type="checkbox"/> Yes: with administrative body (b) <input checked="" type="checkbox"/> Yes
(3) Alternative	(a) Are the alternatives considered?	(a) <input checked="" type="checkbox"/> Yes: Alternative potential sites
2 Pollution		
(1) Water Quality	(a) Does the water quality of dam pond/reservoir comply with the country's ambient water quality standards? Is there a possibility that proliferation of phytoplankton and zooplankton will occur? (b) Does the quality of water discharged from the dam pond/reservoir comply with the country's ambient water quality standards?	(a) Scale of the existing pond at the Batang Hari weir is small. Proliferation of plankton in the pond would not be an issue. (b) <input checked="" type="checkbox"/> Yes: Pond scale is small. Degradation of water quality in the pond would not be an issue.

Environmental Item	Check Items	Check Results
	<p>(c) Are adequate measures, such as clearance of woody vegetation from the inundation zone prior to flooding planned to prevent water quality degradation in the dam pond/reservoir?</p> <p>(d) Is there a possibility that reduced the river flow downstream will cause water quality degradation resulting in areas that do not comply with the country's ambient water quality standards?</p> <p>(e) Is the discharge of water from the lower portion of the dam pond/reservoir (the water temperature of the lower portion is generally lower than the water temperature of the upper portion) planned by considering the impacts to downstream areas?</p>	<p>(c) N/A. The Batang Hari weir already exists.</p> <p>(d) <input type="checkbox"/> No: The Batang Hari River has sufficient quantity of run-off. Reduction of river flow would not cause water quality degradation.</p> <p>(e) Scale of the Batang Hari weir is small and difference of water temperature in the pond would not be an issue.</p>
(2) Wastes	(a) Are earth and sand generated by excavation properly treated and disposed of in accordance with the country's regulations?	(a) Actions shall be taken in further stages.
3 Natural Environment		
(1) Protected Areas	(a) Is the project site located in protected areas designated by the country's laws or international treaties and conventions? Is there a possibility that the project will affect the protected areas?	(a) <input type="checkbox"/> No: The project site is out of the conservation forest (hutan konservasi). No possibility is identified that the project will affect the conservation forest.
(2) Ecosystem	<p>(a) Does the project site encompass primeval forests, tropical rain forests, ecologically valuable habitats (e.g., coral reefs, mangroves, or tidal flats)?</p> <p>(b) Does the project site encompass the protected habitats of endangered species designated by the country's laws or international treaties and conventions?</p> <p>(c) Is there a possibility that the project will adversely affect downstream aquatic organisms, animals, plants, and ecosystems? Are adequate protection measures taken to reduce the impacts on the ecosystem?</p> <p>(d) Is there a possibility that installation of structures, such as dams will block the movement of the migratory fish species (such as salmon, trout and eel those move between rivers and sea for spawning)? Are adequate measures taken to reduce the impacts on these species?</p>	<p>(a) <input type="checkbox"/> No: The project site is out of primeval forests, tropical rain forests, ecologically valuable habitats.</p> <p>(b) <input type="checkbox"/> No: The project site is out of the protected habitats of endangered species.</p> <p>(c) <input type="checkbox"/> No: The Batang Hari River has sufficient quantity of run-off. Reduction of river flow would not adversely affect downstream ecosystem..</p> <p>(d) <input type="checkbox"/> No: New installation of the power plant structures would not block the movement of migratory fish species.</p>
(3) Hydrology	(a) Is there a possibility that hydrologic changes due to the installation of structures, such as weirs will adversely affect the surface and groundwater flows (especially in "run of the river generation" projects)?	(a) <input type="checkbox"/> No: New installation of the power plant structures would not adversely affect the surface and groundwater flows.
(4) Topography and Geology	(a) Is there a possibility that reductions in sediment loads downstream due to settling of suspended particles in the reservoir will cause impacts, such as scouring of the downstream riverbeds and soil erosion? Is there a possibility that sedimentation of the reservoir will cause loss of the storage capacity, water logging upstream, and formation of sediment deposits at the reservoir entrance? Are the	(a) <input type="checkbox"/> No: As the scale of existing Batang Hari weir is rather small, sedimentation would be not significant issue.

Environmental Item	Check Items	Check Results
	<p>possibilities of the impacts studied, and adequate prevention measures taken?</p> <p>(b) Is there a possibility that the project will cause a large-scale alteration of the topographic features and geologic structures in the surrounding areas (especially in run of the river generation projects)?</p>	<p>(b) <input type="checkbox"/> No: There would be no substantial scale of excavation.</p>
4 Social Environment		
(1) Resettlement	<p>(a) Is involuntary resettlement caused by project implementation? If involuntary resettlement is caused, are efforts made to minimize the impacts caused by the resettlement?</p> <p>(b) Is adequate explanation on compensation and resettlement assistance given to affected people prior to resettlement?</p> <p>(c) Is the resettlement plan, including compensation with full replacement costs, restoration of livelihoods and living standards developed based on socioeconomic studies on resettlement?</p> <p>(d) Are the compensations going to be paid prior to the resettlement?</p> <p>(e) Are the compensation policies prepared in document?</p> <p>(f) Does the resettlement plan pay particular attention to vulnerable groups or people, including women, children, the elderly, people below the poverty line, ethnic minorities, and indigenous peoples?</p> <p>(g) Are agreements with the affected people obtained prior to resettlement?</p> <p>(h) Is the organizational framework established to properly implement resettlement? Are the capacity and budget secured to implement the plan?</p> <p>(i) Are any plans developed to monitor the impacts of resettlement?</p> <p>(j) Is the grievance redress mechanism established?</p>	<p>(a) <input type="checkbox"/> No: Involuntary resettlement is not recognized. However this shall be again checked in further stages.</p> <p>(b) Actions shall be taken in further stages, if necessary.</p> <p>(c) Actions shall be taken in further stages, if necessary.</p> <p>(d) Actions shall be taken in further stages, if necessary.</p> <p>(e) Actions shall be taken in further stages, if necessary.</p> <p>(f) Actions shall be taken in further stages, if necessary.</p> <p>(g) Actions shall be taken in further stages, if necessary.</p> <p>(h) Actions shall be taken in further stages, if necessary.</p> <p>(i) Actions shall be taken in further stages, if necessary.</p> <p>(j) Actions shall be taken in further stages, if necessary.</p>
(2) Living and Livelihood	<p>(a) Is there any possibility that the project will adversely affect the living conditions of inhabitants? Are adequate measures considered to reduce the impacts, if necessary?</p> <p>(b) Is there any possibility that the project causes the change of land uses in the neighboring areas to affect adversely livelihood of local people?</p> <p>(c) Is there any possibility that the project facilities adversely affect the traffic systems?</p> <p>(d) Is there any possibility that diseases, including infectious diseases, such as HIV, will be brought due to the immigration of workers associated with the project? Are adequate considerations given to public health, if necessary?</p> <p>(e) Is the minimum flow required for maintaining downstream water uses secured?</p>	<p>(a) <input type="checkbox"/> No: The project would not affect the existing nor planned irrigation/fishpond area.</p> <p>(b) <input type="checkbox"/> No: Impact to the neighboring area is not assumed.</p> <p>(c) <input type="checkbox"/> No: Negative impact to traffic system is not assumed.</p> <p>(d) <input type="checkbox"/> No: Number of immigration of workers would not be substantial.</p> <p>(e) <input type="checkbox"/> Yes: Project scale is formulated taking account of the existing and planned irrigation system.</p>

Environmental Item	Check Items	Check Results
	(f) Is there any possibility that reductions in water flow downstream or seawater intrusion will have impacts on downstream water and land uses? (g) Is there any possibility that water-borne or water-related diseases (e.g., schistosomiasis, malaria, filariasis) will be introduced? (h) Is there any possibility that fishery rights, water usage rights, and common usage rights, etc. would be restricted?	(f) <input type="checkbox"/> No: Impact to downstream water and land uses is not assumed. (g) <input type="checkbox"/> No: Introduction of water-borne or water related disease is not assumed. (h) <input type="checkbox"/> No: Project scale is formulated taking account of the existing and planned irrigation system.
(3) Heritage	(a) Is there a possibility that the project will damage the local archeological, historical, cultural, and religious heritage sites? Are adequate measures considered to protect these sites in accordance with the country's laws?	(a) <input type="checkbox"/> No: No cultural heritages are identified.
(4) Landscape	(a) Is there a possibility that the project will adversely affect the local landscape? Are necessary measures taken?	(a) <input type="checkbox"/> No: There would be no substantial scale of excavation.
(5) Ethnic Minorities and Indigenous Peoples	(a) Does the project comply with the country's laws for rights of ethnic minorities and indigenous peoples? (b) Are considerations given to reduce the impacts on culture and lifestyle of ethnic minorities and indigenous peoples?	(a) N/A: No ethnic minorities or indigenous peoples are identified. (b) N/A
5 Others		
(1) Impacts during Construction	(a) Are the mitigation measures prepared against pollution during construction? (b) Are the mitigation measures prepared against impact to natural environment during construction? (c) Are the mitigation measures prepared against impacts to social environment during construction?	(a) Actions shall be taken in further stages. (b) Actions shall be taken in further stages, if necessary. (c) Actions shall be taken in further stages, if necessary.
(2) Accidents	(a) Are the prevention measures prepared to prevent accidents during construction and operation?	(a) Actions shall be taken in further stages.
(3) Monitoring	(a) Does the proponent develop and implement monitoring program for the environmental items that are considered to have potential impacts? (b) Are the items, methods and frequencies included in the monitoring program judged to be appropriate? (c) Does the proponent establish an adequate monitoring framework (organization, personnel, equipment, and adequate budget to sustain the monitoring framework)? (d) Are any regulatory requirements pertaining to the monitoring report system identified, such as the format and frequency of reports from the proponent to the regulatory authorities?	(a) Actions shall be taken in further stages. (b) Actions shall be taken in further stages. (c) Actions shall be taken in further stages. (d) Actions shall be taken in further stages.

Source: JICA Survey Team

5.5 Preliminary Design

Based on the result in Section 5.3, the power generation plan utilizing the SEDASI pumping station is further examined in detail.

5.5.1 Layout

The general layout of the canal and powerhouse building is shown in Figures 5.5.1 and 5.5.2.

The intake will be provided by enlarging the capacity of the existing intake at the diversion structure of BBH6. The Sitiung secondary canal and a part of the old canal for pumping will be used after their rehabilitation in order to discharge the flow required for power generation.

All the existing steel pipes for pumping will be removed, then two lanes of the steel penstock will be provided instead.

The existing pump station building will be reutilized as the powerhouse. All pumping equipment will be removed from the building, and then two sets of turbine-generators will be newly installed on the floor level of the building. The superstructure of the building will be thoroughly rehabilitated, while the substructure and the tailrace will be reused as much as possible.

For the alternative layout, it is conceivable to remove the entire existing pump station building including its substructure and tailrace, then construct a new powerhouse to utilize the maximum head available there. Preliminary examination indicates, however, that such alternative layout will cause higher project cost which might not be compensated with the additional benefit. Therefore, the idea to utilize the existing building as much as possible is adopted in this preliminary design.

Table 5.5.1 Comparison of Alternatives for Powerhouse

Concept	To reuse the existing substructure as much as possible	To remove all the existing substructure and construct a new powerhouse building
Installed Capacity	420 kW	620 kW
Project Cost	US\$1.56 million	US\$2.59 million
Annual Energy	2,723 MWh	4,020 MWh
EIRR	10.0	8.5
FIRR	12.4	10.6

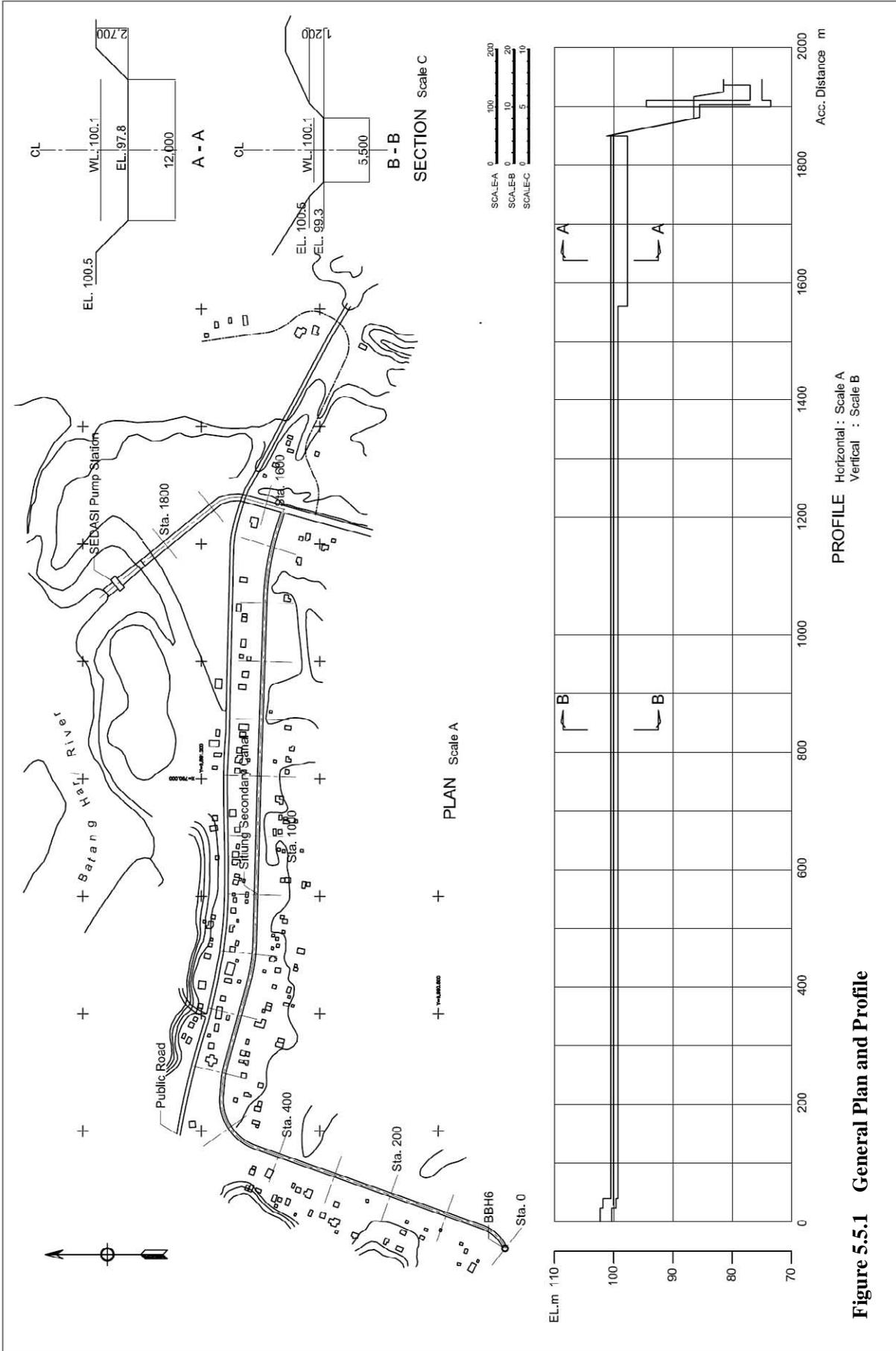


Figure 5.5.1 General Plan and Profile

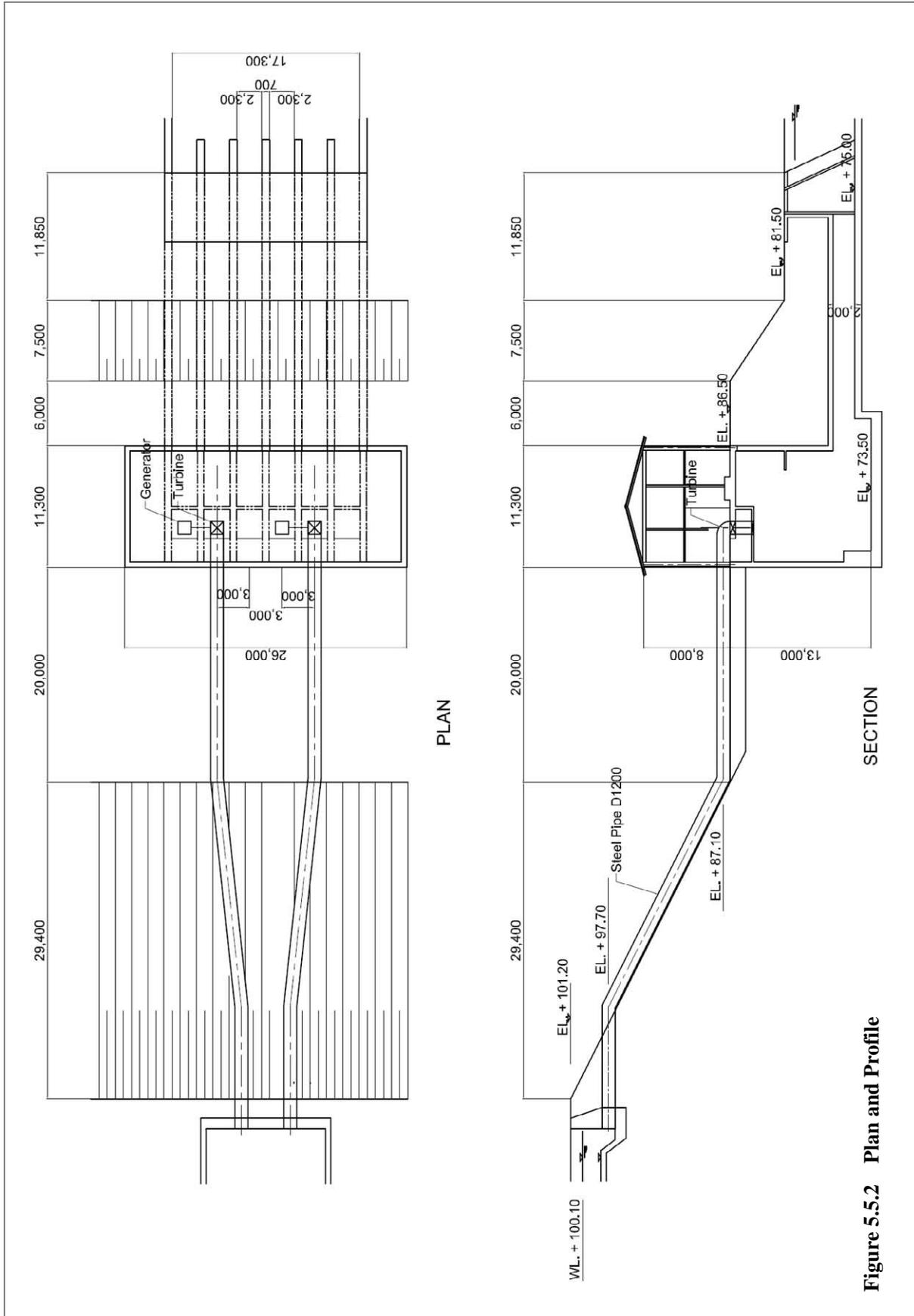
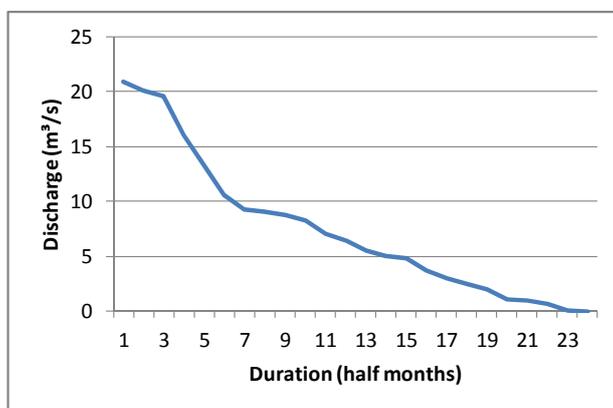


Figure 5.5.2 Plan and Profile

5.5.2 Scale

(1) Maximum Plant Discharge

As presented in Table 5.2.5, the maximum plant discharge is determined assuming the surplus water available at BBH6 in the case of the basic scenario. Figure 5.5.3 shows its flow duration curve, which is arranged in descending order.



Source: JICA Survey Team

Figure 5.5.3 Surplus Water Available for Power Generation (Basic Scenario)

The annual water utilization factor (=annual discharge used / maximum plant discharge) were obtained from the flow duration curve. The obtained factors are shown in Table 5.5.2.

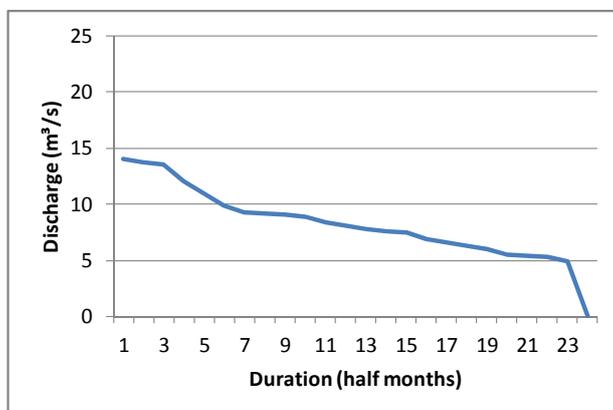
Table 5.5.2 Annual Water Utilization Factor (Basic Scenario)

Maximum plant discharge (m ³ /s)	1.0	3.0	5.0	7.0	9.0
Annual water utilization factor (%)	90	80	74	67	61

Source: JICA Survey Team

As a common practice in Indonesia, the annual water utilization factor of the small-scale hydro power plants are taken in the range of 60%~75%. It is safe to take a higher figure in case there is uncertainty in water availability. Thus in this Survey, the maximum plant discharge is set at 5.0 m³/s, which is equivalent to the upper limit of the range.

For the reference purpose, the annual water utilization factor in case of the alternative scenario was also checked. Figure 5.5.4 shows the flow duration curve of this case.



Source: JICA Survey Team

Figure 5.5.4 Surplus Water Available for Power Generation (Alternative Scenario)

The annual water utilization factor obtained from this flow duration curve against the maximum plant discharge of 5.0 m³/s is 96%.

(2) Head

Since the turbine/generator is installed above the floor level of the existing substructure, a cross flow turbine, which does not require a draft head, is selected for this plant.

The gross head was defined as the difference of elevations between the water surface at the inlet (EL. 100.1 m) and the centerline of the end of the penstock (EL. 87.1 m). Thus, it is obtained as 13.0 m.

The effective head was obtained as the gross head minus the head loss. The head loss obtained was 0.31 m, as detailed in Section 5.5.3 (3). Thus, the net head obtained is 12.69 m.

(3) Power Output and Annual Power Generation

Power output (P) is obtained from the following formula:

$$P = 9.8 \times H \times Q \times \eta_t \times \eta_g = 420 \text{ kW}$$

where,

H: Effective head (= 12.69 m)

Q: Discharge (= 5.0 m³/s)

η_t : Efficiency of turbine (= 0.75)

η_g : Efficiency of generator (= 0.9)

Annual power generation (E) is obtained from the following formula:

$$E = P \times \xi \times 24 \times 365 = 2,723 \text{ MWh (basic scenario) and } 3,532 \text{ MWh (alternative scenario)}$$

where,

P: Power Output (=420 kW)

ξ : Annual water utilization factor
(= 0.74 for the basic scenario, and 0.96 for the alternative scenario)

5.5.3 Design Dimensions and Hydraulic Calculations

(1) Diversion Structure BBH 6

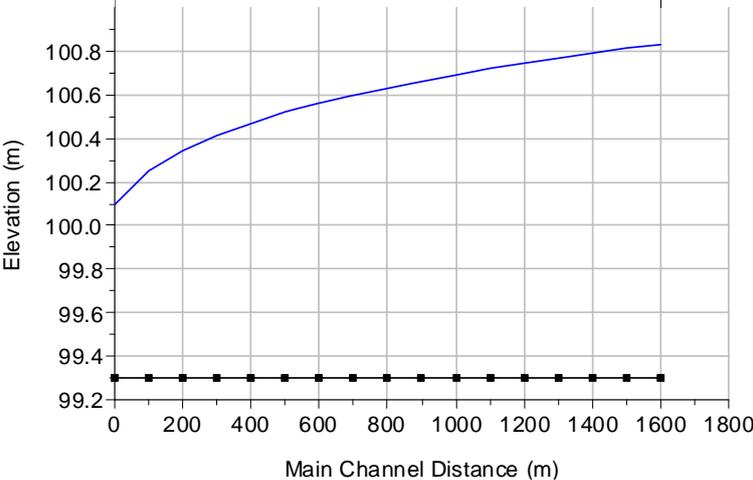
The existing intake for the Sitiung secondary canal which is provided at the diversion structure of BBH6 has a discharge capacity of 0.32 m³/s only. The existing reinforced concrete pipe (0.7 m diameter) with the slide gate (0.7 m wide by 0.7 m high) will be removed, and instead a concrete culvert (3.0 m width by 2.0 m high) with a slide gate (3.0 m width by 1.0 m high) will be newly installed.

(2) Sitiung Secondary Canal

The as-built drawings of the Sitiung secondary canal were not available during the Survey. Therefore, the definite dimensions and elevations of the canal as built are unknown. Therefore, the design drawings prepared in 1996 were referred to in this Survey.

Assuming the typical section in Figure 5.5.1, backwater calculation in the Sitiung secondary canal in

case of $Q = 5.32 \text{ m}^3/\text{s}$ ($= 5.0 \text{ m}^3/\text{s}$ for power generation and $0.32 \text{ m}^3/\text{s}$ for irrigation) was conducted. The boundary condition was given as the water level at EL. 100.1 m at the junction with the old canal for pumping. Basically, the elevations of the top of the both embankments are higher than EL.101.0 m, and thus the required additional embankment is not substantially large.



Source: JICA Survey Team

Figure 5.5.5 Water Surface Profile in Sitiung Secondary Canal

(3) Penstock

The existing steel pipes (0.7m diameter) will be removed, and instead two lanes of new steel pipes (1.2m diameter and 53 m long) will be newly installed.

Loss head (h) in the penstock is obtained from the following formula:

$$h = h_i + h_f = 0.12 + 0.19 = 0.31 \text{ m}$$

$$h_i = f_e \times V^2 / (2g) = 0.12 \text{ m}$$

$$h_f = f \times L/D \times V^2 / (2g) = 0.19 \text{ m}$$

$$f = 124.5 \times n^2 / D^{1/3} = 0.0169$$

where,

- hi: Inlet loss
- hf: Friction loss
- fe: Inlet loss coefficient (= 0.5)
- V: Velocity in the steel pipe (= 2.21 m/s)
- g: Acceleration of gravity (= 9.8 m/s²)
- f: Friction coefficient
- n: Manning’s roughness coefficient (= 0.012 for steel)
- L: Length of steel pipe (= 53 m)
- D: Diameter of steel pipe (= 1.2 m)

(4) Powerhouse and Tailrace

According to the drawings provided by BWS Sumatra VI, the substructure of the pump station building consists of six chambers, each having a width of 2.4 m. Among the six chambers, two will be

used for power generation.

The existing tailrace structure is also divided into six with width of 2.3 m and height of 2.0 m. Similarly, two conduits among the six will be used for releasing the discharge to the Batang Hari River.

5.6 Implementation Schedule and Preliminary Cost Estimate

5.6.1 Implementation Schedule

The assumed implementation schedule is shown in Figure 5.6.1.

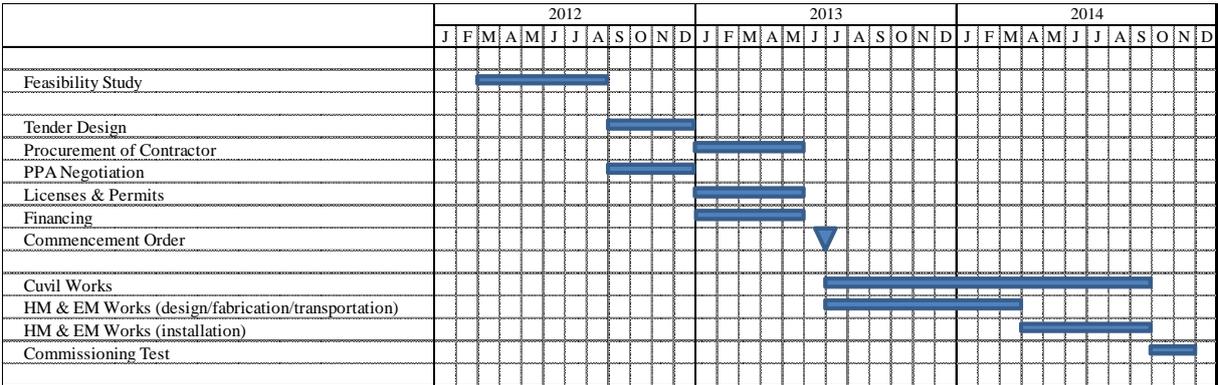
This project would require about three years after the completion of this Survey until its commissioning. The project implementation would undergo the following three phases:

- Feasibility Study (6 months);
- Procurement (10 months); and
- Construction including commissioning test (17 months).

During the feasibility study phase, detailed survey on existing facilities as well as topography and geology will be conducted. Availability of surplus water will also be confirmed again. Based on such data and information, definite hydropower planning will be consolidated. It was assumed that six months are required for such activities.

Preparation of tender design and procurement of the contractor will be conducted during the procurement phase. In parallel, PPA negotiation, licenses and permits, and financing will be arranged. It was assumed that nine months are required for such activities.

After the commencement order is issued, the construction phase will be continued for 17 months, which consist of nine months for design/fabrication/transportation of hydro-mechanical (HM) and electro-mechanical (EM) works, six months for installation of HM and EM works, and two months for commissioning test.



Source: JICA Survey Team

Figure 5.6.1 Implementation Schedule

5.6.2 Preliminary Cost Estimate

The conditions and assumptions for the preliminary cost estimate are as follows:

- Base year for the cost estimate is 2011;
- Fiscal year is from January to December;
- Exchange rate: US\$ 1.0 = Rp 9,100;
- The estimated cost is expressed in US\$;
- Unit rates of construction cost are set referring to other hydropower projects under implementation or implemented recently in Indonesia;
- Contractor's overhead cost and profit are included in the unit rates of the construction cost;
- Value added tax (PPN) is 10% of the direct construction cost;
- Land to be used is owned by GOI. It was assumed that the land is available for the project at no cost;
- Administration and engineering cost were estimated at 10% in proportion to the direct construction cost excluding the VAT portion;
- Price contingency is counted at 3.5% per annum;
- Physical contingency is assumed at 10% for all the cost items;
- Construction cost is assumed to be disbursed during three years of implementation with the yearly disbursement ratio of 0%, 40%, and 60%; and
- Administration and engineering cost were assumed to be disbursed with yearly disbursement ratio of 40%, 40%, and 20%.

The project cost and its annual disbursement schedule are presented in Table 5.6.1. Breakdown of the direct construction cost is presented in Table 5.6.2.

Table 5.6.1 Project Cost and Annual Disbursement Schedule

Item No. / Project Cost Item	Amount (US\$)	Year 1	Year 2	Year 3
		2012	2013	2014
I Direct Construction Cost				
1 Civil Works	400,675	0	160,270	240,405
2 Hydro-mechanical Works	196,000	0	78,400	117,600
3 Generating Equipment	378,000	0	151,200	226,800
4 Transmission Line	10,000	0	4,000	6,000
5 Preparatory Works	98,468	0	39,387	59,081
Sub-total	1,083,143	0	433,257	649,886
Value Added tax	108,314	0	43,326	64,989
Total	1,191,457	0	476,583	714,874
II Land Acquisition	0	0	0	0
III Administration & Engineering	108,314	43,326	43,326	21,663
V Price Contingency	118,622	1,516	37,030	80,075
VI Physical Contingency	141,839	4,484	55,694	81,661
Grand Total	1,560,232	49,326	612,633	898,273

Source: JICA Survey Team

Table 5.6.2 Breakdown of Direct Construction Cost

Item No. / Work Item	Unit	Quantity	Unit Rate (US\$)	Amount (US\$)
I CIVIL WORKS				
1 Intake				
1) Excavation, common	m ³	500	2.0	1,000
2) Earth backfill	m ³	200	2.0	400
3) Concrete, structure w/form	m ³	200	120.0	24,000
4) Re-bar	m ³	10	1,350.0	13,500
5) Removal of existing concrete	m ³	100	20.0	2,000
6) Others (10% of the above)	LS	-		4,090
2 Canal				
1) Excavation, common	m ³	5,000	2.0	10,000
2) Earth backfill	m ³	1,500	2.0	3,000
3) Concrete, structure w/form	m ³	500	120.0	60,000
4) Re-bar	t	25	1,350.0	33,750
5) Others (10% of the above)	LS	-		10,675
3 Inlet & Penstock				
1) Excavation, common	m ³	500	2.0	1,000
2) Earth backfill	m ³	800	2.0	1,600
3) Concrete, structure w/form	m ³	500	120.0	60,000
4) Re-bar	t	25	1,350.0	33,750
5) Others (10% of the above)	LS	-		9,635
4 Powerhouse & Tailrace				
1) Excavation, common	m ³	1,000	2.0	2,000
2) Earth backfill	m ³	1,000	2.0	2,000
3) Concrete, structure w/form	m ³	300	120.0	36,000
4) Re-bar	t	15	1,350.0	20,250
5) Building and utility works	LS	-		60,000
6) Others (10% of the above)	LS	-		12,025
Sub-total Item I				400,675
II HYDRO-MECHANICAL WORKS				
1) Intake gate & hoist (3mx1m)	t	2	7,000.0	14,000
2) Inlet trashrack	t	4	5,000.0	20,000
3) Steel penstock	t	20	6,000.0	120,000
4) Tailrace gate & hoist	t	6	7,000.0	42,000
Sub-total Item II				196,000
III GENERATING EQUIPMENT				
1) Turbines, Generators,	LS			
2) Transformers,	LS			
3) Control equipment and auxiliaries	LS			
Sub-total Item III				378,000
IV Transmission Line				
20kV distribution line	km	0.2	50,000.0	10,000
Sub-total Item IV				10,000
V Preparatory Works				
10% of Sub-total I to IV				98,468
Sub-total Item V				98,468
Total I to V				1,083,143

Source: JICA Survey Team

5.7 Preliminary Economic and Financial Analysis

5.7.1 Preliminary Economic Analysis

(1) Basic Assumption

Economic analysis is aimed at comparing two different sources of electricity; one from the questioned hydropower plant, and the other supplied by the cheapest possible alternative plant. Hydropower should be chosen for electricity supply, only when its generation cost is evaluated more economical than the alternative plant.

The micro hydroelectric power plant proposed in this Survey will supply base load electricity to PLN's power system in West Sumatra Province. Therefore, the practical type of the alternative plant is a coal fired steam thermal plant, which also generates base load electricity.

In the economic analysis, the following assumptions were made:

- The evaluation period is 28 years, which is composed of three years for implementation and 25 years for operation;
- The useful life of the project components is 25 years, which is the same as the period of operation; and
- 10% per annum discount rate was assumed in the economic analysis.

(2) Economic Benefit

Economic benefit is the opportunity cost of alternative electricity, which can be defined as capacity benefit and energy benefit. Capacity benefit is the opportunity cost required for the alternative plant which is ready to generate electricity as demanded. Energy benefit is the opportunity cost required for generating electricity by using the alternative plant.

Capacity benefit is obtained by multiplying the capacity value with the firm power of the hydropower plant. Energy benefit is obtained by multiplying the energy value with the annual electricity generated. The details of calculation for the capacity value and energy value are presented in Table 5.7.1.

Table 5.7.1 Capacity Value and Energy Value

Unit Construction Cost (UCC)	US\$/kW	1300
Annual Fixed O&M Cost	%	2.0%
Life Time	year	20
Discount Rate	%	10%
Capital Recovery Factor (CRT)		0.117460
kW Value Adjustment factor (AF1)		1.331967
Capacity Value = UCC x (CRF+O&M) x AF1	US\$/kW	238.02
Unit Price of Fuel	US\$/ton	90
Caloric Value	kcal/kg	5,100
Thermal Efficiency	%	30%
Heat Rate	kcal/kWh	2,867
Fuel Consumption	kg/kWh	0.5621
Fuel Cost	US\$/kWh	0.0506
Variable O&M Cost	US\$/kWh	0.0008
kWh Value Adjustment factor (AF2)		1.10590
Energy Value = (Fuel Cost + O&M) x AF2	US\$/kWh	0.0568

Source: JICA Survey Team

The kW adjustment factor and the kWh adjustment factor are obtained from the following formula:

$$\text{kW adjustment factor} = \frac{(1-a) \times (1-b) \times (1-c) \times (1-d)}{(1-a') \times (1-b') \times (1-c') \times (1-d')}$$

$$\text{kWh adjustment factor} = \frac{(1-a) \times (1-d)}{(1-a') \times (1-d')}$$

The adjustment factors are shown in Table 5.7.2.

Table 5.7.2 Adjustment Factors

Adjustment Factor	Hydropower		Coal	
Station use	a	0.3%	a'	7.0%
Forced outage	b	0.5%	b'	8.0%
Scheduled outage	c	2.0%	c'	12.0%
Transmission line loss	d	2.0%	d'	5.0%

(3) Economic Cost

In the economic analysis, the financial to economic conversions were ruled using the standard conversion factor of 0.90. Tax and price contingency are excluded from the economic cost of capital expenditure.

Operating expenditure is also expressed in economic terms. The following are the two kinds of operating expenditure: i) fixed operating cost, which will be incurred no matter how much electricity is generated, and ii) variable operating cost, which will be burdened proportionally to actual electricity.

Fixed operating cost is composed of costs required for daily operation, maintenance, and management. From past experience, its yearly cost is assumed to be 1.0% of the capital expenditure.

Variable operating cost includes lubricant cost, which is Rp 1.5 per kWh of electricity.

(4) Result of Analysis

For the economic analysis, three measures of project worth were introduced as the key indicators: i) the economic net present value (ENPV), ii) the economic internal rate of return (EIRR), and iii) the benefit-cost ratio (B/C). These three measures were calculated with the economic costs and benefits as variables. The results are shown in Table 5.7.3.

Table 5.7.3 Result of Economic Analysis

Scenario	ENPV	EIRR	B/C
Basic Scenario	US\$1,610	10.0%	1.00
Alternative Scenario	US\$995,830	21.1%	1.94

Source: JICA Survey Team

The economic streams are tabulated in Tables 5.7.4 and 5.7.5.

Table 5.7.4 Result of Economic Analysis (Basic Scenario)

Unit: US\$

Year		Benefit			Cost			Net
		Capacity	Energy	Total	Capital	O&M	Total	
2012	-3	0	0	0	21,446	0	21,446	-21,446
2013	-2	0	0	0	498,029	0	498,029	-498,029
2014	-1	0	0	0	725,597	0	725,597	-725,597
2015	1	0	154,666	154,666	0	11,280	11,280	143,386
2016	2	0	154,666	154,666	0	11,280	11,280	143,386
2017	3	0	154,666	154,666	0	11,280	11,280	143,386
2018	4	0	154,666	154,666	0	11,280	11,280	143,386
2019	5	0	154,666	154,666	0	11,280	11,280	143,386
2020	6	0	154,666	154,666	0	11,280	11,280	143,386
2021	7	0	154,666	154,666	0	11,280	11,280	143,386
2022	8	0	154,666	154,666	0	11,280	11,280	143,386
2023	9	0	154,666	154,666	0	11,280	11,280	143,386
2024	10	0	154,666	154,666	0	11,280	11,280	143,386
2025	11	0	154,666	154,666	0	11,280	11,280	143,386
2026	12	0	154,666	154,666	0	11,280	11,280	143,386
2027	13	0	154,666	154,666	0	11,280	11,280	143,386
2028	14	0	154,666	154,666	0	11,280	11,280	143,386
2029	15	0	154,666	154,666	0	11,280	11,280	143,386
2030	16	0	154,666	154,666	0	11,280	11,280	143,386
2031	17	0	154,666	154,666	0	11,280	11,280	143,386
2032	18	0	154,666	154,666	0	11,280	11,280	143,386
2033	19	0	154,666	154,666	0	11,280	11,280	143,386
2034	20	0	154,666	154,666	0	11,280	11,280	143,386
2035	21	0	154,666	154,666	0	11,280	11,280	143,386
2036	22	0	154,666	154,666	0	11,280	11,280	143,386
2037	23	0	154,666	154,666	0	11,280	11,280	143,386
2038	24	0	154,666	154,666	0	11,280	11,280	143,386
2039	25	0	154,666	154,666	0	11,280	11,280	143,386
Total		0	3,866,660	3,866,660	1,245,072	282,007	1,527,079	2,339,581
NPV		0	1,054,781	1,054,781	976,243	76,928	1,053,171	1,610

NPV= 1,610 IRR= 10.0% B/C= 1.00

Source: JICA Survey Team

Table 5.7.5 Result of Economic Analysis (Alternative Scenario)

Unit: US\$

Year		Benefit			Cost			Net
		Capacity	Energy	Total	Capital	O&M	Total	
2012	-3	0	0	0	21,446	0	21,446	-21,446
2013	-2	0	0	0	498,029	0	498,029	-498,029
2014	-1	0	0	0	725,597	0	725,597	-725,597
2015	1	99,968	200,618	300,586	0	11,414	11,414	289,172
2016	2	99,968	200,618	300,586	0	11,414	11,414	289,172
2017	3	99,968	200,618	300,586	0	11,414	11,414	289,172
2018	4	99,968	200,618	300,586	0	11,414	11,414	289,172
2019	5	99,968	200,618	300,586	0	11,414	11,414	289,172
2020	6	99,968	200,618	300,586	0	11,414	11,414	289,172
2021	7	99,968	200,618	300,586	0	11,414	11,414	289,172
2022	8	99,968	200,618	300,586	0	11,414	11,414	289,172
2023	9	99,968	200,618	300,586	0	11,414	11,414	289,172
2024	10	99,968	200,618	300,586	0	11,414	11,414	289,172
2025	11	99,968	200,618	300,586	0	11,414	11,414	289,172
2026	12	99,968	200,618	300,586	0	11,414	11,414	289,172
2027	13	99,968	200,618	300,586	0	11,414	11,414	289,172
2028	14	99,968	200,618	300,586	0	11,414	11,414	289,172
2029	15	99,968	200,618	300,586	0	11,414	11,414	289,172
2030	16	99,968	200,618	300,586	0	11,414	11,414	289,172
2031	17	99,968	200,618	300,586	0	11,414	11,414	289,172
2032	18	99,968	200,618	300,586	0	11,414	11,414	289,172
2033	19	99,968	200,618	300,586	0	11,414	11,414	289,172
2034	20	99,968	200,618	300,586	0	11,414	11,414	289,172
2035	21	99,968	200,618	300,586	0	11,414	11,414	289,172
2036	22	99,968	200,618	300,586	0	11,414	11,414	289,172
2037	23	99,968	200,618	300,586	0	11,414	11,414	289,172
2038	24	99,968	200,618	300,586	0	11,414	11,414	289,172
2039	25	99,968	200,618	300,586	0	11,414	11,414	289,172
Total		2,499,210	5,015,440	7,514,650	1,245,072	285,341	1,530,413	5,984,237
NPV		681,756	1,368,155	2,049,911	976,243	77,838	1,054,080	995,830

NPV= 995,830 IRR= 21.1% B/C= 1.94

Source: JICA Survey Team

5.7.2 Preliminary Financial Analysis

(1) Financial Benefit

The project revenue is straightforward. It is the electricity tariff multiplied by the expected electricity sold.

(2) Financial Cost

Tax and price contingency are also included in the financial cost.

The fixed operating cost was assumed to be 1.0% of the capital expenditure, which is the same as in the economic analysis. The variable operating cost includes lubricant cost, which is Rp 1.5 per kWh of electricity and water charge of Rp 5.0 per kWh of electricity levied by the regional government.

(3) Result of Analysis

The key indicators of the financial net present value (FNPV), the financial internal rate of return (FIRR) and B/C were calculated with the economic costs and benefits as variables. The results are shown in Table 5.7.6.

Table 5.7.6 Result of Financial Analysis

Scenario	FNPV	EIRR	B/C
Basic Scenario	US\$241,549	12.4%	1.18
Alternative Scenario	US\$714,277	16.7%	1.52

Source: JICA Survey Team

The financial streams are tabulated in Tables 5.7.7 and 5.7.8.

Form the above, the following were concluded:

- The project is viable in terms of economic and financial aspects, in both the basic and alternative scenarios;
- However, indicators of the economic analysis in case of the basic scenario are equal to the break-even point; and
- Project viability in terms of economic and financial aspects largely depends on the available water discharge for power generation.

Table 5.7.7 Result of Financial Analysis (Basic Scenario)

Unit: US\$

Year		Benefit		Cost			Net Benefit
		Sales	Total	Capital	O&M	Total	
2012	-3	0	0	49,326	0	49,326	-49,326
2013	-2	0	0	612,633	0	612,633	-612,633
2014	-1	0	0	898,273	0	898,273	-898,273
2015	1	235,495	235,495	0	15,683	15,683	219,811
2016	2	235,495	235,495	0	16,180	16,180	219,315
2017	3	235,495	235,495	0	16,694	16,694	218,801
2018	4	235,495	235,495	0	17,226	17,226	218,269
2019	5	235,495	235,495	0	17,776	17,776	217,718
2020	6	235,495	235,495	0	18,346	18,346	217,148
2021	7	235,495	235,495	0	18,936	18,936	216,559
2022	8	235,495	235,495	0	19,546	19,546	215,948
2023	9	235,495	235,495	0	20,178	20,178	215,316
2024	10	235,495	235,495	0	20,832	20,832	214,663
2025	11	235,495	235,495	0	21,509	21,509	213,986
2026	12	235,495	235,495	0	22,209	22,209	213,285
2027	13	235,495	235,495	0	22,934	22,934	212,560
2028	14	235,495	235,495	0	23,684	23,684	211,810
2029	15	235,495	235,495	0	24,461	24,461	211,034
2030	16	235,495	235,495	0	25,265	25,265	210,230
2031	17	235,495	235,495	0	26,097	26,097	209,398
2032	18	235,495	235,495	0	26,958	26,958	208,537
2033	19	235,495	235,495	0	27,849	27,849	207,646
2034	20	235,495	235,495	0	28,771	28,771	206,723
2035	21	235,495	235,495	0	29,726	29,726	205,769
2036	22	235,495	235,495	0	30,714	30,714	204,781
2037	23	235,495	235,495	0	31,737	31,737	203,758
2038	24	235,495	235,495	0	32,795	32,795	202,700
2039	25	235,495	235,495	0	33,890	33,890	201,604
Total		5,887,365	5,887,365	1,560,232	589,997	2,150,229	3,737,136
NPV		1,606,006	1,606,006	1,226,036	138,422	1,364,457	241,549

NPV= 241,549 IRR= 12.4% B/C= 1.18

Source: JICA Survey Team

Table 5.7.8 Result of Financial Analysis (Alternative Scenario)

Unit: US\$

Year		Benefit		Cost			Net Benefit
		Sales	Total	Capital	O&M	Total	
2012	-3	0	0	49,326	0	49,326	-49,326
2013	-2	0	0	612,633	0	612,633	-612,633
2014	-1	0	0	898,273	0	898,273	-898,273
2015	1	305,460	305,460	0	16,281	16,281	289,179
2016	2	305,460	305,460	0	16,783	16,783	288,677
2017	3	305,460	305,460	0	17,302	17,302	288,157
2018	4	305,460	305,460	0	17,840	17,840	287,620
2019	5	305,460	305,460	0	18,397	18,397	287,063
2020	6	305,460	305,460	0	18,972	18,972	286,487
2021	7	305,460	305,460	0	19,569	19,569	285,891
2022	8	305,460	305,460	0	20,186	20,186	285,274
2023	9	305,460	305,460	0	20,824	20,824	284,636
2024	10	305,460	305,460	0	21,485	21,485	283,975
2025	11	305,460	305,460	0	22,169	22,169	283,291
2026	12	305,460	305,460	0	22,877	22,877	282,583
2027	13	305,460	305,460	0	23,610	23,610	281,850
2028	14	305,460	305,460	0	24,368	24,368	281,091
2029	15	305,460	305,460	0	25,153	25,153	280,307
2030	16	305,460	305,460	0	25,966	25,966	279,494
2031	17	305,460	305,460	0	26,807	26,807	278,653
2032	18	305,460	305,460	0	27,677	27,677	277,783
2033	19	305,460	305,460	0	28,578	28,578	276,882
2034	20	305,460	305,460	0	29,510	29,510	275,950
2035	21	305,460	305,460	0	30,475	30,475	274,985
2036	22	305,460	305,460	0	31,474	31,474	273,986
2037	23	305,460	305,460	0	32,507	32,507	272,953
2038	24	305,460	305,460	0	33,577	33,577	271,883
2039	25	305,460	305,460	0	34,684	34,684	270,775
Total		7,636,495	7,636,495	1,560,232	607,070	2,167,302	5,469,193
NPV		2,083,148	2,083,148	1,226,036	142,836	1,368,872	714,277

NPV= 714,277 IRR= 16.7% B/C= 1.52

Source: JICA Survey Team

5.7.3 Re-Use of Discharged Water

Since it is indispensable for taking measures to cope with the DGWR's administrative framework of water resource management, a pumping-up plan is worked out for the alternative scenario in order to return the irrigation water after using for power generation to the canal network of Batang Hari Irrigation System. Project viability in case of adopting such plan is examined with the following assumption:

- Part of electricity generated in the power plant is used for pumping up the discharged water, and not for obtaining project revenue; and
- The amount of electricity that may be used for the pumping is determined so that the FIRR of the project does not fall short of the private developers' expectation, say 12%.

Using the financial stream tabulated in Table 5.7.8, the amount of electricity sales was examined so as to obtain FIRR of 12%. As a result, it was found out that the FIRR drops to 12% if electricity sales are decreased to 75% in the alternative scenario.

Assuming that 25% of the power output of the plant, which is equal to 105 kW (= 0.25 × 420 kW), is used for pumping, the lift height of pumping (H) was calculated using the following formula:

$$H = P \times \eta / (9.8 \times Q) = 1.5 \text{ m}$$

where,

- P: Power (= 105 kW)
- Q: Discharge (= 5.0 m³/s)
- η : Efficiency (= 0.7)

The above means that the lift height of pumping is limited to only 1.5 m at the maximum in order to ensure FIRR of 12%. It should be noted that this examination does not count the additional cost for the pumping equipment and its power line. This suggests that the allowable pump height would be further lessened, if such cost was also accounted for.

In the downstream reach of the SEDASI pumping station, the height difference between the Batang Hari River and the main canal for irrigation becomes gradually lessens. However the difference is about 5 m at the least. It can be said, therefore, that the alternative scenario would be no longer viable if the re-use plan of pumping up discharged water is adopted. .

5.8 Operation and Maintenance System

Logically, there are two possibilities of who the project executing organization would be, i.e., i) a public body such as PLN or ii) a private developer.

Generally, PLN has sufficient knowledge and experience for implementation, operation and maintenance of hydropower plants. However, mainly due to budget constraints, PLN does not engage in the implementation of all hydropower projects.

In the interconnected power system like the one in Sumatra, PLN puts priority on implementing the hydropower projects that generates peak load electricity. Although such power plants need to cope with sharp increase of power demand and also stabilize the power system, the willingness of the private sector to engage in implementing such projects is not strong. One of the reasons for this is that hydropower projects that generates peak load electricity requires higher tariff, which PLN does not necessarily accepts, in order to ensure project viability in terms of financing aspects. Accordingly, PLN, by itself, concentrates its resources to implement peak load hydropower projects. Meanwhile, development of base load hydropower projects, especially of small or medium scale (less than 10 MW), is entrusted mainly to the private sector.

According to the hearing survey, the PLN regional office of West Sumatra Province assumes that the

private sector, not PLN by itself, would be the project executing organization in case the project in this Survey is implemented. In its area of jurisdiction, there already exist small-scale hydropower plants that are operated by the private sector, and some are in the construction stage or MoU. This project is also regarded among such candidate of projects.

Also it was confirmed from the hearing survey that DGWR, BWS Sumatra VI and Dharmasraya District Government have no intention of becoming, by themselves, the project executing organization of this project, even though they act as the competent authorities.

There are several business models applicable to hydropower development that enables participation of both public body and private developer, as shown in Table 5.8.1. For this project, a build-own-operate (BOO) business scheme would be the most applicable option.

Table 5.8.1 Business Model Applicable to Hydropower

Business Schemes	Financing	Ownership	Commercial Risk	Operation	Design & Construction
1. Pure Public (PLN)	PLN	PLN	PLN	PLN	PLN
2. Design-Build (DB)	PLN	PLN	PLN	PLN	PRIVATE
3. Design-Build-Operate (DBO)	PLN	PLN	PLN	PRIVATE	PRIVATE
4. Design-Build-Lease (DBL)	PLN	PLN	PRIVATE	PRIVATE	PRIVATE
5. Design-Build-Finance-Operate (DBFO)	PRIVATE	PLN	PLN	PRIVATE	PRIVATE
6. Build-Lease-Transfer (BLT)	PRIVATE	PRIVATE	PLN	PLN	PRIVATE
7. Build-Own-Operate (BOO)	PRIVATE	PRIVATE	PRIVATE	PRIVATE	PRIVATE

Source: JICA Survey Team

5.9 Impacts of Micro Hydroelectric Power Generation Plant on Irrigation System

The following are the impacts on the irrigation system in case micro hydroelectric power generation plants are constructed.

(1) Operation of Irrigation Canal

Currently, the operation of irrigation canal is strictly not required, as the main canal has a sufficiently large discharge capacity compared to the water requirement of the existing irrigation and fishpond areas. If a power generation plant had been constructed, however, stricter operations of the irrigation canal networks would be required in order to ensure the scheduled distribution of power generation water especially for the case of basic scenario.

During construction of the project, the Sitiung secondary canal and a part of the old canal for pumping will be temporarily dried up. Conveyance of irrigation water to the command area of the Sitiung secondary canal will be stopped during this period.

(2) Maintenance of Irrigation Canal

Any incidents related to the irrigation canal that could disturb the design flow discharge might be a problem for power generation. In order to minimize such adverse effect, maintenance activities for the main canal and the Sitiung secondary canal should be conducted in accordance with the operation and maintenance manual of the Batang Hari Irrigation System.

5.10 Possibility of Irrigation Water Utilization for Power Generation Purpose

The results of examination on hydropower generation potentials using irrigation water of the Batang Hari Irrigation System are summarized as follows:

- Concerning the plan using heads of drop works, diversion works and siphons available on irrigation canals, very limited power generation potential is expected due to low head of less than 2 m by which power generating capacity is limited to some 10 kW at the maximum compared with high cost of applicable turbines;
- As for the plan constructing a new power plant attached to the Batang Hari headworks, power output of 2,000 kW can be expected and no adverse effect is put over the original irrigation plan. However, no economic viability is secured because expensive investment cost is required for dealing with topographic and high sedimentation conditions in constructing the new power plant; and
- Regarding the plan using the existing idle SEDASI pump station, the economic and financial viability largely depends on usable quantity of irrigation water from the existing canal networks. In case of the basic scenario using surplus irrigation water, annual power generation is expected at 2,723 MWh and the economic project viability is equal to the break-even point. For implementing the basic scenario, stricter operations of the irrigation water distribution to the irrigation area based on the original paddy cropping schedule would be required in order to ensure the scheduled distribution of power generation water. In case of the alternative scenario diverting directly irrigation water of 5 m³/s for the use of power generation, annual power generation is expected at 3,532 MWh, and the economic project viability will go up corresponding to increasing amount of irrigation water use. For implementing the alternative scenario, additional investment costs would be required for constructing re-use system of discharged water for irrigation purpose in order to cope with the legal regulation..

CHAPTER 6 CONCLUSION AND RECOMMENDATIONS

6.1 Conclusion

(1) Current Situation of Irrigation Sector

As of 2007, the total irrigable area of paddy field in Indonesia was 8.77 million ha on the basis of design irrigation service area. Out of this irrigable area, 7.23 million ha or 82% was commanded by 33,226 surface irrigation systems to which river discharges are diverted for irrigation purpose. In these surface irrigation systems, only about 0.8 million ha is provided with regulated flows from reservoirs or ponds (*Embung*). Such situation is one of the reasons to restrict the expansion and stabilization of the dry season irrigated paddy cultivation area. In line with the decentralization policy, the management authority of irrigation systems is shared by the institutions concerned of central, provincial and district governments based on the spatial scale of irrigation systems and the administrative boundary. The responsible management authorities of irrigation systems are DGWR's regional offices at central level and the institutions concerned in charge of irrigation administration at provincial and district levels. International organizations and GOJ have contributed to financially and technically assist GOI for implementing the development of new irrigation projects and the rehabilitation of existing ones to a considerable extent. Especially, GOJ has provided GOI with a great deal of financing for individual projects with the accumulated irrigation areas covering 1.53 million ha of completed and on-going projects. After completion of irrigation development projects, O&M activities are shared by the responsible management authorities in unified manner for their responsible areas. The O&M budget allocated by each authority is usually insufficient so that irrigation areas under good functioning condition reduced by around 30% for the last 11 years.

(2) Role of Irrigation Sector to National Food Security

Despite self-supply quantity of rice in Indonesia has increased since 2007 resulting from the expansion of dry season irrigated paddy cultivation areas owing to the implementation of irrigation development and rehabilitation projects, Indonesia has still imported rice of 0.5 million tons to one million tons every year. In response to the president's direction, government institutions concerned jointly started to draw up a strengthening plan of national food security from February 2011. Its output, "Roadmap towards National Rice Surplus 10 million tons in 2014", was reported to and approved by the cabinet meeting in January 2012. Its strategy focuses on establishment of a collaboration system among sectors with the core function made by agriculture and irrigation sectors as well as a coordination system among the institutions concerned of central, provincial and district governments. Furthermore, the action plan of this roadmap aims to intensively practice seven activities with synergistic effects if implemented in the package form. These activities were selected from sector-wise programs so far individually performed under the framework of vertical structured administration by applying the selection and concentration principle. In order to realize paddy production increase by 13 million tons for the coming four years until 2014 by increasing the average paddy yield from 6.0 ton/ha to 6.8 ton/ha, the numerical targets of irrigation activity are set up at 1,777,917 ha for improvement of irrigation networks, 164,235 ha for rehabilitation of water resources facilities, 86,435 ha for completion of surface irrigation facilities, 109,000 ha for rehabilitation of village irrigation systems with a scale of less than 100 ha and 1,512,598 ha for strengthening of irrigation facility management

works necessary for water management rationalization. In agriculture sector, the focal point is to establish and practice the agricultural activity that enables beneficiary farmers to learn advanced irrigated paddy cultivation practices aiming to attain the paddy production target by effectively utilizing irrigation water secured by the above irrigation activity.

(3) Maximum Utilization of Irrigation Water

If surplus irrigation water is available throughout the dry season, farming systems, which are more attractive to farmers in combination with paddy cultivation, are presumed to be patterns such as: i) triple cropping of irrigated paddy; ii) double cropping of paddy plus other food crops under irrigated condition; iii) fish culture side business in fish ponds newly developed by utilizing land resources unsuitable for paddy field; and iv) supplemental irrigated sugarcane cultivation on dry land adjacent to irrigation areas. For the first pattern, cash crops like vegetables with short growing period can be introduced, but the crop should be selected by farmers themselves according to their preference from either triple cropping of paddy with stable farm income or double cropping of paddy plus cash crop cultivation with high-risk and high-return. In order to use irrigation water for fish culture purpose, legal registration is required as an objective area of irrigation water distribution in accordance with the government regulation on irrigation. Regarding non-food crops, oil palm, jatrofa, sugarcane and cassava were selected as objective crops for the examination of growing possibilities in irrigation areas, since these crops are taken up as the strategic bio-energy resource crops in the national energy policy. The first two are perennial crops with potential for producing bio-diesel, but not suitable for the above farming systems. The pre-conditions to introduce sugarcane cultivation as a raw material of bio-ethanol for the maximum utilization purpose of irrigation water are the availability of dry farm land adjacent to irrigation areas and a sugar mill factory operating at the transportable distance within a time limit to avoid sugar content reduction. Cassava is not recommendable, considering that no bio-ethanol producing technology has been put into practice and its planting on irrigated paddy field triggers to reduce irrigation efficiency due to deterioration of soil physical condition.

As of 2011 three years after the completion of Batang Hari Irrigation Project, the irrigated paddy field and fish pond areas cover 5,137 ha and 257 ha, respectively, out of the design irrigation service area of 15,271 ha commanded by Batang Hari Headworks, and the irrigated and rain-fed paddy field areas cover 800 ha and 620 ha, respectively, out of the design area of 3,665 ha commanded by three intake weirs on tributaries of Batang Hari River. Blessed with year-round availability of irrigation water from the headworks, triple cropping of paddy is practiced in 44% of the irrigated area and double cropping covers the remaining area, producing paddy of around 62,000 tons annually. The average paddy yield has reached 4.45 tons, nearly to the target yield level of 4.5 ton/ha during the wet season and 5.0 ton/ha during the dry season. Along with the strategic development plan based on the agreement between DGWR and the Dharmasuraya District Government, it is planned to complete new paddy field development of 2,000 ha in the command area of the headworks and provision of irrigation facilities to rain-fed paddy field of 620 ha in the tributary irrigation area up to 2014. When implemented, the total irrigation area of Batang Hari Irrigation System will reach 8,557 ha. If another plan to expand fish culture ponds up to 700 ha is realized, the future extension of irrigation area will be limited 2,970 ha after 2014. Through downward modification of over-estimated unit water requirement of fish culture, further extension of irrigation area will be possible. It is also planned to allocate irrigation water equivalent to irrigation water requirement for paddy field of 70 ha to meet

domestic water demand for 13,700 inhabitants living in the center of Batang Hari irrigation area.

(4) Micro Hydroelectric Power Generation in Batang Hari Irrigation Area

With regard to the micro hydroelectric power generation ideas of the Dharmasuraya District Government, potential sites such as power generation plant attached to Batang Hari Headworks as well as drop works, diversion structures, aqueduct and siphons set on the main canal of Batang Hari Irrigation System were initially screened out due to the difficulty of construction works, the unavailability of small-size turbine pump for generation to meet technical specifications in Indonesia, and the high cost requirement exceeding the break-even point of US\$3,000/kW based on the current PLN's buying price. On the other hand, the utilization plan of the existing idle pumping station along the Batang Hari River, with the effective head of 19.0 m and the availability of PLN grid line at a distance of 200 m, can expect the installed capacity of 420 kW by using irrigation water of 5.0 m³/s. Taking such merits into account, the possibility of constructing micro hydroelectric power generation plant in the Batang Hari Irrigation System was preliminarily examined for two scenarios: i) a basic scenario using surplus water during the irrigation water distribution period without any effect on the original design irrigation area; and ii) an alternative scenario to directly divert irrigation water of 5.0 m³/s for the specific use of power generation. As a result, the both scenarios will be economically viable, and, with increasing irrigation water use, the economic viability will become better. Considering the additional investment cost to cope with the condition for the reuse of discharged water for irrigation purpose, however, the alternative plan will be financially not viable. For the basic scenario, it is a prerequisite that beneficiary farmers should follow the officially decided cropping schedule in the irrigation area and the management authority should strictly control the irrigation water distribution plan according to the cropping schedule in order to ensure the surplus water for the use of power generation.

6.2 Recommendations

Aiming to contribute to the maximum utilization of irrigation water, the creation of farming system more attractive to farmers and the national food security, the following are recommended; :

- To promote triple cropping of paddy as well as double cropping of paddy plus additional cropping of other food crops considering socio-economic, natural and market conditions specified in individual irrigation systems; and
- To utilize the established database of DGWR on the existing irrigation systems as a common tool by all stakeholders aiming to support their timely planning and budgeting works based on monitoring data concerning whether irrigation water is properly and fully used in each irrigation system; to key in basic data with high accuracy and correct indication on actual condition of irrigation systems in the database; and to re-evaluate usable water resources potential, usable land resources potential, functioning condition of irrigation facilities and paddy cultivation potential in each river basin throughout the country for the purpose of drawing up a sustainable irrigation water utilization program from the medium- and long-term viewpoint.

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Appendix A
Irrigation Statistics

SURVEY
FOR
MAXIMUM UTILIZATION OF IRRIGATION WATER
IN
THE REPUBLIC OF INDONESIA

DRAFT FINAL REPORT

APPENDIX A

Irrigation Statistics

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CHAPTER A1 IRRIGATION STATISTICS

A1.1 Surface Irrigation System Database on Management Responsibility Division

The division of irrigation tasks among national, provincial and local (district/city) governments is stipulated by the Government Regulation No. 20/2006 enacted in line with the new Water Law No. 7/2004. The management responsibilities are currently divided as follows:

- National government is responsible for management, funding and implementation of irrigation systems which across a provincial boundary with any sizes, are located in a province with a size of more than 3,000 ha, and across a district/city boundary with a size of more than 3,000 ha;
- Provincial government is responsible for management, funding and implementation of irrigation systems which are located in a province with a size between 1,000 ha and 3,000 ha, and across a district/city boundary with any sizes; and
- District/City government is responsible for management, funding and implementation of irrigation systems which are located in a district/city with a size of less than 1,000 ha.

All of the existing irrigation schemes in the country are categorized by the Directorate General of Water Resources (DGWR) of Ministry of Public Works (MPW) in accordance with the above division of irrigation tasks. The database indicates numbers and designed irrigation service areas of surface irrigation systems as of 2007. It is summarized in Annex A1.1.1 on provincial basis and compiled in Annex 1.1.2 to Annex A1.1.32 on district/city basis.

A1.2 Surface Irrigation System Database on Irrigation Facility Status

Taking the opportunity when the Government Regulation No. 20/2006 was enacted, the Water Resources Data Center of DGWR commenced to establish an integrated database in which all the relevant information on individual irrigation systems is gathered together. Till now, however, input data into this database are limited to only spatial data based on the following classification of irrigation facility status, and other data such as hydrology, water users, etc. have not been transferred from available data sources of DGWR and other agencies concerned:

- *Luas Rencana*: Designed area of the scheme, except for the area occupied by roads, villages, home yard, etc., the area can be converted to irrigated paddy field;
- *Luas Potensial*: Area for which main and secondary canals have been constructed;
- *Sawah*; Area which has been developed for paddy cultivation;
- *Belum Sawah*: Area for which the land development such as land clearing, land leveling and paddy field formation has not yet been completed in spite of completion of main and secondary canal construction;
- *Luas Potensi Sawah Irigasi*: Irrigated paddy field;
- *Sawah Belum Irigasi*: Paddy field for which main and secondary canals have been constructed, but irrigation was not made so far for some reasons;

- *Petak Tersier Sudah Dikembangkan*: Area for which tertiary canals have been constructed;
- *Petak Tersier Belum Dikembangkan*: Area for which tertiary canals have been not yet constructed; and
- *Lahan Alih Fungsi*: Area that has been converted for other purposes such as public facility, resulting in that the area is not changeable to paddy field.

Moreover, there are considerable cases with the discrepancy in designed service area data of the same irrigation system between these two databases of DGWRD. This database is summarized in Annex A1.2.1 on provincial basis and compiled in Annex 1.2.2 to Annex A1.2.32 on district/city basis.

A1.3 Classification of Surface Irrigation Systems by Availability of Discharge Measurement Apparatus

Formerly, surface irrigation systems were classified into three categories such as technical, semi-technical and simple irrigation schemes based on the availability and function of discharge measurement apparatus on canal systems. By referring to the data as of 2005, DGWR recapitulated designed irrigation service areas on provincial base as compiled as Annex 1.3.1.

A1.4 Operation and Maintenance Budget

As no statistical data on annual budget and actual expenditure for operation and maintenance (O&M) of irrigation systems at central, provincial and district levels have been compiled, one reference indicating O&M budget allocated to provincial and district levels for 2007 is compiled in Annex A1.4 by referring to the attachment of the MPW's Regulation No. 38/PRT/M/2006 regarding Guideline for Implementation of Activities in Public Works Section which is under Government Authority and executed by De-centralization and Assisting Task for 2007.

A1.5 Completed Foreign Loan Projects of Water Resources Sector

Until November 2011, implementation of 35 World Bank financed projects, 26 Asian Development Bank (ADB) financed projects and 96 Yen Loan projects in total were completed under the management of DGWR of MPW. The project list is presented in Annex A1.5.

A1.6 On-going Foreign Loan Projects of Water Resources Sector

Currently, DGWR of MPW is executing 15 projects comprising one financed by the World Bank, two by ADB, 11 by JICA and one by China. The project list with current disbursement condition of the respective projects is given as Annex A1.6.

A1.7 Design Irrigation Service Areas of Yen Loan Irrigation Projects Completed and On-going

The data on design irrigation service areas of completed and on-going irrigation projects financed by Yen Loan are compiled in Annex 1.7.

Annex A

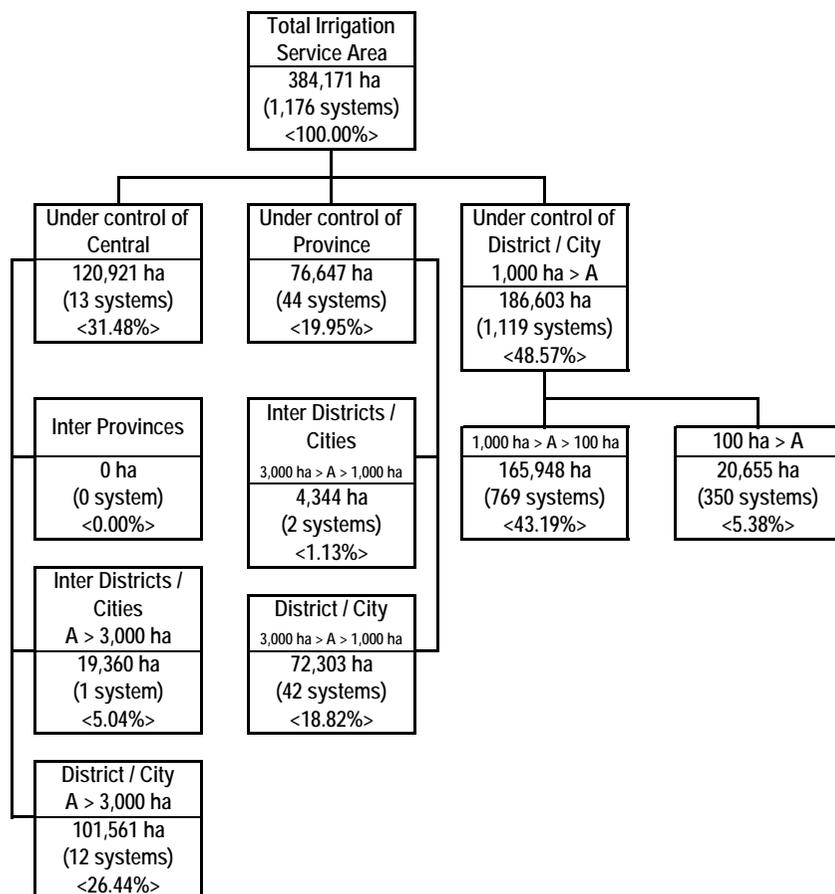
Annex A1.1.1 Distribution of Irrigation Schemes by Management System as of 2007

Province	Central						Province				District/City				Total	
	Inter Provinces		Inter Districts/Cities A > 3,000 ha		Inner Province A > 3,000 ha		Inter Districts/Cities 3,000 ha > A		Inner District/City 3,000 ha > A > 1,000 ha		Inner District/City 1,000 ha > A > 100 ha		100 ha > A			
	System (No.)	Area (ha)	System (No.)	Area (ha)	System (No.)	Area (ha)	System (No.)	Area (ha)	System (No.)	Area (ha)	System (No.)	Area (ha)	System (No.)	Area (ha)	System (No.)	Area (ha)
Aceh	0	0	1	19,360	12	101,561	2	4,344	42	72,303	769	165,948	350	20,655	1,176	384,171
North Sumatra	0	0	2	10,650	10	43,849	17	8,712	47	69,446	600	164,986	332	17,737	1,008	315,380
West Sumatra	1	17,291	1	4,200	10	63,657	31	14,305	24	36,831	504	129,019	762	40,014	1,333	305,317
Riau	0	0	0	0	0	0	0	57	104,784	134	54,083	31	1,765	222	160,632	
Jambi	-	2,645	0	0	2	9,429	0	0	5	7,933	57	14,043	29	1,843	93	35,893
South Sumtra	1	59,728	1	10,163	13	113,461	0	0	14	21,718	109	33,834	15	862	153	239,766
Bengkulu	1	5,600	0	0	4	23,608	1	514	8	13,689	140	35,192	190	10,256	344	88,859
Lampung	-	8,100	2	57,281	23	176,526	4	3,851	14	22,386	487	108,406	275	14,419	805	390,969
Kep. Bangka Belitung	0	0	0	0	2	8,868	0	0	5	9,036	31	10,462	7	405	45	28,771
Kepulauan Riau	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<i>Sumtra Total</i>	<i>3</i>	<i>93,364</i>	<i>7</i>	<i>101,654</i>	<i>76</i>	<i>540,959</i>	<i>55</i>	<i>31,726</i>	<i>216</i>	<i>358,126</i>	<i>2,831</i>	<i>715,973</i>	<i>1,991</i>	<i>107,956</i>	<i>5,179</i>	<i>1,949,758</i>
Bantaen	0	0	3	51,104	3	48,441	0	0	13	23,203	392	70,352	570	35,749	981	228,849
DIK Jakarta	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
West Java	-	5,484	6	346,056	27	270,015	31	16,835	75	119,625	551	197,202	467	22,438	1,157	977,655
Central Java	4	48,120	14	190,155	17	108,723	63	32,713	35	56,266	1,022	241,009	7,959	240,046	9,114	917,032
DI Yogyakarta	2	5,749	1	5,159	1	7,152	36	4,891	8	12,222	57	12,533	2,411	33,948	2,516	81,654
East Java	-	865	14	150,567	22	156,612	94	49,862	94	139,897	1,132	286,401	6,631	173,035	7,987	957,239
<i>Java Total</i>	<i>6</i>	<i>60,218</i>	<i>38</i>	<i>743,041</i>	<i>70</i>	<i>590,943</i>	<i>224</i>	<i>104,301</i>	<i>225</i>	<i>351,213</i>	<i>3,154</i>	<i>807,497</i>	<i>18,038</i>	<i>505,216</i>	<i>21,755</i>	<i>3,162,429</i>
Bali	0	0	2	9,598	0	0	15	8,033	18	23,872	252	72,205	580	29,300	867	143,008
West Nusa Tenggara	0	0	7	28,101	3	12,673	0	0	39	65,984	271	100,741	33	1,982	353	209,481
East Nusa Tenggara	0	0	0	0	23	87,994	3	1,630	38	56,295	505	99,133	694	31,773	1,263	276,825
<i>Bali Nusa Total</i>	<i>0</i>	<i>0</i>	<i>9</i>	<i>37,699</i>	<i>26</i>	<i>100,667</i>	<i>18</i>	<i>9,663</i>	<i>95</i>	<i>146,151</i>	<i>1,028</i>	<i>272,079</i>	<i>1,307</i>	<i>63,055</i>	<i>2,483</i>	<i>629,314</i>
West Kalimantan	0	0	0	0	0	0	0	0	8	11,704	296	55,859	217	12,370	521	79,933
Central Kalimantan	0	0	0	0	0	0	0	0	25	38,051	89	34,915	14	1,015	128	73,981
South Kalimantan	0	0	1	6,000	4	15,090	0	0	26	41,602	228	69,014	29	2,014	288	133,720
East Kalimantan	0	0	0	0	0	0	0	0	47	63,051	415	127,940	23	1,695	485	192,686
<i>Kalimantan Total</i>	<i>0</i>	<i>0</i>	<i>1</i>	<i>6,000</i>	<i>4</i>	<i>15,090</i>	<i>0</i>	<i>0</i>	<i>106</i>	<i>154,408</i>	<i>1,028</i>	<i>287,728</i>	<i>283</i>	<i>17,094</i>	<i>1,422</i>	<i>480,320</i>
North Sulawesi	0	0	0	0	3	16,782	3	2,895	11	16,533	134	34,013	82	4,618	233	74,841
Gorontalo	0	0	0	0	0	0	2	2,688	10	15,623	29	12,578	1	42	42	30,931
Central Sulawesi	0	0	1	7,922	6	32,142	0	0	30	48,777	156	60,720	7	438	200	149,999
South Sulawesi	0	0	9	113,763	33	260,701	3	5,016	32	56,488	796	170,651	678	40,975	1,551	647,594
Southeast Sulawesi	0	0	0	0	2	19,471	1	1,406	10	18,085	73	28,268	0	0	86	67,230
West Sulawesi	0	0	0	0	2	20,085	0	0	2	2,800	92	22,321	122	6,121	218	51,327
<i>Sulawesi Total</i>	<i>0</i>	<i>0</i>	<i>10</i>	<i>121,685</i>	<i>46</i>	<i>349,181</i>	<i>9</i>	<i>12,005</i>	<i>95</i>	<i>158,306</i>	<i>1,280</i>	<i>328,551</i>	<i>890</i>	<i>52,194</i>	<i>2,330</i>	<i>1,021,922</i>
Maluku	0	0	0	0	7	34,035	0	0	22	38,499	35	21,474	0	0	64	94,008
North Maluku	0	0	0	0	2	7,500	0	0	33	43,810	16	6,965	3	204	54	58,479
West Papua	0	0	0	0	1	3,450	0	0	9	12,285	9	4,621	0	0	19	20,356
Papua	0	0	0	0	2	10,200	0	0	2	3,150	10	5,022	18	789	32	19,161
<i>Maluku Papua Total</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>12</i>	<i>55,185</i>	<i>0</i>	<i>0</i>	<i>66</i>	<i>97,744</i>	<i>70</i>	<i>38,082</i>	<i>21</i>	<i>993</i>	<i>169</i>	<i>192,004</i>
Indonesia Total	9	153,582	65	1,010,079	234	1,652,025	306	157,695	803	1,265,948	9,391	2,449,910	22,530	746,508	33,338	7,435,747

Source: Status Daerah Irigasi yang Menjadi Wewenang dan Tanggung Jawab Pemerintah Provinsi dan Kabupaten, 2007, MPW

Annex A1.1.2 Design Irrigation Service Areas by Management Setup in Aceh Province as of 2007

AA - 2

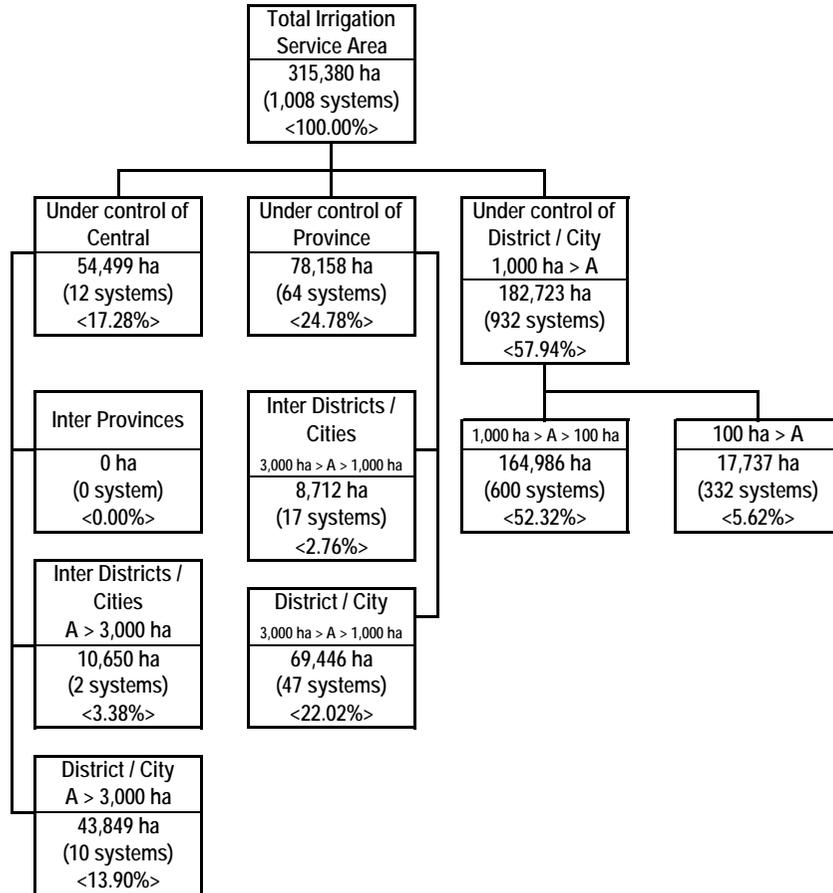


District / City	Central (A > 3,000 ha)			Province (3,000 ha > A > 1,000 ha)		Total (No. / ha)
	Inter-Provinces (No. / ha)	Inter-Districts/Cities (No. / ha)	Inner-District/City (No. / ha)	Inter-Districts/Cities (No. / ha)	Inner-District/City (No. / ha)	
	Kab. Aceh Besar	0 0	0 0	2 15,961	0 0	
Kab. Biren	0 0	0 0	2 9,683	1 1,838	3 4,024	6 15,545
Kab. Pidie	0 0	0 0	1 19,118	- 306	3 4,738	4 24,162
Kab. Aceh Utara	0 0	1 15,880	2 12,935	0 0	2 3,226	5 32,041
Kota Langasa	0 0	0 0	0 0	1 1,300	0 0	1 1,300
Kab. Aceh Timur	0 0	- 3,480	0 0	- 900	4 7,975	4 12,355
Kab. Aceh Tamiang	0 0	0 0	0 0	0 0	3 5,800	3 5,800
Kab. Aceh Tengah	0 0	0 0	0 0	0 0	1 2,000	1 2,000
Kab. Bener Meriah	0 0	0 0	1 3,200	0 0	0 0	1 3,200
Kab. Aceh Jaya	0 0	0 0	0 0	0 0	6 12,707	6 12,707
Kab. Simeuleu	0 0	0 0	0 0	0 0	3 3,085	3 3,085
Kab. Nagan Raya	0 0	0 0	2 29,446	0 0	0 0	2 29,446
Kab. Aceh Barat Daya	0 0	0 0	1 5,793	0 0	3 6,134	4 11,927
Kab. Aceh Selatan	0 0	0 0	0 0	0 0	6 9,740	6 9,740
Kab. Aceh Tenggara	0 0	0 0	1 5,425	0 0	6 8,199	7 13,624
Kab. Gayo Luwes	0 0	0 0	0 0	0 0	2 4,675	2 4,675
Total	0 0	1 19,360	12 101,561	2 4,344	42 72,303	57 197,568

District / City	District/City (1,000 ha > A > 100 ha)		District / City	District/City (100 ha > A)	
	(No. / ha)	(No. / ha)		(No. / ha)	(No. / ha)
Kab. Aceh Besar	31 8,818	13 1,543	Kab. Aceh Barat	60 10,806	9 650
Kab. Biren	49 9,995	36 1,677	Kab. Aceh Jaya	41 9,464	6 381
Kab. Pidie	53 11,797	91 3,839	Kab. Simeuleu	49 9,463	13 990
Kab. Aceh Utara	99 21,084	30 2,544	Kab. Nagan Raya	30 6,067	7 531
Kota Langasa	6 867	2 183	Kab. Aceh Singkil	10 3,590	10 510
Kab. Aceh Timur	31 8,865	2 150	Kab. Aceh Barat Daya	37 8,315	12 794
Kab. Aceh Tamiang	22 6,095	1 85	Kab. Aceh Selatan	39 7,031	63 3,099
Kab. Aceh Tengah	62 10,406	25 1,455	Kab. Aceh Tenggara	68 14,378	10 700
Kab. Bener Meriah	46 9,618	12 774	Kab. Gayo Luwes	36 9,289	8 750
Total			Total	769 165,948	350 20,655

Annex A1.1.3 Design Irrigation Service Areas by Management Setup in North Sumatra Province as of 2007

AA - 3



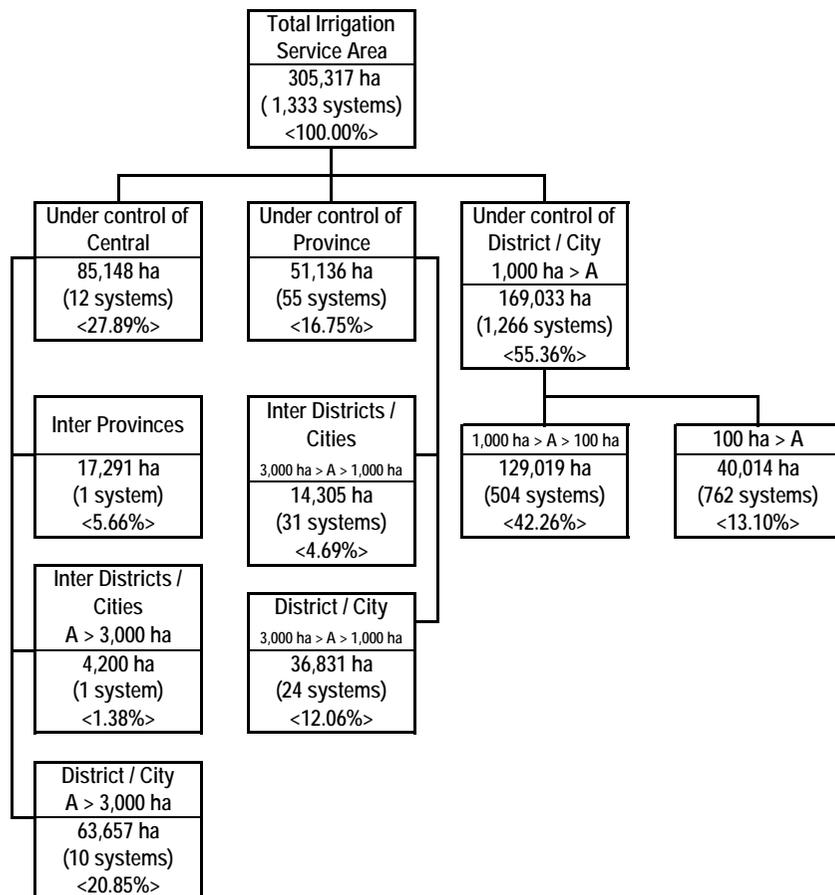
District / City	Central (A > 3,000 ha)			Province (3,000 ha > A > 1,000 ha)			Total (No. / ha)
	Inter-Provinces (No. / ha)	Inter-Districts/Cities (No. / ha)	Inner-District/City (No. / ha)	Inter-Districts/Cities (No. / ha)	Inner-District/City (No. / ha)		
	Kab. Langkat	0 0	1 5,521	0 0	0 0	1 1,400	
Kota Binjai	0 0	- 779	0 0	0 0	0 0	0 779	
Kab. Deli Serdang	0 0	0 0	1 3,017	1 200	5 10,089	7 13,306	
Kab. Serdang Bedagai	0 0	0 0	3 15,022	2 2,001	4 5,530	9 22,553	
Kab. Simalungun	0 0	0 0	1 5,000	0 0	9 11,428	10 16,428	
Kota Pematang Siantar	0 0	0 0	0 0	7 2,272	0 0	7 2,272	
Kab. Tanah Karo	0 0	0 0	0 0	0 0	1 1,242	1 1,242	
Kab. Dairi	0 0	0 0	0 0	0 0	1 1,400	1 1,400	
Kab. Asahan	0 0	0 0	2 6,688	0 0	7 12,977	9 19,665	
Kota Tanjung Balai	0 0	0 0	0 0	1 980	0 0	1 980	
Kab. Tapanuli Tengah	0 0	0 0	0 0	1 890	3 4,109	4 4,999	
Kab. Tapanuli Utara	0 0	0 0	0 0	0 0	1 2,492	1 2,492	
Kab. Toba Samosir	0 0	0 0	0 0	3 453	2 2,565	5 3,018	
Kab. Humbang Hasungdutan	0 0	0 0	0 0	0 0	3 3,430	3 3,430	
Kab. Labuhan Batu	0 0	- 0	1 3,300	0 0	1 1,200	2 4,500	
Kab. Tapanuli Selatan	0 0	- 0	1 4,194	0 0	7 8,930	8 13,124	
Kota Padang Sidempuan	0 0	1 4,350	0 0	0 0	1 1,396	2 5,746	
Kab. Nias	0 0	0 0	0 0	0 0	1 1,258	1 1,258	
Kab. Samosir	0 0	0 0	0 0	1 500	0 0	1 500	
Kab. Mandailing Natar	0 0	0 0	1 6,628	1 1,416	0 0	2 8,044	
Total	0 0	2 10,650	10 43,849	17 8,712	47 69,446	76 132,657	

District / City	District/City (1,000 ha > 100 ha)		District / City	District/City (100 ha > A)	
	(No. / ha)	(No. / ha)		(No. / ha)	(No. / ha)
Kab. Langkat	14 4,468	18 1,090	Kab. Tapanuli Utara	44 10,438	38 2,532
Kab. Deli Serdang	15 7,693	0 0	Kab. Toba Samosir	28 9,223	17 1,100
Kota Tebing Tinggi	1 300	0 0	Kab. Humbang Hasungdutan	9 2,587	4 240
Kab. Serdang Bedagai	4 3,030	0 0	Kab. Labuhan Batu	5 975	1 60
Kab. Simalungun	139 42,352	29 2,160	Kab. Tapanuli Selatan	31 11,042	1 50
Kab. Tanah Karo	44 11,073	75 3,052	Kota Padang Sidempuan	9 3,020	1 86
Kab. Dairi	70 13,777	73 3,422	Kab. Nias	71 15,131	28 1,779
Kab. Pakpak Barat	13 2,471	29 1,115	Kab. Nias Selatan	15 3,264	6 350
Kab. Asahan	27 9,666	0 0	Kab. Samosir	21 3,574	5 294
Kab. Tapanuli Tengah	31 9,225	2 129	Kab. Mandailing Natar	9 1,677	5 278
Total	600 164,986	332 17,737			

Source: Status Daerah Irigasi yang Menjadi Wewenang dan Tanggung Jawab Pemerintah Provinsi dan Kabupaten, 2007, MPW

Annex A1.1.4 Design Irrigation Service Areas by Management Setup in West Sumatra Province as of 2007

AA - 4



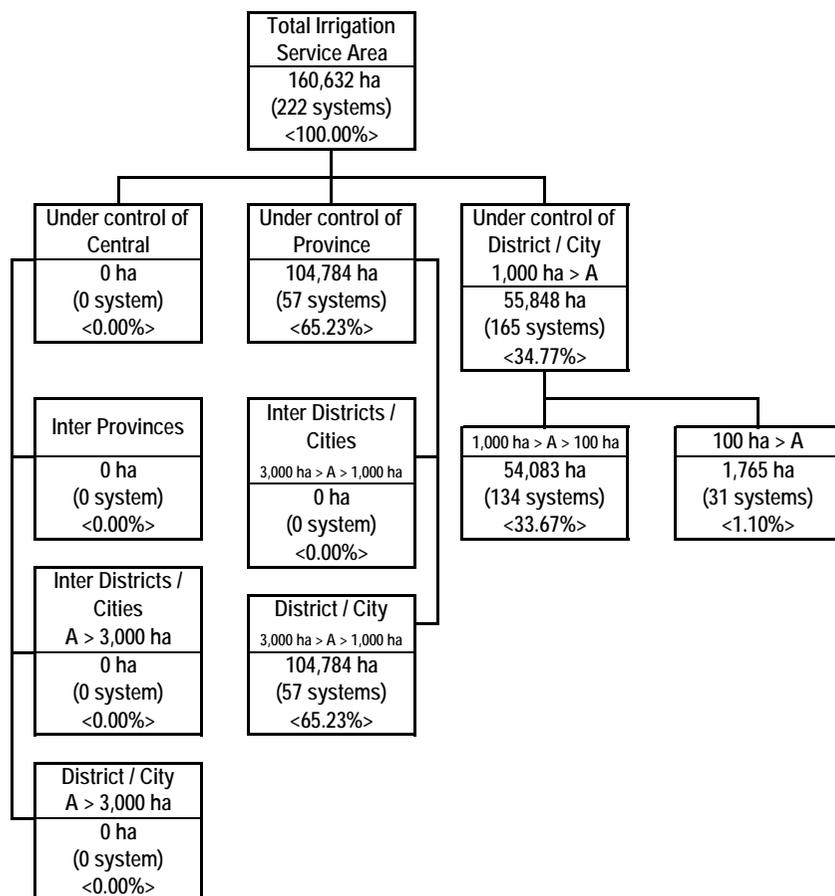
District / City	Central (A > 3,000 ha)			Province (3,000 ha > A > 1,000 ha)			Total (No. / ha)
	Inter-Provinces (No. / ha)	Inter-Districts/Cities (No. / ha)	Inner-District/City (No. / ha)	Inter-Districts/Cities (No. / ha)	Inner-District/City (No. / ha)		
	Kab. Pasaman	0 0	0 0	1 8,300	0 0	1 2,326	
Kab. Pasaman Barat	0 0	0 0	3 19,300	0 0	2 3,500	5 22,800	
Kab. Agam	0 0	1 4,000	0 0	10 1,822	4 4,608	15 10,430	
Kota Bukit Tinggi	0 0	0 0	0 0	- 414	0 0	0 414	
Kab. Lima Puluh Kota	0 0	0 0	0 0	5 3,091	0 0	5 3,091	
Kota Payakumbuh	0 0	0 0	0 0	- 1,546	0 0	0 1,546	
Kab. Tanah Datar	0 0	0 0	1 3,000	9 1,281	2 2,387	12 6,668	
Kab. Padang Pariaman	0 0	- 200	1 13,604	1 612	2 2,425	4 16,841	
Kota Padang	0 0	0 0	0 0	0 0	2 3,091	2 3,091	
Kab. Solok	0 0	0 0	0 0	6 3,227	1 1,525	7 4,752	
Kab. Solok Selatan	0 0	0 0	0 0	0 0	1 1,450	1 1,450	
Kab. Sawahlunto Sijunjung	0 0	0 0	0 0	- 194	1 1,158	1 1,352	
Kab. Pesisir Selatan	- 1,000	0 0	3 15,153	0 0	8 14,361	11 31,514	
Kab. Dharmasraya	1 16,291	0 0	0 0	0 0	0 0	1 32,582	
Kota Padang Panjang	0 0	0 0	0 0	- 447	0 0	0 447	
Kota Pariaman	0 0	0 0	0 0	- 57	0 0	0 57	
Kota Solok	0 0	0 0	0 0	- 1,614	0 0	0 1,614	
Kota Sawah Lunto	0 0	0 0	1 4,300	0 0	0 0	1 4,300	
Total	1 17,291	1 4,200	10 63,657	31 14,305	24 36,831	67 153,575	

District / City	District/City (1,000 ha > 100 ha (No. / ha)		District/City 100 ha > A (No. / ha)		District / City	District/City (1,000 ha > 100 ha (No. / ha)		District/City 100 ha > A (No. / ha)	
	Kab. Pasaman	26	6,904	61		3,216	Kab. Solok Selatan	43	9,815
Kab. Pasaman Barat	28	9,618	17	1,098	Kab. Sawahlunto Sijunjung	33	7,461	63	3,410
Kab. Agam	76	17,108	79	4,761	Kab. Pesisir Selatan	29	10,505	4	253
Kota Bukit Tinggi	0	0	3	174	Kab. Dharmasraya	15	3,382	58	2,022
Kab. Lima Puluh Kota	47	10,225	96	5,550	Kota Padang Panjang	1	108	29	684
Kota Payakumbuh	2	514	4	241	Kota Pariaman	6	2,094	11	500
Kab. Tanah Datar	46	9,531	140	6,914	Kota Solok	1	108	16	554
Kab. Padang Pariaman	69	17,928	66	3,609	Kota Sawah Lunto	0	0	18	754
Kota Padang	9	4,886	5	266	Kab. Mentawai	1	120	5	272
Kab. Solok	72	18,712	43	2,804	Total	504	129,019	762	40,014

Source: Status Daerah Irigasi yang Menjadi Wewenang dan Tanggung Jawab Pemerintah Provinsi dan Kabupaten, 2007, MPW

Annex A1.1.5 Design Irrigation Service Areas by Management Setup in Riau Province as of 2007

AA - 5



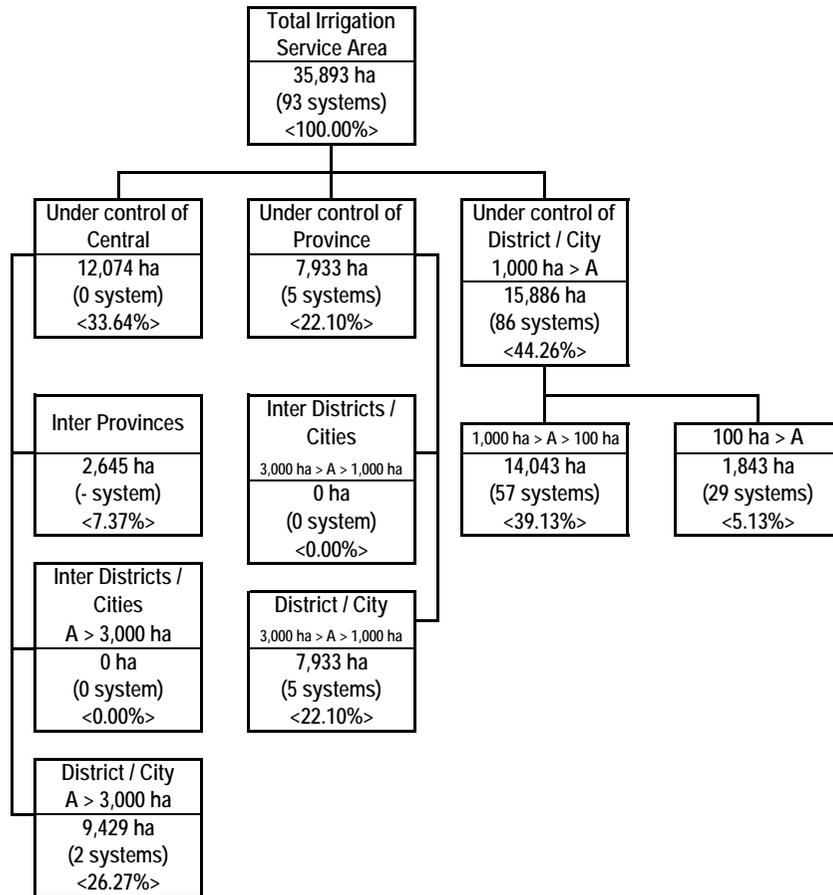
District / City	Central (A > 3,000 ha)						Province (3,000 ha > A > 1,000 ha)				Total (No. / ha)	
	Inter-Provinces (No. / ha)		Inter-Districts/Cities (No. / ha)		Inner-District/City (No. / ha)		Inter-Districts/Cities (No. / ha)		Inner-District/City (No. / ha)			
	Kab. Indragiri Hilir	0	0	0	0	0	0	0	0	27		51,267
Kab. Palalawan	0	0	0	0	0	0	0	0	13	24,900	13	24,900
Kab. Indragiri Hulu	0	0	0	0	0	0	0	0	4	6,620	4	6,620
Kab. Siak	0	0	0	0	0	0	0	0	1	2,088	1	2,088
Kab. Kampar	0	0	0	0	0	0	0	0	5	7,355	5	7,355
Kab. Rokan Hulu	0	0	0	0	0	0	0	0	1	1,654	1	1,654
Kab. Rokan Hilir	0	0	0	0	0	0	0	0	6	10,900	6	10,900
Total	0	0	0	0	0	0	0	0	57	104,784	57	104,784

District / City	District/City (1,000 ha > 100 ha)				District / City	District/City (100 ha > A)			
	1,000 ha > 100 ha (No. / ha)		100 ha > A (No. / ha)			1,000 ha > 100 ha (No. / ha)		100 ha > A (No. / ha)	
	Kab. Indragiri Hilir	35	19,862	5		248	Kab. Siak	2	900
Kota Dumai	5	1,920	0	0	Kab. Kampar	25	8,868	2	173
Kab. Palalawan	9	5,415	3	160	Kab. Rokan Hulu	23	4,796	17	935
Kab. Kuantan Senggigi	22	6,287	2	109	Kab. Rokan Hilir	5	3,250	0	0
Kab. Indragiri Hulu	8	2,785	2	140	Total	134	54,083	31	1,765

Source: Status Daerah Irigasi yang Menjadi Wewenang dan Tanggung Jawab Pemerintah Provinsi dan Kabupaten, 2007, MPW

Annex A1.1.6 Design Irrigation Service Areas by Management Setup in Jambi Province as of 2007

AA - 9

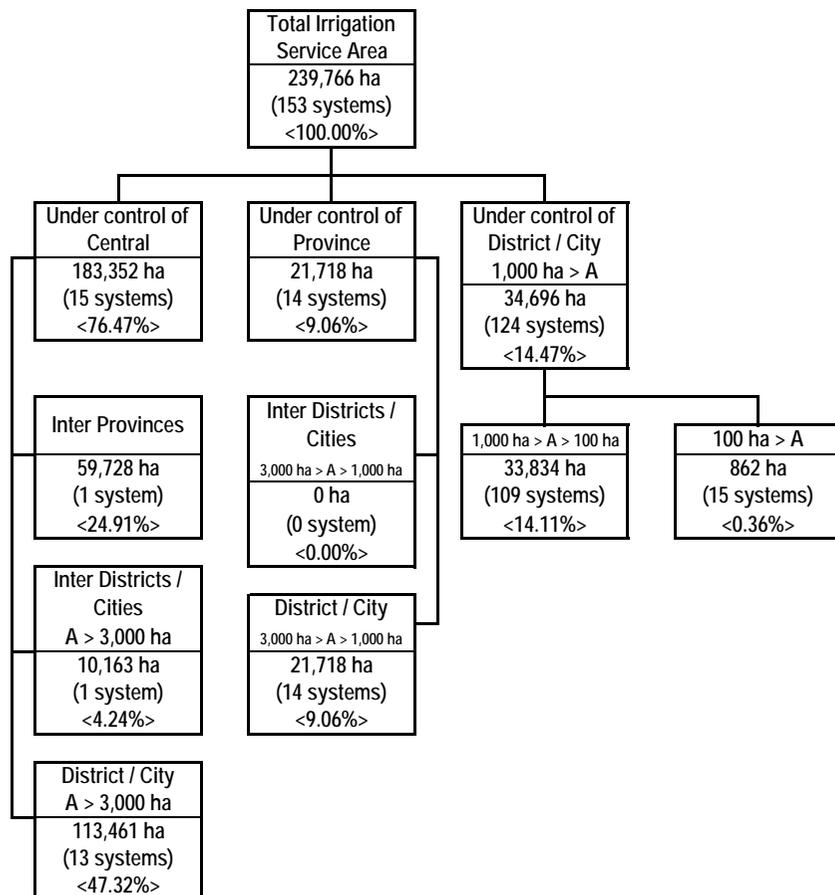


District / City	Central (A > 3,000 ha)			Province (3,000 ha > A > 1,000 ha)			Total (No. / ha)
	Inter-Provinces (No. / ha)	Inter-Districts/Cities (No. / ha)	Inner-District/City (No. / ha)	Inter-Districts/Cities (No. / ha)	Inner-District/City (No. / ha)		
	Kab. Kerinci	0 0	0 0	2 9,429	0 0	2 2,301	
Kab. Sarolangun	0 0	0 0	0 0	0 0	1 2,468	1 2,468	
Kab. Bungo	- 1,600	0 0	0 0	0 0	1 2,043	1 3,643	
Kab. Tebo	- 1,045	0 0	0 0	0 0	0 0	0 1,045	
Kab. Tanjung Jabung Barat	0 0	0 0	0 0	0 0	1 1,121	1 1,121	
Total	- 2,645	0 0	2 9,429	0 0	5 7,933	7 20,007	

District / City	District/City (1,000 ha > 100 ha)		District / City	District/City (100 ha > A)	
	(No. / ha)	(No. / ha)		(No. / ha)	(No. / ha)
Kab. Kerinci	20 5,511	8 437	Kab. Tebo	4 643	3 187
Kab. Sarolangun	5 1,407	3 181	Kab. Batanghari	1 480	0 0
Kab. Merangin	8 2,590	8 612	Kab. Tanjung Jabung Barat	2 275	0 0
Kab. Bungo	17 3,137	7 426	Total	57 14,043	29 1,843

Annex A1.1.7 Design Irrigation Service Areas by Management Setup in South Sumatra Province as of 2007

AA - 7

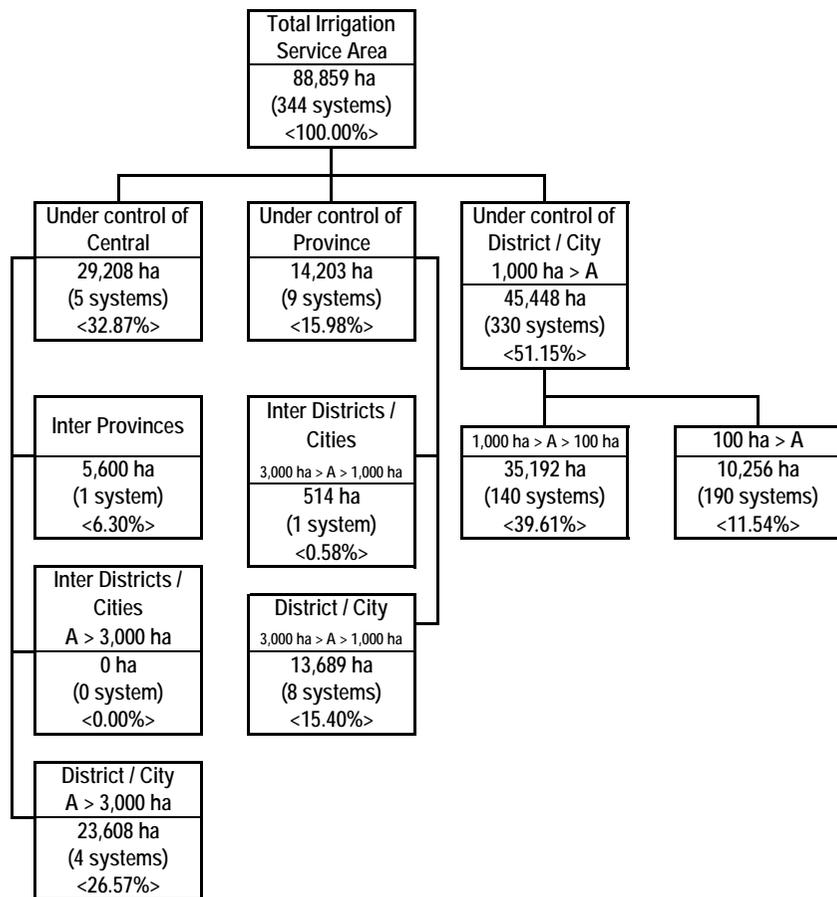


District / City	Central (A > 3,000 ha)			Province (3,000 ha > A > 1,000 ha)			Total (No. / ha)
	Inter-Provinces (No. / ha)	Inter-Districts/Cities (No. / ha)	Inner-District/City (No. / ha)	Inter-Districts/Cities (No. / ha)	Inner-District/City (No. / ha)		
	Kab. Ogan Komering Ulu Selatar	0 0	0 0	0 0	0 0	1 1,000	
Kab. Ogan Komering Ulu Timur	0 0	0 0	4 64,858	0 0	3 5,021	7 69,879	
Kab. Musi Rawas	0 0	1 10,163	2 17,795	0 0	2 3,193	5 31,151	
Kab. Lahat	0 0	0 0	4 15,400	0 0	3 3,474	7 18,874	
Kab. Pagar Alam	0 0	0 0	3 15,408	0 0	0 0	3 15,408	
Kab. Muara Enim	0 0	0 0	0 0	0 0	3 5,810	3 5,810	
Kab. Ogan Komering Ulu Induk	0 0	0 0	0 0	0 0	1 2,200	1 2,200	
Kab. Ogan Komering Ilir	1 59,728	0 0	0 0	0 0	0 0	1 59,728	
	0 0	0 0	0 0	0 0	1 1,020	1 1,020	
Total	1 59,728	1 10,163	13 113,461	0 0	14 21,718	29 205,070	

District / City	District/City		District / City	District/City	
	(1,000 ha > 100 ha) (No. / ha)	100 ha > A (No. / ha)		(1,000 ha > 100 ha) (No. / ha)	100 ha > A (No. / ha)
Kab. Ogan Komering Ulu Selatar	20 5,762	0 0	Kota Pagar Alam	3 1,330	1 48
Kab. Ogan Komering Ulu Timur	4 550	2 85	Kab. Muara Enim	6 2,481	5 275
Kab. Musi Rawas	33 10,873	0 0	Kota Prabumulih	1 350	0 0
Kab. Lahat	31 9,372	6 384	Kab. Ogan Komering Ulu Induk	7 1,699	1 70
Lubuk Linggau	4 1,417	0 0	Total	109 33,834	15 862

Source: Status Daerah Irigasi yang Menjadi Wewenang dan Tanggung Jawab Pemerintah Provinsi dan Kabupaten, 2007, MPW

Annex A1.1.8 Design Irrigation Service Areas by Management Setup in Bengkulu Province as of 2007



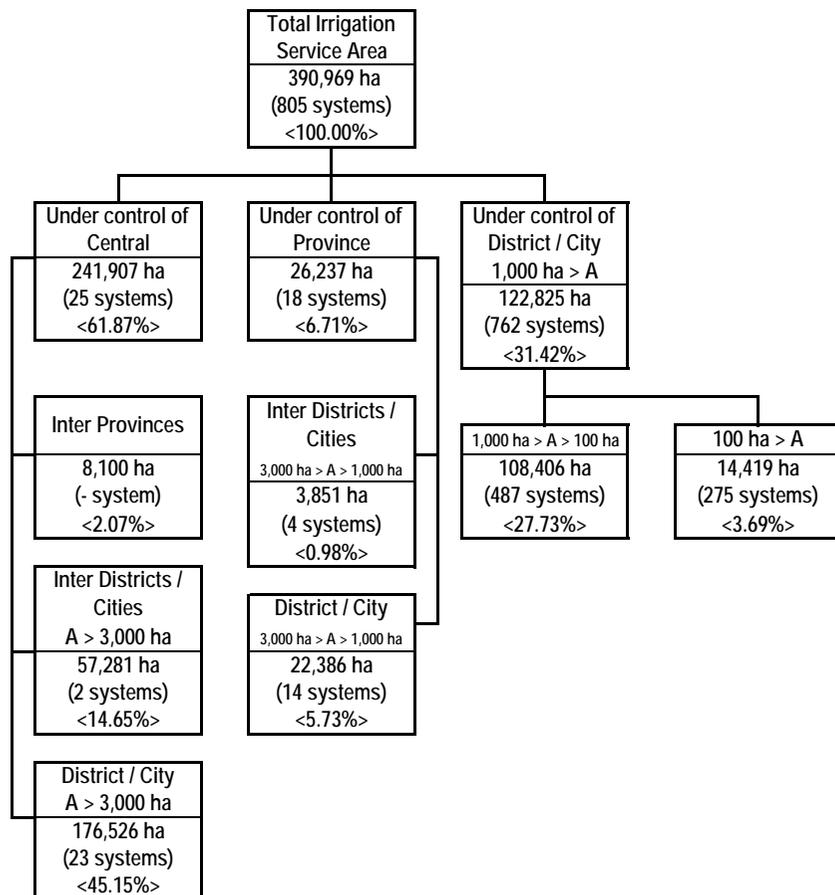
District / City	Central (A > 3,000 ha)			Province (3,000 ha > A > 1,000 ha)			Total (No. / ha)
	Inter-Provinces (No. / ha)	Inter-Districts/Cities (No. / ha)	Inner-District/City (No. / ha)	Inter-Districts/Cities (No. / ha)	Inner-District/City (No. / ha)		
	Kab. Muko Muko	1 5,600	0 0	1 7,060	0 0	0 0	
Kab. Seluma	0 0	0 0	1 7,496	0 0	2 3,956	3 11,452	
Kota Bengkulu	0 0	0 0	0 0	1 400	0 0	1 400	
Kab. Bengkulu Selatan	0 0	0 0	1 3,116	- 114	1 1,024	2 4,254	
Kab. Bengkulu Utara	0 0	0 0	1 5,936	0 0	2 3,175	3 9,111	
Kab. Rejang Lebong	0 0	0 0	0 0	0 0	3 5,534	3 5,534	
Total	1 5,600	0 0	4 23,608	1 514	8 13,689	14 49,011	

District / City	District/City (1,000 ha > 100 ha)		District / City	District/City (100 ha > A)	
	(No. / ha)	(No. / ha)		(No. / ha)	(No. / ha)
Kab. Bengkulu Selatan	44 10,685	86 4,270	Kab. Rejang Lebong	49 13,944	48 2,711
Kab. Bengkulu Utara	47 10,563	56 3,275	Total	140 35,192	190 10,256

AA - 8

Annex A1.1.9 Design Irrigation Service Areas by Management Setup in Lampung Province as of 2007

AA - 9



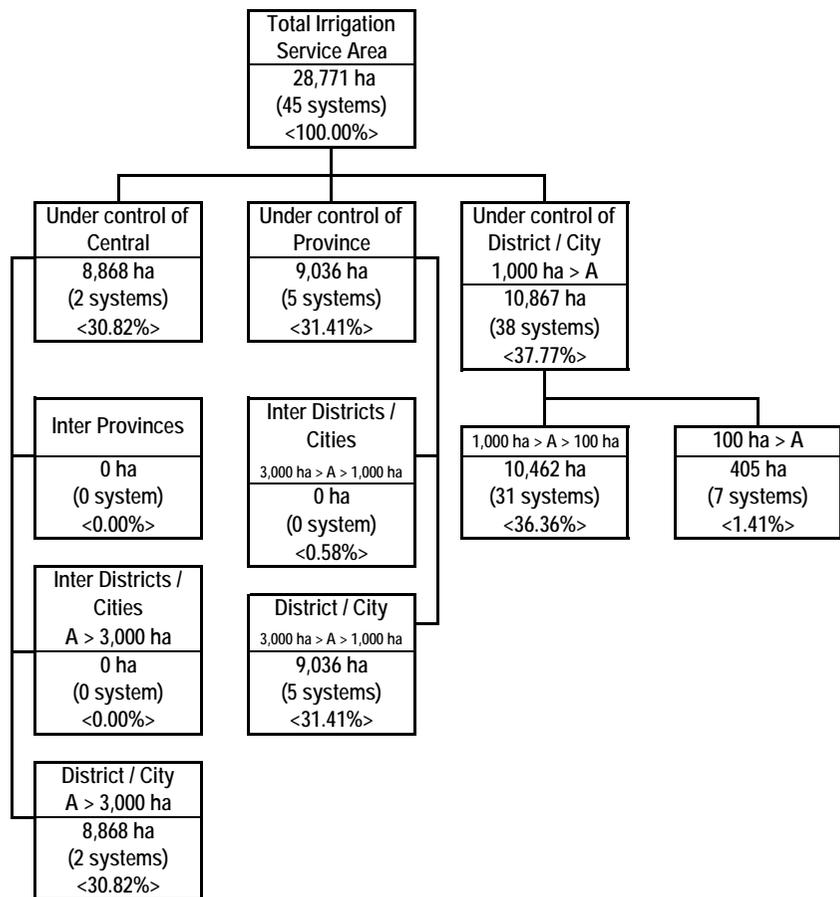
District / City	Central (A > 3,000 ha)			Province (3,000 ha > A > 1,000 ha)		Total (No. / ha)
	Inter-Provinces (No. / ha)	Inter-Districts/Cities (No. / ha)	Inner-District/City (No. / ha)	Inter-Districts/Cities (No. / ha)	Inner-District/City (No. / ha)	
	Kab. Lampung Selatan	0 0	0 0	1 3,500	2 1,282	
Kota Metro	0 0	- 2,569	0 0	2 2,569	0 0	2 5,138
Kab. Tanggamus	0 0	0 0	1 5,413	0 0	4 6,635	5 12,048
Kab. Lampung Tengah	0 0	0 0	6 48,713	0 0	4 7,853	10 56,566
Kab. Lampung Timur	0 0	1 33,602	8 44,582	0 0	0 0	9 78,184
Kab. Lampung Utara	0 0	- 9,259	2 6,200	0 0	0 0	2 15,459
Kab Tulang Bawang	0 0	1 11,851	4 60,618	0 0	0 0	5 72,469
Kab. Way Kanan	- 8,100	0 0	1 7,500	0 0	1 1,200	2 24,900
Kab. Lampung Barat	0 0	0 0	0 0	0 0	1 1,839	1 1,839
Total	- 8,100	2 57,281	23 176,526	4 3,851	14 22,386	43 276,244

District / City	District/City (1,000 ha > 100 ha)		District / City	District/City (100 ha > A)	
	(No. / ha)	(No. / ha)		(No. / ha)	(No. / ha)
Kab. Lampung Selatan	138 31,771	44 2,410	Kab. Lampung Utara	34 8,456	43 2,018
Kab. Tanggamus	113 25,087	17 1,210	Kab Tulang Bawang	6 2,164	2 60
Kab. Lampung Tengah	84 18,483	45 3,146	Kab. Way Kanan	42 9,439	4 290
Kab. Lampung Timur	4 993	13 422	Kab. Lampung Barat	66 12,013	107 4,863
Total	487 108,406	275 14,419			

Source: Status Daerah Irigasi yang Menjadi Wewenang dan Tanggung Jawab Pemerintah Provinsi dan Kabupaten, 2007, MPW

Annex A1.1.10 Design Irrigation Service Areas by Management Setup in Bangka Belitung Province as of 2007

AA - 10



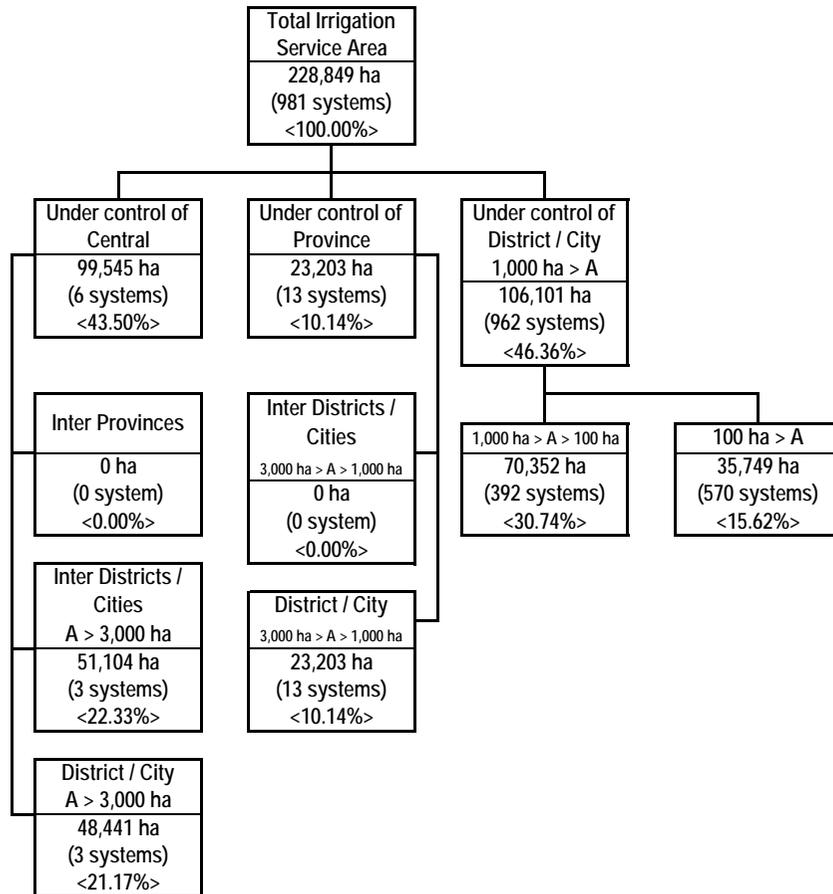
District / City	Central (A > 3,000 ha)			Province (3,000 ha > A > 1,000 ha)		Total (No. / ha)
	Inter-Provinces (No. / ha)	Inter-Districts/Cities (No. / ha)	Inner-District/City (No. / ha)	Inter-Districts/Cities (No. / ha)	Inner-District/City (No. / ha)	
	Kab. Bangka Selatan	0 0	0 0	1 4,500	0 0	
Kab. Bangka Barat	0 0	0 0	1 4,368	0 0	1 2,750	2 7,118
Total	0 0	0 0	2 8,868	0 0	5 9,036	7 17,904

District / City	District/City (1,000 ha > 100 ha)		District / City	District/City (100 ha > A)	
	(No. / ha)	(No. / ha)		(No. / ha)	(No. / ha)
Kab. Bangka	14 4,400	3 150	Kab. Bangka Selatan	5 2,287	1 85
Kab. Bangka Barat	3 600	0 0	Kab. Belitung	4 807	3 170
Kab. Bangka Tengah	2 500	0 0	Kab. Belitung Timur	3 1,868	0 0
Total	19 5,500	3 150	Total	31 10,462	7 405

Source: Status Daerah Irigasi yang Menjadi Wewenang dan Tanggung Jawab Pemerintah Provinsi dan Kabupaten, 2007, MPW

Annex A1.1.11 Design Irrigation Service Areas by Management Setup in Banten Province as of 2007

AA - 11



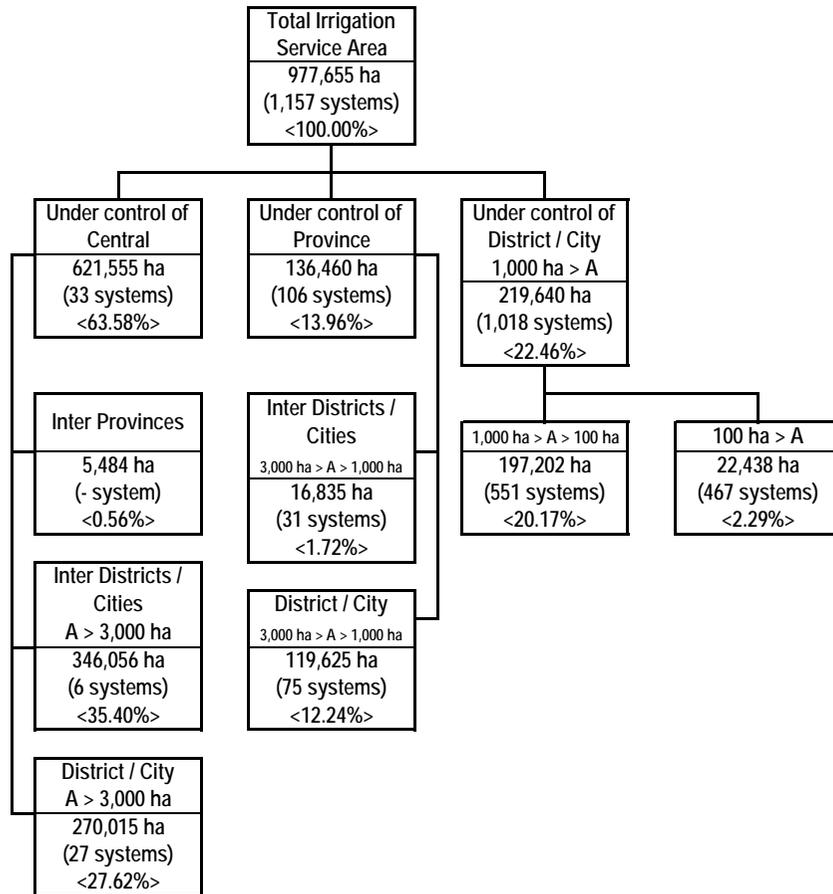
District / City	Central (A > 3,000 ha)			Province (3,000 ha > A > 1,000 ha)		Total (No. / ha)
	Inter-Provinces (No. / ha)	Inter-Districts/Cities (No. / ha)	Inner-District/City (No. / ha)	Inter-Districts/Cities (No. / ha)	Inner-District/City (No. / ha)	
	Kab. Serang	0 0	1 21,575	1 33,881	0 0	
Kota Cilegon	0 0	- 259	0 0	0 0	1 1,455	1 1,714
Kab. Pandeglang	0 0	1 5,423	1 4,288	0 0	3 6,029	5 15,740
Kab. Lebak	0 0	- 0	0 0	0 0	3 6,171	3 6,171
Kab. Tangerang	0 0	1 22,392	1 10,272	0 0	0 0	2 32,664
Kota Tangerang	0 0	- 1,455	0 0	0 0	0 0	0 1,455
Total	0 0	3 51,104	3 48,441	0 0	13 23,203	19 122,748

District / City	District/City (1,000 ha > 100 ha)		District / City	District/City (100 ha > A)	
	(No. / ha)	(No. / ha)		(No. / ha)	(No. / ha)
Kab. Serang	77 14,309	97 6,577	Kab. Lebak	142 24,357	130 9,342
Kota Cilegon	0 0	1 21	Kab. Tangerang	19 5,461	17 774
Kab. Pandeglang	154 26,225	324 19,014	Kota Tangerang	0 0	1 21
Total			Total	392 70,352	570 35,749

Source: Status Daerah Irigasi yang Menjadi Wewenang dan Tanggung Jawab Pemerintah Provinsi dan Kabupaten, 2007, MPW

Annex A1.1.12 (1/2) Design Irrigation Service Areas by Management Setup in West Java Province as of 2007

AA - 12



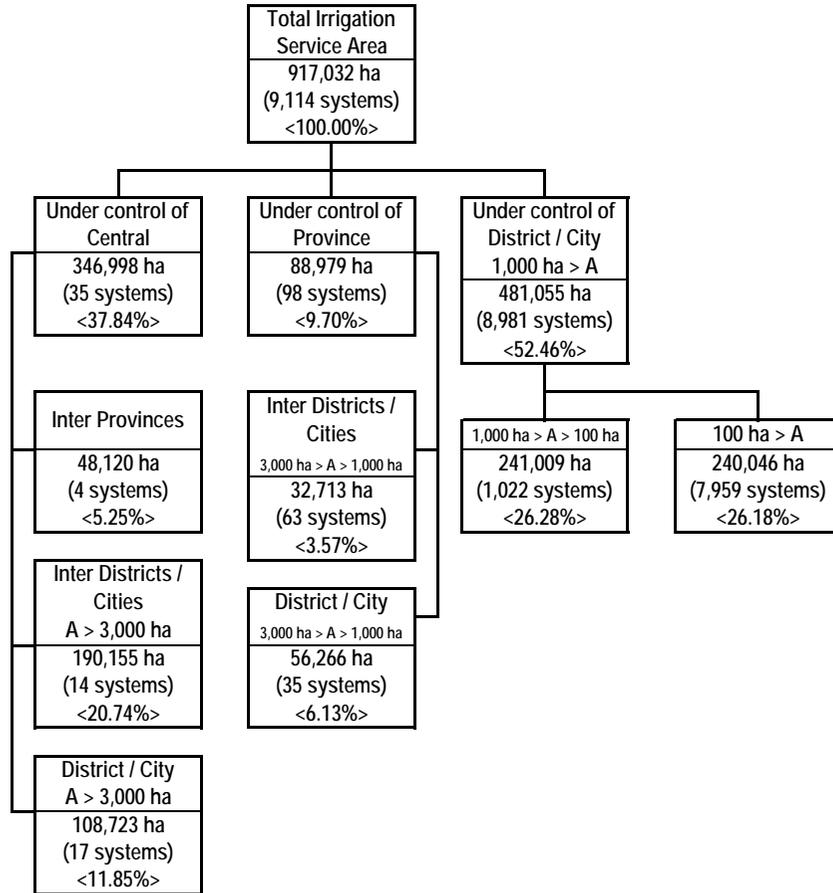
District / City	Central (A > 3,000 ha)						Province (3,000 ha > A > 1,000 ha)				Total (No. / ha)	
	Inter-Provinces (No. / ha)		Inter-Districts/Cities (No. / ha)		Inner-District/City (No. / ha)		Inter-Districts/Cities (No. / ha)		Inner-District/City (No. / ha)			
	No.	ha	No.	ha	No.	ha	No.	ha	No.	ha		
Kab. Bandung	0	0	0	0	0	0	7	3,210	6	13,864	13	17,074
Kota Bandung	0	0	0	0	0	0	1	220	0	0	1	220
Kota Cimahi	0	0	0	0	0	0	-	45	0	0	0	45
Kab. Bogor	0	0	-	1,371	1	5,506	6	1,854	4	4,392	11	13,123
Kota Bogor	0	0	0	0	0	0	-	196	0	0	0	196
Kota Depok	0	0	0	0	0	0	3	748	1	1,242	4	1,990
Kab. Cirebon	0	0	-	21,438	2	10,755	6	4,200	10	18,088	18	54,481
Kota Cirebon	0	0	0	0	0	0	-	430	0	0	0	430
Kab. Kuningan	0	0	0	0	0	0	3	1,245	3	3,515	6	4,760
Kab. Majalengka	0	0	1	4,479	2	13,004	0	0	8	13,937	11	31,420
Kab. Sumedang	0	0	0	0	1	4,300	-	140	2	2,849	3	7,289
Kab. Indramayu	0	0	1	91,203	3	13,547	0	0	2	4,354	6	109,104
Kab. Bekasi	0	0	1	55,948	2	67,616	0	0	1	1,189	4	124,753
Kab. Karawang	0	0	1	100,049	2	66,450	1	1,111	1	1,256	5	168,866
Kab. Subang	0	0	-	60,502	6	50,492	0	0	3	7,075	9	118,069
Kota Subang	0	0	0	0	0	0	-	0	0	0	0	0
Kab. Purwakarta	0	0	0	0	1	11,052	-	0	5	9,129	6	20,181
Kab. Sukabumi	0	0	0	0	3	10,921	1	632	10	13,545	14	25,098
Kab. Cianjur	0	0	0	0	1	5,495	0	0	8	10,464	9	15,959
Kab. Garut	0	0	0	0	1	4,020	0	0	3	3,161	4	7,181
Kab. Tasikmalaya	0	0	-	1,779	1	3,352	-	955	4	5,975	5	12,061
Kota Tasikmalaya	0	0	1	2,614	0	0	3	1,849	0	0	4	4,463
Kab. Ciamis	-	4,969	1	5,272	1	3,505	0	0	4	5,590	6	24,305
Kota Banjar	-	515	-	1,401	0	0	0	0	0	0	0	1,916
Total	-	5,484	6	346,056	27	270,015	31	16,835	75	119,625	139	761,068

Source: Status Daerah Irigasi yang Menjadi Wewenang dan Tanggung Jawab Pemerintah Provinsi dan Kabupaten, 2007, MPW

Annex A1.1.12 (2/2) Design Irrigation Service Areas by Management Setup in West Java Province as of 2007

District / City	District/City				District / City	District/City			
	(1,000 ha > 100 ha) (No. / ha)		100 ha > A (No. / ha)			(1,000 ha > 100 ha) (No. / ha)		100 ha > A (No. / ha)	
Kab. Bandung	25	11,824	5	320	Kota Bekasi	2	534	1	38
Kota Bandung	2	534	4	155	Kab. Karawang	12	4,322	11	677
Kota Cimahi	2	519	3	48	Kab. Subang	37	8,987	151	6,241
Kab. Bogor	74	25,150	27	1,355	Kab. Purwakarta	25	5,432	40	1,987
Kota Depok	0	0	2	64	Kab. Sukabumi	56	23,347	1	75
Kab. Cirebon	25	10,315	22	1,527	Kab. Cianjur	30	15,091	19	973
Kab. Kuningan	40	17,703	9	271	Kab. Garut	32	16,015	1	75
Kab. Majalengka	63	14,460	55	2,936	Kab. Tasikmalaya	25	11,524	7	326
Kab. Sumedang	44	9,780	90	4,462	Kota Tasikmalaya	3	834	0	0
Kab. Indramayu	9	3,407	1	98	Kab. Ciamis	29	13,193	5	232
Kab. Bekasi	16	4,231	11	469	Kota Bogor	0	0	2	109
Total						551	197,202	467	22,438

Annex A1.1.13 (1/2) Design Irrigation Service Areas by Management Setup in Central Java Province as of 2007



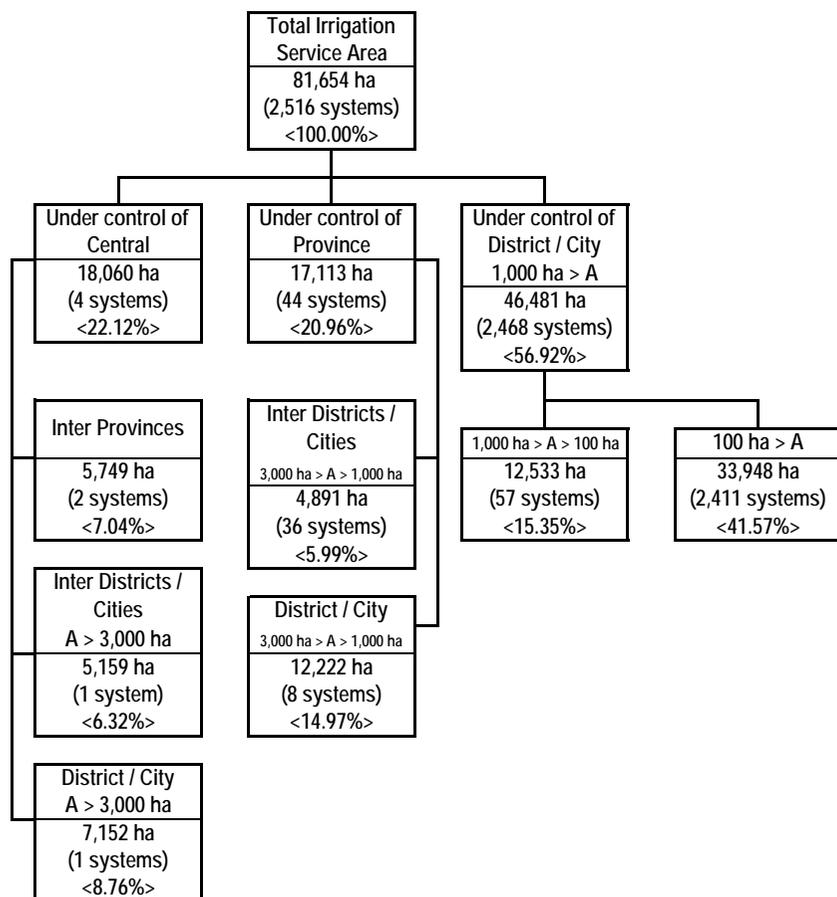
District / City	Central (A > 3,000 ha)			Province (3,000 ha > A > 1,000 ha)		Total (No. / ha)
	Inter-Provinces (No. / ha)	Inter-Districts/Cities (No. / ha)	Inner-District/City (No. / ha)	Inter-Districts/Cities (No. / ha)	Inner-District/City (No. / ha)	
	Kab. Brebes	0 0	1 27,091	1 12,486	1 690	
Kab. Tegal	0 0	1 4,014	3 21,705	5 4,652	0 0	9 30,371
Kota Tegal	0 0	0 0	0 0	1 931	0 0	1 931
Kab. Pemalang	0 0	2 12,504	1 9,005	0 0	1 2,049	4 23,558
Kab. Pekalongan	0 0	1 5,404	1 3,212	1 238	3 5,239	6 14,093
Kota Pekalongan	0 0	- 1,190	0 0	0 70	0 0	- 1,260
Kab. Batang	0 0	1 3,246	0 0	0 0	1 1,176	2 4,422
Kab. Kendal	0 0	1 3,178	1 8,861	0 174	2 3,685	4 15,898
Kota Semarang	0 0	0 0	0 0	1 652	0 0	1 652
Kab. Semarang	0 0	0 0	0 0	8 5,082	0 0	8 5,082
Kota Salatiga	0 0	0 0	0 0	2 208	0 0	2 208
Kab. Demak	0 0	3 39,087	1 4,053	2 2,356	2 4,777	8 50,273
Kab. Grobogan	0 0	- 17,236	2 15,856	0 644	1 1,818	3 35,554
Kab. Kudus	0 0	- 6,515	0 0	0 0	2 4,041	2 10,556
Kab. Jepara	0 0	- 60	0 0	1 866	1 1,379	2 2,305
Kab. Pati	0 0	- 9,348	2 8,527	- 112	2 4,152	4 22,139
Kab. Rembang	1 564	0 0	0 0	0 0	1 1,590	2 2,718
Kab. Blora	0 0	0 0	0 0	1 658	0 0	1 658
Kab. Boyolali	0 0	0 0	0 0	5 2,566	2 2,926	7 5,492
Kab. Sukoharjo	1 10,514	0 0	0 0	13 4,004	0 0	14 14,518
Kab. Karanganyar	- 1,903	0 0	0 0	11 3,138	0 0	11 5,041
Kab. Sragen	- 9,717	0 0	0 0	2 866	3 6,125	5 26,425
Kab. Klaten	- 2,003	0 0	0 0	0 525	2 2,291	2 6,822
Kab. Wonogiri	- 439	0 0	0 0	2 802	0 0	2 1,680
Kab. Magelang	0 0	1 3,366	0 0	1 555	2 2,527	4 6,448
Kota Magelang	0 0	- 214	0 0	0 71	0 0	- 285
Kab. Purworejo	0 0	- 10,431	2 9,477	1 210	0 0	3 20,118
Kab. Kebumen	0 0	1 21,802	1 6,478	0 0	0 0	2 28,280
Kab. Temanggung	0 0	- 53	0 0	1 297	2 2,142	3 2,492
Kab. Wonosobo	0 0	0 0	0 0	- 65	0 0	- 65
Kab. Banjarnegara	0 0	- 1,305	1 5,863	1 991	0 0	2 8,159
Kab. Purbalingga	0 0	1 3,696	0 0	1 99	1 1,375	3 5,170
Kab. Banyumas	0 0	- 3,378	1 3,200	2 1,026	4 5,090	7 12,694
Kab. Cilacap	2 22,980	1 17,037	0 0	- 165	2 2,858	5 43,040
Total	4 48,120	14 190,155	17 108,723	63 32,713	35 56,266	133 448,700

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Annex A1.1.13 (2/2) Design Irrigation Service Areas by Management Setup in Central Java Province as of 2007

District / City	District/City				District / City	District/City			
	(1,000 ha > 100 ha) (No. / ha)		100 ha > A (No. / ha)			(1,000 ha > 100 ha) (No. / ha)		100 ha > A (No. / ha)	
Kab. Brebes	57	12,224	342	11,344	Kab. Boyolali	24	4,334	175	5,830
Kab. Tegal	38	7,475	131	4,695	Kab. Sukoharjo	20	3,681	47	1,840
Kab. Pemasang	15	4,711	76	2,632	Kab. Karanganyar	42	8,724	266	8,760
Kab. Pekalongan	17	3,098	259	8,186	Kab. Sragen	24	10,320	34	1,604
Kab. Batang	36	7,449	514	14,049	Kab. Klaten	68	15,610	408	13,888
Kab. Kendal	20	10,291	1	41	Kab. Wonogiri	88	18,100	304	12,472
Kota Semarang	7	1,976	33	829	Kab. Magelang	55	14,178	828	19,767
Kab. Semarang	39	9,669	524	16,833	Kab. Purworejo	15	4,126	191	4,300
Kota Salatiga	4	718	15	431	Kab. Kebumen	21	4,643	174	6,146
Kab. Demak	3	1,427	0	0	Kab. Temanggung	41	6,815	303	10,791
Kab. Grobogan	36	8,659	118	4,879	Kab. Wonosobo	29	5,774	675	15,724
Kab. Kudus	22	5,808	143	4,090	Kab. Banjarnegara	37	6,499	225	7,814
Kab. Jepara	41	10,197	465	11,414	Kab. Purbalingga	40	11,353	138	5,833
Kab. Pati	38	10,388	236	7,038	Kab. Banyumas	43	7,904	610	20,031
Kab. Rembang	38	8,599	86	3,657	Kab. Cilacap	32	8,248	537	11,315
Kab. Blora	32	8,011	101	3,813					
					Total	1,022	241,009	7,959	240,046

Annex A1.1.14 Design Irrigation Service Areas by Management Setup in DI Yogyakarta as of 2007

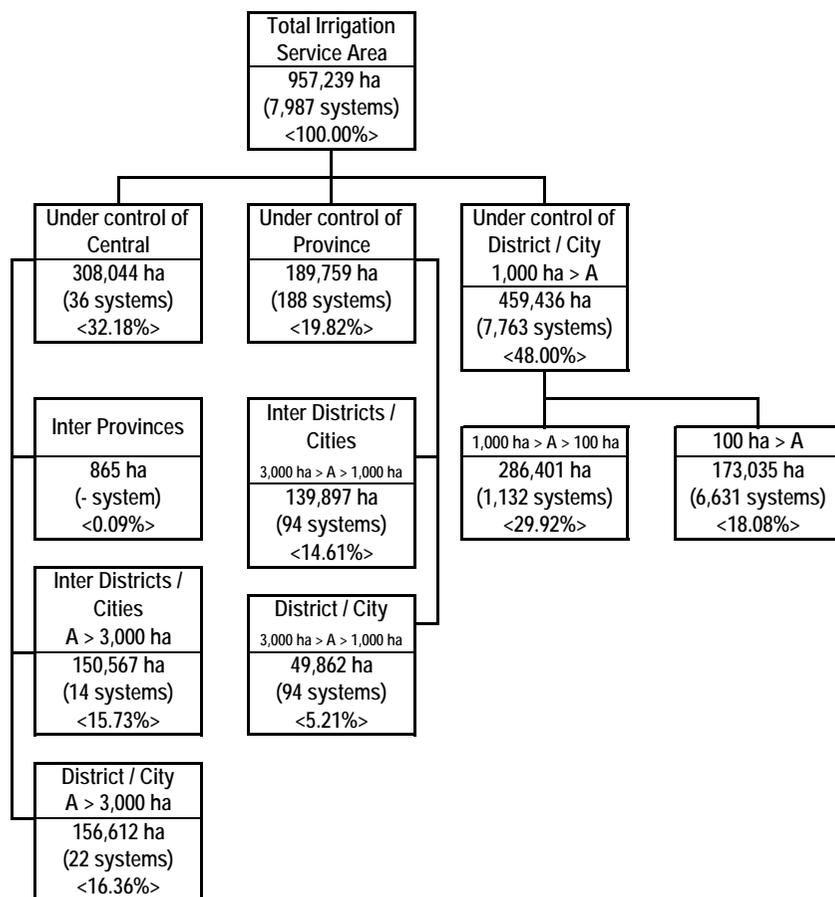


District / City	Central (A > 3,000 ha)			Province (3,000 ha > A > 1,000 ha)			Total (No. / ha)
	Inter-Provinces (No. / ha)	Inter-Districts/Cities (No. / ha)	Inner-District/City (No. / ha)	Inter-Districts/Cities (No. / ha)	Inner-District/City (No. / ha)		
	Kab. Sleman	1 149	1 4,453	0 0	10 1,230	0 0	
Kab. Gunung Kidul	1 5,600	0 0	0 0	0 0	2 2,287	3 13,487	
Kab. Bantul	0 0	0 0	0 0	22 3,600	4 6,000	26 9,600	
Kota Yogyakarta	0 0	- 706	0 0	4 61	0 0	4 767	
Kab. Kulonprogo	0 0	0 0	1 7,152	0 0	2 3,935	3 11,087	
Total	2 5,749	1 5,159	1 7,152	36 4,891	8 12,222	48 40,922	

District / City	District/City (1,000 ha > 100 ha)		District / City (100 ha > A)	District/City (1,000 ha > 100 ha)		District / City (100 ha > A)
	(No. / ha)	(No. / ha)		(No. / ha)	(No. / ha)	
Kab. Sleman	16 3,029	2,066 22,213	Kota Yogyakarta	0 0	15 91	
Kab. Gunung Kidul	10 1,304	221 6,960	Kab. Kulonprogo	6 1,400	66 2,466	
Kab. Bantul	25 6,800	43 2,218	Total	57 12,533	2,411 33,948	

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Annex A1.1.15 (1/2) Design Irrigation Service Areas by Management Setup in East Java Province as of 2007



District / City	Central (A > 3,000 ha)			Province (3,000 ha > A > 1,000 ha)			Total (No. / ha)
	Inter-Provinces (No. / ha)	Inter-Districts/Cities (No. / ha)	Inner-District/City (No. / ha)	Inter-Districts/Cities (No. / ha)	Inner-District/City (No. / ha)		
	Kab. Malang	0 0	1 4,582	1 3,974	10 3,146	0 0	
Kota Malang	0 0	- 601	0 0	9 1,222	0 0	9 1,823	
Kota Batu	0 0	0 0	0 0	- 328	0 0	0 328	
Kab. Tulungagung	0 0	1 10,582	0 0	3 3,551	1 1,381	5 15,514	
Kab. Blitar	0 0	- 1,637	0 0	8 507	0 0	8 2,144	
Kota Blitar	0 0	0 0	0 0	7 335	0 0	7 335	
Kab. Trenggalek	0 0	0 0	0 0	- 1,901	0 0	0 1,901	
Kab. Kediri	0 0	- 9,844	0 0	3 1,048	11 16,044	14 26,936	
Kota Kediri	0 0	0 0	0 0	3 609	0 0	3 609	
Kab. Nganjuk	0 0	1 17,589	1 8,753	0 0	3 3,896	5 30,238	
Kab. Jombang	0 0	2 31,503	0 0	2 374	2 2,895	6 34,772	
Kab. Mojokerto	0 0	2 7,657	0 0	7 5,550	1 1,055	10 14,262	
Kota Mojokerto	0 0	- 53	0 0	1 557	0 0	1 610	
Kab. Sidoarjo	0 0	1 23,883	0 0	0 0	0 0	1 23,883	
Kab. Madiun	0 0	1 5,677	0 0	5 5,255	5 7,141	11 18,073	
Kota Madiun	0 0	- 447	0 0	2 659	0 0	2 1,106	
Kab. Magetan	0 0	1 8,810	0 0	7 4,635	0 0	8 13,445	
Kab. Ponorogo	0 0	1 3,938	1 3,065	- 25	6 8,383	8 15,411	
Kab. Ngawi	- 500	1 3,835	1 3,128	5 3,446	8 12,189	15 23,598	
Kab. Bojonegoro	0 0	0 0	1 16,688	0 0	3 4,224	4 20,912	
Kab. Tuban	- 365	0 0	1 4,834	- 0	4 6,518	5 12,082	
Kab. Lamongan	0 0	0 0	3 23,331	2 3,938	5 6,284	10 33,553	
Kab. Gresik	0 0	0 0	0 0	1 2,072	5 6,811	6 8,883	
Kab. Bondowoso	0 0	- 1,876	0 0	3 1,648	2 2,584	5 6,108	
Kab. Situbondo	0 0	1 6,269	2 13,934	1 451	2 3,595	6 24,249	
Kab. Banyuwangi	0 0	0 0	4 31,635	1 468	3 4,333	8 36,436	
Kab. Jember	0 0	1 10,897	4 32,805	1 354	9 16,032	15 60,088	
Kab. Lumajang	0 0	- 887	1 4,337	0 0	6 8,431	7 13,655	
Kab. Probolinggo	0 0	0 0	2 10,128	4 1,765	5 7,837	11 19,730	
Kota Probolinggo	0 0	0 0	0 0	4 934	0 0	4 934	
Kab. Pasuruan	0 0	0 0	0 0	3 2,933	8 10,883	11 13,816	
Kota Pasuruan	0 0	0 0	0 0	2 2,151	0 0	2 2,151	
Kab. Bangkalan	0 0	0 0	0 0	0 0	2 2,892	2 2,892	
Kab. Sampang	0 0	0 0	0 0	0 0	1 2,603	1 2,603	
Kab. Pamekasan	0 0	0 0	0 0	0 0	1 2,462	1 2,462	
Kab. Sumenep	0 0	0 0	0 0	0 0	1 1,424	1 1,424	
Total	- 865	14 150,567	22 156,612	94 49,862	94 139,897	224 498,668	

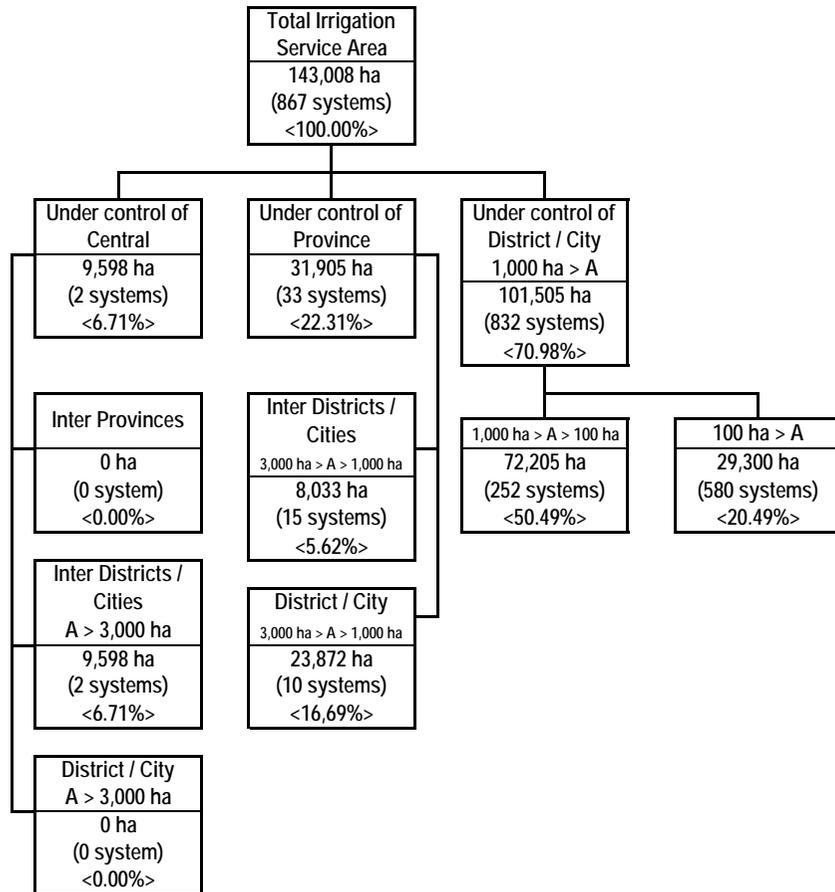
Source: Status Daerah Irigasi yang Menjadi Wewenang dan Tanggung Jawab Pemerintah Provinsi dan Kabupaten, 2007, MPW

Annex A1.1.15 (2/2) Design Irrigation Service Areas by Management Setup in East Java Province as of 2007

District / City	District/City				District / City	District/City			
	(1,000 ha > 100 ha) (No. / ha)		100 ha > A (No. / ha)			(1,000 ha > 100 ha) (No. / ha)		100 ha > A (No. / ha)	
Kab. Malang	90	17,122	513	13,592	Kab. Bojonegoro	4	1,471	2	66
Kota Malang	0	0	11	330	Kab. Tuban	25	8,032	22	1,106
Kota Batu	6	1,218	36	1,067	Kab. Lamongan	26	10,497	4	143
Kab. Tulungagung	27	5,342	131	4,191	Kab. Gresik	21	9,561	10	517
Kab. Blitar	58	12,389	728	17,468	Kab. Bondowoso	58	11,559	465	14,362
Kota Blitar	0	0	35	1,112	Kab. Situbondo	15	4,217	197	3,342
Kab. Trenggalek	11	3,344	500	6,255	Kab. Banyuwangi	93	20,790	299	9,498
Kab. Kediri	106	31,102	267	9,503	Kab. Jember	93	18,619	280	12,145
Kota Kediri	4	509	43	1,426	Kab. Lumajang	56	17,227	259	9,528
Kab. Nganjuk	39	10,881	171	4,029	Kab. Probolinggo	52	12,545	234	6,615
Kab. Jombang	35	8,536	150	3,311	Kota Probolinggo	6	1,013	13	278
Kab. Mojokerto	34	9,011	298	8,171	Kab. Pasuruan	68	17,726	317	9,155
Kota Surabaya	0	0	8	74	Kota Pasuruan	0	0	1	32
Kab. Madiun	23	7,248	313	3,972	Kab. Bangkalan	12	1,901	64	2,024
Kab. Magetan	30	10,976	104	2,927	Kab. Sampang	5	968	40	1,486
Kab. Ponorogo	41	9,899	347	7,307	Kab. Pamekasan	11	2,355	41	1,415
Kab. Ngawi	62	16,035	319	8,558	Kab. Sumenep	16	3,688	41	1,804
Kab. Pacitan	5	620	368	6,226	Total	1,132	286,401	6,631	173,035

Annex A1.1.16 Design Irrigation Service Areas by Management Setup in Bali Province as of 2007

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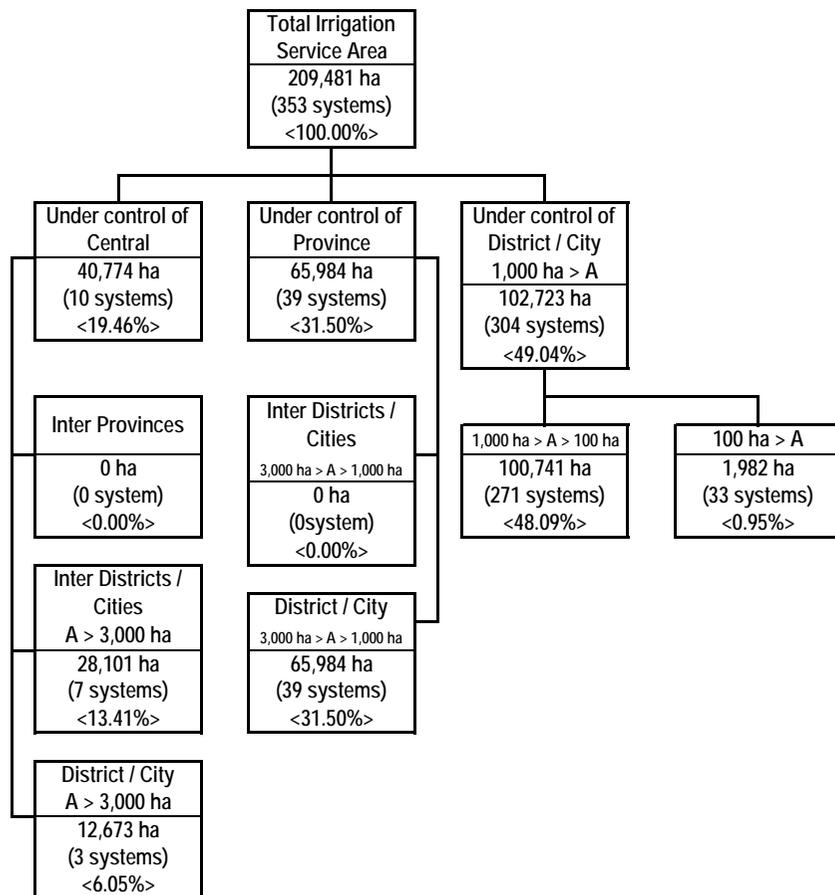


District / City	Central (A > 3,000 ha)			Province (3,000 ha > A > 1,000 ha)		Total (No. / ha)
	Inter-Provinces (No. / ha)	Inter-Districts/Cities (No. / ha)	Inner-District/City (No. / ha)	Inter-Districts/Cities (No. / ha)	Inner-District/City (No. / ha)	
	Kab. Jembrana	0 0	0 0	0 0	1 154	
Kab. Tabanan	0 0	- 1,790	0 0	- 1,337	3 3,654	3 6,781
Kab. Badung	0 0	1 4,063	0 0	5 2,527	3 3,506	9 10,096
Kota Denpasar	0 0	- 1,910	0 0	4 2,855	2 3,319	6 8,084
Kab. Giayar	0 0	1 1,835	0 0	1 389	5 6,471	7 8,695
Kab. Bangli	0 0	0 0	0 0	3 359	0 0	3 359
Kab. Klungkung	0 0	0 0	0 0	1 412	1 1,483	2 1,895
Kab. Buleleng	0 0	0 0	0 0	0 0	2 3,092	2 3,092
Total	0 0	2 9,598	0 0	15 8,033	18 23,872	35 41,503

District / City	District/City (1,000 ha > 100 ha)		District / City (100 ha > A)	
	(No. / ha)	(No. / ha)	(No. / ha)	(No. / ha)
Kab. Jembrana	24 6,380	48 2,116	Kab. Bangli	12 1,825
Kab. Tabanan	59 14,741	156 8,696	Kab. Klungkung	12 2,291
Kab. Badung	16 4,898	21 897	Kab. Karang Asem	24 3,294
Kota Denpasar	7 2,775	5 141	Kab. Buleleng	37 8,728
Kab. Giayar	61 27,273	91 3,516	Total	252 72,205
				580 29,300

Source: Status Daerah Irigasi yang Menjadi Wewenang dan Tanggung Jawab Pemerintah Provinsi dan Kabupaten, 2007, MPW

Annex A1.1.17 Design Irrigation Service Areas by Management Setup in West Nusa Tenggara Province as of 2007

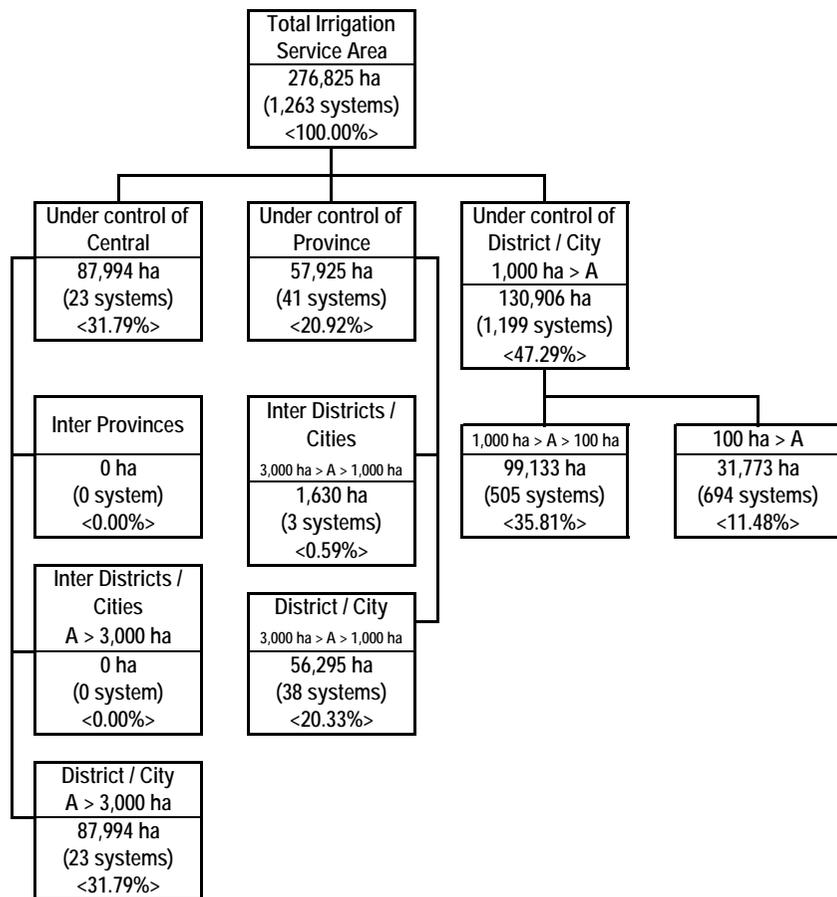


District / City	Central (A > 3,000 ha)			Province (3,000 ha > A > 1,000 ha)		Total (No. / ha)
	Inter-Provinces (No. / ha)	Inter-Districts/Cities (No. / ha)	Inner-District/City (No. / ha)	Inter-Districts/Cities (No. / ha)	Inner-District/City (No. / ha)	
	Kab. Lombok Barat	0 0	- 9364	0 0	0 0	
Kab. Lombok Tengah	0 0	7 18,737	0 0	0 0	8 13,933	15 32,670
Kab. Lombok Timur	0 0	0 0	0 0	0 0	7 13,465	7 13,465
Kab. Sumbawa Barat	0 0	0 0	0 0	0 0	4 6,410	4 6,410
Kab. Sumbawa	0 0	0 0	2 8,839	0 0	6 11,192	8 20,031
Kab. Dompu	0 0	0 0	0 0	0 0	6 7,953	6 7,953
Kab. Bima	0 0	0 0	1 3,834	0 0	4 6,080	5 9,914
Total	0 0	7 28,101	3 12,673	0 0	39 65,984	49 106,758

District / City	District/City (1,000 ha > 100 ha)		District / City	District/City (100 ha > A)	
	(No. / ha)	(No. / ha)		(No. / ha)	(No. / ha)
Kota Mataram	6 2,284	0 0	Kab. Sumbawa	28 14,175	0 0
Kab. Lombok Barat	33 14,157	5 241	Kab. Dompu	17 7,686	1 70
Kab. Lombok Tengah	38 10,805	12 805	Kab. Bima	39 15,994	6 334
Kab. Lombok Timur	106 34,008	9 532	Kota Bima	1 225	0 0
Kab. Sumbawa Barat	3 1,407	0 0	Total	271 100,741	33 1,982

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Annex A1.1.18 Design Irrigation Service Areas by Management Setup in East Nusa Tenggara Province as of 2007

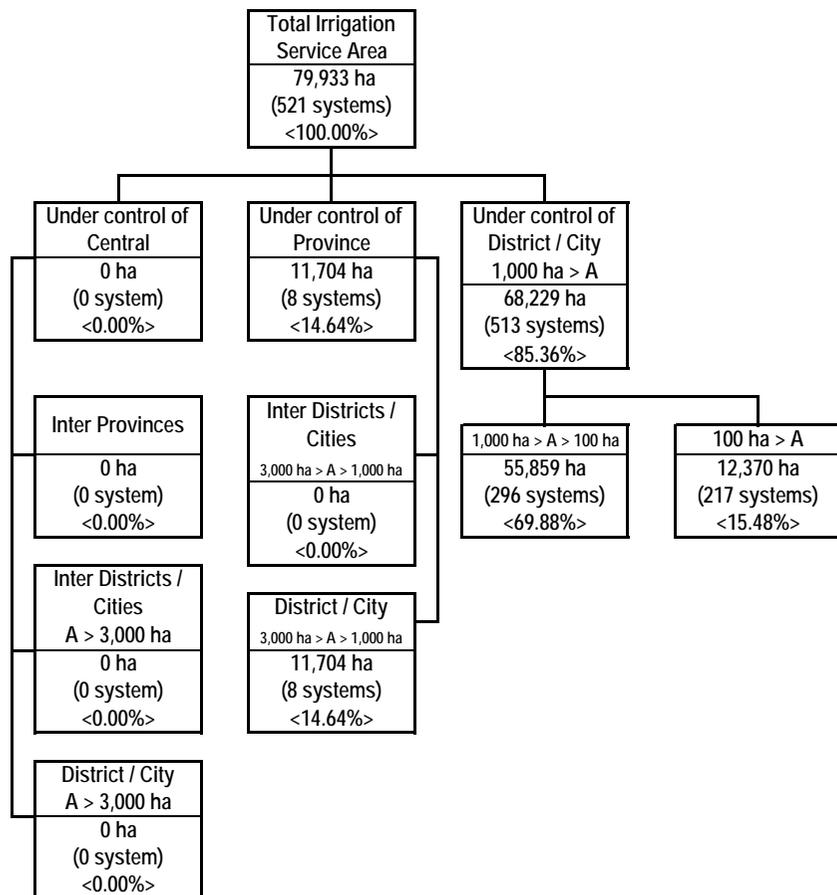


District / City	Central (A > 3,000 ha)						Province (3,000 ha > A > 1,000 ha)				Total (No. / ha)	
	Inter-Provinces (No. / ha)		Inter-Districts/Cities (No. / ha)		Inner-District/City (No. / ha)		Inter-Districts/Cities (No. / ha)		Inner-District/City (No. / ha)			
	No.	ha	No.	ha	No.	ha	No.	ha	No.	ha		
Kab. Kupang	0	0	0	0	5	18,926	0	0	7	8,187	12	27,113
Kab. Rote Ndao	0	0	0	0	1	3,800	0	0	1	1,250	2	5,050
Kab. Timor Tengah Selatan	0	0	0	0	2	6,514	-	540	1	1,089	3	8,143
Kab. Timor Tengah Utara	0	0	0	0	3	9,885	3	1,090	3	3,761	9	14,736
Kab. Belu	0	0	0	0	2	10,100	0	0	4	6,465	6	16,565
Kab. Alor	0	0	0	0	1	3,459	0	0	0	0	1	3,459
Kab. Lembata	0	0	0	0	0	0	0	0	2	3,500	2	3,500
Kab. Flores Timur	0	0	0	0	0	0	0	0	1	1,100	1	1,100
Kab. Sikka	0	0	0	0	0	0	0	0	2	2,515	2	2,515
Kab. Ngada	0	0	0	0	3	10,240	0	0	6	6,472	9	16,712
Kab. Manggarai	0	0	0	0	3	13,933	0	0	4	10,171	7	24,104
Kab. Manggarai Barat	0	0	0	0	3	11,137	0	0	2	2,481	5	13,618
Kab. Sumba Timur	0	0	0	0	0	0	0	0	3	5,304	3	5,304
Kab. Sumba Barat	0	0	0	0	0	0	0	0	2	4,000	2	4,000
Total	0	0	0	0	23	87,994	3	1,630	38	56,295	64	145,919

District / City	District/City (1,000 ha > 100 ha)		District / City (100 ha > A)		District / City	District/City (1,000 ha > 100 ha)		District/City (100 ha > A)	
	No.	ha	No.	ha		No.	ha	No.	ha
Kota Kupang	5	722	34	1,237	Kab. Flores Timur	7	2,006	16	796
Kab. Kupang	47	10,267	61	2,908	Kab. Sikka	15	3,021	1	85
Kab. Rote Ndao	45	9,210	69	4,189	Kab. Ende	23	4,047	69	3,050
Kab. Timor Tengah Selatan	22	4,774	85	4,792	Kab. Ngada	34	8,458	183	4,988
Kab. Timor Tengah Utara	23	4,965	20	1,221	Kab. Manggarai	44	8,379	15	706
Kab. Belu	27	5,872	3	150	Kab. Manggarai Barat	101	14,048	11	555
Kab. Alor	18	5,812	3	164	Kab. Sumba Timur	43	7,054	43	2,318
Kab. Lembata	11	2,757	12	605	Kab. Sumba Barat	40	7,741	69	4,009
Total					Total	505	99,133	694	31,773

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Annex A1.1.19 Design Irrigation Service Areas by Management Setup in West Kalimantan Province as of 2007



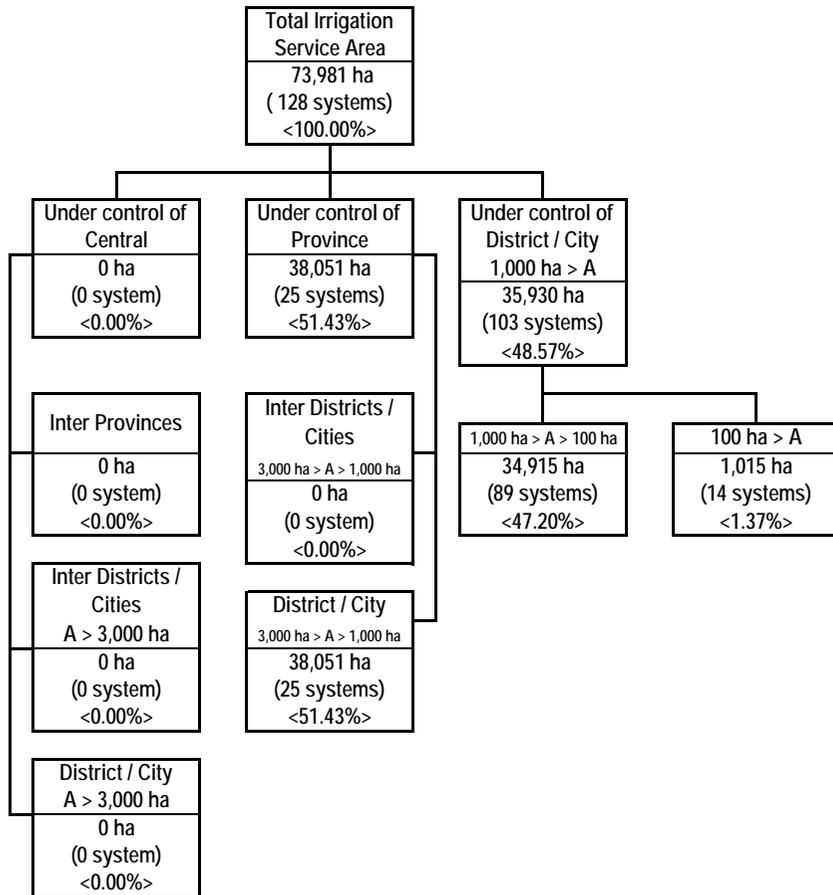
District / City	Central (A > 3,000 ha)						Province (3,000 ha > A > 1,000 ha)				Total (No. / ha)	
	Inter-Provinces (No. / ha)		Inter-Districts/Cities (No. / ha)		Inner-District/City (No. / ha)		Inter-Districts/Cities (No. / ha)		Inner-District/City (No. / ha)			
	Kab. Bengkayang	0	0	0	0	0	0	0	0	2		2,672
Kota Singkawang	0	0	0	0	0	0	0	0	1	1,000	1	1,000
Kab. Pontianak	0	0	0	0	0	0	0	0	1	1,335	1	1,335
Kota Pontianak	0	0	0	0	0	0	0	0	1	3,000	1	3,000
Kab. Sanggau	0	0	0	0	0	0	0	0	1	1,660	1	1,660
Kab. Sekadau	0	0	0	0	0	0	0	0	1	1,025	1	1,025
Kab. Melawai	0	0	0	0	0	0	0	0	1	1,012	1	1,012
Total	0	0	0	0	0	0	0	0	8	11,704	8	11,704

District / City	District/City (1,000 ha > 100 ha)		District / City (100 ha > A)		District/City (1,000 ha > 100 ha)				
	(No. / ha)	(No. / ha)	(No. / ha)	(No. / ha)	(No. / ha)		(No. / ha)		
Kab. Sambas	12	3,227	1	110	Kab. Sekadau	9	1,399	7	598
Kab. Bengkayang	32	6,565	6	470	Kab. Sintang	19	3,350	20	1,103
Kota Singkawang	14	4,757	0	0	Kab. Melawai	5	823	23	1,215
Kab. Pontianak	46	8,549	5	290	Kab. Kapuas Hulu	17	3,216	59	2,453
Kab. Landak	73	11,827	43	3,020	Kab. Ketapang	36	5,945	25	1,576
Kab. Sanggau	33	6,201	28	1,535	Total	296	55,859	217	12,370

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Annex A1.1.20 Design Irrigation Service Areas by Management Setup in Central Kalimantan Province as of 2007

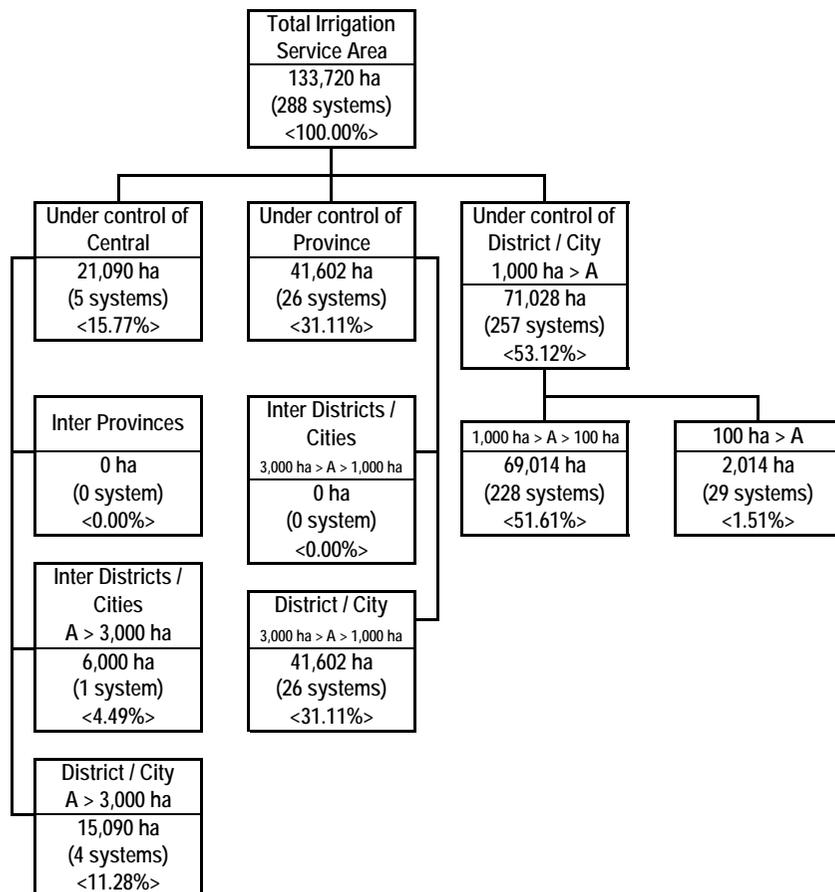
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District / City	Central (A > 3,000 ha)			Province (3,000 ha > A > 1,000 ha)			Total (No. / ha)
	Inter-Provinces (No. / ha)	Inter-Districts/Cities (No. / ha)	Inner-District/City (No. / ha)	Inter-Districts/Cities (No. / ha)	Inner-District/City (No. / ha)		
	Kab. Barito Timur	0 0	0 0	0 0	0 0	2 3,074	
Kab. Waringin Timur	0 0	0 0	0 0	0 0	11 18,027	11 18,027	
Kab. Sukamara	0 0	0 0	0 0	0 0	7 7,200	7 7,200	
Kab. Seruyan	0 0	0 0	0 0	0 0	1 2,400	1 2,400	
Kota Palangkaraya	0 0	0 0	0 0	0 0	1 1,000	1 1,000	
Kab. Pulau Pisang	0 0	0 0	0 0	0 0	3 6,350	3 6,350	
Total	0 0	0 0	0 0	0 0	25 38,051	25 38,051	

District / City	District/City 1,000 ha > 100 ha (No. / ha)		District / City	District/City 100 ha > A (No. / ha)	
	1,000 ha > 100 ha (No. / ha)	100 ha > A (No. / ha)		1,000 ha > 100 ha (No. / ha)	100 ha > A (No. / ha)
Kab. Murung Raya	0 0	1 40	Kab. Sukamara	5 1,880	3 175
Kab. Gunung Mas	3 1,510	0 0	Kab. Seruyan	2 1,360	0 0
Kab. Barito Utara	9 2,471	1 50	Kota Palangkaraya	1 500	0 0
Kab. Barito Timur	4 1,791	0 0	Kab. Pulau Pisang	10 4,635	0 0
Kab. Waringin Timur	17 10,443	0 0	Kab. Barito Selatan	10 4,037	0 0
Kota Waringin Barat	3 1,078	1 50	Kab. Kapuas	7 2,410	0 0
Kab. Lamandau	18 2,800	8 700	Total	89 34,915	14 1,015

Annex A1.1.21 Design Irrigation Service Areas by Management Setup in South Kalimantan Province as of 2007

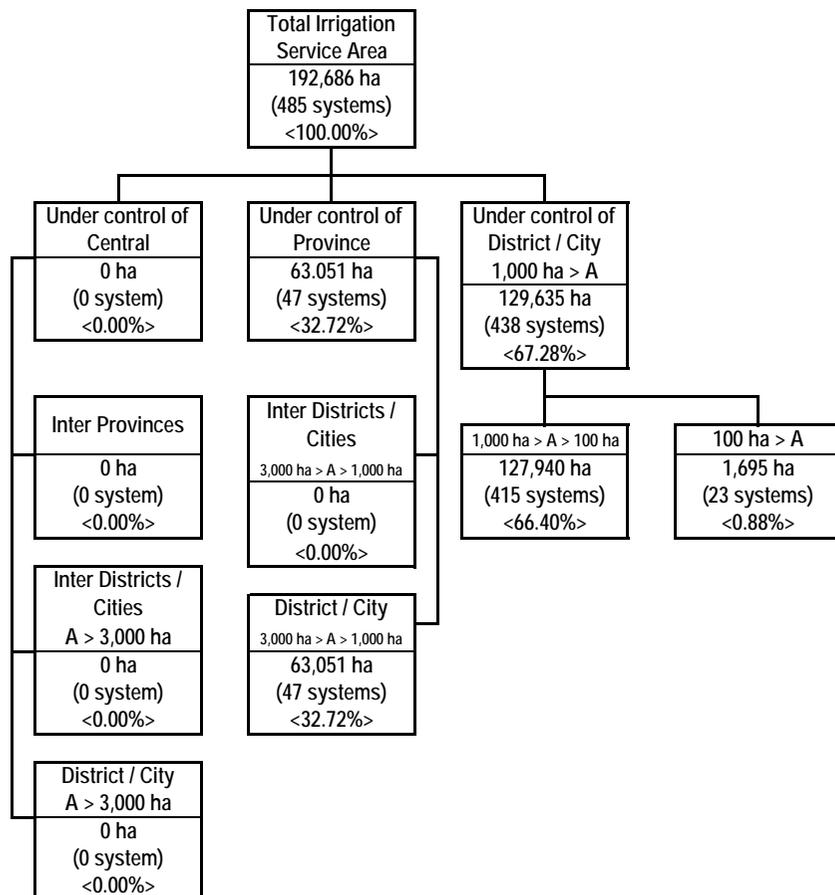


District / City	Central (A > 3,000 ha)				Province (3,000 ha > A > 1,000 ha)				Total (No. / ha)			
	Inter-Provinces (No. / ha)		Inter-Districts/Cities (No. / ha)		Inner-District/City (No. / ha)		Inter-Districts/Cities (No. / ha)				Inner-District/City (No. / ha)	
	Kab. Barito Kuala	0	0	0	0	0	0	0	0	15	20,064	15
Kab. Banjarbaru	0	0	1	5,000	0	0	0	0	0	0	1	5,000
Kota Banjarbaru	0	0	-	1,000	0	0	0	0	0	0	0	1,000
Kab. Tapin	0	0	0	0	1	5,472	0	0	1	1,408	2	6,880
Kab. Hulu Sungai Tengah	0	0	0	0	1	3,018	0	0	3	4,635	4	7,653
Kab. Balangan	0	0	0	0	0	0	0	0	1	2,600	1	2,600
Kab. Tanah Bumbu	0	0	0	0	1	3,000	0	0	5	11,695	6	14,695
Kab. Kota Baru	0	0	0	0	1	3,600	0	0	1	1,200	2	4,800
Total	0	0	1	6,000	4	15,090	0	0	26	41,602	31	62,692

District / City	District/City (1,000 ha > 100 ha)		District / City (100 ha > A)		District/City (1,000 ha > 100 ha)		District/City (100 ha > A)		
	(No. / ha)	(No. / ha)	(No. / ha)	(No. / ha)	(No. / ha)	(No. / ha)	(No. / ha)		
Kab. Barito Kuala	83	29,846	2	118	Kab. Balangan	5	1,864	0	0
Kab. Banjarbaru	6	3,385	0	0	Kab. Tabalong	11	3,622	2	130
Kab. Tapin	4	1,121	2	178	Kab. Tanah Laut	22	5,850	9	541
Kab. Hulu Sungai Selatan	7	2,072	0	0	Kab. Tanah Bumbu	42	10,206	3	245
Kab. Hulu Sungai Tengah	5	2,283	0	0	Kab. Kota Baru	14	3,268	5	306
Kab. Hulu Sungai Utara	29	5,497	6	496	Total	228	69,014	29	2,014

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Annex A1.1.22 Design Irrigation Service Areas by Management Setup in East Kalimantan Province as of 2007

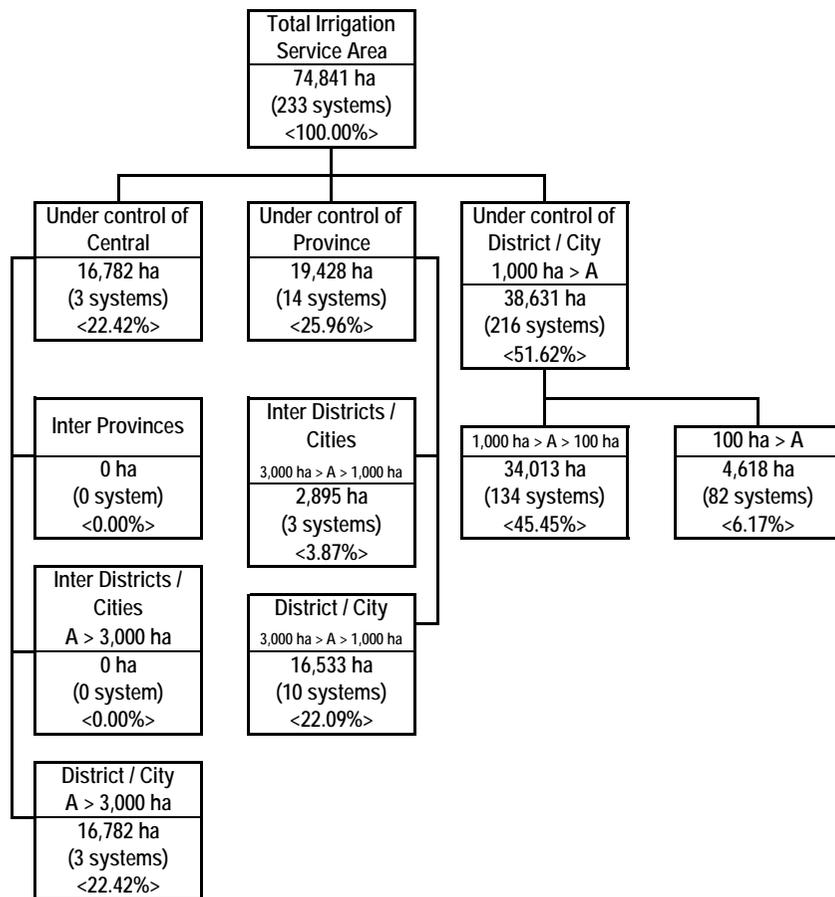


District / City	Central (A > 3,000 ha)			Province (3,000 ha > A > 1,000 ha)		Total (No. / ha)
	Inter-Provinces (No. / ha)	Inter-Districts/Cities (No. / ha)	Inner-District/City (No. / ha)	Inter-Districts/Cities (No. / ha)	Inner-District/City (No. / ha)	
	Kota Balikpapan	0	0	0	0	
Kab. Kutai Kertanegara	0	0	0	0	8 10,167	8 10,167
Kab. Pasir	0	0	0	0	9 16,845	9 16,845
Kab. Kutai Barat	0	0	0	0	3 3,075	3 3,075
Kab. Kutai Timur	0	0	0	0	7 9,580	7 9,580
Kab. Berau	0	0	0	0	8 10,366	8 10,366
Kab. Bulungan	0	0	0	0	2 2,040	2 2,040
Kab. Malinau	0	0	0	0	2 2,200	2 2,200
Kab. Penajam Paser Utara	0	0	0	0	3 3,204	3 3,204
Kab. Nunukan	0	0	0	0	4 4,260	4 4,260
Total	0	0	0	0	47 63,051	47 63,051

District / City	District/City (1,000 ha > 100 ha)		District / City (100 ha > A)		District / City	District/City (1,000 ha > 100 ha)		District/City (100 ha > A)	
	No. / ha	No. / ha	No. / ha	No. / ha		No. / ha	No. / ha	No. / ha	No. / ha
Kota Samarinda	12	5,572	0	0	Kab. Berau	35	10,690	0	0
Kota Balikpapan	19	8,751	4	255	Kab. Bulungan	21	8,184	0	0
Kab. Kutai Kertanegara	172	54,154	1	50	Kab. Malinau	1	800	0	0
Kab. Pasir	24	6,075	8	625	Kab. Penajam Paser Utara	21	7,306	0	0
Kab. Kutai Barat	68	14,223	6	420	Kab. Nunukan	4	2,185	0	0
Kab. Kutai Timur	38	10,000	4	345	Total	415	127,940	23	1,695

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Annex A1.1.23 Design Irrigation Service Areas by Management Setup in North Sulawesi Province as of 2007

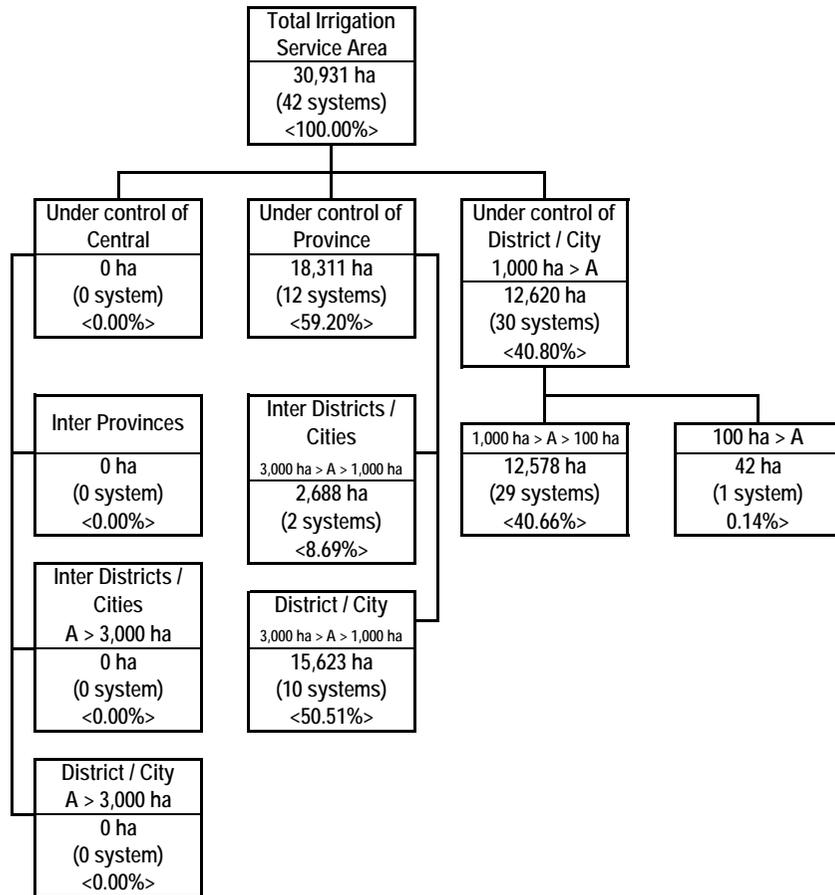


District / City	Central (A > 3,000 ha)			Province (3,000 ha > A > 1,000 ha)			Total (No. / ha)
	Inter-Provinces (No. / ha)	Inter-Districts/Cities (No. / ha)	Inner-District/City (No. / ha)	Inter-Districts/Cities (No. / ha)	Inner-District/City (No. / ha)		
	Kab. Bolaang Mongondow	0 0	0 0	3 16,782	3 1,945	6 10,267	
Kota Bolaang Mongondow	0 0	0 0	0 0	- 692	0 0	0 692	
Kab. Minahasa	0 0	0 0	0 0	- 258	1 1,286	1 1,544	
Kab. Minahasa Selatan	0 0	0 0	0 0	0 0	3 3,275	3 3,275	
Kab. Minahasa Utara	0 0	0 0	0 0	0 0	1 1,705	1 1,705	
Total	0 0	0 0	3 16,782	3 2,895	11 16,533	17 36,210	

District / City	District/City (1,000 ha > 100 ha)		District / City	District/City (100 ha > A)	
	(No. / ha)	(No. / ha)		(No. / ha)	(No. / ha)
Kab. Bolaang Mongondow	63 16,086	37 2,126	Kota Manado	2 606	0 0
Kab. Minahasa	15 4,791	6 363	Kota Bitung	1 146	0 0
Kab. Minahasa Selatan	21 5,706	9 484	Kep. Sangihe	2 650	1 60
Kab. Minahasa Utara	19 3,587	23 1,275	Kab. Talaud	8 1,615	0 0
Kab. Tomohon	3 826	6 310	Total	134 34,013	82 4,618

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Annex A1.1.24 Design Irrigation Service Areas by Management Setup in Gorontalo Province as of 2007

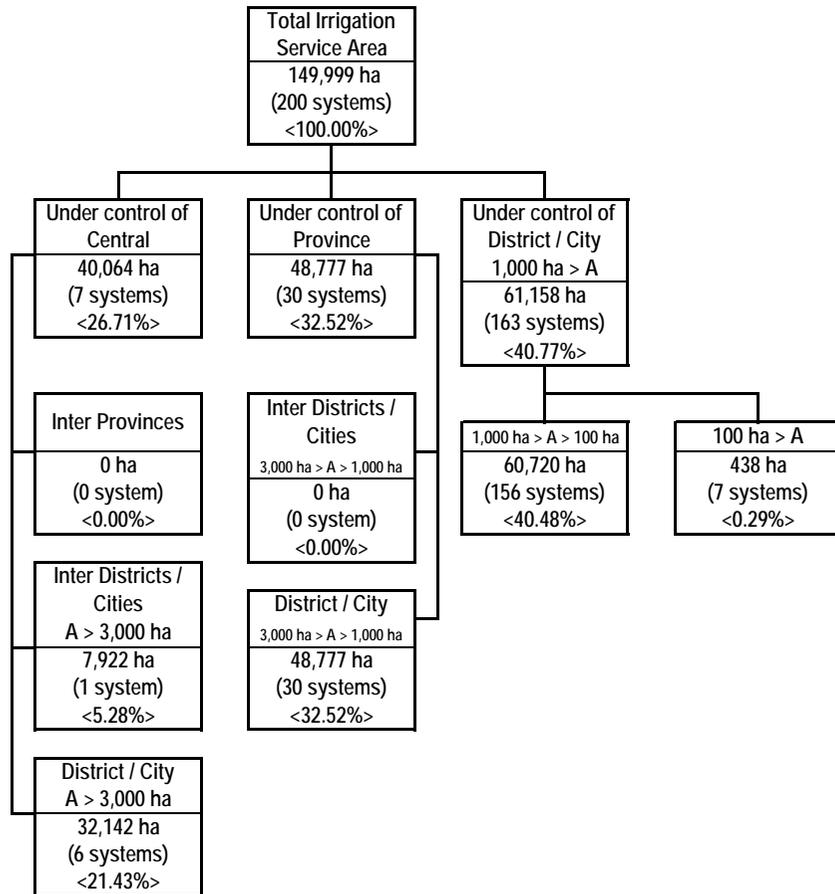


District / City	Central (A > 3,000 ha)						Province (3,000 ha > A > 1,000 ha)				Total (No. / ha)	
	Inter-Provinces (No. / ha)		Inter-Districts/Cities (No. / ha)		Inner-District/City (No. / ha)		Inter-Districts/Cities (No. / ha)		Inner-District/City (No. / ha)			
	Kab. Gorontalo	0	0	0	0	0	0	-	895	3		4,537
Kab. Boalemo	0	0	0	0	0	0	0	0	3	5,211	3	5,211
Kab. Pohuwato	0	0	0	0	0	0	0	0	3	3,612	3	3,612
Kodya Gorontalo	0	0	0	0	0	0	2	1,793	1	2,263	3	4,056
Total	0	0	0	0	0	0	2	2,688	10	15,623	12	18,311

District / City	District/City (1,000 ha > 100 ha) (No. / ha)		District/City 100 ha > A (No. / ha)		District / City	District/City (1,000 ha > 100 ha) (No. / ha)		District/City 100 ha > A (No. / ha)	
	Kab. Gorontalo	13	6,546	1		42	Kab. Pohuwato	3	965
Kab. Boalemo	12	4,642	0	0	Kodya Gorontalo	1	425	0	0
Total	25	11,188	1	42	Total	29	12,578	1	42

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Annex A1.1.25 Design Irrigation Service Areas by Management Setup in Central Sulawesi Province as of 2007

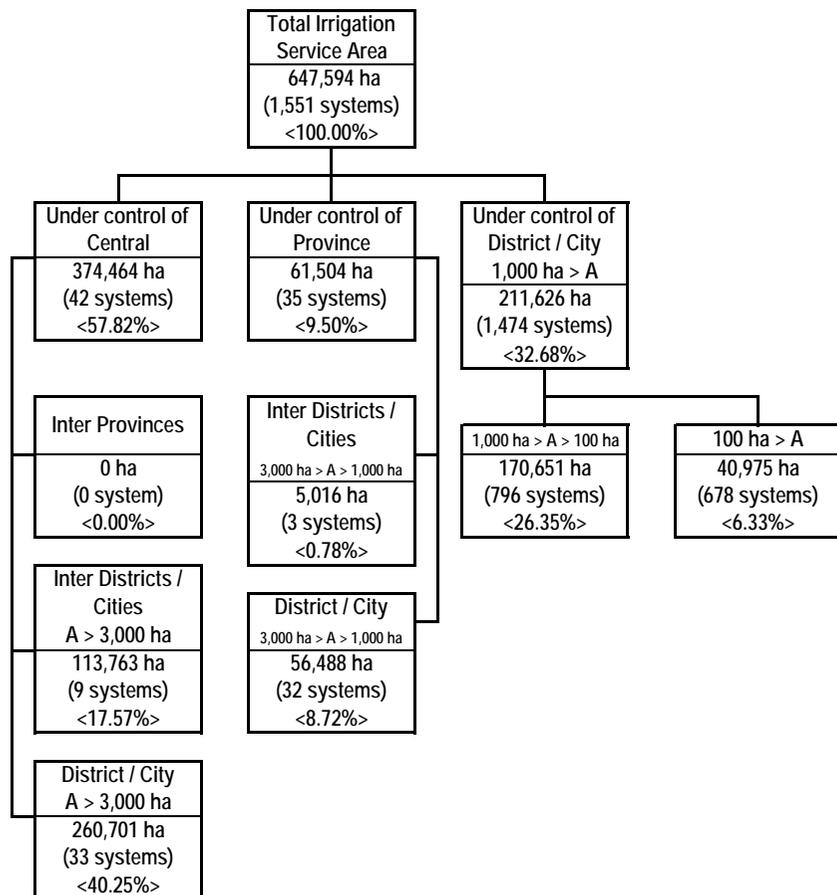


District / City	Central (A > 3,000 ha)			Province (3,000 ha > A > 1,000 ha)		Total (No. / ha)
	Inter-Provinces (No. / ha)	Inter-Districts/Cities (No. / ha)	Inner-District/City (No. / ha)	Inter-Districts/Cities (No. / ha)	Inner-District/City (No. / ha)	
	Kab. Donggala	0 0	1 7,700	1 7,922	0 0	
Kab. Parigi Moutong	0 0	0 0	2 14,258	0 0	9 16,262	11 30,520
Kab. Poso	0 0	0 0	0 0	0 0	4 5,628	4 5,628
Kab. Banggai	0 0	0 0	3 9,962	0 0	8 13,316	11 23,278
Kab. Toli - Toli	0 0	0 0	0 0	0 0	3 4,348	3 4,348
Kab. Morowali	0 0	0 0	0 0	0 0	3 5,103	3 5,103
Kota Palu	0 0	- 222	0 0	0 0	0 0	- 222
Total	0 0	1 7,922	6 32,142	0 0	30 48,777	37 88,841

District / City	District/City (1,000 ha > 100 ha)		District / City	District/City (100 ha > A)	
	(No. / ha)	(No. / ha)		(No. / ha)	(No. / ha)
Kab. Donggala	35 15,606	2 165	Kab. Toli - Toli	17 6,385	0 0
Kab. Parigi Moutong	23 11,518	1 75	Kab. Morowali	9 2,946	0 0
Kab. Poso	28 9,879	0 0	Kota Palu	7 1,050	3 138
Kab. Banggai	17 7,372	0 0	Kab Tojo Una - Una	7 2,173	0 0
Kab. Banggai Kepulauan	8 1,288	1 60	Kab Buol	5 2,503	0 0
Total	156 60,720	7 438			

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Annex A1.1.26 Design Irrigation Service Areas by Management Setup in South Sulawesi Province as of 2007

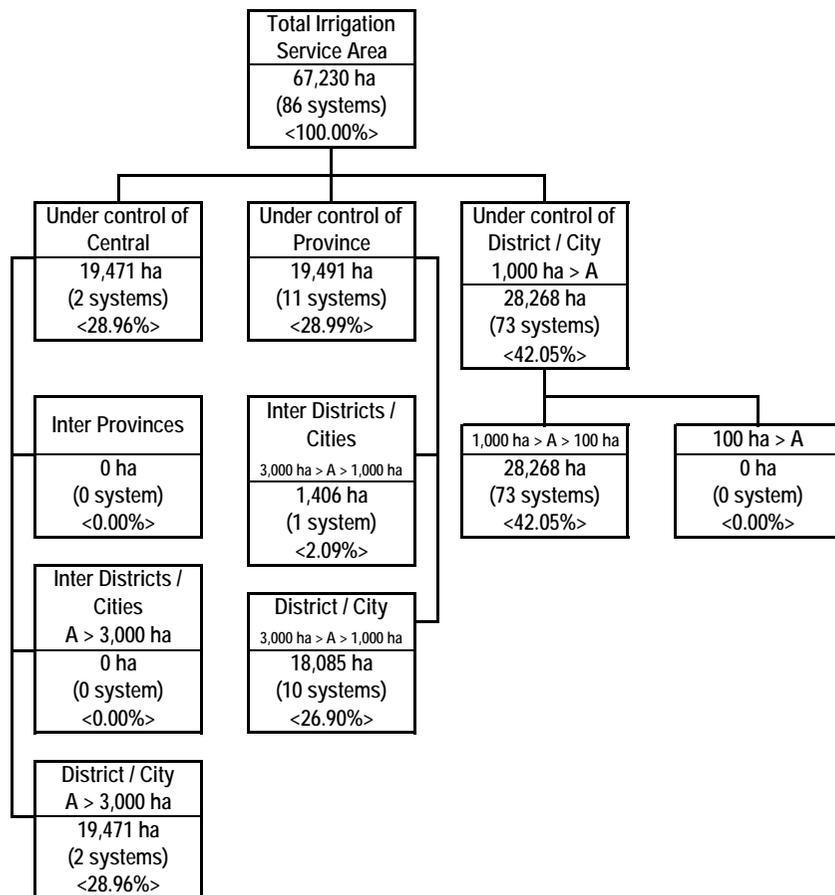


District / City	Central (A > 3,000 ha)						Province (3,000 ha > A > 1,000 ha)				Total (No. / ha)	
	Inter-Provinces (No. / ha)		Inter-Districts/Cities (No. / ha)		Inner-District/City (No. / ha)		Inter-Districts/Cities (No. / ha)		Inner-District/City (No. / ha)			
	No.	ha	No.	ha	No.	ha	No.	ha	No.	ha		
Kab. Pangkep	0	0	0	0	1	8,615	0	0	2	4,187	3	12,802
Kab. Maros	0	0	1	3,626	1	6,513	0	0	0	0	2	10,139
Kota Makasar	0	0	-	0	0	0	0	0	0	0	0	0
Kab. Gowa	0	0	2	14,202	0	0	1	2,443	0	0	3	16,645
Kab. Takalar	0	0	-	7,101	1	5,204	0	0	1	1,052	2	13,357
Kab. Jeneponto	0	0	0	0	1	7,199	0	0	0	0	1	7,199
Kab. Bulukumba	0	0	0	0	2	8,860	0	0	2	2,913	4	11,773
Kab. Sinjai	0	0	0	0	0	0	0	0	3	4,255	3	4,255
Kab. Bone	0	0	0	0	4	23,471	0	0	4	6,307	8	29,778
Kab. Pare Pare	0	0	-	10,733	0	0	0	0	0	0	0	10,733
Kab. Pinrang	0	0	-	15,798	0	0	0	0	0	0	0	15,798
Kab. Sidrap	0	0	3	41,643	2	11,441	0	0	2	3,253	7	56,337
Kab. Wajo	0	0	2	10,354	1	7,000	1	1,113	3	5,033	7	23,500
Kab. Soppeng	0	0	0	0	5	21,628	0	0	3	5,344	8	26,972
Kab. Luwu	0	0	0	0	4	23,290	0	0	3	4,930	7	28,220
Kab. Luwu Utara	0	0	-	3,435	3	63,700	1	1,460	3	7,134	7	75,729
Kab. Luwu Timur	0	0	0	0	2	34,529	0	0	1	1,200	3	35,729
Kab. Luwu Selatan	0	0	1	6,871	2	19,588	0	0	2	3,800	5	30,259
Kab. Barru	0	0	0	0	0	0	0	0	1	1,828	1	1,828
Kab. Tanah Toraja	0	0	0	0	1	4,226	0	0	0	0	1	4,226
Kab. Sideneng Rappang	0	0	-	0	3	15,437	0	0	1	2,294	4	17,731
Kab. Pangkajene Kepulauan	0	0	0	0	0	0	0	0	1	2,958	1	2,958
Total	0	0	9	113,763	33	260,701	3	5,016	32	56,488	77	435,968

District / City	District/City		District / City	District/City	
	1,000 ha > 100 ha (No. / ha)	100 ha > A (No. / ha)		1,000 ha > 100 ha (No. / ha)	100 ha > A (No. / ha)
Kab. Pangkep	29	4,498	Kab. Soppeng	32	5,210
Kab. Maros	32	7,154	Kab. Palopo	2	888
Kab. Gowa	71	16,011	Kab. Luwu	34	8,615
Kab. Takalar	8	2,227	Kab. Luwu Utara	52	10,951
Kab. Jeneponto	48	11,198	Kab. Luwu Timur	25	5,225
Kab. Bantaeng	83	16,220	Kab. Tator	27	3,961
Kab. Bulukumba	55	13,837	Kab. Engrekang	38	6,248
Kab. Sinjai	25	4,698	Kab. Pinrang	28	6,431
Kab. Bone	111	25,052	Kab. Barru	35	9,007
Kab. Sidrap	35	8,461	Kab. Parepare	4	600
Kab. Wajo	22	4,159	Total	796	170,651
				678	40,975

Source: Status Daerah Irigasi yang Menjadi Wewenang dan Tanggung Jawab Pemerintah Provinsi dan Kabupaten, 2007, MPW

Annex A1.1.27 Design Irrigation Service Areas by Management Setup in Southeast Sulawesi Province as of 2007

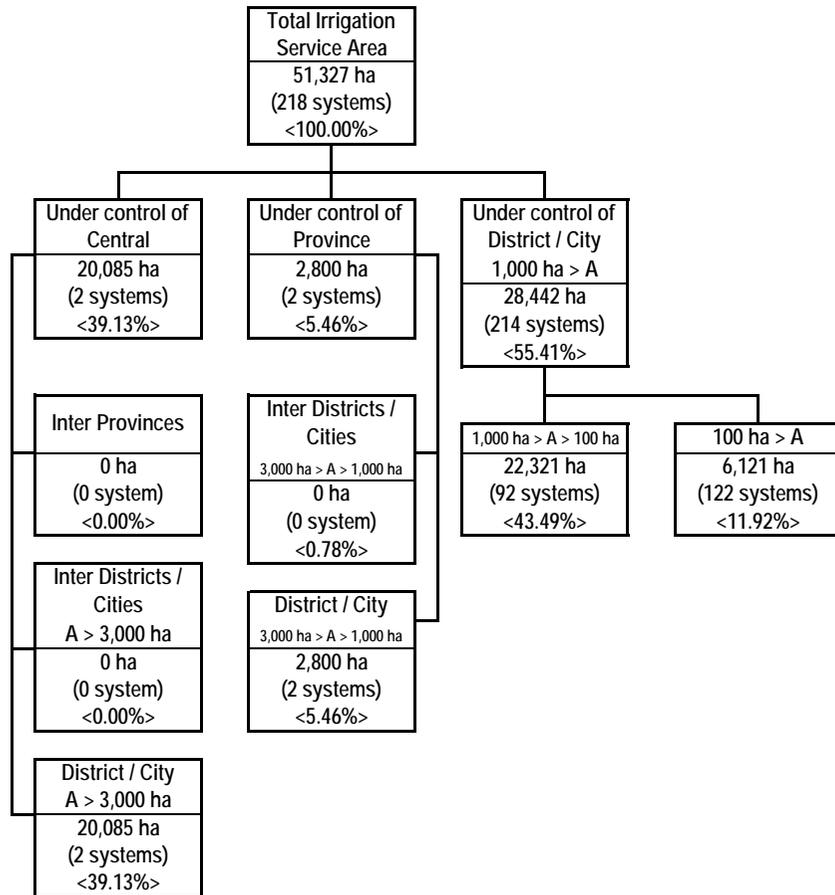


District / City	Central (A > 3,000 ha)						Province (3,000 ha > A > 1,000 ha)				Total (No. / ha)	
	Inter-Provinces (No. / ha)		Inter-Districts/Cities (No. / ha)		Inner-District/City (No. / ha)		Inter-Districts/Cities (No. / ha)		Inner-District/City (No. / ha)			
	Kab. Buton	0	0	0	0	0	0	1	834	0		0
Kab. Konawe Selatan	0	0	0	0	0	0	0	0	3	4,617	3	4,617
Kab. Muna	0	0	0	0	0	0	-	294	1	2,038	1	2,332
Kab. Kolaka	0	0	0	0	1	3,113	0	0	2	3,607	3	6,720
Kab. Konawe	0	0	0	0	1	16,358	0	0	3	5,292	4	21,650
Kodya Bau Bau	0	0	0	0	0	0	-	278	0	0	0	278
Kab. Bombana	0	0	0	0	0	0	0	0	1	2,531	1	2,531
Total	0	0	0	0	2	19,471	1	1,406	10	18,085	12	38,962

District / City	District/City				District / City	District/City			
	(1,000 ha > 100 ha) (No. / ha)		100 ha > A (No. / ha)			(1,000 ha > 100 ha) (No. / ha)		100 ha > A (No. / ha)	
Kab. Kolaka Utara	1	280	0	0	Kab. Konawe	10	4,660	0	0
Kab. Buton	5	1,600	0	0	Kodya Bau Bau	4	1,956	0	0
Kab. Konawe Selatan	22	8,063	0	0	Kodya Kendari	1	550	0	0
Kab. Muna	8	2,121	0	0	Kab. Bombana	5	2,237	0	0
Kab. Kolaka	17	6,801	0	0	Total	73	28,268	0	0

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Annex A1.1.28 Design Irrigation Service Areas by Management Setup in West Sulawesi Province as of 2007

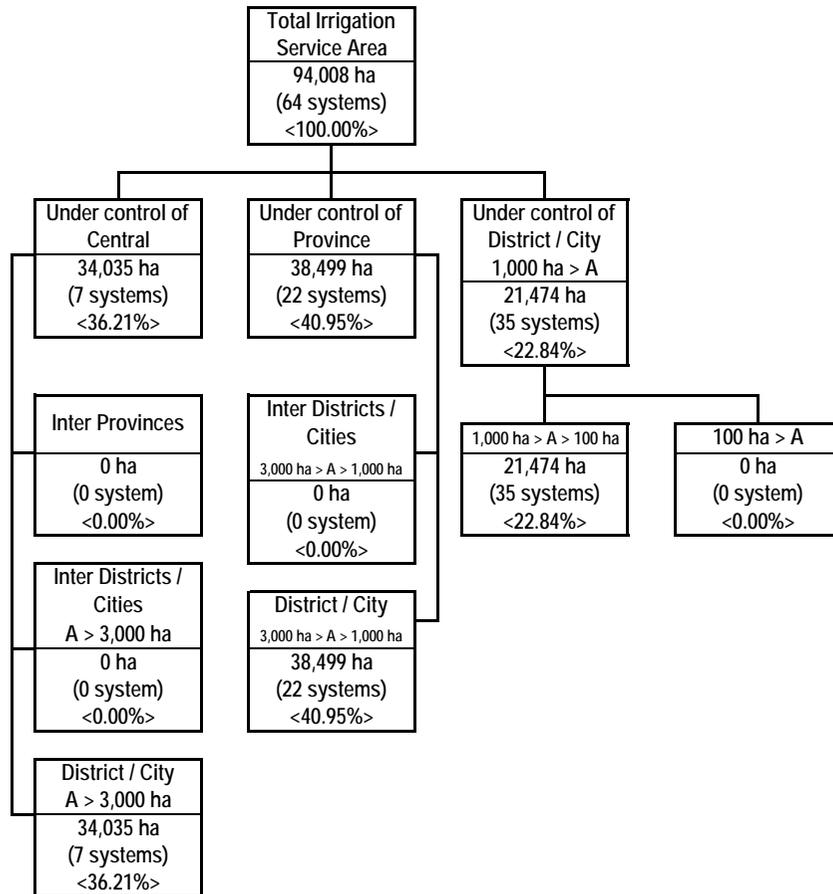


District / City	Central (A > 3,000 ha)			Province (3,000 ha > A > 1,000 ha)			Total (No. / ha)
	Inter-Provinces (No. / ha)	Inter-Districts/Cities (No. / ha)	Inner-District/City (No. / ha)	Inter-Districts/Cities (No. / ha)	Inner-District/City (No. / ha)		
	Kab. Polewali Mamasa	0 0	0 0	2 20,085	0 0	2 2,800	
Total	0 0	0 0	2 20,085	0 0	2 2,800	4 22,885	

District / City	District/City (1,000 ha > 100 ha) (No. / ha)		District / City	District/City (1,000 ha > 100 ha) (No. / ha)	
	100 ha > A (No. / ha)	100 ha > A (No. / ha)		100 ha > A (No. / ha)	
Kab. Potmas	58 11,547	102 5,274	Kab. Mamuju	27 9,258	9 493
Kab. Majene	7 1,516	11 354	Total	92 22,321	122 6,121

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Annex A1.1.29 Design Irrigation Service Areas by Management Setup in Maluku Province as of 2007

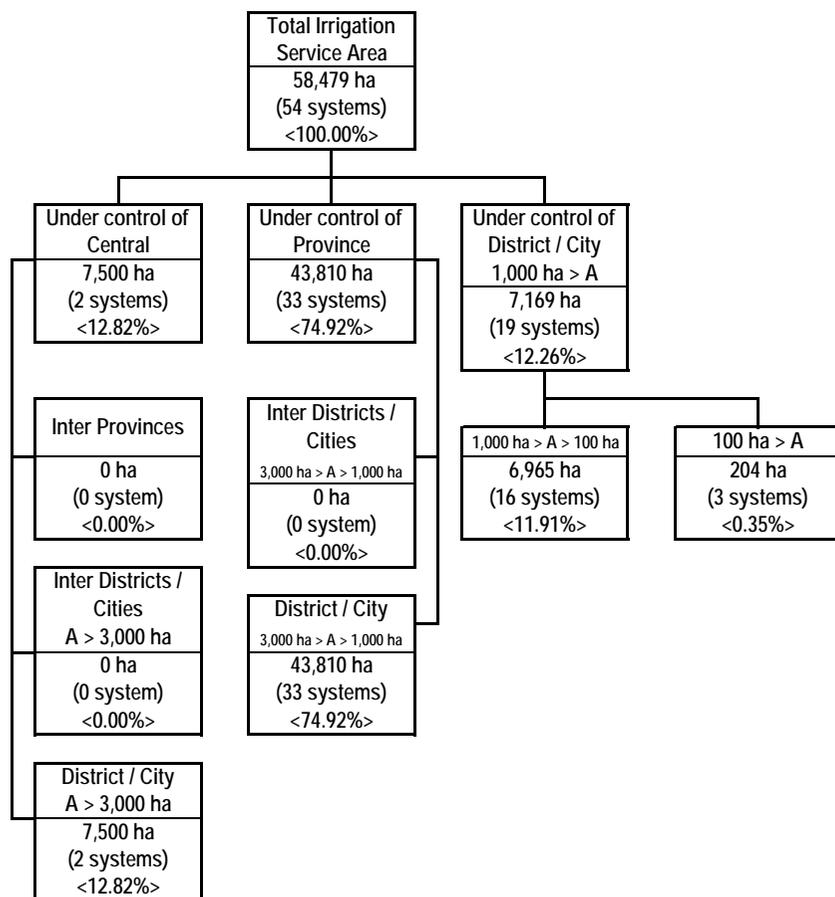


District / City	Central (A > 3,000 ha)			Province (3,000 ha > A > 1,000 ha)		Total (No. / ha)
	Inter-Provinces (No. / ha)	Inter-Districts/Cities (No. / ha)	Inner-District/City (No. / ha)	Inter-Districts/Cities (No. / ha)	Inner-District/City (No. / ha)	
	Kab. Maluku Tengah	0 0	0 0	1 4,717	0 0	
Kab. Bulu	0 0	0 0	2 7,892	0 0	6 10,510	8 18,402
Kab. Maluku Tenggara	0 0	0 0	2 8,926	0 0	8 15,641	10 24,567
Kab. Maluku Tenggara Bara	0 0	0 0	0 0	0 0	1 1,115	1 1,115
Kab. Seram Bagian Timur	0 0	0 0	2 12,500	0 0	3 6,580	5 19,080
Total	0 0	0 0	7 34,035	0 0	22 38,499	29 72,534

District / City	District/City (1,000 ha > 100 ha)		District / City	District/City (1,000 ha > 100 ha)	
	(No. / ha)	100 ha > A (No. / ha)		(No. / ha)	100 ha > A (No. / ha)
Kab. Maluku Tengah	8 4,025	0 0	Kab. Maluku Tenggara Bara	1 427	0 0
Kab. Bulu	6 4,350	0 0	Kab. Seram Bagian Barat	4 2,527	0 0
Kab. Maluku Tenggara	15 9,345	0 0	Kab. Seram Bagian Timur	1 800	0 0
Total	35 21,474	0 0	Total	35 21,474	0 0

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Annex A1.1.30 Design Irrigation Service Areas by Management Setup in North Maluku Province as of 2007

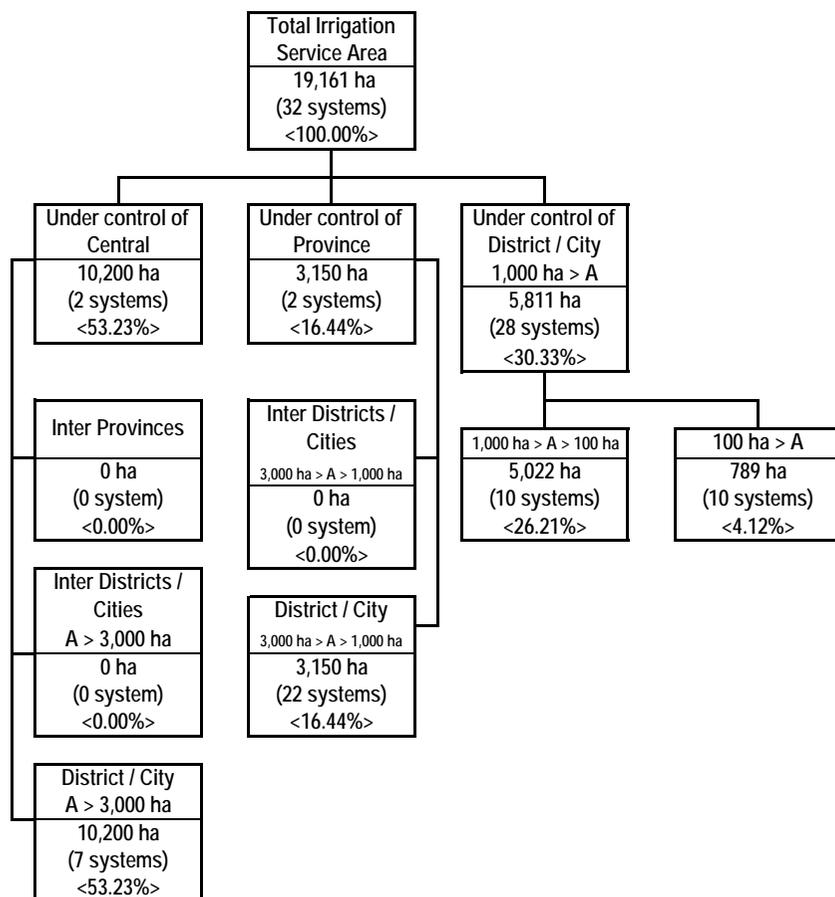


District / City	Central (A > 3,000 ha)			Province (3,000 ha > A > 1,000 ha)			Total (No. / ha)
	Inter-Provinces (No. / ha)	Inter-Districts/Cities (No. / ha)	Inner-District/City (No. / ha)	Inter-Districts/Cities (No. / ha)	Inner-District/City (No. / ha)		
	Kab. Halmahera Utara	0 0	0 0	1 3,000	0 0	6 8,250	
Kab. Halmahera Barat	0 0	0 0	0 0	0 0	6 6,500	6 6,500	
Kab. Halmahera Timur	0 0	0 0	1 4,500	0 0	10 14,772	11 19,272	
Kab. Halmahera Tengah	0 0	0 0	0 0	0 0	2 2,788	2 2,788	
Kab. Halmahera Selatan	0 0	0 0	0 0	0 0	5 6,500	5 6,500	
Kab. Kota Tidore Kepulauan	0 0	0 0	0 0	0 0	2 3,000	2 3,000	
Kab. Kepulauan Sula	0 0	0 0	0 0	0 0	2 2,000	2 2,000	
Total	0 0	0 0	2 7,500	0 0	33 43,810	35 51,310	

District / City	District/City (1,000 ha > 100 ha)		District / City	District/City (100 ha > A)	
	(No. / ha)	(No. / ha)		(No. / ha)	(No. / ha)
Kab. Halmahera Utara	8 2,720	1 85	Kab. Halmahera Selatan	1 800	0 0
Kab. Halmahera Barat	3 1,170	2 119	Kab. Kota Tidore Kepulauan	2 1,000	0 0
Kab. Halmahera Timur	2 1,275	0 0	Total	16 6,965	3 204

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Annex A1.1.32 Design Irrigation Service Areas by Management Setup in Papua Province as of 2007



District / City	Central (A > 3,000 ha)			Province (3,000 ha > A > 1,000 ha)		Total (No. / ha)
	Inter-Provinces (No. / ha)	Inter-Districts/Cities (No. / ha)	Inner-District/City (No. / ha)	Inter-Districts/Cities (No. / ha)	Inner-District/City (No. / ha)	
	Kota Jayapura	0 0	0 0	1 3,800	0 0	
Kab. Jayapura	0 0	0 0	0 0	0 0	1 2,000	1 2,000
Kab. Nabire	0 0	0 0	1 6,400	0 0	1 1,150	2 7,550
Total	0 0	0 0	2 10,200	0 0	2 3,150	4 13,350

District / City	District/City (1,000 ha > 100 ha)		District / City	District/City (100 ha > A)	
	(No. / ha)	(No. / ha)		(No. / ha)	(No. / ha)
Kab. Jayapura	3 2,059	3 150	Kab. Jayawijaya	5 1,663	9 404
Kab. Keerom	0 0	1 75	Kab. Mimika	1 300	0 0
Kab. Sarmi	0 0	1 20	Kab. Yappen Waropen	0 0	2 30
Kab. Nabire	1 1,000	2 110	Total	10 5,022	18 789

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Annex A1.2.1 Design Irrigation Service Areas by Facility Status in Indonesia as of 2007

Province / Region	Design Irrigation Service Area (No. / ha)		Area Facilitated with Main and Secondary Canal System										Area Not Yet Facilitated										
			Irrigated Area						Converted Area				Paddy Field										
			Tertiary System		Paddy Field		Sub-total		Paddy Field		Sub-total		Under Rainfed Condition (No. / ha)	Not Yet Opened (No. / ha)	Sub-total (No. / ha)								
			Facilitated (No. / ha)	Not Yet (No. / ha)	Facilitated (No. / ha)	Not Yet (No. / ha)	Once Opened (No. / ha)	Not Yet (No. / ha)	Sub-total (No. / ha)														
Aceh**	1,176	384,171	1,026	285,338	329	61,047	3	623	1,358	347,008	0	0	0	0	0	0	31	18,751	7	20,954	38	39,705	
North Sumatra	1,009	315,390	1,008	315,320	1	70	0	0	1,009	315,390	0	0	0	0	0	0	0	0	0	0	0	0	0
West Sumatra**	1,368	293,722	1,344	316,999	14	430	8	861	1,366	318,290	1	20	0	0	1	20	3	376	4	1,324	7	1,700	
Riau**	206	130,331	199	121,740	30	1,872	21	3,616	250	127,228	7	250	2	500	9	750	3	755	2	1,420	5	2,175	
Jambi**	95	52,184	89	50,879	3	31	16	1,114	108	52,024	0	0	0	0	0	0	0	0	0	0	0	0	
South Sumatra**	153	247,866	128	201,150	40	7,779	2	1,727	170	210,656	0	0	0	0	0	0	1	19	48	20,846	49	20,865	
Bengkulu	344	89,859	344	86,236	13	913	20	2,248	377	89,397	4	37	0	0	4	37	0	0	2	425	2	425	
Lampung**	811	422,705	783	328,857	4	5,977	12	10,986	799	345,820	2	34	7	181	9	215	10	5,269	2	12	12	5,281	
Bangka Belitung	45	28,771	45	28,771	0	0	0	0	45	28,771	0	0	0	0	0	0	0	0	0	0	0	0	
Sumatra Total	5,207	1,964,995	4,966	1,735,290	434	78,119	82	21,175	5,482	1,834,584	14	341	9	681	23	1,022	48	25,170	65	44,981	113	70,151	
Bantan**	986	228,849	978	223,621	159	9,530	0	0	1,137	233,151	1	349	0	0	1	349	1	84	0	0	226	140,302	
West Java**	1,193	1,001,232	1,100	833,295	95	11,116	40	4,178	1,235	848,589	76	6,009	0	0	76	6,009	25	263,352	25	5,058	50	268,410	
Central Java**	9,217	885,481	9,204	1,016,549	0	0	0	0	9,204	1,016,549	0	0	0	0	0	0	2	322	0	0	2	322	
DI. Yogyakarta**	2,550	75,904	2,543	81,357	0	0	0	0	2,543	81,357	0	0	0	0	0	0	0	0	0	0	0	0	
East Java**	8,121	956,375	8,096	1,023,098	1	1	0	0	8,097	1,023,099	1	3	0	0	1	3	3	1,612	7	192	10	1,804	
Java Total	22,067	3,147,841	21,921	3,177,920	255	20,647	40	4,178	22,216	3,202,745	78	6,361	0	0	78	6,361	31	265,370	32	5,250	62	270,536	
Bali**	888	143,008	869	129,100	199	11,851	0	0	1,068	140,951	0	0	0	0	0	0	0	0	0	0	0	0	
West Nusa Tenggara	360	213,070	349	181,483	28	4,887	81	14,663	458	201,033	157	11,632	1	5	158	11,637	1	100	1	300	2	400	
East Nusa Tenggara++	1,263	523,498	1,254	245,419	11	3,023	11	1,960	1,276	250,402	0	0	1	535	1	535	23	36,559	30	33,653	53	70,212	
Bali Nusa Tenggara Total	2,511	879,576	2,472	556,002	238	19,761	92	16,623	2,802	592,386	157	11,632	2	540	159	12,172	24	36,659	31	33,953	55	70,612	
West Kalimantan**	522	76,218	522	76,198	0	0	0	0	522	76,198	0	0	0	0	0	0	0	0	0	0	0	0	
Central Kalimantan	128	73,981	124	72,064	5	765	5	527	134	73,356	0	0	0	0	0	0	6	515	2	110	8	625	
South Kalimantan**	288	133,730	289	136,730	0	0	0	0	289	136,730	0	0	0	0	0	0	0	0	0	0	0	0	
East Kalimantan**	485	192,686	476	185,912	7	1,515	8	1,767	491	189,194	5	667	0	0	5	667	2	200	3	1,385	5	1,585	
Kalimantan Total	1,423	476,615	1,411	470,904	12	2,280	13	2,294	1,436	475,478	5	667	0	0	5	667	8	715	5	1,495	13	2,210	
North Sulawesi	236	74,841	235	63,039	4	636	64	10,780	303	74,455	2	386	0	0	2	386	0	0	0	0	0	0	
Golontalo	3	4,951	3	4,951	0	0	0	0	3	4,951	0	0	0	0	0	0	0	0	0	0	0	0	
Central Sulawesi	201	149,999	201	113,345	0	0	118	36,521	319	149,866	1	129	1	4	2	133	0	0	0	0	0	0	
South Sulawesi**	1,555	619,018	1,557	733,043	2	1,018	0	0	1,559	734,061	3	1,022	0	0	3	1,022	1	7,000	0	0	1	7,000	
Southeast Sulawesi	88	67,230	88	48,010	23	13,766	5	555	116	62,331	0	0	1	2	1	2	20	4,897	0	0	20	4,897	
West Sulawesi	218	51,327	217	39,998	0	0	0	0	217	39,998	2	3,829	0	0	2	3,829	1	2,600	1	4,900	2	7,500	
Sulawesi Total	2,301	967,366	2,301	1,002,386	29	15,420	187	47,856	2,517	1,065,662	8	5,366	2	6	10	5,372	22	14,497	7	4,900	23	19,397	
Maluku**	64	151,742	51	57,683	15	6,807	6	1,627	72	66,117	5	671	0	0	5	671	12	9,502	13	17,973	25	27,475	
North Maluku	54	58,479	43	39,164	7	5,515	0	0	50	44,679	0	0	0	0	0	0	4	850	11	12,950	15	13,800	
West Papua	19	20,356	19	20,356	0	0	0	0	19	20,356	0	0	0	0	0	0	0	0	0	0	0	0	
Papua	28	12,752	28	12,752	0	0	0	0	28	12,752	0	0	0	0	0	0	0	0	0	0	0	0	
Maluku Papua Total	165	243,325	141	129,955	22	12,322	6	1,627	169	143,904	5	671	0	0	5	671	16	10,352	24	30,923	40	41,275	
Indonesia Total	33,674	7,679,726	33,212	7,072,457	990	148,549	420	93,753	34,622	7,314,759	267	25,038	13	1,227	280	26,265	149	352,763	158	121,502	306	474,181	

Note: **: Inconsistence between total design irrigation service areas and total areas of all breakdown items

Source: Water Resources Data Center (WRDC) of DGWR, MPW

Annex A1.2.2 Design Irrigation Service Areas by Facility Status in Aceh Province as of 2007

District / City	Design Irrigation Service Area (No. / ha)		Area Facilitated with Main and Secondary Canal System										Area Not Yet Facilitated									
			Irrigated Area					Converted Area					Paddy Field									
			Tertiary System		Paddy Field		Sub-total	Paddy Field		Sub-total	Under Rainfed Condition	Not Yet Opened	Sub-total									
			Facilitated	Not Yet	Not Yet	Once Opened		Not Yet														
		(No. / ha)	(No. / ha)	(No. / ha)	(No. / ha)	(No. / ha)	(No. / ha)	(No. / ha)	(No. / ha)	(No. / ha)	(No. / ha)											
Kab. Aceh Besar	43	26,322	31	23,322	15	1,635	1	100	47	25,057	0	0	0	0	0	0	6	1,265	0	0	6	1,265
Kab. Bireun	91	27,217	46	19,961	51	7,153	1	3	98	27,117	0	0	0	0	0	0	1	100	0	0	1	100
Kab. Pidie	149	39,798	149	39,410	8	388	0	0	157	39,798	0	0	0	0	0	0	0	0	0	0	0	0
Kab. Aceh Utara**	135	60,049	133	54,216	6	1,232	0	0	139	55,448	0	0	0	0	0	0	1	1,121	0	0	1	1,121
Kota Langasa**	9	2,350	9	3,250	0	0	0	0	9	3,250	0	0	0	0	0	0	0	0	0	0	0	0
Kab. Aceh Timur**	38	16,990	25	12,332	13	4,598	0	0	38	16,930	0	0	0	0	0	0	4	3,540	0	0	4	3,540
Kab. Aceh Tamiang	26	11,980	26	10,480	0	0	0	0	26	10,480	0	0	0	0	0	0	1	1,500	0	0	1	1,500
Kab. Aceh Tengah**	88	13,861	86	12,131	23	1,720	0	0	109	13,851	0	0	0	0	0	0	0	0	0	0	0	0
Kab. Bener Meriah	59	13,592	59	10,701	24	2,816	0	0	83	13,517	0	0	0	0	0	0	1	75	0	0	1	75
Kab. Aceh Barat	69	11,456	62	9,484	11	1,911	0	0	73	11,395	0	0	0	0	0	0	1	61	0	0	1	61
Kab. Aceh Jaya**	53	22,552	40	7,247	21	8,693	0	0	61	15,940	0	0	0	0	0	0	5	4,460	3	3,804	8	8,264
Kab. Simeuleu	65	13,538	65	13,538	0	0	0	0	65	13,538	0	0	0	0	0	0	0	0	0	0	0	0
Kab. Nagan Raya	39	36,044	27	10,680	17	8,720	0	0	44	19,400	0	0	0	0	0	0	1	23	2	16,621	3	16,644
Kab. Aceh Singkil	20	4,100	12	680	6	1,020	0	0	18	1,700	0	0	0	0	0	0	3	1,871	2	529	5	2,400
Kab. Aceh Barat Daya	53	21,036	22	16,110	31	4,926	0	0	53	21,036	0	0	0	0	0	0	0	0	0	0	0	0
Kab. Aceh Selatan	108	19,870	106	14,959	23	1,436	1	520	130	16,915	0	0	0	0	0	0	3	2,955	0	0	3	2,955
Kab. Aceh Tenggara	85	28,702	84	18,602	56	10,050	0	0	140	28,652	0	0	0	0	0	0	1	50	0	0	1	50
Kab. Gayo Luwes	46	14,714	44	8,235	24	4,749	0	0	68	12,984	0	0	0	0	0	0	3	1,730	0	0	3	1,730
Total	1,176	384,171	1,026	285,338	329	61,047	3	623	1,358	347,008	0	0	0	0	0	0	31	18,751	7	20,954	38	39,705

Note: **: Inconsistence between total design irrigation service areas and total areas of all breakdown items

Source: Water Resources Data Center (WRDC) of DGWR, MPW

Annex A1.2.3 Design Irrigation Service Areas by Facility Status in North Sumatra Province as of 2007

District / City	Design Irrigation Service Area (No. / ha)		Area Facilitated with Main and Secondary Canal System										Area Not Yet Facilitated						
			Irrigated Area					Converted Area					Paddy Field						
			Tertiary System		Paddy Field		Sub-total	Paddy Field		Sub-total	Under Rainfed Condition	Not Yet Opened		Sub-total					
			Facilitated	Not Yet	Not Yet	Once Opened		Not Yet	Not Yet										
		(No. / ha)	(No. / ha)	(No. / ha)	(No. / ha)	(No. / ha)	(No. / ha)	(No. / ha)	(No. / ha)	(No. / ha)	(No. / ha)	(No. / ha)	(No. / ha)	(No. / ha)					
Kab. Langkat	34	13,258	34	13,258	0	0	0	0	34	13,258	0	0	0	0	0	0	0	0	0
Kota Binjai	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Kab. Deli Serdang	22	20,999	22	20,999	0	0	0	0	22	20,999	0	0	0	0	0	0	0	0	0
Kota Tebing Tinggi	1	300	1	300	0	0	0	0	1	300	0	0	0	0	0	0	0	0	0
Kab. Serdang Bedagai	13	25,583	13	25,583	0	0	0	0	13	25,583	0	0	0	0	0	0	0	0	0
Kab. Simalungun	178	60,940	178	60,940	0	0	0	0	178	60,940	0	0	0	0	0	0	0	0	0
Kota Pematang Siantar	7	2,272	7	2,272	0	0	0	0	7	2,272	0	0	0	0	0	0	0	0	0
Kab. Tanah Karo	120	15,367	120	15,367	0	0	0	0	120	15,367	0	0	0	0	0	0	0	0	0
Kab. Dairi	144	18,599	144	18,599	0	0	0	0	144	18,599	0	0	0	0	0	0	0	0	0
Kab. Pakpak Barat	42	3,586	42	3,586	0	0	0	0	42	3,586	0	0	0	0	0	0	0	0	0
Kab. Asahan	36	29,331	36	29,331	0	0	0	0	36	29,331	0	0	0	0	0	0	0	0	0
Kota Tanjung Balai	1	980	1	980	0	0	0	0	1	980	0	0	0	0	0	0	0	0	0
Kab. Tapanuli Tengah	37	14,353	37	14,353	0	0	0	0	37	14,353	0	0	0	0	0	0	0	0	0
Kab. Tapanuli Utara	83	15,462	83	15,462	0	0	0	0	83	15,462	0	0	0	0	0	0	0	0	0
Kab. Toba Samosir	50	13,351	49	13,281	1	70	0	0	50	13,351	0	0	0	0	0	0	0	0	0
Kab. Humbang Hasungdutan	16	6,257	16	6,257	0	0	0	0	16	6,257	0	0	0	0	0	0	0	0	0
Kab. Labuhan Batu	8	5,535	8	5,535	0	0	0	0	8	5,535	0	0	0	0	0	0	0	0	0
Kab. Tapanuli Selatan	41	24,216	41	24,216	0	0	0	0	41	24,216	0	0	0	0	0	0	0	0	0
Kota Padang Sidempuan	12	8,852	12	8,852	0	0	0	0	12	8,852	0	0	0	0	0	0	0	0	0
Kab. Nias	100	18,168	100	18,168	0	0	0	0	100	18,168	0	0	0	0	0	0	0	0	0
Kab. Nias Selatan	21	3,614	21	3,614	0	0	0	0	21	3,614	0	0	0	0	0	0	0	0	0
Kab. Samosir	27	4,368	27	4,368	0	0	0	0	27	4,368	0	0	0	0	0	0	0	0	0
Kab. Mandailing Natar	16	9,999	16	9,999	0	0	0	0	16	9,999	0	0	0	0	0	0	0	0	0
Total	1,009	315,390	1,008	315,320	1	70	0	0	1,009	315,390	0	0	0	0	0	0	0	0	0

Source: Water Resources Data Center (WRDC) of DGWR, MPW

Annex A1.2.5 Design Irrigation Service Areas by Facility Status in Riau Province as of 2007

District / City	Design Irrigation Service Area (No. / ha)		Area Facilitated with Main and Secondary Canal System									Area Not Yet Facilitated										
			Irrigated Area					Converted Area				Paddy Field										
			Tertiary System		Paddy Field		Sub-total	Paddy Field			Sub-total	Under Rainfed Condition	Not Yet Opened		Sub-total							
			Facilitated	Not Yet	Not Yet	Once Opened		Not Yet	Once Opened	Not Yet			Once Opened	Not Yet								
(No. / ha)	(No. / ha)	(No. / ha)	(No. / ha)	(No. / ha)	(No. / ha)	(No. / ha)	(No. / ha)	(No. / ha)	(No. / ha)	(No. / ha)	(No. / ha)	(No. / ha)	(No. / ha)	(No. / ha)	(No. / ha)	(No. / ha)						
Kab. Indragiri Hilir	67	71,377	67	71,377	0	0	0	0	67	71,377	0	0	0	0	0	0	0	0	0	0	0	0
Kota Dumai	5	1,920	5	1,920	0	0	0	0	5	1,920	0	0	0	0	0	0	0	0	0	0	0	0
Kab. Pelalawan**	24	6,396	24	6,128	2	30	2	37	28	6,195	2	23	0	0	2	23	0	0	0	0	0	0
Kab. Kuantan Senggigi	9	174	3	174	0	0	0	0	3	174	0	0	0	0	0	0	0	0	0	0	0	0
Kab. Indragiri Hulu	14	9,545	14	9,545	0	0	0	0	14	9,545	0	0	0	0	0	0	0	0	0	0	0	0
Kab. Siak	3	2,988	3	2,988	0	0	0	0	3	2,988	0	0	0	0	0	0	0	0	0	0	0	0
Kab. Kampar	32	16,396	31	9,763	8	452	16	3,279	55	13,494	5	227	2	500	7	727	3	755	2	1,420	5	2,175
Kab. Rokan Hulu	41	7,385	41	5,695	20	1,390	3	300	64	7,385	0	0	0	0	0	0	0	0	0	0	0	0
Kab. Rokan Hilir	11	14,150	11	14,150	0	0	0	0	11	14,150	0	0	0	0	0	0	0	0	0	0	0	0
Total	206	130,331	199	121,740	30	1,872	21	3,616	250	127,228	7	250	2	500	9	750	3	755	2	1,420	5	2,175

Note: **: Inconsistence between total design irrigation service areas and total areas of all breakdown items

Source: Water Resources Data Center (WRDC) of DGWR, MPW

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Annex A1.2.6 Design Irrigation Service Areas by Facility Status in Jambi Province as of 2007

District / City	Design Irrigation Service Area (No. / ha)		Area Facilitated with Main and Secondary Canal System									Area Not Yet Facilitated											
			Irrigated Area					Converted Area				Paddy Field											
			Tertiary System		Paddy Field		Sub-total	Paddy Field			Sub-total	Under Rainfed Condition	Not Yet Opened		Sub-total								
			Facilitated	Not Yet	Not Yet	Once Opened		Not Yet	Once Opened	Not Yet			Once Opened	Not Yet									
(No. / ha)	(No. / ha)	(No. / ha)	(No. / ha)	(No. / ha)	(No. / ha)	(No. / ha)	(No. / ha)	(No. / ha)	(No. / ha)	(No. / ha)	(No. / ha)	(No. / ha)	(No. / ha)	(No. / ha)	(No. / ha)	(No. / ha)	(No. / ha)	(No. / ha)	(No. / ha)	(No. / ha)	(No. / ha)		
Kab. Kerinci	32	17,678	32	17,669	0	0	0	0	32	17,669	0	0	0	0	0	0	0	0	0	0	0	0	0
Kab. Sarolangun	9	4,056	9	3,629	0	0	5	427	14	4,056	0	0	0	0	0	0	0	0	0	0	0	0	0
Kab. Merangin	16	3,202	16	3,202	0	0	0	0	16	3,202	0	0	0	0	0	0	0	0	0	0	0	0	0
Kab. Bungo**	26	5,606	20	4,737	3	31	11	687	34	5,455	0	0	0	0	0	0	0	0	0	0	0	0	0
Kab. Tebo	8	19,766	8	19,766	0	0	0	0	8	19,766	0	0	0	0	0	0	0	0	0	0	0	0	0
Kab. Batanghari	1	480	1	480	0	0	0	0	1	480	0	0	0	0	0	0	0	0	0	0	0	0	0
Kab. Tanjung Jabung Barat	3	1,396	3	1,396	0	0	0	0	3	1,396	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	95	52,184	89	50,879	3	31	16	1,114	108	52,024	0	0	0	0	0	0	0	0	0	0	0	0	0

Note: **: Inconsistence between total design irrigation service areas and total areas of all breakdown items

Source: Water Resources Data Center (WRDC) of DGWR, MPW

Annex A1.2.7 Design Irrigation Service Areas by Facility Status in South Sumatra Province as of 2007

District / City	Design Irrigation Service Area (No. / ha)	Area Facilitated with Main and Secondary Canal System										Area Not Yet Facilitated			
		Irrigated Area					Converted Area					Paddy Field			
		Tertiary System		Paddy Field		Sub-total	Paddy Field		Sub-total	Under Rainfed Condition	Not Yet Opened	Sub-total	Under Rainfed Condition	Not Yet Opened	Sub-total
		Facilitated	Not Yet	Not Yet	Not Yet		Once Opened	Not Yet							
(No. / ha)	(No. / ha)	(No. / ha)	(No. / ha)	(No. / ha)	(No. / ha)	(No. / ha)	(No. / ha)	(No. / ha)	(No. / ha)	(No. / ha)	(No. / ha)	(No. / ha)	(No. / ha)		
Kab. Ogan Komering Ulu Selatan**	14 138,342	12 125,725	0 0	0 0	12 125,725	0 0	0 0	0 0	0 0	0 0	0 0	0 0	1 11,266	1 11,266	
Kab. Ogan Komering Ulu Timur	21 6,762	20 5,761	9 671	0 0	29 6,432	0 0	0 0	0 0	0 0	0 0	0 0	0 0	4 330	4 330	
Kab. Musi Rawas**	38 42,024	24 32,942	1 50	1 50	26 33,042	0 0	0 0	0 0	0 0	0 0	0 0	0 0	7 1,459	7 1,459	
Kab. Lahat**	44 28,630	42 13,937	26 6,685	1 1,677	69 22,299	0 0	0 0	0 0	0 0	0 0	0 0	0 0	28 5,838	28 5,838	
Kota Lubuk Linggau	4 1,417	4 1,367	1 50	0 0	5 1,417	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	
Kota Pagar Alam**	7 16,786	6 10,105	2 23	0 0	8 10,128	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	
Kab. Muara Enim	14 8,566	14 7,393	1 300	0 0	15 7,693	0 0	0 0	0 0	0 0	0 0	0 0	0 0	5 873	5 873	
Kota Prabumulih	1 350	1 220	0 0	0 0	1 220	0 0	0 0	0 0	0 0	0 0	0 0	0 0	1 130	1 130	
Kab. Ogan Komering Ulu Induk**	9 3,969	4 2,699	0 0	0 0	4 2,699	0 0	0 0	0 0	0 0	0 0	0 0	0 0	2 950	2 950	
Kab. Ogan Komering Ilir	1 1,020	1 1,001	0 0	0 0	1 1,001	0 0	0 0	0 0	0 0	0 0	1 19	0 0	1 19	1 19	
Total	153 247,866	128 201,150	40 7,779	2 1,272	170 210,656	0 0	0 0	0 0	0 0	0 0	1 19	48 20,846	49 20,865		

Note: **: Inconsistence between total design irrigation service areas and total areas of all breakdown items

Source: Water Resources Data Center (WRDC) of DGWR, MPW

BEGKULU

Annex A1.2.8 Design Irrigation Service Areas by Facility Status in Bengkulu Province as of 2007

District / City	Design Irrigation Service Area (No. / ha)	Area Facilitated with Main and Secondary Canal System										Area Not Yet Facilitated			
		Irrigated Area					Converted Area					Paddy Field			
		Tertiary System		Paddy Field		Sub-total	Paddy Field		Sub-total	Under Rainfed Condition	Not Yet Opened	Sub-total	Under Rainfed Condition	Not Yet Opened	Sub-total
		Facilitated	Not Yet	Not Yet	Not Yet		Once Opened	Not Yet							
(No. / ha)	(No. / ha)	(No. / ha)	(No. / ha)	(No. / ha)	(No. / ha)	(No. / ha)	(No. / ha)	(No. / ha)	(No. / ha)	(No. / ha)	(No. / ha)	(No. / ha)	(No. / ha)		
Kab. Muko Muko	2 13,660	2 13,660	0 0	0 0	2 13,660	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	
Kab. Seluma	3 11,452	3 11,452	0 0	0 0	3 11,452	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	
Kota Bengkulu	1 514	1 514	0 0	0 0	1 514	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	
Kab. Bengkulu Selatan	132 19,095	132 18,629	3 27	3 439	138 19,095	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	
Kab. Bengkulu Utara	106 22,949	106 20,727	10 886	14 884	130 22,497	3 27	0 0	3 27	0 0	2 425	2 425	2 425	2 425		
Kab. Rejang Lebong	100 22,189	100 21,254	0 0	3 925	103 22,179	1 10	0 0	1 10	0 0	0 0	0 0	0 0	0 0		
Total	344 89,859	344 86,236	13 913	20 2,248	377 89,397	4 37	0 0	4 37	0 0	2 425	2 425	2 425			

Source: Water Resources Data Center (WRDC) of DGWR, MPW

Annex A1.2.9 Design Irrigation Service Areas by Facility Status in Bangka Belitung Province as of 2007

District / City	Design Irrigation Service Area (No. / ha)		Area Facilitated with Main and Secondary Canal System									Area Not Yet Facilitated											
			Irrigated Area						Converted Area			Paddy Field											
			Tertiary System			Paddy Field			Paddy Field			Under Rainfed		Not Yet		Sub-total							
			Facilitated (No. / ha)		Not Yet (No. / ha)	Not Yet (No. / ha)		Sub-total (No. / ha)	Once Opened (No. / ha)		Not Yet (No. / ha)	Sub-total (No. / ha)	Condition (No. / ha)		Opened (No. / ha)		Sub-total (No. / ha)						
Kab. Bangka	17	4,550	17	4,550	0	0	0	0	17	4,550	0	0	0	0	0	0	0	0	0	0	0	0	0
Kab. Bangka Tengah	2	500	2	500	0	0	0	0	2	500	0	0	0	0	0	0	0	0	0	0	0	0	0
Kab. Bangka Selatan	4	3,350	4	3,350	0	0	0	0	4	3,350	0	0	0	0	0	0	0	0	0	0	0	0	0
Kab. Bangka Barat	11	13,158	11	13,158	0	0	0	0	11	13,158	0	0	0	0	0	0	0	0	0	0	0	0	0
Kab. Belitung	7	977	7	977	0	0	0	0	7	977	0	0	0	0	0	0	0	0	0	0	0	0	0
Kab. Belitung Timur	4	6,236	4	6,236	0	0	0	0	4	6,236	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	45	28,771	45	28,771	0	0	0	0	45	28,771	0	0	0	0	0	0	0	0	0	0	0	0	0

Source: Water Resources Data Center (WRDC) of DGWR, MPW

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Annex A1.2.10 Design Irrigation Service Areas by Facility Status in Lampung Province as of 2007

District / City	Design Irrigation Service Area (No. / ha)		Area Facilitated with Main and Secondary Canal System									Area Not Yet Facilitated											
			Irrigated Area						Converted Area			Paddy Field											
			Tertiary System			Paddy Field			Paddy Field			Under Rainfed		Not Yet		Sub-total							
			Facilitated (No. / ha)		Not Yet (No. / ha)	Not Yet (No. / ha)		Sub-total (No. / ha)	Once Opened (No. / ha)		Not Yet (No. / ha)	Sub-total (No. / ha)	Condition (No. / ha)		Opened (No. / ha)		Sub-total (No. / ha)						
Kab. Lampung Selatan**	189	43,822	185	43,362	0	0	0	0	185	43,362	0	0	0	0	0	0	0	0	0	0	0	0	0
Kota Metro	3	2,569	1	2,569	0	0	0	0	1	2,569	0	0	0	0	0	0	0	0	0	0	0	0	0
Kab. Tanggamus**	137	38,345	135	40,015	0	0	0	0	135	40,015	0	0	0	0	0	0	0	0	0	0	0	0	0
Kab. Lampung Tengah**	140	154,201	140	109,716	2	4,648	3	2,908	145	117,272	2	34	1	10	3	44	4	776	0	0	4	776	0
Kab. Lampung Timur**	26	45,997	18	35,017	0	0	0	0	18	35,017	0	0	0	0	0	0	0	0	0	0	0	0	0
Kab. Lampung Utara**	80	37,784	76	21,587	1	119	7	864	84	22,570	0	0	6	171	6	171	0	0	2	12	2	12	0
Kab Tulang Bawang**	13	62,842	12	41,046	1	1,210	2	7,214	15	49,470	0	0	0	0	0	0	6	4,493	0	0	6	4,493	0
Kab. Way Kanan**	49	18,429	44	17,259	0	0	0	0	44	17,259	0	0	0	0	0	0	0	0	0	0	0	0	0
Kab. Lampung Barat**	174	18,716	172	18,286	0	0	0	0	172	18,286	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	811	422,705	783	328,857	4	5,977	12	10,986	799	345,820	2	34	7	181	9	215	10	5,269	2	12	12	5,281	0

Note: **: Inconsistence between total design irrigation service areas and total areas of all breakdown items

Source: Water Resources Data Center (WRDC) of DGWR, MPW

Annex A1.2.11 Design Irrigation Service Areas by Facility Status in Banten Province as of 2007

District / City	Design Irrigation Service Area (No. / ha)		Area Facilitated with Main and Secondary Canal System											Area Not Yet Facilitated								
			Irrigated Area						Converted Area					Paddy Field								
			Tertiary System				Paddy Field		Paddy Field			Sub-total		Under Rainfed Condition (No. / ha)	Not Yet Opened (No. / ha)	Sub-total (No. / ha)						
			Facilitated (No. / ha)		Not Yet (No. / ha)		Not Yet (No. / ha)		Sub-total (No. / ha)		Once Opened (No. / ha)		Not Yet (No. / ha)				Sub-total (No. / ha)					
Kab. Serang**	184	85,665	184	85,806	0	0	0	0	184	85,806	0	0	0	0	0	0	1	84	0	0	1	84
Kota Cilegon**	3	1,476	3	1,735	0	0	0	0	3	1,735	0	0	0	0	0	0	0	0	0	0	0	0
Kab. Pandeglang**	483	55,556	483	60,416	0	0	0	0	483	60,416	0	0	0	0	0	0	0	0	0	0	0	0
Kab. Lebak**	276	45,293	268	35,638	159	9,530	0	0	427	45,168	0	0	0	0	0	0	0	0	0	0	0	0
Kab. Tangerang**	38	40,838	38	38,899	0	0	0	0	38	38,899	0	0	0	0	0	0	0	0	0	0	0	0
Kota Tangerang**	2	21	2	1,127	0	0	0	0	2	1,127	1	349	0	0	1	349	0	0	0	0	0	0
Total	986	228,849	978	223,621	159	9,530	0	0	1,137	233,151	1	349	0	0	1	349	1	84	0	0	1	84

Note: **: Inconsistence between total design irrigation service areas and total areas of all breakdown items

Source: Water Resources Data Center (WRDC) of DGWR, MPW

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Annex A1.2.12 Design Irrigation Service Areas by Facility Status in DI Yogyakarta as of 2007

District / City	Design Irrigation Service Area (No. / ha)		Area Facilitated with Main and Secondary Canal System											Area Not Yet Facilitated								
			Irrigated Area						Converted Area					Paddy Field								
			Tertiary System				Paddy Field		Paddy Field			Sub-total		Under Rainfed Condition (No. / ha)	Not Yet Opened (No. / ha)	Sub-total (No. / ha)						
			Facilitated (No. / ha)		Not Yet (No. / ha)		Not Yet (No. / ha)		Sub-total (No. / ha)		Once Opened (No. / ha)		Not Yet (No. / ha)				Sub-total (No. / ha)					
Kab. Sleman**	2,113	31,630	2,109	37,083	0	0	0	0	2,109	37,083	0	0	0	0	0	0	0	0	0	0	0	0
Kab. Gunung Kidul	233	10,551	233	10,551	0	0	0	0	233	10,551	0	0	0	0	0	0	0	0	0	0	0	0
Kab. Bantul	104	18,618	104	18,618	0	0	0	0	104	18,618	0	0	0	0	0	0	0	0	0	0	0	0
Kota Yogyakarta	25	152	22	152	0	0	0	0	22	152	0	0	0	0	0	0	0	0	0	0	0	0
Kab. Kulonprogo	75	14,953	75	14,953	0	0	0	0	75	14,953	0	0	0	0	0	0	0	0	0	0	0	0
Total	2,550	75,904	2,543	81,357	0	0	0	0	2,543	81,357	0	0	0	0	0	0	0	0	0	0	0	0

Note: **: Inconsistence between total design irrigation service areas and total areas of all breakdown items

Source: Water Resources Data Center (WRDC) of DGWR, MPW

Annex A1.2.13 Design Irrigation Service Areas by Facility Status in West Java Province as of 2007

District / City	Design Irrigation Service Area (No. / ha)		Area Facilitated with Main and Secondary Canal System										Area Not Yet Facilitated									
			Irrigated Area					Converted Area					Paddy Field									
			Tertiary System		Paddy Field		Sub-total (No. / ha)	Paddy Field		Sub-total (No. / ha)	Under Rainfed Condition		Not Yet Opened		Sub-total (No. / ha)							
			Facilitated (No. / ha)	Not Yet (No. / ha)	Not Yet (No. / ha)	Once Opened (No. / ha)		Not Yet (No. / ha)	Condition (No. / ha)		Not Yet Opened (No. / ha)											
Kab. Bandung	44	29,116	43	24,365	1	20	1	168	45	24,553	4	194	0	0	4	194	0	0	21	4,369	21	4,369
Kota Bandung	10	909	10	489	0	0	1	338	11	827	1	82	0	0	1	82	0	0	0	0	0	0
Kota Cimahi**	7	612	7	564	0	0	1	102	8	666	0	0	0	0	0	0	0	0	0	0	0	0
Kab. Bogor**	115	42,848	115	39,300	6	898	4	133	125	40,331	17	1,529	0	0	17	1,529	2	830	1	103	3	933
Kota Bogor	6	305	6	305	0	0	0	0	6	305	0	0	0	0	0	0	0	0	0	0	0	0
Kota Depok	8	2,054	8	1,358	0	0	0	0	8	1,358	1	696	0	0	1	696	0	0	0	0	0	0
Kab. Cirebon	70	137,494	66	128,594	2	799	1	58	69	129,451	10	163	0	0	10	163	4	7,880	0	0	4	7,880
Kota Cirebon	2	430	2	430	0	0	0	0	2	430	0	0	0	0	0	0	0	0	0	0	0	0
Kab. Kuningan	53	21,837	46	20,801	2	626	1	2	49	21,429	6	92	0	0	6	92	0	0	1	316	1	316
Kab. Majalengka	131	44,908	128	43,981	0	0	1	425	129	44,406	10	502	0	0	10	502	0	0	0	0	0	0
Kab. Sumedang	138	21,503	136	17,219	5	2,523	0	0	141	19,742	5	1,761	0	0	5	1,761	0	0	0	0	0	0
Kab. Indramayu	17	259,196	16	258,101	0	0	0	0	16	258,101	2	3	0	0	2	3	1	1,092	0	0	1	1,092
Kab. Bekasi**	33	73,701	25	10,540	1	410	0	0	26	10,950	3	334	0	0	3	334	7	184,963	0	0	7	184,963
Kota Bekasi	3	572	3	560	0	0	0	0	3	560	0	0	0	0	0	0	1	12	0	0	1	12
Kab. Karawang**	28	77,816	26	10,592	0	0	0	0	26	10,592	0	0	0	0	0	0	2	66,963	0	0	2	66,963
Kab. Subang**	198	68,795	141	65,818	58	2,954	0	0	199	68,772	0	0	0	0	0	0	0	0	0	0	0	0
Kota Subang	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Kab. Purwakarta	71	27,600	71	27,158	0	0	0	0	71	27,158	2	442	0	0	2	442	0	0	0	0	0	0
Kab. Sukabumi**	71	48,520	70	44,889	12	1,976	17	1,344	99	48,209	11	156	0	0	11	156	0	0	0	0	0	0
Kab. Cianjur	58	32,023	57	30,961	2	191	4	337	63	31,489	1	22	0	0	1	22	6	512	0	0	6	512
Kab. Garut**	37	23,271	36	22,971	0	0	0	0	36	22,971	0	0	0	0	0	0	0	0	0	0	0	0
Kab. Tasikmalaya	41	26,441	40	24,620	5	583	7	1,108	52	26,311	2	20	0	0	2	20	1	110	0	0	1	110
Kota Tasikmalaya	8	2,629	7	2,629	0	0	0	0	7	2,629	0	0	0	0	0	0	0	0	0	0	0	0
Kab. Ciamis**	42	58,652	41	57,050	1	136	2	163	44	57,349	1	13	0	0	1	13	1	990	2	270	3	1,260
Kota Banjar	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	1,193	1,001,232	1,100	833,295	95	11,116	40	4,178	1,235	848,589	76	6,009	0	0	76	6,009	25	263,352	25	5,058	50	268,410

Note: **: Inconsistence between total design irrigation service areas and total areas of all breakdown items

Source: Water Resources Data Center (WRDC) of DGWR, MPW

Annex A1.2.14 Design Irrigation Service Areas by Facility Status in Central Java Province as of 2007

District / City	Design Irrigation Service Area (No. / ha)		Area Facilitated with Main and Secondary Canal System											Area Not Yet Facilitated							
			Irrigated Area						Converted Area					Paddy Field							
			Tertiary System			Paddy Field			Paddy Field			Sub-total		Under Rainfed Condition		Not Yet Opened		Sub-total			
			Facilitated (No. / ha)	Not Yet (No. / ha)	Not Yet (No. / ha)	Not Yet (No. / ha)	Not Yet (No. / ha)	Sub-total (No. / ha)	Once Opened (No. / ha)	Not Yet (No. / ha)	Sub-total (No. / ha)	No. / ha	No. / ha	No. / ha	No. / ha	No. / ha	No. / ha	No. / ha			
Kab. Brebes	408	37,770	408	37,770	0	0	0	0	408	37,770	0	0	0	0	0	0	0	0	0	0	0
Kab. Tegal	182	76,696	182	76,696	0	0	0	0	182	76,696	0	0	0	0	0	0	0	0	0	0	0
Kota Tegal	3	931	3	931	0	0	0	0	3	931	0	0	0	0	0	0	0	0	0	0	0
Kab. Pemalang**	95	25,945	94	23,838	0	0	0	0	94	23,838	0	0	0	0	0	0	0	0	0	0	0
Kab. Pekalongan**	284	23,489	284	34,072	0	0	0	0	284	34,072	0	0	0	0	0	0	0	0	0	0	0
Kota Pekalongan**	3	70	3	6,627	0	0	0	0	3	6,627	0	0	0	0	0	0	0	0	0	0	0
Kab. Batang**	553	30,067	553	29,046	0	0	0	0	553	29,046	0	0	0	0	0	0	0	0	0	0	0
Kab. Kendal**	26	23,052	26	27,405	0	0	0	0	26	27,405	0	0	0	0	0	0	0	0	0	0	0
Kota Semarang	43	3,457	43	3,457	0	0	0	0	43	3,457	0	0	0	0	0	0	0	0	0	0	0
Kab. Semarang**	576	31,584	575	31,215	0	0	0	0	575	31,215	0	0	0	0	0	0	0	0	0	0	0
Kota Salatiga	24	1,367	24	1,367	0	0	0	0	24	1,367	0	0	0	0	0	0	0	0	0	0	0
Kab. Demak**	11	12,613	11	51,700	0	0	0	0	11	51,700	0	0	0	0	0	0	0	0	0	0	0
Kab. Grobogan**	161	104,102	161	57,934	0	0	0	0	161	57,934	0	0	0	0	0	0	0	0	0	0	0
Kab. Kudus**	170	13,939	170	20,154	0	0	0	0	170	20,154	0	0	0	0	0	0	0	0	0	0	0
Kab. Jepara**	509	23,856	509	61,347	0	0	0	0	509	61,347	0	0	0	0	0	0	0	0	0	0	0
Kab. Pati**	280	30,218	280	67,333	0	0	0	0	280	67,333	0	0	0	0	0	0	0	0	0	0	0
Kab. Rembang**	126	14,775	126	14,707	0	0	0	0	126	14,707	0	0	0	0	0	0	0	0	0	0	0
Kab. Blora	134	12,482	134	12,482	0	0	0	0	134	12,482	0	0	0	0	0	0	0	0	0	0	0
Kab. Boyolali**	216	16,077	216	16,085	0	0	0	0	216	16,085	0	0	0	0	0	0	0	0	0	0	0
Kab. Sukoharjo**	85	9,490	85	34,460	0	0	0	0	85	34,460	0	0	0	0	0	0	0	0	0	0	0
Kab. Karanganyar**	330	20,620	330	20,242	0	0	0	0	330	20,242	0	0	0	0	0	0	0	0	0	0	0
Kab. Sragen**	78	18,915	77	20,397	0	0	0	0	77	20,397	0	0	0	0	0	1	18	0	0	1	18
Kab. Klaten**	484	22,578	483	31,885	0	0	0	0	483	31,885	0	0	0	0	0	0	0	0	0	0	0
Kab. Wonogiri**	396	56,335	395	55,895	0	0	0	0	395	55,895	0	0	0	0	0	1	304	0	0	1	304
Kab. Magelang**	888	37,028	887	36,703	0	0	0	0	887	36,703	0	0	0	0	0	0	0	0	0	0	0
Kota Magelang	2	71	1	71	0	0	0	0	1	71	0	0	0	0	0	0	0	0	0	0	0
Kab. Purworejo**	210	49,966	210	49,948	0	0	0	0	210	49,948	0	0	0	0	0	0	0	0	0	0	0
Kab. Kebumen**	198	17,267	196	23,582	0	0	0	0	196	23,582	0	0	0	0	0	0	0	0	0	0	0
Kab. Temanggung**	348	23,678	348	23,349	0	0	0	0	348	23,349	0	0	0	0	0	0	0	0	0	0	0
Kab. Wonosobo**	705	21,563	704	20,338	0	0	0	0	704	20,338	0	0	0	0	0	0	0	0	0	0	0
Kab. Banjarnegara**	268	26,168	268	22,472	0	0	0	0	268	22,472	0	0	0	0	0	0	0	0	0	0	0
Kab. Purbalingga**	183	18,660	183	22,356	0	0	0	0	183	22,356	0	0	0	0	0	0	0	0	0	0	0
Kab. Banyumas**	663	58,047	663	57,740	0	0	0	0	663	57,740	0	0	0	0	0	0	0	0	0	0	0
Kab. Cilacap**	575	22,605	572	22,945	0	0	0	0	572	22,945	0	0	0	0	0	0	0	0	0	0	0
Total	9,217	885,481	9,204	1,016,549	0	0	0	0	9,204	1,016,549	0	0	0	0	0	2	322	0	0	2	322

Note: **, Inconsistence between total design irrigation service areas and total areas of all breakdown items

Source: Water Resources Data Center (WRDC) of DGWR, MPW

Annex A1.2.15 Design Irrigation Service Areas by Facility Status in East Java Province as of 2007

District / City	Design Irrigation Service Area (No. / ha)		Area Facilitated with Main and Secondary Canal System										Area Not Yet Facilitated									
			Irrigated Area					Converted Area					Paddy Field									
			Tertiary System		Paddy Field		Sub-total	Paddy Field		Sub-total	Under Rainfed Condition		Not Yet Opened		Sub-total							
			Facilitated	Not Yet	Not Yet	Once Opened		Not Yet	No. / ha		No. / ha	No. / ha	No. / ha									
		(No. / ha)	(No. / ha)	(No. / ha)	(No. / ha)	(No. / ha)	(No. / ha)	(No. / ha)	(No. / ha)	(No. / ha)	(No. / ha)	(No. / ha)	(No. / ha)									
Kab. Malang**	624	43,017	624	42,433	1	1	0	0	625	42,434	1	3	0	0	1	3	0	0	0	0	0	0
Kota Malang**	29	1,552	29	2,153	0	0	0	0	29	2,153	0	0	0	0	0	0	0	0	0	0	0	0
Kota Batu	44	2,613	44	2,613	0	0	0	0	44	2,613	0	0	0	0	0	0	0	0	0	0	0	0
Kab. Tulungagung	164	14,465	163	14,357	0	0	0	0	163	14,357	0	0	0	0	0	0	1	108	0	0	1	108
Kab. Blitar**	804	42,584	797	41,727	0	0	0	0	797	41,727	0	0	0	0	0	0	1	80	0	0	1	80
Kota Blitar**	50	1,447	49	1,567	0	0	0	0	49	1,567	0	0	0	0	0	0	0	0	0	0	0	0
Kab. Trenggalek**	513	11,500	513	11,113	0	0	0	0	513	11,113	0	0	0	0	0	0	0	0	0	0	0	0
Kab. Kediri**	418	116,224	418	106,377	0	0	0	0	418	106,377	0	0	0	0	0	0	0	0	0	0	0	0
Kota Kediri	52	2,544	52	3,165	0	0	0	0	52	3,165	0	0	0	0	0	0	0	0	0	0	0	0
Kab. Nganjuk	215	27,559	214	27,559	0	0	0	0	214	27,559	0	0	0	0	0	0	0	0	0	0	0	0
Kab. Jombang**	194	15,116	192	27,073	0	0	0	0	192	27,073	0	0	0	0	0	0	0	0	0	0	0	0
Kab. Mojokerto**	346	31,728	346	56,280	0	0	0	0	346	56,280	0	0	0	0	0	0	0	0	0	0	0	0
Kota Mojokerto	7	557	4	557	0	0	0	0	4	557	0	0	0	0	0	0	0	0	0	0	0	0
Kota Surabaya**	8	74	4	30	0	0	0	0	4	30	0	0	0	0	0	0	0	0	0	0	0	0
Kab. Sidoarjo	1	24,061	1	24,061	0	0	0	0	1	24,061	0	0	0	0	0	0	0	0	0	0	0	0
Kab. Madiun**	352	46,323	352	47,359	0	0	0	0	352	47,359	0	0	0	0	0	0	0	0	0	0	0	0
Kota Madiun**	7	659	7	892	0	0	0	0	7	892	0	0	0	0	0	0	0	0	0	0	0	0
Kab. Magetan**	147	18,538	144	23,602	0	0	0	0	144	23,602	0	0	0	0	0	0	0	0	0	0	0	0
Kab. Ponorogo**	397	28,679	396	28,558	0	0	0	0	396	28,558	0	0	0	0	0	0	0	0	0	0	0	0
Kab. Ngawi**	402	43,356	402	81,718	0	0	0	0	402	81,718	0	0	0	0	0	0	0	0	0	0	0	0
Kab. Pacitan**	373	6,846	373	6,820	0	0	0	0	373	6,820	0	0	0	0	0	0	0	0	0	0	0	0
Kab. Bojonegoro**	10	22,449	10	22,443	0	0	0	0	10	22,443	0	0	0	0	0	0	0	0	0	0	0	0
Kab. Tuban**	54	20,490	54	23,562	0	0	0	0	54	23,562	0	0	0	0	0	0	0	0	0	0	0	0
Kab. Lamongan	41	44,193	41	44,193	0	0	0	0	41	44,193	0	0	0	0	0	0	0	0	0	0	0	0
Kab. Gresik**	38	18,961	38	20,756	0	0	0	0	38	20,756	0	0	0	0	0	0	0	0	0	0	0	0
Kab. Bondowoso**	531	38,298	531	30,541	0	0	0	0	531	30,541	0	0	0	0	0	0	0	0	0	0	0	0
Kab. Situbondo**	221	25,539	221	31,008	0	0	0	0	221	31,008	0	0	0	0	0	0	0	0	0	0	0	0
Kab. Banyuwangi**	400	66,724	400	65,691	0	0	0	0	400	65,691	0	0	0	0	0	0	0	0	0	0	0	0
Kab. Jember**	389	79,955	389	88,965	0	0	0	0	389	88,965	0	0	0	0	0	0	0	0	0	0	0	0
Kab. Lumajang**	323	51,307	323	41,149	0	0	0	0	323	41,149	0	0	0	0	0	0	0	0	7	192	7	192
Kab. Probolinggo**	301	38,890	299	35,475	0	0	0	0	299	35,475	0	0	0	0	0	0	0	0	0	0	0	0
Kota Probolinggo**	27	2,225	27	2,181	0	0	0	0	27	2,181	0	0	0	0	0	0	0	0	0	0	0	0
Kab. Pasuruan**	398	40,697	398	39,959	0	0	0	0	398	39,959	0	0	0	0	0	0	0	0	0	0	0	0
Kota Pasuruan**	6	2,183	6	2,155	0	0	0	0	6	2,155	0	0	0	0	0	0	0	0	0	0	0	0
Kab. Bangkalan**	78	6,817	78	6,801	0	0	0	0	78	6,801	0	0	0	0	0	0	0	0	0	0	0	0
Kab. Sampang	46	5,057	46	5,057	0	0	0	0	46	5,057	0	0	0	0	0	0	0	0	0	0	0	0
Kab. Pamekasan	53	6,232	53	6,232	0	0	0	0	53	6,232	0	0	0	0	0	0	0	0	0	0	0	0
Kab. Sumenep**	58	6,916	58	6,916	0	0	0	0	58	6,916	0	0	0	0	0	0	1	1,424	0	0	1	1,424
Total	8,121	956,375	8,096	1,023,098	1	1	0	0	8,097	1,023,099	1	3	0	0	1	3	3	1,612	7	192	10	1,804

Note: **: Inconsistence between total design irrigation service areas and total areas of all breakdown items

Source: Water Resources Data Center (WRDC) of DGWR, MPW

Annex A1.2.16 Design Irrigation Service Areas by Facility Status in Bali Province as of 2007

District / City	Design Irrigation Service Area (No. / ha)		Area Facilitated with Main and Secondary Canal System									Area Not Yet Facilitated								
			Irrigated Area						Converted Area			Paddy Field								
			Tertiary System		Paddy Field		Sub-total	Paddy Field		Sub-total	Under Rainfed Condition		Not Yet Opened		Sub-total					
			Facilitated (No. / ha)	Not Yet (No. / ha)	Not Yet (No. / ha)	Once Opened (No. / ha)		Not Yet (No. / ha)	Under Rainfed (No. / ha)		Not Yet (No. / ha)									
Kab. Jembrana*	75	11,073	75	9,413	21	1,692	0	0	96	11,105	0	0	0	0	0	0	0	0	0	0
Kab. Tabanan**	226	27,091	218	25,883	44	1,154	0	0	262	27,037	0	0	0	0	0	0	0	0	0	0
Kab. Badung**	50	19,052	46	15,503	22	1,839	0	0	68	17,342	0	0	0	0	0	0	0	0	0	0
Kota Denpasar	20	9,090	18	6,336	11	2,754	0	0	29	9,090	0	0	0	0	0	0	0	0	0	0
Kab. Giayur**	162	40,976	159	38,871	40	1,840	0	0	199	40,711	0	0	0	0	0	0	0	0	0	0
Kab. Bangli	52	4,204	51	4,064	15	140	0	0	66	4,204	0	0	0	0	0	0	0	0	0	0
Kab. Klungkung	27	5,195	26	4,844	14	351	0	0	40	5,195	0	0	0	0	0	0	0	0	0	0
Kab. Karang Asem	121	9,683	121	9,632	3	51	0	0	124	9,683	0	0	0	0	0	0	0	0	0	0
Kab. Buleleng**	155	16,644	155	14,554	29	2,030	0	0	184	16,584	0	0	0	0	0	0	0	0	0	0
Total	888	143,008	869	129,100	199	11,851	0	0	1,068	140,951	0	0	0	0	0	0	0	0	0	0

Note: **: Inconsistence between total design irrigation service areas and total areas of all breakdown items

Source: Water Resources Data Center (WRDC) of DGWR, MPW

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Annex A1.2.17 Design Irrigation Service Areas by Facility Status in West Nusa Tenggara Province as of 2007

District / City	Design Irrigation Service Area (No. / ha)		Area Facilitated with Main and Secondary Canal System									Area Not Yet Facilitated										
			Irrigated Area						Converted Area			Paddy Field										
			Tertiary System		Paddy Field		Sub-total	Paddy Field		Sub-total	Under Rainfed Condition		Not Yet Opened		Sub-total							
			Facilitated (No. / ha)	Not Yet (No. / ha)	Not Yet (No. / ha)	Once Opened (No. / ha)		Not Yet (No. / ha)	Under Rainfed (No. / ha)		Not Yet (No. / ha)											
Kota Mataram	6	2,284	6	1,581	0	0	0	0	6	1,581	6	703	0	0	6	703	0	0	0	0	0	
Kab. Lombok Barat	49	24,938	41	18,003	3	468	2	477	46	18,948	34	5,690	0	0	34	5,690	0	0	1	300	1	300
Kab. Lombok Tengah	65	53,644	64	52,401	0	0	2	119	66	52,520	16	1,024	0	0	16	1,024	1	100	0	0	1	100
Kab. Lombok Timur	122	48,005	122	41,849	10	1,439	23	2,028	155	45,316	83	2,689	0	0	83	2,689	0	0	0	0	0	0
Kab. Sumbawa Barat	7	7,817	7	5,845	4	896	2	992	13	7,733	2	84	0	0	2	84	0	0	0	0	0	0
Kab. Sumbawa	36	34,206	36	27,885	8	1,724	20	4,472	64	34,081	4	120	1	5	5	125	0	0	0	0	0	0
Kab. Dompu	24	15,709	24	12,153	3	360	14	2,369	41	14,882	5	827	0	0	5	827	0	0	0	0	0	0
Kab. Bima	50	26,242	48	21,541	0	0	18	4,206	66	25,747	7	495	0	0	7	495	0	0	0	0	0	0
Kota Bima	1	225	1	225	0	0	0	0	1	225	0	0	0	0	0	0	0	0	0	0	0	0
Total	360	213,070	349	181,483	28	4,887	81	14,663	458	201,033	157	11,632	1	5	158	11,637	1	100	1	300	2	400

Source: Water Resources Data Center (WRDC) of DGWR, MPW

Annex A1.2.18 Design Irrigation Service Areas by Facility Status in East Nusa Tenggara Province as of 2007

District / City	Design Irrigation Service Area (No. / ha)		Area Facilitated with Main and Secondary Canal System											Area Not Yet Facilitated									
			Irrigated Area						Converted Area					Paddy Field									
			Tertiary System				Paddy Field		Paddy Field			Sub-total		Under Rainfed Condition (No. / ha)	Not Yet Opened		Sub-total (No. / ha)						
			Facilitated (No. / ha)		Not Yet (No. / ha)		Not Yet (No. / ha)		Sub-total (No. / ha)		Once Opened (No. / ha)		Not Yet (No. / ha)										
Kota Kupang	39	1,959	39	1,959	0	0	0	0	39	1,959	0	0	0	0	0	0	0	0	0	0	0	0	0
Kab. Kupang	120	40,288	120	43,413	0	0	0	0	120	43,413	0	0	0	0	0	0	0	0	0	0	0	0	0
Kab. Rote Ndao	116	18,449	116	14,219	0	0	0	0	116	14,219	0	0	0	0	0	0	0	0	0	0	0	0	0
Kab. Timor Tengah Selatan	110	17,169	109	11,455	0	0	0	0	109	11,455	0	0	0	0	0	0	1	50	2	5,664	3	5,714	
Kab. Timor Tengah Utara	52	21,462	47	20,182	3	464	1	42	51	20,688	0	0	0	0	0	0	5	50	8	3,159	13	3,209	
Kab. Belu	36	22,587	36	25,387	0	0	0	0	36	25,387	0	0	0	0	0	0	0	0	0	0	0	0	0
Kab. Alor	22	9,435	22	8,539	2	176	2	79	26	8,794	0	0	0	0	0	0	2	40	2	601	4	641	
Kab. Lembata	25	6,862	25	4,099	2	94	1	456	28	4,649	0	0	1	267	1	267	0	0	1	1,946	1	1,946	
Kab. Flores Timur	24	3,902	24	3,902	0	0	0	0	24	3,902	0	0	0	0	0	0	0	0	0	0	0	0	0
Kab. Sikka	18	5,621	18	3,916	2	66	2	105	22	4,087	0	0	0	0	0	0	1	54	2	1,480	3	1,534	
Kab. Ende	92	7,097	92	6,175	1	212	1	10	94	6,397	0	0	0	0	0	0	1	100	1	600	2	700	
Kab. Ngada	226	30,158	225	26,248	0	0	0	0	225	26,248	0	0	0	0	0	0	1	55	1	3,807	2	3,862	
Kab. Manggarai	66	33,189	64	21,342	0	0	2	935	66	22,277	0	0	0	0	0	0	6	1,652	6	9,350	12	11,002	
Kab. Manggarai Barat	117	28,221	117	24,986	1	40	1	233	119	25,259	0	0	0	0	0	0	3	599	3	2,363	6	2,962	
Kab. Sumba Timur	89	14,676	89	14,676	0	0	0	0	89	14,676	0	0	0	0	0	0	0	0	0	0	0	0	0
Kab. Sumba Barat	111	15,750	111	14,921	0	0	1	100	112	15,021	0	0	0	0	0	0	3	276	2	453	5	729	
Total	1,263	523,498	1,254	245,419	11	3,023	11	1,960	1,276	248,431	0	0	1	535	1	267	23	36,559	30	33,653	53	36,529	

*Nc Note: **: Inconsistence between total design irrigation service areas and total areas of all breakdown items*

Sc Source: Water Resources Data Center (WRDC) of DGWR, MPW

Annex A1.2.19 Design Irrigation Service Areas by Facility Status in West Kalimantan Province as of 2007

District / City	Design Irrigation Service Area (No. / ha)		Area Facilitated with Main and Secondary Canal System											Area Not Yet Facilitated							
			Irrigated Area							Converted Area				Paddy Field							
			Tertiary System				Paddy Field			Paddy Field				Under Rainfed Condition		Not Yet Opened		Sub-total			
			Facilitated		Not Yet		Not Yet			Sub-total		Once Opened		Not Yet		Sub-total		Condition		Not Yet Opened	
(No. / ha)		(No. / ha)		(No. / ha)		(No. / ha)			(No. / ha)		(No. / ha)		(No. / ha)		(No. / ha)		(No. / ha)		(No. / ha)		
Kab. Sambas	14	3,337	14	3,337	0	0	0	0	14	3,337	0	0	0	0	0	0	0	0	0	0	0
Kab. Bengkayang	40	7,637	40	7,637	0	0	0	0	40	7,637	0	0	0	0	0	0	0	0	0	0	0
Kota Singkawang	15	5,757	15	5,757	0	0	0	0	15	5,757	0	0	0	0	0	0	0	0	0	0	0
Kab. Pontianak	52	10,174	52	10,174	0	0	0	0	52	10,174	0	0	0	0	0	0	0	0	0	0	0
Kota Pontianak	1	3,000	1	3,000	0	0	0	0	1	3,000	0	0	0	0	0	0	0	0	0	0	0
Kab. Landak**	116	14,847	116	14,827	0	0	0	0	116	14,827	0	0	0	0	0	0	0	0	0	0	0
Kab. Sanggau	62	7,751	62	7,751	0	0	0	0	62	7,751	0	0	0	0	0	0	0	0	0	0	0
Kab. Sekadau	17	3,022	17	3,022	0	0	0	0	17	3,022	0	0	0	0	0	0	0	0	0	0	0
Kab. Sintang	39	4,453	39	4,453	0	0	0	0	39	4,453	0	0	0	0	0	0	0	0	0	0	0
Kab. Melawai	29	3,050	29	3,050	0	0	0	0	29	3,050	0	0	0	0	0	0	0	0	0	0	0
Kab. Kapuas Hulu	76	5,669	76	5,669	0	0	0	0	76	5,669	0	0	0	0	0	0	0	0	0	0	0
Kab. Ketapang	61	7,521	61	7,521	0	0	0	0	61	7,521	0	0	0	0	0	0	0	0	0	0	0
Total	522	76,218	522	76,198	0	0	0	0	522	76,198	0	0	0	0	0	0	0	0	0	0	0

Note: **: Inconsistence between total design irrigation service areas and total areas of all breakdown items

Source: Water Resources Data Center (WRDC) of DGWR, MPW

Annex A1.2.20 Design Irrigation Service Areas by Facility Status in Central Kalimantan Province as of 2007

District / City	Design Irrigation Service Area (No. / ha)		Area Facilitated with Main and Secondary Canal System											Area Not Yet Facilitated							
			Irrigated Area							Converted Area				Paddy Field							
			Tertiary System				Paddy Field			Paddy Field				Under Rainfed Condition		Not Yet Opened		Sub-total			
			Facilitated		Not Yet		Not Yet			Sub-total		Once Opened		Not Yet		Sub-total		Condition		Not Yet Opened	
(No. / ha)		(No. / ha)		(No. / ha)		(No. / ha)			(No. / ha)		(No. / ha)		(No. / ha)		(No. / ha)		(No. / ha)		(No. / ha)		
Kab. Murung Raya	1	40	1	40	0	0	0	0	1	40	0	0	0	0	0	0	0	0	0	0	0
Kab. Gunung Mas	3	1,510	3	1,510	0	0	0	0	3	1,510	0	0	0	0	0	0	0	0	0	0	0
Kab. Barito Utara	10	2,521	10	2,521	0	0	0	0	10	2,521	0	0	0	0	0	0	0	0	0	0	0
Kab. Barito Timur	6	4,865	6	4,865	0	0	0	0	6	4,865	0	0	0	0	0	0	0	0	0	0	0
Kab. Waringin Timur	28	28,470	28	28,470	0	0	0	0	28	28,470	0	0	0	0	0	0	0	0	0	0	0
Kota Waringin Barat	4	1,128	4	1,128	0	0	0	0	4	1,128	0	0	0	0	0	0	0	0	0	0	0
Kab. Lamandau	26	3,500	26	3,500	0	0	0	0	26	3,500	0	0	0	0	0	0	0	0	0	0	0
Kab. Sukamara	15	9,255	15	9,255	0	0	0	0	15	9,255	0	0	0	0	0	0	0	0	0	0	0
Kab. Seruyan	3	3,760	3	3,760	0	0	0	0	3	3,760	0	0	0	0	0	0	0	0	0	0	0
Kota Palangkaraya	2	1,500	2	1,500	0	0	0	0	2	1,500	0	0	0	0	0	0	0	0	0	0	0
Kab. Pulau Pisang	13	10,985	13	10,985	0	0	0	0	13	10,985	0	0	0	0	0	0	0	0	0	0	0
Kab. Barito Selatan	10	4,037	10	4,037	0	0	0	0	10	4,037	0	0	0	0	0	0	0	0	0	0	0
Kab. Kapuas	7	2,410	3	493	5	765	5	527	13	1,785	0	0	0	0	0	6	515	2	110	8	625
Total	128	73,981	124	72,064	5	765	5	527	134	73,356	0	0	0	0	0	6	515	2	110	8	625

Source: Water Resources Data Center (WRDC) of DGWR, MPW

Annex A1.2.21 Design Irrigation Service Areas by Facility Status in South Kalimantan Province as of 2007

District / City	Design Irrigation Service Area (No. / ha)		Area Facilitated with Main and Secondary Canal System											Area Not Yet Facilitated								
			Irrigated Area								Converted Area						Paddy Field					
			Tertiary System				Paddy Field				Paddy Field				Under Rainfed Condition		Not Yet Opened		Sub-total			
			Facilitated (No. / ha)		Not Yet (No. / ha)		Not Yet (No. / ha)		Sub-total (No. / ha)		Once Opened (No. / ha)		Not Yet (No. / ha)		Sub-total (No. / ha)		Condition (No. / ha)		Not Yet Opened (No. / ha)		Sub-total (No. / ha)	
Kab. Barito Kuala	100	50,028	100	50,028	0	0	0	0	100	50,028	0	0	0	0	0	0	0	0	0	0	0	
Kab. Banjarbaru**	1	6,000	1	5,000	0	0	0	0	1	5,000	0	0	0	0	0	0	0	0	0	0	0	
Kota Banjarbaru**	6	3,385	7	4,385	0	0	0	0	7	4,385	0	0	0	0	0	0	0	0	0	0	0	
Kab. Tapin	8	8,179	8	8,179	0	0	0	0	8	8,179	0	0	0	0	0	0	0	0	0	0	0	
Kab. Hulu Sungai Selatan	8	5,090	8	5,090	0	0	0	0	8	5,090	0	0	0	0	0	0	0	0	0	0	0	
Kab. Hulu Sungai Tengah	8	6,918	8	6,918	0	0	0	0	8	6,918	0	0	0	0	0	0	0	0	0	0	0	
Kab. Hulu Sungai Utara	35	5,993	35	5,993	0	0	0	0	35	5,993	0	0	0	0	0	0	0	0	0	0	0	
Kab. Balangan	6	4,464	6	4,464	0	0	0	0	6	4,464	0	0	0	0	0	0	0	0	0	0	0	
Kab. Tabalong	13	3,762	13	3,762	0	0	0	0	13	3,762	0	0	0	0	0	0	0	0	0	0	0	
Kab. Tanah Laut	31	6,391	31	6,391	0	0	0	0	31	6,391	0	0	0	0	0	0	0	0	0	0	0	
Kab. Tanah Bumbu**	51	25,146	51	28,146	0	0	0	0	51	28,146	0	0	0	0	0	0	0	0	0	0	0	
Kab. Kota Baru	21	8,374	21	8,374	0	0	0	0	21	8,374	0	0	0	0	0	0	0	0	0	0	0	
Total	288	133,730	289	136,730	0	0	0	0	289	136,730	0	0	0	0	0	0	0	0	0	0	0	

Note: **, Inconsistence between total design irrigation service areas and total areas of all breakdown items

Source: Water Resources Data Center (WRDC) of DGWR, MPW

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Annex A1.2.22 Design Irrigation Service Areas by Facility Status in East Kalimantan Province as of 2007

District / City	Design Irrigation Service Area (No. / ha)		Area Facilitated with Main and Secondary Canal System											Area Not Yet Facilitated								
			Irrigated Area								Converted Area						Paddy Field					
			Tertiary System				Paddy Field				Paddy Field				Under Rainfed Condition		Not Yet Opened		Sub-total			
			Facilitated (No. / ha)		Not Yet (No. / ha)		Not Yet (No. / ha)		Sub-total (No. / ha)		Once Opened (No. / ha)		Not Yet (No. / ha)		Sub-total (No. / ha)		Condition (No. / ha)		Not Yet Opened (No. / ha)		Sub-total (No. / ha)	
Kota Samarinda	12	5,572	12	5,572	0	0	0	0	12	5,572	0	0	0	0	0	0	0	0	0	0	0	
Kota Balikpapan	24	10,320	15	4,786	7	1,515	8	1,767	30	8,068	5	667	0	0	5	667	2	200	3	1,385	5	1,585
Kab. Kutai Kertanegara**	181	64,371	181	63,131	0	0	0	0	181	63,131	0	0	0	0	0	0	0	0	0	0	0	0
Kab. Pasir	41	23,545	41	23,545	0	0	0	0	41	23,545	0	0	0	0	0	0	0	0	0	0	0	0
Kab. Kutai Barat	77	17,718	77	17,718	0	0	0	0	77	17,718	0	0	0	0	0	0	0	0	0	0	0	0
Kab. Kutai Timur	49	19,925	49	19,925	0	0	0	0	49	19,925	0	0	0	0	0	0	0	0	0	0	0	0
Kab. Berau	43	21,056	43	21,056	0	0	0	0	43	21,056	0	0	0	0	0	0	0	0	0	0	0	0
Kab. Bulungan	23	10,224	23	10,224	0	0	0	0	23	10,224	0	0	0	0	0	0	0	0	0	0	0	0
Kab. Malinau	3	3,000	3	3,000	0	0	0	0	3	3,000	0	0	0	0	0	0	0	0	0	0	0	0
Kab. Penajam Paser Utara	24	10,510	24	10,510	0	0	0	0	24	10,510	0	0	0	0	0	0	0	0	0	0	0	0
Kab. Nunukan	8	6,445	8	6,445	0	0	0	0	8	6,445	0	0	0	0	0	0	0	0	0	0	0	0
Total	485	192,686	476	185,912	7	1,515	8	1,767	491	189,194	5	667	0	0	5	667	2	200	3	1,385	5	1,585

Note: **, Inconsistence between total design irrigation service areas and total areas of all breakdown items

Source: Water Resources Data Center (WRDC) of DGWR, MPW

Annex A1.2.23 Design Irrigation Service Areas by Facility Status in North Sulawesi Province as of 2007

District / City	Design Irrigation Service Area (No. / ha)		Area Facilitated with Main and Secondary Canal System										Area Not Yet Facilitated											
			Irrigated Area					Converted Area					Paddy Field											
			Tertiary System		Paddy Field		Sub-total	Paddy Field		Sub-total	Under Rainfed Condition	Not Yet Opened		Sub-total										
			Facilitated	Not Yet	Not Yet	Once Opened		Not Yet	Under Rainfed Condition			Not Yet Opened	Sub-total											
		(No. / ha)	(No. / ha)	(No. / ha)	(No. / ha)	(No. / ha)	(No. / ha)	(No. / ha)	(No. / ha)	(No. / ha)	(No. / ha)	(No. / ha)	(No. / ha)	(No. / ha)	(No. / ha)	(No. / ha)	(No. / ha)							
Kab. Bolaang Mongondow	114	48,156	114	41,570	3	526	15	5,674	132	47,770	2	386	0	0	2	386	0	0	0	0	0	0	0	0
Kota Bolaang Mongondow	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Kab. Minahasa	22	6,440	22	5,609	0	0	13	831	35	6,440	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Kab. Minahasa Selatan	34	9,465	33	7,636	0	0	13	1,829	46	9,465	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Kab. Minahasa Utara	43	6,567	43	5,800	0	0	11	767	54	6,567	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Kab. Tomohon	9	1,136	9	1,001	0	0	3	135	12	1,136	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Kota Manado	2	606	2	89	1	110	2	407	5	606	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Kota Bitung	1	146	1	46	0	0	1	100	2	146	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Kep. Sangihe	3	710	3	125	0	0	3	585	6	710	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Kep. Talaud	8	1,615	8	1,163	0	0	3	452	11	1,615	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	236	74,841	235	63,039	4	636	64	10,780	303	74,455	2	386	0	0	2	386	0	0	0	0	0	0	0	0

Source: Water Resources Data Center (WRDC) of DGWR, MPW

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Annex A1.2.24 Design Irrigation Service Areas by Facility Status in Gorontalo Province as of 2007

District / City	Design Irrigation Service Area (No. / ha)		Area Facilitated with Main and Secondary Canal System										Area Not Yet Facilitated											
			Irrigated Area					Converted Area					Paddy Field											
			Tertiary System		Paddy Field		Sub-total	Paddy Field		Sub-total	Under Rainfed Condition	Not Yet Opened		Sub-total										
			Facilitated	Not Yet	Not Yet	Once Opened		Not Yet	Under Rainfed Condition			Not Yet Opened	Sub-total											
		(No. / ha)	(No. / ha)	(No. / ha)	(No. / ha)	(No. / ha)	(No. / ha)	(No. / ha)	(No. / ha)	(No. / ha)	(No. / ha)	(No. / ha)	(No. / ha)	(No. / ha)	(No. / ha)	(No. / ha)	(No. / ha)							
Kab. Gorontalo	5	2,503	5	2,025	0	0	5	478	5	2,503	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Kab. Boalemo	15	9,853	14	6,015	0	0	11	3,838	14	9,853	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Kab. Pohuwanto	7	5,002	5	2,414	1	58	1	30	6	2,502	0	0	0	0	0	0	2	2,500	0	0	2	2,500	0	0
Kota Gorontalo	3	4,951	3	4,951	0	0	0	0	3	4,951	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	30	22,309	27	15,405	1	58	17	4,346	28	19,809	0	0	0	0	0	0	2	2,500	0	0	2	2,500	0	0

Note: **: Inconsistence between total design irrigation service areas and total areas of all breakdown items

Source: Water Resources Data Center (WRDC) of DGWR, MPW

Annex A1.2.25 Design Irrigation Service Areas by Management Setup in Central Sulawesi Province as of 2007

District / City	Design Irrigation Service Area (No. / ha)		Area Facilitated with Main and Secondary Canal System											Area Not Yet Facilitated								
			Irrigated Area						Converted Area					Paddy Field								
			Tertiary System		Paddy Field		Sub-total	Paddy Field		Sub-total	Under Rainfed Condition	Not Yet Opened	Sub-total									
			Facilitated	Not Yet	Not Yet	Once Opened		Not Yet														
Kab. Donggala	42	35,735	42	30,759	0	0	19	4,972	61	35,731	0	0	1	4	1	4	0	0	0	0	0	0
Kab. Parigi Moutong	35	42,113	35	26,358	0	0	32	15,755	67	42,113	0	0	0	0	0	0	0	0	0	0	0	0
Kab. Poso	32	15,507	32	10,289	0	0	21	5,218	53	15,507	0	0	0	0	0	0	0	0	0	0	0	0
Kab. Banggai	28	30,650	28	25,700	0	0	15	4,821	43	30,521	1	129	0	0	1	129	0	0	0	0	0	0
Kab. Banggai Kepulauan	9	1,348	9	1,348	0	0	0	0	9	1,348	0	0	0	0	0	0	0	0	0	0	0	0
Kab. Toli - Toli	20	10,733	20	7,618	0	0	16	3,115	36	10,733	0	0	0	0	0	0	0	0	0	0	0	0
Kab. Morowali	12	8,049	12	6,915	0	0	4	1,134	16	8,049	0	0	0	0	0	0	0	0	0	0	0	0
Kota Palu	11	1,188	11	1,188	0	0	0	0	11	1,188	0	0	0	0	0	0	0	0	0	0	0	0
Kab Tojo Una - Una	7	2,173	7	1,145	0	0	6	1,028	13	2,173	0	0	0	0	0	0	0	0	0	0	0	0
Kab Buol	5	2,503	5	2,025	0	0	5	478	10	2,503	0	0	0	0	0	0	0	0	0	0	0	0
Total	201	149,999	201	113,345	0	0	118	36,521	319	149,866	1	129	1	4	2	133	0	0	0	0	0	0

Source: Water Resources Data Center (WRDC) of DGWR, MPW

Annex A1.2.26 Design Irrigation Service Areas by Facility Status in South Sulawesi Province as of 2007

District / City	Design Irrigation Service Area (No. / ha)		Area Facilitated with Main and Secondary Canal System											Area Not Yet Facilitated							
			Irrigated Area								Converted Area			Paddy Field							
			Tertiary System				Paddy Field		Sub-total		Paddy Field		Sub-total	Under Rainfed Condition (No. / ha)	Not Yet Opened (No. / ha)	Sub-total (No. / ha)					
			Facilitated (No. / ha)		Not Yet (No. / ha)		Not Yet (No. / ha)		Sub-total (No. / ha)		Once Opened (No. / ha)	Not Yet (No. / ha)	Sub-total (No. / ha)								
Kab. Pangkajene Kepulauan	44	20,984	44	20,984	0	0	0	0	44	20,984	0	0	0	0	0	0	0	0	0	0	
Kab. Maros	54	18,790	54	18,790	0	0	0	0	54	18,790	0	0	0	0	0	0	0	0	0	0	
Kota Makassar	1	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	
Kab. Gowa	118	31,567	118	31,567	0	0	0	0	118	31,567	0	0	0	0	0	0	0	0	0	0	
Kab. Takalar**	11	8,528	12	19,286	0	0	0	0	12	19,286	0	0	0	0	0	0	0	0	0	0	
Kab. Jeneponto	52	18,627	52	18,627	0	0	0	0	52	18,627	0	0	0	0	0	0	0	0	0	0	
Kab. Bantaeng	96	17,253	96	17,253	0	0	0	0	96	17,253	0	0	0	0	0	0	0	0	0	0	
Kab. Bulukumba	85	27,767	85	27,767	0	0	0	0	85	27,767	0	0	0	0	0	0	0	0	0	0	
Kab. Sinjai	154	16,113	154	16,078	0	0	0	0	154	16,078	0	0	0	0	0	0	0	0	0	0	
Kab. Bone	156	57,718	156	57,718	0	0	0	0	156	57,718	0	0	0	0	0	0	0	0	0	0	
Kota Pare Pare**	4	600	5	43,531	0	0	0	0	5	43,531	0	0	0	0	0	0	0	0	0	0	
Kab. Pinrang**	75	9,135	77	67,261	0	0	0	0	77	67,261	0	0	0	0	0	0	0	0	0	0	
Kab. Sidrap	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Kab. Wajo	35	28,324	35	28,324	0	0	0	0	35	28,324	0	0	0	0	0	0	0	0	0	0	
Kab. Soppeng	125	36,903	125	36,903	0	0	0	0	125	36,903	0	0	0	0	0	0	0	0	0	0	
Kota Palopo	3	962	3	962	0	0	0	0	3	962	0	0	0	0	0	0	0	0	0	0	
Kab. Luwu**	65	71,491	66	72,473	0	0	0	0	66	72,473	0	0	0	0	0	0	0	0	0	0	
Kab. Luwu Utara**	79	81,693	80	91,999	0	0	0	0	80	91,999	0	0	0	0	0	0	0	0	0	0	
Kab. Luwu Timur	37	26,597	37	26,597	0	0	0	0	37	26,597	0	0	0	0	0	0	0	0	0	0	
Kab. Luwu Selatan	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Kab. Tator	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Kab. Engrekang	135	11,517	135	11,517	0	0	0	0	135	11,517	0	0	0	0	0	0	0	0	0	0	
Kab. Pinrang	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Kab. Barru	88	13,953	88	13,953	0	0	0	0	88	13,953	0	0	0	0	0	0	0	0	0	0	
Kab. Parepare	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Kab. Tanah Toraja	67	10,586	67	10,533	1	53	0	0	68	10,586	0	0	0	0	0	0	0	0	0	0	
Kab. Sideneng Rappang	71	109,910	67	100,920	1	965	0	0	68	101,885	3	1,022	0	0	3	1,022	1	7,000	0	1	7,000
Total	1,555	619,018	1,557	733,043	2	1,018	0	0	1,559	734,061	3	1,022	0	0	3	1,022	1	7,000	0	1	7,000

Note: **: Inconsistence between total design irrigation service areas and total areas of all breakdown items

Source: Water Resources Data Center (WRDC) of DGWR, MPW

Annex A1.2.27 Design Irrigation Service Areas by Facility Status in Southeast Sulawesi Province as of 2007

District / City	Design Irrigation Service Area (No. / ha)		Area Facilitated with Main and Secondary Canal System									Area Not Yet Facilitated											
			Irrigated Area						Converted Area			Paddy Field											
			Tertiary System		Paddy Field		Sub-total	Paddy Field		Sub-total	Under Rainfed Condition		Not Yet Opened		Sub-total								
			Facilitated (No. / ha)	Not Yet (No. / ha)	Not Yet (No. / ha)	Once Opened (No. / ha)		Not Yet (No. / ha)	Once Opened (No. / ha)		Not Yet (No. / ha)	Once Opened (No. / ha)	Not Yet (No. / ha)										
Kab. Kolaka Utara	1	280	1	280	0	0	0	0	1	280	0	0	0	0	0	0	0	0	0	0			
Kab. Buton	5	1,600	5	1,045	0	0	5	555	10	1,600	0	0	0	0	0	0	0	0	0	0			
Kab. Konawe Selatan	25	12,680	25	7,707	4	4,973	0	0	29	12,680	0	0	0	0	0	0	0	0	0	0			
Kab. Muna	9	4,159	9	3,071	3	683	0	0	12	3,754	0	0	0	0	0	0	1	405	0	0	1	405	
Kab. Kolaka	20	13,521	20	9,009	1	20	0	0	21	9,029	0	0	0	0	0	0	19	4,492	0	0	19	4,492	
Kab. Konawe	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Kota Bau Bau	3	1,406	3	1,406	0	0	0	0	3	1,406	0	0	0	0	0	0	0	0	0	0	0	0	
Kota Kendari	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Kab. Wakatobi	19	28,816	19	20,851	12	7,963	0	0	31	28,816	0	0	1	2	1	2	0	0	0	0	0	0	0
Kab. Bombana	6	4,768	6	4,641	3	127	0	0	9	4,768	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	88	67,230	88	48,010	23	13,766	5	555	116	62,331	0	0	1	2	1	2	20	4,897	0	0	20	4,897	

Source: Water Resources Data Center (WRDC) of DGWR, MPW

Annex A1.2.28 Design Irrigation Service Areas by Facility Status in West Sulawesi Province as of 2007

District / City	Design Irrigation Service Area (No. / ha)		Area Facilitated with Main and Secondary Canal System									Area Not Yet Facilitated											
			Irrigated Area						Converted Area			Paddy Field											
			Tertiary System		Paddy Field		Sub-total	Paddy Field		Sub-total	Under Rainfed Condition		Not Yet Opened		Sub-total								
			Facilitated (No. / ha)	Not Yet (No. / ha)	Not Yet (No. / ha)	Once Opened (No. / ha)		Not Yet (No. / ha)	Once Opened (No. / ha)		Not Yet (No. / ha)	Once Opened (No. / ha)	Not Yet (No. / ha)										
Kab. Polewali Mamasa	164	39,706	163	28,410	0	0	0	0	163	28,410	1	3,796	0	0	1	3,796	1	2,600	1	4,900	2	7,500	
Kab. Majene	18	1,870	18	1,837	0	0	0	0	18	1,837	1	33	0	0	1	33	0	0	0	0	0	0	0
Kab. Mamuju	36	9,751	36	9,751	0	0	0	0	36	9,751	0	0	0	0	0	0	0	0	0	0	0	0	0
Kab. Potmas	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	218	51,327	217	39,998	0	0	0	0	217	39,998	2	3,829	0	0	2	3,829	1	2,600	1	4,900	2	7,500	

Source: Water Resources Data Center (WRDC) of DGWR, MPW

Annex A1.2.29 Design Irrigation Service Areas by Facility Status in Maluku Province as of 2007

District / City	Design Irrigation Service Area (No. / ha)	Area Facilitated with Main and Secondary Canal System										Area Not Yet Facilitated							
		Irrigated Area								Converted Area									
		Tertiary System				Paddy Field				Paddy Field									
		Facilitated (No. / ha)		Not Yet (No. / ha)		Not Yet (No. / ha)		Sub-total (No. / ha)		Once Opened (No. / ha)		Not Yet (No. / ha)		Sub-total (No. / ha)		Under Rainfed Condition (No. / ha)		Not Yet Opened (No. / ha)	
Kab. Maluku Tengah	13 13,395	8 5292	1 150	0 0	9 5,442	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	6 7,953	6 7,953				
Kab. Buru	14 22,752	11 11,629	3 1,927	0 0	14 13,556	0 0	0 0	0 0	0 0	0 0	0 0	1 396	4 8,800	5 9,196					
Kab. Maluku Tenggara**	25 33,912	23 19,739	9 3,119	5 1,312	37 24,170	5 671	0 0	5 671	11 9,106	2 220	13 9,326								
Kab. Maluku Tenggara Barat	2 1,542	0 0	2 1,227	1 315	3 1,542	0 0	0 0	0 0	0 0	0 0	0 0								
Kab. Seram Bagian Barat	6 19,880	6 19,880	0 0	0 0	6 19,880	0 0	0 0	0 0	0 0	0 0	0 0								
Kab. Seram Bagian Timur	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0								
Kab. Kepulauan Aru	4 2,527	3 1,143	2 384	0 0	5 1,527	0 0	0 0	0 0	0 0	1 1,000	1 1,000								
Total	64 151,742	51 57,683	15 6,807	6 1,627	74 66,117	5 671	0 0	5 671	12 9,502	13 17,973	25 27,475								

Note: **: Inconsistence between total design irrigation service areas and total areas of all breakdown items

Source: Water Resources Data Center (WRDC) of DGWR, MPW

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Annex A1.2.30 Design Irrigation Service Areas by Facility Status in North Maluku Province as of 2007

District / City	Design Irrigation Service Area (No. / ha)	Area Facilitated with Main and Secondary Canal System										Area Not Yet Facilitated							
		Irrigated Area								Converted Area									
		Tertiary System				Paddy Field				Paddy Field									
		Facilitated (No. / ha)		Not Yet (No. / ha)		Not Yet (No. / ha)		Sub-total (No. / ha)		Once Opened (No. / ha)		Not Yet (No. / ha)		Sub-total (No. / ha)		Under Rainfed Condition (No. / ha)		Not Yet Opened (No. / ha)	
Kab. Halmahera Utara	16 14,055	16 14,055	0 0	0 0	16 14,055	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0				
Kab. Halmahera Barat	11 7,789	11 7,789	0 0	0 0	11 7,789	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0					
Kab. Halmahera Timur	13 20,547	10 12,875	6 4,172	0 0	16 17,047	0 0	0 0	0 0	2 450	3 3,050	5 3,500								
Kab. Halmahera Tengah	2 2,000	2 2,000	0 0	0 0	2 2,000	0 0	0 0	0 0	0 0	0 0	0 0								
Kab. Halmahera Selatan	6 7,300	0 0	0 0	0 0	0 0	0 0	0 0	0 0	1 200	6 7,100	7 7,300								
Kab. Kota Tidore Kepulauan	4 4,000	3 2,000	0 0	0 0	3 2,000	0 0	0 0	0 0	0 0	1 2,000	1 2,000								
Kab. Kepulauan Sula	2 2,788	1 445	1 1,343	0 0	2 1,788	0 0	0 0	0 0	1 200	1 800	2 1,000								
Total	54 58,479	43 39,164	7 5,515	0 0	50 44,679	0 0	0 0	0 0	4 850	11 12,950	15 13,800								

Source: Water Resources Data Center (WRDC) of DGWR, MPW

Annex A1.2.31 Design Irrigation Service Areas by Facility Status in West Papua Province as of 2007

District / City	Design Irrigation Service Area (No. / ha)	Area Facilitated with Main and Secondary Canal System											Area Not Yet Facilitated								
		Irrigated Area								Converted Area						Paddy Field					
		Tertiary System				Paddy Field				Paddy Field				Under Rainfed Condition		Not Yet Opened		Sub-total			
		Facilitated (No. / ha)		Not Yet (No. / ha)		Not Yet (No. / ha)		Sub-total (No. / ha)		Once Opened (No. / ha)		Not Yet (No. / ha)		Sub-total (No. / ha)		No. / ha		No. / ha		No. / ha	
Kab. Manokwari	6 10,400	6 10,400	0 0	0 0	0 0	0 0	6 10,400	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0		
Kab. Sorong	12 9,826	12 9,826	0 0	0 0	0 0	0 0	12 9,826	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0		
Kab. Fak-Fak	1 130	1 130	0 0	0 0	0 0	0 0	1 130	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0		
Total	19 20,356	19 20,356	0 0	0 0	0 0	0 0	19 20,356	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0		

Source: Water Resources Data Center (WRDC) of DGWR, MPW

Annex A1.2.32 Design Irrigation Service Areas by Facility Status in Papua Province as of 2007

District / City	Design Irrigation Service Area (No. / ha)	Area Facilitated with Main and Secondary Canal System											Area Not Yet Facilitated								
		Irrigated Area								Converted Area						Paddy Field					
		Tertiary System				Paddy Field				Paddy Field				Under Rainfed Condition		Not Yet Opened		Sub-total			
		Facilitated (No. / ha)		Not Yet (No. / ha)		Not Yet (No. / ha)		Sub-total (No. / ha)		Once Opened (No. / ha)		Not Yet (No. / ha)		Sub-total (No. / ha)		No. / ha		No. / ha		No. / ha	
Kota Jayapura	1 3,800	1 3,800	0 0	0 0	0 0	0 0	1 3,800	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0		
Kab. Jayapura	7 4,200	7 4,200	0 0	0 0	0 0	0 0	7 4,200	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0		
Kab. Keerom	1 75	1 75	0 0	0 0	0 0	0 0	1 75	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0		
Kab. Sarmi	1 20	1 20	0 0	0 0	0 0	0 0	1 20	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0		
Kab. Nabire	1 2,260	1 2,260	0 0	0 0	0 0	0 0	1 2,260	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0		
Kab. Jayawijaya	14 2,067	14 2,067	0 0	0 0	0 0	0 0	14 2,067	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0		
Kab. Mimika	1 300	1 300	0 0	0 0	0 0	0 0	1 300	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0		
Kab. Yappen Waropen	2 30	2 30	0 0	0 0	0 0	0 0	2 30	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0		
Total	28 12,752	28 12,752	0 0	0 0	0 0	0 0	28 12,752	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0		

Source: Water Resources Data Center (WRDC) of DGWR, MPW

Annex A1.3.1 (1/3) Recapitulated Irrigation Service Areas as of 2005

Province	Class	Land facilitated with Irrigation System					Total
		Paddy Field Opened		Paddy Field Not Yet Opened	Land Already Converted		
		Optimum	Not Yet Optimum		Opened Paddy Field	Not Yet Paddy Field	
Aceh	Technical	209,612	4,550	1,570	0	0	215,732
	Semi-technical	30,796	6,398	1,195	200	0	38,589
	Simple	44,478	25,440	4,811	265	0	74,994
	Sub-total	284,886	36,388	7,576	465	0	329,315
North Sumatra	Technical	176,032	9,550	8,504	1,484	0	195,570
	Semi-technical	133,991	13,763	23,577	2,078	4	173,413
	Simple	2,744	741	580	73	0	4,138
	Sub-total	312,767	24,054	32,661	3,635	4	373,121
West Sumatra	Technical	226,387	3,632	10,884	439	152	241,494
	Semi-technical	63,175	2,023	4,365	1,096	67	70,726
	Simple	60,208	545	1,168	236	11	62,168
	Sub-total	349,770	6,200	16,417	1,771	230	374,388
Riau	Technical	31,856	142	199	0	200	32,397
	Semi-technical	11,620	3,107	16,209	1,146	779	32,861
	Simple	1,927	1,735	300	0	0	3,962
	Sub-total	45,403	4,984	16,708	1,146	979	69,220
Jambi	Technical	98,070	243	40	0	0	98,353
	Semi-technical	10,045	132	247	0	0	10,424
	Simple	4,341	20	2,304	746	0	7,411
	Sub-total	112,456	395	2,591	746	0	116,188
South Sumatra	Technical	362,392	0	110	0	0	362,502
	Semi-technical	54,467	2,667	3,504	0	0	60,638
	Simple	10,956	350	1,806	0	0	13,112
	Sub-total	427,815	3,017	5,420	0	0	436,252
Bengkulu	Technical	54,846	3,813	10,682	1,395	0	70,736
	Semi-technical	23,129	9,650	15,108	542	0	48,429
	Simple	6,735	7,785	9,606	90	0	24,216
	Sub-total	84,710	21,248	35,396	2,027	0	143,381
Lampung	Technical	318,019	7,136	29,317	273	0	354,745
	Semi-technical	48,399	200	12,421	191	0	61,211
	Simple	2,783	0	0	0	0	2,783
	Sub-total	369,201	7,336	41,738	464	0	418,739
Kep. Bangka Belitung	Technical	19,056	0	0	0	0	19,056
	Semi-technical	2,717	0	846	0	0	3,563
	Simple	0	0	0	0	0	0
	Sub-total	21,773	0	846	0	0	22,619
Sumatra Total	Technical	1,496,270	29,066	61,306	3,591	352	1,590,585
	Semi-technical	378,339	37,940	77,472	5,253	850	499,854
	Simple	134,172	36,616	20,575	1,410	11	192,784
	Total	2,008,781	103,622	159,353	10,254	1,213	2,283,223
Bantaen	Technical	174,540	1,404	0	0	0	175,944
	Semi-technical	47,474	0	0	2,805	0	50,279
	Simple	4,657	0	0	335	0	4,992
	Total	226,671	1,404	0	3,140	0	231,215
DIK Jakarta	Technical	1,468	0	0	0	0	1,468
	Semi-technical	6,692	0	0	0	0	6,692
	Simple	252	0	0	0	0	252
	Total	8,412	0	0	0	0	8,412
West Java	Technical	950,756	5,236	2,628	3,419	0	962,039
	Semi-technical	75,542	2,837	1,488	1,565	0	81,432
	Simple	44,034	5,138	331	3,048	0	52,551
	Total	1,070,332	13,211	4,447	8,032	0	1,096,022

Source: Rekapitulasi Daerah Irigasi Tahun 2005, MPW

Annex A1.3.1 (2/3) Recapitulated Irrigation Service Areas as of 2005

Province	Class	Land facilitated with Irrigation System					Total
		Paddy Field Opened		Paddy Field	Land Already	Converted	
		Optimum	Not Yet Optimum	Not Yet Opened	Opened Paddy Field	Not Yet Paddy Field	
Central Java	Technical	612,014	32,835	14,551	2,887	0	662,287
	Semi-technical	62,411	962	7,731	336	0	71,440
	Simple	152,218	23,181	402	392	0	176,193
	Total	826,643	56,978	22,684	3,615	0	909,920
DI Yogyakarta	Technical	40,543	16	0	163	0	40,722
	Semi-technical	20,907	113	154	139	0	21,313
	Simple	10,037	489	1,811	31	0	12,368
	Total	71,487	618	1,965	333	0	74,403
East Java	Technical	554,359	755	195	20,122	0	575,431
	Semi-technical	144,348	3,079	292	705	0	148,424
	Simple	77,333	786	23	352	0	78,494
	Total	776,040	4,620	510	21,179	0	802,349
Java Total	Technical	2,333,680	40,246	17,374	26,591	0	2,417,891
	Semi-technical	357,374	6,991	9,665	5,550	0	379,580
	Simple	288,531	29,594	2,567	4,158	0	324,850
	Total	2,979,585	76,831	29,606	36,299	0	3,122,321
Bali	Technical	46,318	0	1,761	638	0	48,717
	Semi-technical	54,109	67	3,707	966	0	58,849
	Simple	0	0	0	0	0	0
	Total	100,427	67	5,468	1,604	0	107,566
West Nusa Tenggara	Technical	101,907	2,191	4,673	5,152	0	113,923
	Semi-technical	81,152	2,246	8,275	5,288	0	96,961
	Simple	827	0	1,226	0	0	2,053
	Total	183,886	4,437	14,174	10,440	0	212,937
East Nusa Tenggara	Technical	15,977	762	941	70	0	17,750
	Semi-technical	18,201	6,266	3,053	757	131	28,408
	Simple	15,096	6,275	2,064	102	90	23,627
	Total	49,274	13,303	6,058	929	221	69,785
Bali Nusa Total	Technical	164,202	2,953	7,375	5,860	0	180,390
	Semi-technical	153,462	8,579	15,035	7,011	131	184,218
	Simple	15,923	6,275	3,290	102	90	25,680
	Total	333,587	17,807	25,700	12,973	221	390,288
West Kalimantan	Technical	3,024	2,820	2,082	0	0	7,926
	Semi-technical	27,851	9,439	1,080	170	0	38,540
	Simple	35,445	3,741	873	16	0	40,075
	Total	66,320	16,000	4,035	186	0	86,541
Central Kalimantan	Technical	2,691	2,197	1,919	0	0	6,807
	Semi-technical	370	50	171	0	0	591
	Simple	1,618	1,183	1,497	0	0	4,298
	Total	4,679	3,430	3,587	0	0	11,696
South Kalimantan	Technical	118,975	5,961	846	0	0	125,782
	Semi-technical	2,178	611	157	0	0	2,946
	Simple	30,107	3,082	982	3	0	34,174
	Total	151,260	9,654	1,985	3	0	162,902
East Kalimantan	Technical	200	200	0	0	0	400
	Semi-technical	3,105	1,208	1,636	326	0	6,275
	Simple	3,378	4,965	4,148	503	0	12,994
	Total	6,683	6,373	5,784	829	0	19,669
Kalimantan Total	Technical	124,890	11,178	4,847	0	0	140,915
	Semi-technical	33,504	11,308	3,044	496	0	48,352
	Simple	70,548	12,971	7,500	522	0	91,541
	Total	228,942	35,457	15,391	1,018	0	280,808

Source: Rekapitulasi Daerah Irigasi Tahun 2005, MPW

Annex A1.3.1 (3/3) Recapitulated Irrigation Service Areas as of 2005

Province	Class	Land facilitated with Irrigation System					Total
		Paddy Field Opened		Paddy Field Not Yet Opened	Land Already Converted		
		Optimum	Not Yet Optimum		Opened Paddy Field	Not Yet Paddy Field	
North Sulawesi	Technical	21,033	296	5,380	1,503	0	28,212
	Semi-technical	15,453	2,505	2,801	851	0	21,610
	Simple	1,544	772	220	18	0	2,554
	Total	38,030	3,573	8,401	2,372	0	52,376
Gorontalo	Technical	7,705	0	2,195	1,041	0	10,941
	Semi-technical	7,057	58	1,289	319	0	8,723
	Simple	0	0	0	0	0	0
	Total	14,762	58	3,484	1,360	0	19,664
Central Sulawesi	Technical	72,842	1,094	32,387	1,115	508	107,946
	Semi-technical	19,164	0	9,474	127	75	28,840
	Simple	7,532	66	5,732	200	44	13,574
	Total	99,538	1,160	47,593	1,442	627	150,360
South Sulawesi	Technical	180,872	15,778	2,384	14,596	0	213,630
	Semi-technical	43,105	4,884	1,095	6,000	0	55,084
	Simple	9,562	431	928	854	0	11,775
	Total	233,539	21,093	4,407	21,450	0	280,489
Southeast Sulawesi	Technical	57,478	13,299	2,227	3,921	0	76,925
	Semi-technical	18,117	6,550	1,873	1,367	0	27,907
	Simple	3,030	0	0	0	0	3,030
	Total	78,625	19,849	4,100	5,288	0	107,862
Sulawesi Total	Technical	339,930	30,467	44,573	22,176	508	437,654
	Semi-technical	102,896	13,997	16,532	8,664	75	142,164
	Simple	21,668	1,269	6,880	1,072	44	30,933
	Total	464,494	45,733	67,985	31,912	627	610,751
Maluku	Technical	12,175	0	0	0	0	12,175
	Semi-technical	370	0	0	0	0	370
	Simple	8,474	4,121	1,597	881	0	15,073
	Total	21,019	4,121	1,597	881	0	27,618
North Maluku	Technical	2,250	0	0	0	0	2,250
	Semi-technical	0	0	0	0	0	0
	Simple	0	0	0	0	0	0
	Total	2,250	0	0	0	0	2,250
Papua	Technical	0	0	0	0	0	0
	Semi-technical	550	850	1,259	0	0	2,659
	Simple	1,572	0	809	0	0	2,381
	Total	2,122	850	2,068	0	0	5,040
Maluku Papua Total	Technical	14,425	0	0	0	0	14,425
	Semi-technical	920	850	1,259	0	0	3,029
	Simple	10,046	4,121	2,406	881	0	17,454
	Total	25,391	4,971	3,665	881	0	34,908
Indonesia Total	Technical	4,473,397	113,910	135,475	58,218	860	4,781,860
	Semi-technical	1,026,495	79,665	123,007	26,974	1,056	1,257,197
	Simple	540,888	90,846	43,218	8,145	145	683,242
	Total	6,040,780	284,421	301,700	93,337	2,061	6,722,299

Source: Rekapitulasi Daerah Irigasi Tahun 2005, MPW

Annex A1.4.1(1/8) Allocation of O&M Budget to Provincial and District Governments for 2007

(unit: Rp 1,000)

Province	District / Municipality	PLN / HLN			RPM OM Irrigation	Total	
		WISMP		PISP			Sub-total
		(Conservation)	(Irrigation)				
Aceh	Province	984,464	291,536	0	1,276,000	2,323,200	3,599,200
	Kab. Aceh Besar	0	0	0	0	1,165,800	1,165,800
	Kab. Bireun	0	331,188	0	331,188	787,440	1,118,628
	Kab. Pidie	0	331,188	0	331,188	2,294,160	2,625,348
	Kab. Aceh Utara	0	0	0	0	943,560	943,560
	Kab. Bener Meriah	0	0	0	0	135,000	135,000
	Kab. Nagan Raya	0	0	0	0	821,640	821,640
	Kab. Aceh Barat Daya	0	331,188	0	331,188	252,000	583,188
	Kab. Aceh Tenggara	0	0	0	0	340,800	340,800
	Total	984,464	1,285,100	0	2,269,564	9,063,600	11,333,164
North Sumatra	Province	7,304,432	1,195,568	0	8,500,000	1,278,000	9,778,000
	Kab. Deli Serdang	0	495,156	0	495,156	362,040	857,196
	Kab. Serdang Bedagai	0	1,332,980	0	1,332,980	1,802,640	3,135,620
	Kab. Simalungun	0	1,341,836	0	1,341,836	600,000	1,941,836
	Kab. Asahan	0	0	0	0	802,560	802,560
	Kab. Labuhan Batu	0	0	0	0	503,280	503,280
	Kab. Tapanuli Selatan	0	0	0	0	795,360	795,360
	Kab. Mandailing Natar	0	0	0	0	162,600	162,600
		Total	7,304,432	4,365,540	0	11,669,972	6,306,480
West Sumatra	Province	0	4,728,000	0	4,728,000	0	4,728,000
	Kab. Pasaman	0	0	0	0	254,880	254,880
	Kab. Pasaman Barat	0	0	0	0	143,040	143,040
	Kab. Tanah Datar	0	1,711,201	0	1,711,201	0	1,711,201
	Kab. Padang Pariaman	0	0	0	0	847,200	847,200
	Kota Padang	0	0	0	0	178,560	178,560
	Kab. Solok	0	2,203,351	0	2,203,351	0	2,203,351
	Kab. Pesisir Selatan	0	0	0	0	369,240	369,240
		Total	0	8,642,552	0	8,642,552	1,792,920

Source: Bureau of Planning, Secretariate General, MPW, 2006

Annex A1.4.1(2/8) Allocation of O&M Budget to Provincial and District Governments for 2007

(unit: Rp 1,000)

Province	District / Municipality	PLN / HLN			RPM OM Irrigation	Total	
		WISMP		PISP			Sub-total
		(Conservation)	(Irrigation)				
Jambi	Province	0	0	0	0	0	
	Kab. Kerinci	0	0	0	0	1,131,480	
	Total	0	0	0	0	1,131,480	
South Sumatra	Province	3,616,000	1,200,000	0	4,816,000	0	4,816,000
	Kab. Musi Rawas	0	413,557	0	413,557	1,219,560	1,633,117
	Kab. Lahat	0	0	0	0	193,080	193,080
	Kota Pagar Alam	0	0	0	0	240,000	240,000
	Total	3,616,000	1,613,557	0	5,229,557	1,652,640	6,882,197
Bengkulu	Province	0	0	0	0	0	0
	Kab. Muko Muko	0	0	0	0	847,200	847,200
	Kab. Seluma	0	0	0	0	516,000	516,000
	Kab. Bengkulu Selatan	0	0	0	0	373,920	373,920
	Kab. Bengkulu Utara	0	0	0	0	712,320	712,320
	Kab. Rejang Lebong	0	0	0	0	360,000	360,000
	Total	0	0	0	0	2,809,440	2,809,440
Bangka Beletung	Province	0	0	0	0	0	0
	Bangka Selatan	0	0	0	0	158,400	158,400
	Total	0	0	0	0	158,400	158,400
Lampung	Province	4,670,000	161,320	537,690	5,369,010	11,653,920	17,022,930
	Kab. Lampung Selatan	0	0	1,849,826	1,849,826	0	1,849,826
	Kab. Lampung Tengah	0	0	477,000	477,000	3,024,120	3,501,120
	Kab. Lampung Timur	0	0	477,000	477,000	1,360,800	1,837,800
	Kab. Lampung Utara	0	181,165	0	181,165	384,000	565,165
	Kab Tulang Bawang	0	226,824	0	226,824	0	226,824
	Kab. Way Kanan	0	0	0	0	900,000	900,000
	Total	4,670,000	569,309	3,341,516	8,580,825	17,322,840	25,903,665

Source: Bureau of Planning, Secretariate General, MPW, 2006

Annex A1.4.1(3/8) Allocation of O&M Budget to Provincial and District Governments for 2007

(unit: Rp 1,000)

Province	District / Municipality	PLN / HLN			RPM OM Irrigation	Total	
		WISMP		PISP			Sub-total
		(Conservation)	(Irrigation)				
Banten	Province	0	1,637,178	728,000	2,365,178	6,132,480	8,497,658
	Kab. Pandeglang	0	0	477,000	477,000	514,560	991,560
	Kab. Lebak	0	0	1,054,815	1,054,815	0	1,054,815
	Kab. Tangerang	0	0	0	0	1,232,640	1,232,640
	Total	0	1,637,178	2,259,815	3,896,993	7,879,680	11,776,673
West Java	Province	9,370,000	692,000	1,503,050	11,565,050	41,324,160	52,889,210
	Kab. Bandung	0	748,590	0	748,590	0	748,590
	Kab. Bogor	0	645,740	0	645,740	0	645,740
	Kab. Cirebon	0	0	477,000	477,000	1,290,600	1,767,600
	Kab. Kuningan	0	0	1,411,877	1,411,877	0	1,411,877
	Kab. Majalengka	0	0	0	0	1,015,440	1,015,440
	Kab. Indramayu	0	0	477,000	477,000	1,150,080	1,627,080
	Kab. Bekasi	0	456,980	0	456,980	0	456,980
	Kab. Karawang	0	1,199,478	0	1,199,478	0	1,199,478
	Kab. Subang	0	568,816	0	568,816	1,171,800	1,740,616
	Kab. Purwakarta	0	656,398	0	656,398	0	656,398
	Kab. Sukabumi	0	416,924	0	416,924	889,920	1,306,844
	Kab. Cianjur	0	2,242,052	0	2,242,052	658,080	2,900,132
	Kab. Garut	0	0	1,971,680	1,971,680	0	1,971,680
	Kab. Tasikmalaya	0	0	0	0	386,640	386,640
Total	9,370,000	7,626,978	5,840,607	22,837,585	47,886,720	70,724,305	

Source: Bureau of Planning, Secretariate General, MPW, 2006

Annex A1.4.1(4/8) Allocation of O&M Budget to Provincial and District Governments for 2007

(unit: Rp 1,000)

Province	District / Municipality	PLN / HLN			RPM	Total	
		WISMP		PISP	Sub-total		OM Irrigation
		(Conservation)	(Irrigation)				
Central Java	Province	6,518,302	4,205,000	1,200,000	11,923,302	21,905,400	33,828,702
	Kab. Brebes	0	0	448,760	448,760	1,498,320	1,947,080
	Kab. Tegal	0	0	477,000	477,000	2,601,960	3,078,960
	Kab. Pemalang	0	0	0	0	1,928,280	1,928,280
	Kab. Pekalongan	0	0	0	0	407,880	407,880
	Kab. Kendal	0	151,998	0	151,998	1,063,440	1,215,438
	Kab. Semarang	0	323,200	0	323,200	0	323,200
	Kab. Demak	0	248,000	0	248,000	486,360	734,360
	Kab. Grobogan	0	672,800	0	672,800	1,260,840	1,933,640
	Kab. Kudus	0	2,622,761	0	2,622,761	0	2,622,761
	Kab. Jepara	0	315,360	0	315,360	0	315,360
	Kab. Pati	0	990,784	0	990,784	1,015,920	2,006,704
	Kab. Rembang	0	289,024	0	289,024	0	289,024
	Kab. Blora	0	641,200	0	641,200	0	641,200
	Kab. Boyolali	0	843,200	0	843,200	0	843,200
	Kab. Sukoharjo	0	340,800	0	340,800	0	340,800
	Kab. Karanganyar	0	364,800	0	364,800	0	364,800
	Kab. Sragen	0	322,560	0	322,560	0	322,560
	Kab. Klaten	0	360,770	0	360,770	0	360,770
	Kab. Wonogiri	0	364,800	0	364,800	0	364,800
	Kab. Magelang	0	356,158	0	356,158	0	356,158
	Kab. Purworejo	0	0	1,378,000	1,378,000	1,137,240	2,515,240
	Kab. Kebumen	0	0	0	0	799,680	799,680
	Kab. Temanggung	0	2,027,520	0	2,027,520	0	2,027,520
	Kab. Banjarnegara	0	0	0	0	703,560	703,560
	Kab. Banyumas	0	0	2,274,455	2,274,455	375,360	2,649,815
Kab. Cilacap	0	0	477,000	477,000	0	477,000	
	Total	6,518,302	15,440,735	6,255,215	28,214,252	35,184,240	63,398,492

Source: Bureau of Planning, Secretariate General, MPW, 2006

Annex A1.4.1(5/8) Allocation of O&M Budget to Provincial and District Governments for 2007

(unit: Rp 1,000)

Province	District / Municipality	PLN / HLN			RPM	Total	
		WISMP		PISP	Sub-total		OM Irrigation
		(Conservation)	(Irrigation)				
DI Yogyakarta	Province	6,051,672	1,098,328	0	7,150,000	1,028,400	8,178,400
	Kab. Sleman	0	438,000	0	438,000	0	438,000
	Kab. Gunung Kidul	0	118,520	0	118,520	0	118,520
	Kab. Bantul	0	357,614	0	357,614	0	357,614
	Kab. Kulonprogo	0	310,616	0	310,616	858,240	1,168,856
	Total	6,051,672	2,323,078	0	8,374,750	1,886,640	10,261,390
East Java	Province	8,515,000	3,720,000	1,149,000	13,384,000	14,234,040	27,618,040
	Kab. Malang	0	0	477,000	477,000	476,880	953,880
	Kab. Tulungagung	0	0	1,321,000	1,321,000	0	1,321,000
	Kab. Nganjuk	0	343,820	0	343,820	1,050,360	1,394,180
	Kab. Jombang	0	263,512	0	263,512	0	263,512
	Kab. Mojokerto	0	238,842	0	238,842	0	238,842
	Kab. Sidoarjo	0	176,912	0	176,912	2,926,200	3,103,112
	Kab. Madiun	0	0	2,192,200	2,192,200	0	2,192,200
	Kab. Ponorogo	0	0	0	0	367,800	367,800
	Kab. Ngawi	0	0	477,000	477,000	375,360	852,360
	Kab. Bojonegoro	0	0	477,000	477,000	2,002,560	2,479,560
	Kab. Tuban	0	0	0	0	580,080	580,080
	Kab. Lamongan	0	0	477,000	477,000	2,799,720	3,276,720
	Kab. Bondowoso	0	356,550	0	356,550	0	356,550
	Kab. Situbondo	0	399,192	0	399,192	1,671,000	2,070,192
	Kab. Banyuwangi	0	1,227,981	0	1,227,981	3,807,240	5,035,221
	Kab. Jember	0	556,720	0	556,720	3,563,400	4,120,120
	Kab. Lumajang	0	0	0	0	520,440	520,440
	Kab. Probolinggo	0	248,348	0	248,348	778,320	1,026,668
	Kab. Pasuruan	0	105,280	0	105,280	0	105,280
	Kab. Bangkalan	0	301,040	0	301,040	0	301,040
	Kab. Sampang	0	270,129	0	270,129	0	270,129
	Kab. Pamekasan	0	224,760	0	224,760	0	224,760
Kab. Sumenep	0	219,817	0	219,817	0	219,817	
Total	8,515,000	8,652,903	6,570,200	23,738,103	35,153,400	58,891,503	

Source: Bureau of Planning, Secretariate General, MPW, 2006

Annex A1.4.1(6/8) Allocation of O&M Budget to Provincial and District Governments for 2007

(unit: Rp 1,000)

Province	District / Municipality	PLN / HLN			RPM	Total	
		WISMP		PISP	Sub-total		OM Irrigation
		(Conservation)	(Irrigation)				
Bali	Province	0	0	0	0	1,151,760	1,151,760
	Total	0	0	0	0	1,151,760	1,151,760
West Nusa Tenggara	Province	8,232,776	2,387,329	0	10,620,105	3,222,480	13,842,585
	Kab. Lombok Barat	0	1,377,656	0	1,377,656	0	1,377,656
	Kab. Lombok Tengah	0	1,323,268	0	1,323,268	0	1,323,268
	Kab. Lombok Timur	0	1,602,372	0	1,602,372	0	1,602,372
	Kab. Sumbawa Barat	0	1,303,068	0	1,303,068	0	1,303,068
	Kab. Sumbawa	0	1,352,946	0	1,352,946	1,060,680	2,413,626
	Kab. Dompu	0	1,039,004	0	1,039,004	0	1,039,004
	Kab. Bima	0	1,500,536	0	1,500,536	0	1,500,536
	Total	8,232,776	11,886,179	0	20,118,955	4,283,160	24,402,115
East Nusa Tenggara	Province	4,719,629	877,170	0	5,596,799	0	5,596,799
	Kab. Kupang	0	0	0	0	2,271,120	2,271,120
	Kab. Rote Ndao	0	0	0	0	369,000	369,000
	Kab. Timor Tengah Utara	0	0	0	0	1,186,200	1,186,200
	Kab. Belu	0	0	0	0	1,212,000	1,212,000
	Kab. Alor	0	0	0	0	415,080	415,080
	Kab. Ngada	0	0	0	0	405,360	405,360
	Kab. Manggarai	0	1,800,000	0	1,800,000	447,960	2,247,960
	Kab. Manggarai Barat	0	1,924,841	0	1,924,841	438,120	2,362,961
	Kab. Sumba Timur	0	628,000	0	628,000	0	628,000
Total	4,719,629	5,230,011	0	9,949,640	6,744,840	16,694,480	
South Kalimantan	Province	0	0	0	0	720,000	720,000
	Kab. Tapin	0	0	0	0	656,640	656,640
	Kab. Hulu Sungai Selatan	0	0	0	0	362,160	362,160
	Kab. Tanah Bumbu**	0	0	0	0	360,000	360,000
	Kab. Kota Baru	0	0	0	0	432,000	432,000
	Total	0	0	0	0	2,530,800	2,530,800

Source: Bureau of Planning, Secretariate General, MPW, 2006

Annex A1.4.1(7/8) Allocation of O&M Budget to Provincial and District Governments for 2007

(unit: Rp 1,000)

Province	District / Municipality	PLN / HLN			RPM	Total	
		WISMP		PISP	Sub-total		OM Irrigation
		(Conservation)	(Irrigation)				
North Sulawesi	Kab. Bolaang Mongondow	0	0	0	0	1,581,720	1,581,720
	Total	0	0	0	0	1,581,720	1,581,720
Central Sulawesi	Province	1,462,500	3,420,437	0	4,882,937	950,640	5,833,577
	Kab. Donggala	0	1,297,392	0	1,297,392	0	1,297,392
	Kab. Parigi Moutong	0	1,596,472	0	1,596,472	1,157,520	2,753,992
	Kab. Banggai	0	0	0	0	1,195,440	1,195,440
	Kab. Toli - Toli	0	1,800,078	0	1,800,078	0	1,800,078
	Total	1,462,500	8,114,379	0	9,576,879	3,303,600	12,880,479
South Sulawesi	Province	5,468,800	866,366	1,222,080	7,557,246	14,170,920	21,728,166
	Kab. Pangkajene Kepulauan	0	926,000	0	926,000	1,033,800	1,959,800
	Kab. Maros	0	0	2,237,800	2,237,800	781,560	3,019,360
	Kab. Gowa	0	1,509,430	0	1,509,430	0	1,509,430
	Kab. Takalar**	0	0	0	0	624,480	624,480
	Kab. Jeneponto	0	519,724	0	519,724	863,880	1,383,604
	Kab. Bulukumba	0	0	477,000	477,000	823,200	1,300,200
	Kab. Sinjai	0	0	1,348,145	1,348,145	0	1,348,145
	Kab. Bone	0	0	477,000	477,000	2,287,200	2,764,200
	Kab. Pinrang**	0	1,244,660	0	1,244,660	0	1,244,660
	Kab. Sidrap	0	1,856,300	0	1,856,300	1,402,920	3,259,220
	Kab. Wajo	0	610,462	0	610,462	0	610,462
	Kab. Soppeng	0	358,408	0	358,408	2,163,360	2,521,768
	Kab. Luwu**	0	364,606	0	364,606	0	364,606
	Kab. Luwu Utara**	0	1,023,924	0	1,023,924	420,000	1,443,924
	Kab. Luwu Timur	0	0	0	0	2,110,080	2,110,080
	Kab. Luwu Selatan	0	0	0	0	1,629,600	1,629,600
	Kab. Enrekang	0	364,656	0	364,656	0	364,656
	Kab. Barru	0	364,656	0	364,656	0	364,656
	Kab. Tanah Toraja	0	0	477,006	477,006	0	477,006
Total	5,468,800	10,009,192	6,239,031	21,717,023	28,311,000	50,028,023	

Source: Bureau of Planning, Secretariate General, MPW, 2006

Annex A1.4.1(8/8) Allocation of O&M Budget to Provincial and District Governments for 2007

(unit: Rp 1,000)

Province	District / Municipality	PLN / HLN			RPM OM Irrigation	Total	
		WISMP		PISP			Sub-total
		(Conservation)	(Irrigation)				
Southeast Sulawesi	Kab. Kolaka	0	0	0	0	373,560	
	Kab. Konawe	0	0	0	0	1,962,960	
	Total	0	0	0	0	2,336,520	
West Sulawesi	Province	2,551,710	230,635	0	2,782,345	0	
	Kab. Polewali Mandar	0	504,997	0	504,997	0	
	Kab. Mamuju	0	493,702	0	493,702	0	
	Kab. Mamuju Utara	0	469,708	0	469,708	0	
	Total	2,551,710	1,699,042	0	4,250,752	0	
West Papua	Kab. Manokwari	0	0	0	0	414,000	
	Total	0	0	0	0	414,000	
Papua	Kota Jayapura	0	0	0	0	600,000	
	Total	0	0	0	0	600,000	
Indonesia Total		69,465,285	89,095,733	30,506,384	189,067,402	218,334,120	

Source: Bureau of Planning, Secretariate General, MPW, 2006

Annex A1.5.1 List of Completed World Bank Financed Projects executed by DGWR of MPW in 1970's to 1990's

Project Name	Credit No. / Loan No.	Date of Approved & Date of Closing (YYYY)	Committed	Completion	Project Name	Credit No. / Loan No.	Date of Approved & Date of Closing (YYYY)	Committed	Completion
			Loan Amount (US\$1,000)	Report (MM-YYYY)				Loan Amount (US\$1,000)	Report (MM-YYYY)
1. Irrigation Rehabilitation I	Credit 0127	1969 1976	6.00	05-1978	14. Cimanuk Flood Control (Irrigation Rehabilitation XIII)	Loan 1691	1981 1985	50.00	06-1987
2. Irrigation Rehabilitation II	Credit 0195	1970 1978	19.00	12-1980	15. Irrigation Rehabilitation XIV	Loan 1811	1980 1987	116.00	06-1989
3. Irrigation Rehabilitation III	Credit 0220	1971 1978	15.00	12-1980	16. Swamp Reclamation I	Loan 1958	1981 1987	22.00	
4. Irrigation Rehabilitation IV	Credit 0289	1972 1979	12.60	12-1980	17. Irrigation Rehabilitation XVI	Loan 2118	1982 1988	37.00	05-1992
5. Jatiluhur Irrigation Extension (Irrigation Rehabilitation V)	Credit 0514	1974 1982	30.00	06-1987	18. Irrigation Rehabilitation XVII	Loan 2119	1982 1989	70.00	
6. Irrigation Rehabilitation XV	Credit 0995	1980 1987	45.00	06-1989	19. Second Provincial Irrigation	Loan 2375	1984 1988	89.00	05-1992
7. Irrigation Rehabilitation VI	Loan 1100	1975 1985	65.00	06-1987	20. Swamp Reclamation II	Loan 2431	1984 1993	65.00	01-1990
8. Irrigation Rehabilitation VII	Loan 1268	1976 1983	33.00	10-1985	21. Multipurpose Dam & Irrigation	Loan 2543	1985 1993	156.00	
9. Irrigation Rehabilitation VIII	Loan 1434	1977 1985	63.00	06-1987	22. West Tarum Canal Improvement	Loan 2560	1986 1993	43.40	03-1994
10. Irrigation Rehabilitation IX	Loan 1435	1977 1984	35.00	06-1987	23. Cental & West Java Provincial Irrigation	Loan 2649	1986 1993	166.00	10-1994
11. Irrigation Rehabilitation X	Loan 1578	1978 1986	140.00	06-1989	24. Irrigation Subsector	Loan 2880	1988 1991	234.00	12-1994
12. Irrigation Rehabilitation XI	Loan 1579	1978 1984	31.00	06-1987	25. Provincial Irrigated Agriculture Development (PIADP)	Loan 3302	1991 1997	125.00	
13. Second Irrigation Package Project	Loan 1645	1981 1986	77.00	06-1990	26. Irrigation Subsector II	Loan 3392	1991 1995	225.00	01-1996

Source: Indonesia - Groundwater Development Project (Staff Appraisal Report), February 1993, World Bank

Indonesia - Java Irrigation Improvement and Water Resources Management Project (Staff Appraisal Report), May 1994, World Bank

Annex A1.5.2 Financial Status of Completed World Bank Financed Projects executed by DGWR of MPW in 1990's and 2000's

Project Name	Loan No.	Date of Approved & Date of Closing (DD-MM-YYYY)	Total Project Cost (US\$1,000)	Committed Loan Amount (US\$1,000)	Share of Cost Allocation by Component	
					By Sector	By Theme
1. Irrigation Subsector Project (02) O & M	P003953	21-07-1991 31-07-1995	450.00	225.00	92% Irrigation and drainage 8% Central government administration	25% Rural services and infrastructure 25% Water resource management 25% Other financial & private sector develop. 25% Public expenditure, financial management and procurement
2. Groundwater Development Project Resources II (PTSL-II)	P003999	13-04-1993 31-12-1999	44.80	54.00	97% Irrigation and drainage 3% Water supply	50% Rural services and infrastructure 50% Water resource management
3. Dam Safety Project (Executed by provincial irrigation and agricultural services)	P004010	31-05-1994 31-03-2003	63.00	55.00	74% Irrigation and drainage 26% Central government administration	50% Water resource management 50% Environmental policies and institutions
4. Integrated Swamps Development Project Safety Project (DOISP)	P003937	14-06-1994 30-09-2000	106.00	65.00	58% Central government administration 23% General agriculture, fishing & forestry 10% Water supply 9% Roads and highways	23% Environmental policies and institutions 22% Water resource management 22% Land administration and management 22% Rural services and infrastructure 11% Gender
5. Java Irrigation Improvement and Water Resources Management Project	P003954	21-06-1994 31-12-2002	304.00	165.70	75% Irrigation and drainage 25% Central government administration	40% Water resource management 40% Environmental policies and institutions 20% Decentralization
6. Water Resources Sector Adjustment Loan Rehabilitation and (Executed by BAPPENAS)	P064118	18-05-1999 09-11-2004	300.00	300.00	46% Water supply 35% Central government administration 19% Irrigation and drainage	25% Water resource management 25% Environmental policies and institutions 24% Pollution management and environmental health 13% Rural markets 13% Macro economic management
7. TF-Indonesia Water Resources and Irrigation Second Irrigation Package Project (Executed by BAPPENAS)	P073720	30-08-2001 30-06-2005	12.10	12.10 (Grant)	50% Irrigation and drainage 50% Water supply	40% Water resource management 40% Rural services and infrastructure 20% Other rural development
8. Water Resources & Irrigation Sector Management Program	P059931	26-06-2003 31-12-2010	115.60	70.00	50% Irrigation and drainage 50% General water, sanitation and flood protection	50% Water resource management 50% Rural services and infrastructure
9. Indonesia Climate Change Development Policy Project (Led by Ministry of Finance and executed by line ministries)	P120313	25-05-2010 31-12-210	200.00	200.00	46% General agriculture, fishing & forestry 32% General energy 11% General water, sanitation and flood protection 11% Other social services	59% Climate change 14% Environmental policies and institutions 12% Water resource management 11% Natural disaster management 4% Rural services and infrastructure

Note: *; Data as of October 31, 2011

Source: Laporan Bulanan, Monitoring Proyek-Proyek PHLN di Lingkungan Kementerian Pekerjaan Umum, October 2011, Biro Perencanaan dan Kerjasama Luar Negeri, Sekretariat Jenderal, Kementerian Pekerjaan Umum

Annex A1.5.3 (1/2) List of Completed Asian Development Bank Financed Projects executed by DGWR of MPW

Project Name	Loan No.	Date of Approved & Date of Closing (DD-MM-YYYY)	Committed	Actual Result			Sub-sector / Component
			Loan Amount (US\$1,000)	Total Cost (US\$1,000)	Foreign Cost (US\$1,000)	Local Cost (US\$1,000)	
1. Tajum Irrigation Project	Loan 0012-INO						
2. Gambarsan-Pesanggrahan Irrigation Rehabilitation Project	Loan 0058-INO						
3. Sempor Dam and Irrigation Project	Loan 0081-INO						
4. Wampu River Flood Control and Development Project	Loan 0092-INO						
5. Lodoyo Irrigation Project	Loan 0301-INO						
6. Bali Irrigation Project	Loan 0352-INO						
7. Tulungagung Drainage Project	Loan 0434-INO						
8. Cibaliung Irrigation Project	Loan 0475-INO						
9. Lower Citanduy Irrigation Project Groundwater Development Project	Loan 0479-INO						
10. Bali Irrigation Sector Project	Loan 0522-INO	08-12-1981 19-04-1990	33.60	56.60	27.30	29.30	
11. Irrigation Package Project	Loan 0581-INO						
12. Tulungagung II and Baro Ruya Irrigation Project	Loan 0582-INO						
13. Second Irrigation Package Project	Loan 0627-INO						
14. Second Irrigation Sector Project	Loan 0638-INO						
15. West Nusa Tenggara Irrigation Study	Loan 0639-INO						
16. Arakudo-Jambu Aye Irrigation and Flood Control Project	Loan 0685-INO						
17. Third Irrigation Package Project	Loan 0799-INO	24-02-1987 12-08-1994	120.70	156.90	82.20	74.70	Irrigation rehabilitation, Special maintenance & handover scheme, Efficient O&M, Institutional strengthening, Irrigation service fee

Source: ADB

Annex A1.5.3 (2/2) List of Completed Asian Development Bank Financed Projects executed by DGWR of MPW

Project Name	Loan No.	Date of Approved & Date of Closing (DD-MM-YYYY)	Committed	Actual Result			Sub-sector
			Loan Amount (US\$1,000)	Total Cost (US\$1,000)	Foreign Cost (US\$1,000)	Local Cost (US\$1,000)	
18. Third Irrigation Sector Project	860-INO 861-INO	19-02-1988 30-09-1994	150.00	150.20	58.60	91.60	Irrigation rehabilitation, Special maintenance & handover scheme, Efficient O&M, Institutional strengthening, Irrigation service fee
19. Integrated Irrigation Sector Project	1017-INO 1018-INO						
20. Central Java Groundwater Irrigation Sector Project	Loan	1992 1999	51.00				Irrigation, Water resource development, Water resource management
21. Second Integrated Irrigation Sector Project (IISP-II)	Loan 1296-INO	18-04-1994 31-12-2000	100.00	76.20	32.70	43.50	Irrigation, Water resource development, Water resource management
22. Capacity Building in Water Resources Project	Loan 1339-INO	06-12-1994 29-11-2002	27.72	22.95	16.21	6.74	Water resource development, Water resource management
23. Farmer Managed Irrigation Systems Project	Loan 1378-INO	21-09-1995 08-09-2003	16.40	20.52	2.82	17.70	Irrigation, Water resource development, Water resource management
24. North Java Flood Control Project	1425-INO 1426-INO	18-01-1996 29-06-2004	45.00 SDR 30.11	73.71	31.53	42.18	Water resource development, Water resource management River basin management
25. South Java Flood Control Project	Loan 1479-INO	27-01-1997 30-01-2006	103.00	116.40	51.20	65.20	Water resource development, Water resource management River basin management
26. Northern Sumatra Irrigated Agriculture Development Project	Loan 1579-INO	13-11-1997 30-04-2006	130.00	106.40	34.40	72.00	Agricultural training and demonstration, Establishment and strengthening of WUA

Source: ADB

Annex A1.5.4 (1/3) List of Completed Yen Loan Projects executed by DGWR of MPW

Project Name	Loan No.	Date of Approved & Date of Closing (DD-MM-YYYY)	Committed	Project Name	Loan No.	Date of Approved & Date of Closing (DD-MM-YYYY)	Committed
			Loan Amount (yen million)				Loan Amount (yen million)
1. Brantas Delta Irrigation Rehabilitation Project	Loan P-039	03-12-1970	326	18. Wonogili Irrigation Project	Loan P-194	16-02-1979	9,800
2. Kali porong Project	Loan P-040	03-12-1970	446	19. Way Rarem Irrigation Project (1)	Loan P-165	15-03-1979	7,365
3. Brantas Delta Irrigation Rehabilitation Project	Loan P-	21-09-1971	142	20. Brantas Middle Reach Basin Biver Improvement Project	Loan P-	15-03-1979	420
4. Kalipolong River Improvement Project	Loan P-	21-09-1971	534	21. Ulalu River improvement and Irrigation Rehabilitation Project	Loan	15-03-1979	20,798
5. Ulalu River Improvement Project	Loan P-	22-11-1971	468	22. Widas Irrigation Project	Loan IP-198	15-03-1979	1,833
6. Way Jepara Irrigation Project	Loan P-	31-03-1973	669	23. Riamkanan Irrigation Project (Engineering Service)	Loan IP-	31-03-1980	450
7. Kalisurabaya River Improvement Project	Loan P-	20-09-1974	1,399	24. Aceh River Urgent River Improvement Project (Engineering Service)	Loan IP-	24-04-1980	550
8. Way Umpu and Way Pengubuan Irrigation Project	Loan P-	27-12-1974	375	25. Way Rarem Irrigation Project (2)	Loan IP-201	02-05-1980	10,245
9. Kalipolong River Improvement Project	Loan P-	17-02-1976	480	26. Jeneberan River Improvement Project (Engineering Service)	Loan IP-	29-05-1980	198
10. Way Umpu and Way Pengubuan Irrigation Project	Loan P-	23-07-1976	1,948	27. Ulalu River improvement and Irrigation Rehabilitation Project	Loan IP-236	29-05-1980	8,140
11. Wonogiri Multipurpose Dam Project	Loan P-	20-01-1976	430	28. Upper Solo and Madiun River Urgent Flood Control Project (Engineering Service)	Loan IP-	14-09-1981	805
12. Kalisurabaya River Improvement Project	Loan P-	23-07-1976	2,681	29. Langkeme Irrigation Project (Engineering Service)	Loan IP-	30-04-1982	320
13. Way Rarem Irrigation Project	Loan P-165	31-03-1977	430	30. Krueng Aceh Irrigation Project (Engineering Service)	Loan IP-248	30-04-1982	380
14. Wonogili Irrigation Project	Loan P-	31-03-1977	513	31. Mount Sumeru Urgent Rehabilitation Project	Loan IP-	22-09-1983	21,464
15. Wonogiri Multipurpose Dam Project (Dam construction)	Loan P-	23-08-1977	9,807	32. West Jakarta Flood Control Project	Loan IP-	06-10-1983	2,808
16. Wonogiri Multipurpose Dam Project (Consulting services)	Loan P-	23-08-1977	320	33. Krueng Aceh Urgent Flood Control Project	Loan IP-	06-10-1983	6,631
17. Brantas Middle Reach Basin Biver Improvement Project (Engineering service)	Loan P-	18-10-1977	504	34. Upper Komerang Irrigation Project (Engineering Service)	Loan IP-	06-10-1983	1,180

Source: JICA

Annex A1.5.4 (2/3) List of Completed Yen Loan Projects executed by DGWR of MPW

Project Name	Loan No.	Date of Approved & Date of Closing (DD-MM-YYYY)	Committed	Project Name	Loan No.	Date of Approved & Date of Closing (DD-MM-YYYY)	Committed
			Loan Amount (yen million)				Loan Amount (yen million)
35. Krueng Aceh River Urgent River Improvement Project (2-1)	Loan IP-	13-06-1984	8,953	52. Way Jepara Irrigation System Rehabilitation Project	Loan IP-334	05-07-1988	1,082
36. Riamkanan Irrigation Project	Loan IP-278	13-06-1984	8,636	53. Porong River Improvement Project	Loan IP-335	05-07-1988	1,767
37. West Jakarta Flood Control Project (2)	Loan IP-	13-06-1984	5,774	54. Pamarayang-Ciujung Irrigation System Rehabilitation Project	Loan IP-341	21-10-1988	5,667
38. Bili-Bili Multipurpose Dam Project (Engineering Service)	Loan IP-	13-06-1984	878	55. The Small Scale Irrigation Management Project	Loan IP-343	22-12-1989	1,896
39. Bila Irrigation Project (Engineering Service)	Loan IP-	13-06-1984	550	56. Rehabilitation of Irrigation and Flood Alleviation Project	Loan IP-347	22-12-1989	21,518
40. Madiun River Urgent Flood Control Project	Loan IP-	15-02-1985	6,400	57. Bili-Bili Multipurpose Dam Project (1)	Loan P-	14-12-1990	6,662
41. Brantas River Middle Reaches Improvement Project (2)	Loan IP-	15-02-1985	6,000	58. Padang Area Flood Control Project	Loan IP-364	14-12-1990	8,063
42. Jeneberan River Improvement Project	Loan IP-	15-02-1985	5,381	59. Urgent Bali Beach Conservation Project (Engineering Service)	Loan IP-	14-12-1990	279
43. Padang Area Flood Control Project (Engineering Service)	Loan IP-	15-02-1985	580	60. Surabaya River Improvement Project (2-1)	Loan IP-	14-12-1990	4,220
44. Upper Solo River Improvement Project	Loan IP-	27-12-1985	4,746	61. Krueng Aceh Irrigation Project (Stage I Phase 1)	Loan IP-363	14-12-1990	6,333
45. Langkeme Irrigation Project	Loan IP-301	27-12-1985	6,951	62. Bila Irrigation Project	Loan IP-364	14-12-1990	6,460
46. Mount Merapi Urgent Volcanic Debris Control Project	Loan IP-	27-12-1985	4,672	63. Way Curup Irrigation Project	Loan IP-368	25-09-1991	1,422
47. Surabaya River Improvement Project (2) (Engineering Service)	Loan IP-	27-12-1985	418	64. Way Rarem Irrigation Project (4)	Loan IP-369	25-09-1991	1,623
48. Way Umpu and Way Pengubuan Irrigation Rehabilitation Project	Loan IP-313	13-01-1987	1,392	65. Wonorejo Multipurpose Dam Project (Engineering Service)	Loan IP-370	25-09-1991	241
49. Lower Ashan River Flood Control Project (Engineering Service)	Loan IP-	16-03-1987	628	66. Mount Kelud Urgent Volcanic Disaster Mitigation Project	Loan IP-371	25-09-1991	3,246
50. Way Rarem Irrigation Project (3)	Loan IP-324	08-12-1987	3,027	67. Lower Solo River Improvement Project (Engineering Service)	Loan IP-372	25-09-1991	669
51. East Jakarta Flood Control Project (Engineering Service)	Loan IP-	08-12-1987	1,053	68. Ancol Drainage Improvement Project	Loan IP-373	25-09-1991	3,128

Source: JICA

Annex A1.5.4 (3/3) List of Completed Yen Loan Projects executed by DGWR of MPW

Project Name	Loan No.	Date of Approved & Date of Closing (DD-MM-YYYY)	Committed	Project Name	Loan No.	Date of Approved & Date of Closing (DD-MM-YYYY)	Committed
			Loan Amount (yen million)				Loan Amount (yen million)
69. Way Sekampung Irrigation Project	Loan IP-387	08-10-1992	7,653	83. Wonorejo Multipurpose Dam Construction Project (2)	Loan IP-	04-12-1996	3,756
70. Bila Irrigation Project (2)	Loan IP-388	08-10-1992	3,788	84. Project Type Sector Loan I	Loan IP-476	04-12-1996	11,797
71. South Sumatra Swamp Improvement Project	Loan IP-389	08-10-1992	5,577	85. Bili-Bili Irrigation Project	Loan IP-479	04-12-1996	5,472
72. Bili-Bili Multipurpose Dam Project (2)	Loan IP-390	08-10-1992	20,798	86. Batang Hari Irrigation Project	Loan IP-478	28-01-1998	6,060
73. Batang Hari Irrigation Project (Engineering Service)	Loan IP-	04-11-1993	676	87. Batang Kumu Irrigation Project (Engineering Service)	Loan IP-	04-12-1996	374
74. Upper Citarum Basin Urgent Flood Control Project (1)	Loan IP-	04-11-1993	3,165	88. Bali Beach Conservation Project	Loan IP-	04-12-1996	9,506
75. Wonorejo Multipurpose Dam Construction Project (1)	Loan IP-	04-11-1993	14,713	89. Medang Flood Control Project	Loan IP-	28-01-1998	9,697
76. Bili-Bili Multipurpose Dam Project (3)	Loan IP-421	29-11-1994	3,488	90. Ciliwung-Cisadane River Flood Control Project (I)	Loan IP-	28-01-1998	17,326
77. Small Scale Irrigation Management Project (2)	Loan IP-422	29-11-1994	8,135	91. Upper Citarum Basin Urgent Flood Control (II)	Loan IP-	28-01-1998	4,722
78. Way Sekampung Irrigation Project (2)	Loan IP-423	29-11-1994	16,210	92. Way Sekampung Irrigation Project (III)	Loan IP-498	28-01-1998	9,216
79. Lower Solo River Improvement Project	Loan IP-450	01-12-1995	10,796	93. Small Scale Irrigation Management Project (III)	Loan IP-499	28-01-1998	16,701
80. Padang Area Flood Control Project (2)	Loan IP-451	01-12-1995	4,859	94. Gilirang Irrigation Project (Engineering Services)	Loan IP-502	28-01-1998	617
81. Mount Merapi and Mount Semeru Volcanic Disaster Countermeasures Project (2)	Loan IP-452	01-12-1995	4,405	95. Batang Hari Irrigation Project (II)	Loan IP-	05-07-2001	7,639
82. Komerang Irrigation Project (Stage II Phase 1)	Loan IP-453	01-12-1995	6,544	96. Water Resources Sector Loan (II)	Loan IP-	05-07-2001	18,676

Source: JICA

Annex 1.6.1 Current Disbursement Condition of On-going Loan Projects executed by Directorate General of Water Resources under Ministry of Public Works

Donor	Project Name	Loan No.	Loan Effective Period		Loan Coverage (%)	Loan Amount			Loan Disbursement			Counter Rupia Budget		
			DD-MM-YYYY	Month		Original Unit	(1,000)	Equivalent (US\$1,000)	Target* (US\$1,000)	Realization* (US\$1,000)	Progress (%)**	Target DIPA* (Rp 1,000)	Realization* (Rp 1,000)	Progress (%)
IBRD	Dam Operational Improvement and Safety Project (DOISP)	7669-IND	08-06-2009 to 11-12-2013	55	80	US\$	50,000	50,000	9,203	8,077	16.15	100,503,187	13,292,176	13.23
ADB	Participatory Irrigation Sector Project (PISP)	2064-IND	02-06-2005 to 11-12-2012	91	70	SDR	13,270	19,000	18,801	17,333	91.23	20,472,836	17,230,512	84.16
		2065-IND	02-06-2005 to 13-12-2012	91	70	US\$	54,000	54,000	53,498	49,177	91.07	52,925,166	35,034,387	66.20
ADB	Integrated Citarum Water Resources Management Investment Program Project 1 (ICWRMP-1)	2500-IND	03-06-2009 to 30-06-2014	61	33	US\$	20,000	20,000	1,837	555	7.78	5,200,000	650,848	12.52
		2501-IND	03-06-2009 to 30-06-2014	61	33	SDR	20,162	30,000	3,914	7,794	12.93	2,800,000	350,457	12.57
JICA	Project Type Sector Loan for Water Resources II (PTSL-II)	IP-505	05-07-2001 to 24-12-2011	125	100	yen	18,676,000	229,093	229,093	195,677	85.41	53,591,974	29,984,013	55.95
JICA	Decentralization Irrigation System Improvement Project (DISIMP)	IP-509	04-02-2003 to 04-02-2012	108	100	yen	27,035,000	331,631	331,631	224,178	67.60	135,417,458	117,651,911	86.88
JICA	Water Resources Existing Facilities Rehabilitation and Capacity Improvement Project	IP-510	04-02-2003 to 04-08-2012	114	100	yen	14,696,000	180,272	180,272	120,654	66.93	70,923,000	52,052,646	73.39
JICA	Lower Solo River Improvement Project	IP-522	28-07-2005 to 28-07-2015	120	100	yen	9,345,000	114,632	79,537	47,491	41.82	299,800,000	142,964,584	47.69
JICA	Komering Irrigation Project Stage II Phase II	IP-523	28-07-2005 to 28-07-2013	96	100	yen	13,790,000	169,158	169,158	64,638	38.21	192,859,530	153,703,360	79.69
JICA	Urgent Disaster Reduction Project for Mount Merapi / Progo and Bawakaraeng	IP-524	28-07-2005 to 28-07-2014	108	100	yen	16,436,000	201,616	182,136	128,666	63.82	203,638,197	140,871,907	69.18
JICA	Integrated Water Resources and Flood Management Project for Semarang City	IP-534	26-07-2006 to 26-07-2015	108	100	yen	12,005,000	147,262	127,795	58,732	39.88	209,000,000	191,190,650	91.48
JICA	Participatory Irrigation Rehabilitation and Improvement Management Project (PIRIMP)	IP-546	25-07-2008 to 25-07-2016	96	100	yen	12,310,000	151,003	111,443	53,180	35.22	266,116,750	158,262,469	59.47
JICA	Decentralization Irrigation System Improvement Project (II) (DISIMP-II)	IP-547	25-07-2008 to 25-07-2016	96	100	yen	8,967,000	109,996	91,743	34,643	31.49	207,246,207	102,505,713	49.46
JICA	Urban Flood Control System Improvement in Selected Areas	IP-551	28-07-2009 to 28-07-2017	96	100	yen	7,490,000	91,878	34,666	-	0.00	61,068,000	-	0.00
JICA	Countermeasure for Sediment in Wonogiri Multipurpose Dam Reservoir	IP-552	28-07-2009 to 28-07-2015	72	100	yen	6,060,000	74,336	48,736	176	0.34	178,000,000	11,076,522	6.22
China	Construction of Jatigede Dam Project	REC No. 14	20-11-2007 to 20-11-2013	72	90	US\$	215,616	215,616	187,580	143,060	66.35	407,000,000	393,495,983	96.68

Note: *: Data as of October 31, 2011

Source: Laporan Bulanan, Monitoring Proyek-Proyek PHLN di Lingkungan Kementerian Pekerjaan Umum, October 2011, Biro Perencanaan dan Kerjasama Luar Negeri, Sekretariat Jenderal, Kementerian Pekerjaan Umum

Annex A1.7.1 (1/2) Salient Features of Yen Loan Major Irrigation Projects Completed by October 2011

Project Name	Province	Loan Period			Irrigation Area (ha)*	Project Outline
		No	From:	To:		
Completed Projects by October 2011						
1 SSIMP-I (Small Scale Irrigation Management Project)	Eastern Region	IP-343	Dec-89	Dec-96	3,600	SSIMP commenced in 1985 under the USAID finance. But, due to shortage of GOI budget, co-finance of OECF became necessary. OECF finance covered (i) Kulit dam irrigation (1700 ha) and (ii) Oesao GW (600ha).
2 SSIMP-II	Eastern Region	IP-422	Nov-94	Dec-00	15,600	(i) 9 surface water irrigation projects (12,227ha) served by 3 dams, 5 weirs and 1 capturing(spring), (ii) 2 groundwater projects (2,000ha)served by 830 shallow tubewells.
3 SSIMP-III	Eastern Region	IP-499	Jan-98	Feb-04	24,000	20 sub-projects in 6 provinces: 6 sub-projects in NTB, 5 in NTT, 4 in South Sulawesi, 2 in Central Sulawesi, 1 in Southeast Sul.. 1 in Maluku.
4 Water Resources Development Sector Loan (PTSL)	All region	IP-476	Dec-96	Dec-00	395,326	New, Rehab/upgrading of Irrigation(56), Village Irrigation(20), Swamp(8), Pond(34), Flood Control(52) sub-projects
5 SPL (Sector Project Loan)	All Regions	INP-22	Oct-99	Oct-01	677,436	(1) Irrigation system, land development, small irrigation in rainfed area, (2) Rehab of irrigation system incl. Village irrigation, (3) Empower WUA, (4) Telaga Tunjung Dam, (5) Pump modification Curug-Karawang
6 Krueng Aceh Irrigation	Aceh	IP-248 IP-363	Apr-82 Dec-90	Dec-97	7,384	Construction of an intake weir (across Krueng Aceh), MC, SC, TC canal system to ensure year-round irrigation over the right bank area of 7,053 ha and the left bank of 331 ha.
7 Ular River Improvement & Irrigation	North Sumatra	IP-236	May-81	May-88	18,500	Construction of irrigation and drainage canals (main, secondary and on-farm) along with river improvement (levee) to realize complete double-cropping of paddy and increase of yield.
8 Batang Hari Irrigation	West Sumatra	IP-478	Nov-93 Dec-96	Dev-02	18,936	Extension of irrigated paddy field from 4,983 ha to 18,936 ha by construction of a weir and canal networks including land development of 13, 953 ha.
9 South Sumatra Swamp Development	South Sumatra	IP-389	Oct-92	Nov-99	41,000	Rehabilitation of drainage facilities for two schemes: Pulau Rimau of 22,600 ha and Air Sugihan Kiri of 18,400 ha. The works are mainly for rehab of the First Stage Development Works.
10 Komerling Irrigation (Stage-1)	South Sumatra	IP-347 IP-453	Sep-83 Dec-89 Dec-95	Dec-01	19,890	Construction of (i) Perjaya Headworks, (ii) Upper Komerling MC, (iii) rehab/improve of Belitang SC, (iii) rehab/improve of SC,TC in Belitang I, II, III areas (19,890 ha). Stage-II (31,460 ha) and Stage-III (64,700 ha) will be developed later.
11 Way Sekampung	Lampung	IP-387 IP-423 IP-498	Oct-92 Nov-94 Jan-98	Nov-01 Dec-00 Feb-05	12,290	Construction of the Batutegi dam (w/hydropower generation) and extension of the Way Sekampung irrigation systems to Bekri and West Rumbia areas (12.290 ha).
12 Way Rarem Irrigation	Lampung	IP-201 IP-219 IP-324 IP-369	Mar-79 May-80 Dec-87 Sep-91	Sep-84 Nov-87 Dec-92 Sep-97	22,000	Construction of the Way Rarem Dam and a year-round irrigation system for transmigrant area around Kotabumi. Construction was divided to 3 packages (P-1 by IP-201, P-2 by IP-219, P-3 by IP-324). IP-369 was for P-4: rehabilitation

Note: *: Design irrigation service area

Source: WATSAL

Annex A1.7.1 (2/2) Salient Features of Yen Loan Majot Irrigation Projects Completed by October 2011

Project Name	Province	Loan Period			Irrigation Area (ha)*	Project Outline
		No	From:	To:		
Completed Projects by October 2011						
13 Way Jepara Irrigation	Lampung	IP-334	Mar-73 Jul-88	Sep-93	6,650	Construction of the Way Jepara Dam (utilizing a natural lake) and irrigation and drainage canal system for 6.650 ha.
14 Way Umpu & Pengubuan	Lampung	IP-	Dec-74 Jul-76 Jan-87	1992/1/1	12,500	Construction of a year-round irrigation system (an intake weir and canal system) for transmigrants (Umpu 7.500 ha and Penaubuan 5.000 ha).
15 Way Curup Irrigation	Lampung	IP-368	Oct-91	Oct-98	4,307	This project has a nature of extension of the Way Jepara project using excessive water from the Kemuning Lake. OECF financed construction of most of irrigation and drainage facilities except the weir and part of the main canal which were constructed previously under finance of IRRD and ADB
16 Pamarayan-Ciujung	West Java	IP-341	Oct-88	Oct-94	21,454	Replacement of a deteriorated weir with new one, together with rehab of irrigation canals.
17 Wonogiri Irrigation	Central Java	IP-194	Feb-79 (1st ext.) (2nd ext.);	Feb-84 Aug-86 Aug-87	23,200	Construction of a year-round irrigation system located on both banks of B' Solo around Surakarta by use of water released from the Wonogiri Multi-purpose Dam
18 Widas Irrigation	East Java	IP-198	Mar-79	Mar-84	8,620	Construction of a dam on the Widas river and rehabilitation and upgrading of an irrigation system (8,600 ha) to realize a year-round irrigation.
19 Riam Kanan Irrigation (Stage-I)	South Kalimantan	IP-278	Jun-84	Jun-90 (Dec-92)	6,000	Construction of a technical irrigation and drainage systems (25,900 ha) using water from the Riam Kanan Dam. Development will be made in 3 stages (Stage1 : 5996ha, Stage2 : 10,364ha, Stage-3: 9920ha)
20 Bila Irrigation	South Sulawesi	IP-364 IP-388	Jun-84 Dec-90 Oct-92	Dec-97 Nov-98	9,800	Construction of Kalola dam and Bila intake weir and with canal systems for 9,800 ha to realize double-cropping of paddy. Construction was made in two stages (Stage-1 and Stage-2).
21 Gilirang Irrigation	South Sulawesi	IP-502 (E/S)	Jan-98	Feb-02	7,000	Construction of Paselloreng dam, Gilirang intake weir, MCs (47.5km), SCs (37.2km), Tertiary Networks to convert rainfed condition to a year-round irrigation.
22 Bili-Bili Irrigation	South Sulawesi	IP-479	Dec-96	Dec-03	23,690	Construction/Upgrading of 3 irrigation systems(Kampali, Bili-Bili and Bissua) to ensure year-round irrigation by use of the release from the Jeneberana dam (to be completed in FY99/00).
23 Langkeme	South Sulawesi	IP-301	Apr-82 Dec-85	Dec-91	7,300	Integration of many number of fragmented irrigation systems into one consistent system by new construction of weirs, main and secondary canals, on-farm development to achieve double cropping of paddy.
Total					1,386,483	

Note: *: Design irrigation service area

Source: WATSAL

Annex A1.7.2 Salient Features of Yen Loan Major Irrigation Projects On-going as of October 2011

Project Name	Province	Loan Period			Irrigation Area (ha)*	Project Outline
		No	From:	To:		
On-going Irrigation Projects by October 2011						
1 Project Type Sector Loan for Water Resources II (PTSL-II)	Western and Central Regions	IP-505	Jul-01	Dec-11		Improvement and rehabilitation an of irrigation facilities for exisitng 13 sub-project
2 Decentralization Irrigation System Improvement Project (DISIMP)	Eastern Region	IP-509	Feb-03	Feb-12		Improvement and rehabilitation an of irrigation facilities for exisitng 13 sub-project
3 Water Resources Existing Facilities Rehabilitation and Capacity Improvement Project	North Sumatra (Irrigation sub-sector)	IP-510	Feb-03	Aug-12	16,500	Irrigation sub-sector component for rehabilitation of intake weir of Ular irrigation scheme
4 Komerling Irrigation Project Stage II Phase II	South Sumatra	IP-523	Jul-05	Jul-13	17,301	Extension of irrigation service areas to downstream existing rainfed paddy field areas
5 Participatory Irrigation Rehabilitation Improvement Management Project (P)	Western and Central Regions	IP-546	Jul-08	Jul-16	105,240	This project is to rehabilitate and extend existing irrigation facilities in 9 provinces of the western part of Indonesia (Java, Sumatra and Kalimantan) as well as to support improving the operation and maintenance (O&M) system of the facilities, thus achieving enhanced rice production and ensuring food security.
6 Decentralization Irrigation System Improvement Project (II) (DISIMP-II)	Eastern Region	IP-547	Jul-08	Jul-16		This project is to rehabilitate, extend, and newly construct irrigation facilities in 9 provinces of the eastern part of Indonesia, where agricultural infrastructure has not been extended sufficiently as a whole, and to support improving the operation and maintenance (O&M) system of the facilities, thus ensuring food security and reducing poverty through enhanced food production.

Note: *: Design irrigation service area

Source: JICA

Appendix B

***Introduction of Non-paddy Products into
Irrigation Service Areas***

SURVEY
FOR
MAXIMUM UTILIZATION OF IRRIGATION WATER
IN
THE REPUBLIC OF INDONESIA

REVISED DRAFT FINAL REPORT

APPENDIX B

Introduction of Non-paddy Products into Irrigation Areas

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CHAPTER B1 STRATEGIC PLAN OF MINISTRY OF AGRICULTURE FOR 2010-2014

B1.1 Performance of Strategic Plan for 2005-2009

B1.1.1 Overview

(1) Vision, Direction and General Strategies

The vision of agricultural development under the Strategic Plan of the Ministry of Agriculture (MOA) for 2005-2009 is to realize strong agriculture for strengthening food security, improving value added and competitiveness of agricultural products, and enhancing farmers' welfare. Main targets of agricultural development under the Strategic Plan for 2005-2009 as follow:

- The national food security is to be strengthened through the improvement of production capacity of agricultural commodities, and the dependency on food import is to be lowered around 5 to 10 % of domestic demand;
- The value added and competitiveness are to be enhanced through the improvement of the qualities of agricultural products, the improvement of diversification for processing agricultural products and the increase of export surplus of agricultural products; and
- The farmer' welfare is to be improved through the increase of labor productivity in agricultural sector and the reduction of poverty incidences.

Under the First National Medium Term Development Plan (2005-2009), the direction of agricultural revitalization is to increase:

- The ability to produce rice domestically around 90 to 95 % of the total demand;
- Diversification of food production and consumption;
- Food availability from animal sources;
- Value added and competitiveness of agricultural production; and
- Production and export of agricultural commodities.

The general strategies to attain objectives and targets of agricultural development are:

- To improve development management that is transparent and without corruption, collusion and nepotism;
- To improve coordination in preparing policies and agricultural development management;
- To expand and utilize production bases sustainability;
- To improve institutional capacities and empower agricultural human resources;
- To improve the availability of agricultural infrastructure;
- To improve innovation and dissemination of appropriate technology; and
- To promote and protect agricultural commodities.

(2) Macro Indicators

As for Gross Domestic Product (GDP) of agriculture sector excluding fishery and forestry sectors, the annual growth rate was slightly lower than the target every year for the period of 2005-2009, although it has increased in constant manner. The actual performance was 2.50% against 3.20% for 2005, 3.20% against 3.40% for 2006, 3.40% against 3.60% for 2007 and 3.57% against 3.80% for 2009 with an exceptional case that the actual rate jumped to 5.16% over the target of 3.60% for 2008 resulting from the steep rise in international commodity market prices, especially for palm oil.

Concerning trade balance of agricultural production, export earnings from estate crops and agricultural processed products have annually made a large surplus, resulting in recovery of deficits in trading food, horticulture and livestock products as shown in Table B1.1.1. As described in the above, the drastic increase in estate crops and processed products was attributed to the same situation.

Table B1.1.1 Trade Balance of Agricultural Products for 2005-2009

Unit: US\$ Million

Product	Item	2005	2006	2007	2008	2009 /1
Food crops	Export	287	264	289	349	321
	Import	2,115	2,568	2,729	3,527	2,738
	Balance	-1,828	-2,304	-2,440	-3,178	-2,417
Horticulture crops	Export	228	238	255	433	379
	Import	367	527	796	910	1,063
	Balance	-139	-289	-541	-477	-684
Estate crops	Export	10,673	13,972	19,949	27,369	21,582
	Import	1,533	1,675	3,380	4,536	3,949
	Balance	9,140	12,297	16,569	22,833	17,633
Livestock products	Export	397	389	748	1,148	755
	Import	1,172	1,190	1,696	2,352	2,133
	Balance	-725	-801	-948	-1,204	-1,338
Processed products	Export	11,584	14,863	21,241	29,299	23,036
	Import	5,137	5,961	8,601	11,325	9,883
	Balance	6,447	8,902	12,640	17,974	13,153

Note: /1; Cumulative value between January and February

Source: Rencana Strategis Kementerian Pertanian Tahun 2010-2014

With regard to labor force, the agricultural sector still remains a reliable source of income for many Indonesians. As a large number of labor force in the agricultural sector is a burden for primary agriculture, however, considerable efforts are required to encourage the transfer of the labor force in primary agriculture to agricultural or non-agricultural industries. The number of agricultural workers including fishery and forestry workers account for about 40% of the national labor force, showing a tendency to increase every year for the period of 2005-2009 as shown in Table B1.1.2.

B1.1.2 Agricultural Land Use

According to "Land Area by Utilization 2009" which is the only one land use statistic officially released by the Central Bureau of Statistic (BPS), farm land is categorized into wetland (paddy) field, dry land using for annual or seasonal crop cultivation, shifting cultivation land and temporary fallow land. However, estate crop field is not included into dry farm land because of permanent crop field. The farm land area for the period of 2005-2009 is summarized in Table B1.1.3 and the provincial

details by category are compiled as Annex B1.1.1 to Annex B1.1.5.

Table B1.1.2 Labor Force Situation for 2005-2009

Year	Labor Force Engaged			Share of Agriculture (%)	Unemployed Labor Force ('000 persons)	National Total ('000 persons)
	Agriculture ('000 persons)	Other sectors ('000 persons)	Total ('000 persons)			
2005	41,310	52,648	93,958	44.0	11,899	105,857
2006	40,136	55,321	95,457	42.1	10,932	106,389
2007	41,206	58,724	99,930	43.7	10,011	109,941
2008	41,332	61,221	102,553	40.3	9,395	111,948
2009 /1	43,029	61,456	104,485	41.2	9,259	113,744

Note: /1; Figures as of February 2009

Source: Rencana Strategis Kementerian Pertanian Tahun 2010-2014

Table B1.1.3 Farm Land Utilization for 2005-2009

Unit: 1,000 ha

Land Use Category	2005	2006	2007	2008	2009
Wetland (paddy field)	7,744	7,791	7,856	7,991	8,062
Dry land (total)	32,407	32,363	33,194	32,612	32,636
- Dry field / Garden	11,506	11,515	12,282	12,239	12,284
- Shifting cultivation	5,228	5,109	5,216	5,341	5,453
- Temporary fallow	15,673	15,739	15,696	15,032	14,902

Source: Luas Lahan Menurut Penggunaan 2009

B1.1.3 Crop Production

(1) Target and Achievement

The achievement of major crop production targets for 2005-2009 is shown in Table B1.1.4.

Table B1.1.4 Achievement of Targets for Major Crop Production for 2005-2009

Crop		2005 ('000 tons)		2009 ('000 tons)		Growth Rate (%)	
		Target	Achieve	Target	Achieve	Target	Achieve
Food crop	Paddy	55,030	54,151	57,708	64,399	1.21	3.18
	Maize	11,815	12,524	13,965	17,592	4.23	8.09
	Soybean	777	808	1,000	973	6.50	4.08
	Groundnut	832	836	850	777	0.48	-1.41
	Cassava	19,575	19,321	19,898	22,039	0.35	2.81
Estate crop	Rubber	1,948	2,271	2,339	2,440	4.79	1.49
	Oil palm	13,149	11,862	16,735	19,324	6.21	12.58
	Coffee	637	640	728	683	5.30	1.63
	Cocoa	753	749	892	810	4.37	1.34
	Sugarcane	2,165	2,242	2,845	2,517	7.09	2.45

Source: Rencana Pembangunan Pertanian Tahun 2005-2009 & BPS

(2) Food Crops

Out of food crops, paddy, maize and cassava have kept upward trend for the period of 2005-2009. Among others, farmers have appreciated increasing local market prices of maize and cassava so that they have grown maize on dry farm land for the wet season and cassava on paddy field after harvesting their wet season paddy, as no irrigation water have been supplied during the dry season. With increase in irrigated paddy field area for the dry season, the paddy production has constantly

shown upward trend since 2007. On the other hand, the production of groundnut and mung bean (green gram) shows downward trend for the period of 2005-2009 as shown in Table B1.1.5. Past records on harvested areas, production and yield of wetland paddy by province from 1970 to 2009 are compiled in Annex B1.2.1 to Annex B1.2.12.

Table B1.1.5 Food Crop Production for 2005-2009

Crop	2005 (‘000 tons)	2006 (‘000 tons)	2007 (‘000 tons)	2008 (‘000 tons)	2009 (‘000 tons)	Average Annual Growth Rate (%)
Paddy	54,151	54,455	57,157	60,326	63,840	3.18
Maize	12,524	11,609	13,288	16,317	17,659	8.09
Soybean	808	748	593	776	966	4.08
Groundnut	836	838	789	770	785	-1.41
Mung bean	321	316	322	298	314	-0.44
Cassava	19,321	19,987	19,988	21,757	22,376	2.81
Sweet potato	1,857	1,854	1,887	1,882	2,207	3.77

Source: Rencana Strategis Kementerian Pertanian Tahun 2010-2014

(3) Horticulture Crops

The achievement of major marketable vegetable and fruit production is given in Table B1.1.6. Horticulture crops with remarkable increase in production are mango and durian.

Table B1.1.6 Major Horticulture Crop Production for 2005-2009

Crop	2005 (‘000 tons)	2006 (‘000 tons)	2007 (‘000 tons)	2008 (‘000 tons)	2009 (‘000 tons)	Average Annual Growth Rate (%)
Potato	1,009	1,012	1,003	1,071	1,176	3.31
Chili	1,058	1,185	1,129	1,159	1,379	6.07
Shallot	733	795	803	853	965	6.33
Mango	1,433	1,622	1,819	2,105	2,243	11.30
Banana	5,178	5,037	5,454	6,004	6,374	4.62
Durian	566	748	595	682	798	8.20
Orange	2,214	2,566	2,626	2,467	2,132	-0.74

Source: Rencana Strategis Kementerian Pertanian Tahun 2010-2014

(4) Estate Crops

Traditional estate crop production like coconut and clove has been in stagnant or decreasing condition. Popular estate crops grown in garden with a small extent such as coffee and cacao have increased at rather low growth rate. In contrast, oil palm has been broadly planted in swampy areas on medium to large scale commercial base, resulting in sharp production outputs as shown in Table B1.1.7.

Table B1.1.7 Major Estate Crop Production for 2005-2009

Crop	2005 (‘000 tons)	2006 (‘000 tons)	2007 (‘000 tons)	2008 (‘000 tons)	2009 (‘000 tons)	Average Annual Growth Rate (%)
Oil palm	11,862	17,351	17,665	17,540	19,324	12.58
Rubber	2,271	2,637	2,755	2,751	2,440	1.49
Coconut	3,097	3,131	3,193	3,240	3,258	1.04
Cacao	749	769	740	803	810	1.63
Coffee	640	682	677	698	683	1.34
Cashew nut	135	149	146	157	147	1.78
Sugar cane	2,242	2,307	2,624	2,668	2,517	2.45
Tobacco	153	146	165	168	177	3.14

Source: Rencana Strategis Kementerian Pertanian Tahun 2010-2014

B1.1.4 Budget

(1) Allocated Budget to Ministry of Agriculture

For the period of 2005-2009, the State Budget of Revenue and Expenditure (APBN) allocated to MOA increased noticeably as shown in Table B1.1.8.

Table B1.1.8 Allocated APBN to Ministry of Agriculture for 2005-2009

Unit: Rp Million

Organization Unit	2005	2006	2007	2008	2009
Secretariat General	227,868	762,185	1,664,487	1,490,145	1,531,866
- Bureau	227,868	212,655	360,912	293,405	433,639
- Centers	-	549,530	1,303,575	1,196,740	1,098,226
Inspectorate General	32,986	37,775	57,149	51,340	61,097
Directorate General of Food Crops	823,673	498,880	1,743,284	1,099,995	1,003,719
Directorate General of Estate Crops	457,182	452,698	387,202	445,855	424,116
Directorate General of Animal Husbandry	372,386	596,996	548,742	755,598	708,002
Directorate General of Processing and Marketing of Agricultural Products	56,110	379,803	413,298	662,582	373,959
DG of Agricultural Infrastructure	89,439	1,005,726	1,015,089	1,015,309	925,469
Directorate General of Horticulture	320,461	251,770	288,860	261,329	269,261
Agricultural Research and Development Agency	761,157	730,778	830,140	793,636	859,561
Agricultural Human Resources Development Agency	355,885	590,950	878,135	940,433	1,227,047
Food Security Agency	331,658	696,520	587,421	419,114	399,289
Agricultural Quarantine Agency	195,998	281,002	375,810	370,171	387,390
Ministry Total	4,024,804	6,285,084	8,789,618	8,305,517	8,170,774

Source: Rencana Strategis Kementerian Pertanian Tahun 2010-2014

(2) Subsidies and Fund

Agricultural subsidies consist of price subsidy and direct subsidy for fertilizers as well as price and direct subsidies for seeds provided through the mechanism of seed aid and reserve as shown in Table B1.1.9. Besides these fertilizer and seed subsidies and aids, APBN is also transferred to local governments in the form of General Allocation Fund (DAU), Special Allocation Fund (DAK), and Reserve Sharing Fund (DBH).

Table B1.1.9 Agricultural Subsidies and Fund for 2005-2009

Unit: Billion Rp.

Item	Type	2005	2006	2007	2008	2009
Fertilizer subsidy	Price subsidy	2,593	4,182	6,797	14,101	16,458
	Direct Fertilizer Aid (BLP)	-	-	-	0.80	0.96
	Monitoring	-	-	-	18.87	20.00
	Total	2,593	4,182	6,797	14,922	17,441
Seed subsidy	Price subsidy	80	99	82	112	122
	National Seed Reserve (CBN)	45	38	38	191	376
	Direct Superior Seed Aid (BLBU)	-	-	222	682	817
	Total	125	137	342	985	1,315
Fund	Special Allocation Fund	170.0	1,094.8	1,492.2	1,492.2	1,492.2

Source: Rencana Strategis Kementerian Pertanian Tahun 2010-2014

(3) Foreign Aid

At moment as of 2011, MOA manages implementation of five loan projects from five donors such as International Bank for Reconstruction and Development (IBRD), Asian Development Bank (ADB), International Fund for Agricultural Development (IFAD) and Islamic Development Bank (IDB). The total amount of loans allocated to MOA is around US\$141 million.

In addition, a total of 41 grant projects in the form of technical assistance on bi-lateral and multi-lateral basis are now being executed by directorate generals and centers of MOA. The on-going foreign aid activities managed by directorate generals are listed up in Table B1.1.10, and another 22 research and development activities with foreign technical assistance are executed by Agriculture Research and Development Agency.

Table B1.1.10 List of On-going Foreign Aid Activities under Ministry of Agriculture

Activity	Donor	Executing Unit	Amount (million)	Period
Loan				
1 Farmer Empowerment through Agriculture Technology and Information	IBRD	BLP	US\$92.82	2007 - 2012
2 Participatory Irrigation Sector Project	ADB	DPLA	US\$8.80	2006 - 2012
3 Integrated Citarum Water Resources Management Investment Program	ADB	DPLA	US\$3.29	2009 - 2014
4 Rural Empowerment and Agricultural Development Program	IFAD	BPSDMP	US\$21,08	2008 - 2014
5 Post Tsunami Rehabilitation of Irrigation Infrastructure in Aceh	IDB	DPLA	US\$15.00	2005 - 2012
Grant for Technical Assistance				
6 IFAD Grant for Policy Review of IFAD	IFAD	SJ	US\$0.50	2009 - 2014
7 Regional Program for Participatory and Integrated Agriculture and Fisheries	FAO	SJ	US\$0.70	2006 - 2011
8 The Food Security Project for Under Pre-village Farmers Program (2KR)	Government of Japan	SJ	Yen 525.00	2006 - 2011
9 Long Term Expert for Advisor Policy and Program Coordination	JICA	SJ	US\$0.20	2009 - 2011
10 The Beef Cattle Development Project Utilization Local Resources in the Eastern Part of Indonesia	JICA	DPN	Yen 400.00	2006 - 2011
11 Improvement of Countermeasure on the Productive Disease of Dairy Cattle in Indonesia	JICA	DPN	Yen 80.49	2008 - 2011
12 Cost Effective Bio-security for Non Industrial Commercial Poultry Operation in Indonesia	ACIAR	DPN	A\$225.11	2008 - 2012
13 Livestock Development Policy Advisor	Australia	DPN	A\$0.40	2008 - 2011
14 Prevention and Control of Avian Influenza in the Veterinary Sector	KFW Germany	DPN	• 3.00	2008 - 2012
15 Training Course of Artificial Insemination on Dairy Cattle for Developing Countries	JICA	DPN	Yen 30.66	2010 - 2012
16 Livestock Movement and Managing Disease in Eastern Indonesia and Eastern Australia	Government of Australia	DPN	A\$0.23 & Rp 968	2008 - 2011
17 Reinforcement and Expansion of the Avian Influenza Participatory Disease Surveillance and Response Program in Indonesia	USDA	DPN	US\$44.20	2008 - 2011

Activity	Donor	Executing Unit	Amount (million)	Period
18 Improving Veterinary Service Delivery in a Decentralized Indonesia	ACIAR	DPN	A\$0.62	2008 - 2012
19 Strategic for Improving the Rice Post Harvest System in Indonesia		DPPHP	US\$0.45	2009 - 2011
20 Management of Fruit Quality and Pest Infection on Mango and Mangosteen to Meet Technical Market Access		DHT	US\$0.22	2010 - 2011
21 Standard of Quality Control for Horticulture Product of Indonesia (Improvement of Thermal Treatment against Fruit Flies on Fresh Mango)		DHT	US\$2,60	2010 - 2011
22 Managing Pest Fruit Flies to Enhance Quarantine Service and Upgrade Fruit and Vegetable Protection in Indonesia	ACIAR	DHT	US\$0.29	2010 - 2011
23 Area Wide Management of Pest Fruit Flies in Indonesian Mango Production System		DHT	US\$0.23	2010
24 Strengthening Quarantine Control Systems for Invasive Alien Species	FAO	Badan Karantina	US\$0.37	2009 - 2011

Source: Pelaksanaan Proyek Pinjaman dan Hibah Luar Negeri, Lingkup Kementerian Pertanian Triwulan I Tahun 2011

B1.2 Potentials, Problems and Challenges

B1.2.1 Potentials

Potentials of agricultural development in Indonesia are itemized in Table B1.2.1.

Table B1.2.1 Potentials of Agricultural Development in Indonesia

Potential	Feature
Biodiversity	Indonesia's biodiversity is sustained through the distribution of geographic conditions (lowland and highland); the abundance of sunlight and even distribution of rainfall throughout the year in some areas; the diverse soil types which enable the cultivation of various kinds of tropical crops and livestock; and the existence of tropical and sub-tropical areas together that make commodities grow in equal distribution manner all year round.
Agricultural land	The total nation's land area was 192 million ha as of 2006, comprising 124 million ha for cultivable land and 68 million ha for protection area. Of the cultivable land, 101 million ha were the potential land possible to be converted for agricultural use consisting of 25.8 million ha of wetland, 24.3 million ha of dry land suitable for annual crop cultivation and 50.9 million ha of land suitable for perennial crop planting. To date, 47 million ha out of the potential land has been cultivated. Though there are the remaining potential lands of 54 million ha, the water resource availability in such potential land areas is a primary key factor for further expansion of agricultural land.
Agricultural workforce	Although more than 43 million workforces depend on agriculture sector, considerable numbers of this workforce have not distributed in proportion with distribution of the remaining potential land. With provision of skills and knowledge necessary for developing competitive agriculture to workforce living in densely populated areas, employment opportunities will be created in processing and marketing industries of agricultural products and other sector industries as well as in new farms to be newly developed in sparsely populated areas coupled with supply of production assets, technological guidance and sufficient marketing guarantees.

Potential	Feature
Technology	There are plenty of appropriate technology packages which farmers can utilize in order to improve the quantity, quality and productivity of various agricultural products, including many highly productive varieties, clones and livestock; fertilizer production technologies and bio-products; agricultural tools and machineries; and various technologies for cultivation and post-harvesting, although these packages are not yet fully utilized due to various limited factors.
Increasing number and purchasing power of population	A large number of population results in a potentially large domestic market for the farmers' agricultural products. Continuous growth of Indonesian economy will be enable people with lower per capita income to strengthen their purchasing power of domestic products of agriculture sector.

Source: Rencana Strategis Kementerian Pertanian Tahun 2010-2014

B1.2.2 Problems

Fundamental problems that the agricultural sector will face in the future, especially for the period of 2010-2014, will be related to the followings:

- Increasing environmental damage and global climate change;
- Availability of infrastructures, facilities, land and water;
- Status and holding size of land ownership (9.55 million families < 0.5 ha);
- National seeding and breeding system that is not yet optimized;
- Farmers' limited access to financing sources and their high interest rates for agricultural businesses;
- Low capacity and institutions for farmers and counselors;
- Vulnerability of food and energy security;
- Food diversification that is not yet properly implemented;
- Farmers' low trading terms;
- Lack of inter-sector integration in supporting agricultural development; and
- Performance and services of the agricultural bureaucracy that is not yet optimized.

B1.2.3 Challenges

Beside the above fundamental problems, future agricultural development will also face various other challenges that need to be thoroughly and accurately met including various items as follows:

- Increased productivity and added values of agricultural products in several production centers through an environmentally friendly agricultural system;
- A balanced use of chemical and organic fertilizers in order to restore and improve soil fertility;
- Restoration and development of land and water resources as well as seeding and breeding;
- Easy access to agricultural financing at a low interest rate for farmers/small scale livestock breeders;

- Achievement of the Millennium Development Goals (MDGs) which include the alleviation of poverty, unemployment, and food shortage;
- Creation of proportional pricing policies for specific agricultural products;
- Global competition and low economic growth due to the global crisis;
- Improvement of the farmers' and agriculture's image to attract the next generation;
- Institutionalization of sound and productive economic businesses in rural areas;
- Effective agricultural counseling system; and
- Fulfillment of food supply in addition to development of superior commodities for horticulture and livestock farming, and increased export commodities for estate crops.

B1.3 Strategic Plan for 2010-2014

B1.3.1 National Development Plan

In line with the National Development Vision for 2005-2025 describing as “Indonesia that is self-reliant, advanced, just and prosperous”, the eight National Development Missions are laid down as follows:

- Realizing a society that has high morals, ethics, culture and civilization, based on the *Pancasila*;
- Realizing a nation that is competitive;
- Realizing a democratic society based on the rule of law;
- Realizing an Indonesia that is secure, peaceful and united;
- Realizing development that is equitable and just;
- Realizing an Indonesia that is balanced and sustainable;
- Realizing an Indonesia as an archipelago nation that is self-reliant, advanced and strong, and that is based on the national interest; and
- Realizing an Indonesia that has an important role in the international community.

The strategy to implement the National Development Vision and Mission of RPJPN (*Rencana Pembangunan Jangka Panjang Nasional*, National Long-term Development Plan) 2005-2025 is specified in five year stages into RPJMs (*Rencana Pembangunan Jangka Menengah*, Medium-Term Development Plans). Each of the stages has a scale of priorities and development strategies that constitute a continuity of scale of priorities and development strategies of preceding periods. The followings show summarized priorities and strategies of the respective RPJMs:

- The First RPJM (2005-2009) is directed at reforming and developing Indonesia in all fields that are aimed at creating an Indonesia that is safe and peaceful as well as just and democratic, and that has an increasingly prosperous population;
- The Second RPJM (2010-2014) aims at the greater consolidation of the reform of Indonesia in all fields by emphasizing endeavors for increasing the quality of human resources,

including the promotion of capacity building in science and technology and the strengthening of economic competitiveness;

- The Third RPJM (2015-2019) is aiming for the greater consolidation of development in comprehensive manner in all fields by emphasizing attainment of economic competitiveness on the basis of competitiveness of natural resources and the quality of human resources, and by increasing the capability to master science and technology; and
- The Fourth RPJM (2020-2025) aims to realize Indonesian society that is self-reliant, advanced, just and prosperous through the acceleration of development in various fields by emphasizing the realized economic structure that is more solid on the basis of competitive advantage in various regions, and that is supported by quality and competitive human resources.

Along the direction of the Second Medium Term Development Plan (2010-2014), the vision is set up as “the realized Indonesia that is prosperous, democratic, and just”, as elaborated as follows:

- Prosperous people: An increase in the welfare of the people through economic development that is based on competitive advantage, assets of natural resources, human resources and national culture;
- Democracy: A society, nation and state that is democratic and cultured, that has self-respect and that upholds responsibility of freedom and basic human rights; and
- Just: Development that is just and equitable, that is actively carried out by all of the people, and that is the fruits of which all the people of Indonesia can benefit.

Also, three development missions of RPJM 2010-2014 are formulated as follows:

- Mission 1 is to continue development towards a prosperous Indonesia;
- Mission 2 is to strengthen the pillars of democracy; and
- Mission 3 is to strengthen the dimension of justice in all fields.

For realizing the vision and missions of national development in RPJM 2010-2014, the following five national development agendas have been determined:

- Economic development and increased welfare of the people;
- Enhancement of good governance;
- Strengthening of the pillars of democracy;
- Enforcement of the law and eradication of corruption; and
- Development that is inclusive and just.

The main national development targets set up in RPJM 2010-2014 are as summarized in Table B1.3.1.

Table B1.3.1 Main Targets of RPJM 2010-2014

Development Index		Targets	
<i>Targets on Development of Welfare of the People</i>			
1. Economic			
a)	Economic growth rate	Average of 6.3~6.8% per year Growth of 7% before 2014	
b)	Inflation rate	Average of 4~6% per year	
c)	Open unemployment rate	5~6% at end of 2014	
d)	Poverty rate	8~10% at end of 2014	
2 Education		Initial Status (2008)	Target in 2014
a)	Increased average school stay of people of 15 years and older (years)	7.50	8.25
b)	Decline in illiteracy rate of population aged 15 and over (%)	5.97	8.25
c)	Increased net enrolment rate of elementary schools (%)	95.14	96.00
d)	Increased net enrolment rate of junior high schools (%)	72.28	76.00
e)	Increased gross enrolment rate of senior high schools (%)	64.28	85.00
f)	Increased gross enrolment rate at universities of those in 19-23 years age bracket (%)	21.26	30.00
g)	Reduced disparity in participation and quality of education services among regions, gender and social-economic groups, and between education units that are implemented by the government and private institutions		
3 Health		Initial Status (2008)	Target in 2014
a)	Increased life expectancy (years)	70.7	72.0
b)	Decreased maternal mortality rate per 100,000 live births	228	118
c)	Decreased infant mortality rate per 1,000 live births	34	24
d)	Decreased prevalence of nutrition deficiency (deficient nutrition and malnutrition) by infants (%)	18.4	Less than 15.0
4 Food			
a)	Production of paddy	Growth rate of 3.22% per year	
b)	Production of maize	Growth rate of 10.02% per year	
c)	Production of soybean	Growth rate of 20.05% per year	
d)	Production of sugar	Growth rate of 12.55% per year	
e)	Production of cow meat	Growth rate of 7.30% per year	
5 Energy			
a)	Increased capacity of electricity generating stations	3,000 MW per year	
b)	Increased electrification rate	Reaching 80% in 2014	
c)	Increased production of crude oil	Reaching 1.01 million barrel per day in 2014	
d)	Increased utilization of geothermal power stations	Reaching 5,000 MW in 2014	
6 Infrastructure			
a)	Construction of the Trans Sumatra, Java, Kalimantan, Sulawesi, west Nusa Tenggara, East Nusa Tenggara, and Papua infrastructure	Reaching a length of 19,370 km by 2014	
b)	Construction of an integrated inter-mode and inter-island transportation network in accordance	Completed in 2014	

Development Index		Targets
	with the National Transportation System and Multi-mode Transportation Blueprint	
	c) Completing the construction of the Optic Fiber Network in Eastern part of Indonesia	Completed before 2013
	d) Repairing the transportation system and network in four big cities (Jakarta, Bandung, Surabaya, and Medan)	Completed in 2014
Targets on Development of Democracy		
1	The increased quality of democracy in <i>Indonesia</i>	1) The increased conduciveness of the political climate for the growth of the quality of civil liberties and political rights of the people that balanced by the increased compliance with the law
		2) The increased performance of democratic institutions, with an average index of 70 by the end of 2014
		3) Implementing of the general election in 2014 in a just and democratic way, with a participation rate of the people of 75% and with a reduced discrimination in the right to be elected and to vote
		4) Increased services in information and communication
		Index of Indonesia's Democracy in 2014: 75
Targets on Development of Law Enforcement		
1	The attained atmosphere of justice through enforcement of the rule of law and the maintenance of public law and order	1) Perception of justice seekers for having a sense of comfort, certainty and security in their interaction, and being satisfactorily served by law enforcers
		2) Increased trust and respect of the general public to the law enforcing apparatus and institutions
		3) Supporting a conducive business climate in order that economic activities can be proceed securely and efficiently
		Corruption Perception Index in 2014 of 5.0, and increase from 2.8 in 2009

Source: RPJMN 2010 – 2014, National Development Planning Agency (BAPPENAS), 2010

B1.3.2 Strategic Plan and Main Targets of Agriculture Sector for 2010-2014

The agricultural development strategy for the period of 2010-2014 is to conduct revitalization in agriculture with a focus on seven basic aspects. These are composed of:

- Planting area;
- Seeding and breeding;
- Infrastructures and facilities;
- Human resources;
- Funding for farmers;
- Farmers institutions; and

- Technology and upstream industry.

The implementation of the revitalization of the seven basic aspects is to continue, expand and deepen the previous efforts taken in the planning, budgeting, executing and evaluating steps with more integrated and synchronized manner.

In order to develop agriculture in Indonesia in line with the direction towards the revitalization of such aspects, the following four main targets are decided:

- Achievement of self-sufficiency and maintenance of sustainable self-sufficiency;
- Promotion of food diversification;
- Increase in value added, competitiveness and export of agricultural products; and
- Improvement of farmers' welfare.

B1.3.3 Production Targets of Commodities for 2010-2014

(1) Main and Superior Commodities

In connection with the above strategies and targets, the production targets of five main food commodities are predicted for the period of 2010-2014 as shown in Table B1.3.2.

Table B1.3.2 Projection and Focus on Production and Growth Rate of Main Food Commodities

Commodity	Target / Goal	Production Result in 2009	Production Target		Annual Average Target
			2010	2014	
			(million tons)		
Paddy	Sustainable self-sufficiency	63.94	66.68	75.70	3.22
Maize	Sustainable self-sufficiency	17.66	19.80	29.00	10.02
Soybean	Achievement of self-sufficiency by 2014	1.00	1.30	2.70	20.05
Sugarcane	Achievement of self-sufficiency by 2014	2.85	2.99	5.70	17.63
Beef	Achievement of self-sufficiency by 2014	0.40	0.41	0.55	7.30

Source: Rencana Strategis Kementerian Pertanian Tahun 2010-2014

The production centers of these main food commodities are distributed as listed up in Table B1.3.3 and illustrated in Figures B1.3.1 to B1.3.5.

Table B1.3.3 Distribution of Major Commodity Production Centers in Indonesia

Commodity	Sumatra	Java	Bali & NT	Kalimantan	Sulawesi
Paddy	Aceh North Sumatra West Sumatra South Sumatra Lampung	Banten West Java Central Java DI Yogyakarta East Java	Bali NTB	West Kalimantan South Kalimantan	Central Sulawesi South Sulawesi
Maize	North Sumatra Lampung	West Java Central Java East Java	NTT		North Sulawesi South Sulawesi
Soybean	Aceh North Sumatra Jambi South Sumatra Lampung	Banten West Java Central Java DI Yogyakarta East Java	NTB		South Sulawesi

Commodity	Sumatra	Java	Bali & NT	Kalimantan	Sulawesi
Sugarcane	North Sumatra South Sumatra Lampung	West Java Central Java DI Yogyakarta East Java			Gorontalo South Sulawesi
Beef	Aceh North Sumatra West Sumatra Riau Jambi South Sumatra Lampung	West Java Central Java DI Yogyakarta East Java	Bali NTB NTT	West Kalimantan South Kalimantan	Gorontalo Central Sulawesi South Sulawesi Southeast Sulawesi

Note: *: Nusa Tenggara

Source: Rencana Strategis Kementerian Pertanian Tah 2010-2

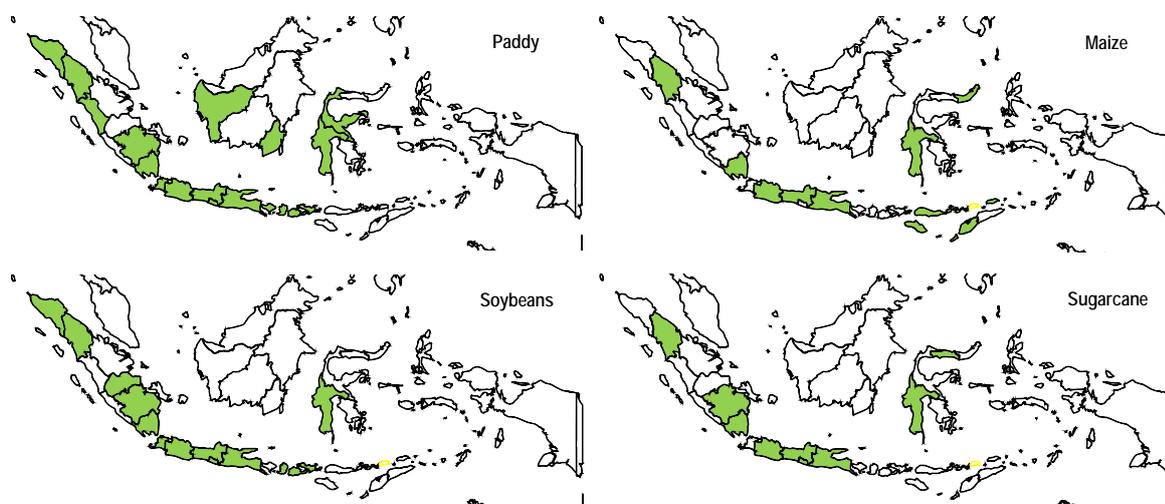


Figure B1.3.1 Paddy, Maize, Soybean and Sugarcane Production Centers in Indonesia

In addition to the above main commodities, another 20 food crops, eight non-food crops and six animal husbandry products are selected by MOA as the national superior commodities as listed up in Table B1.3.4. These are grown for either earning foreign currency, meeting domestic demand for raw materials of processing industries and import substitute, and enhancing farmers' income sources.

Table B1.3.4 List of Superior Commodities in Agriculture Sector

Sub-sector	Food category	Non-food category
Food crop	Groundnut, Cassava, Sweet potato	-
Horticulture crop	Chili, Shallot, Potato, Mango, Banana, Durian, Mangosteen	Medical and ornamental plants
Estate crop	Oil palm, Coconut, Cocoa, Coffee, Pepper, Cashew nut, Tea, Sugar cane	Rubber, Cotton, Tobacco, Clove, Jathropa, Patchouli, Kemiri sunan
Animal husbandry crop	Dairy cattle, Buffalo, Goat/Sheep, Pig, Chicken, Dug	

Source: Rencana Strategis Kementerian Pertanian Tahun 2010-2014

(2) Production Targets of Food Crops

The production target of food crop commodities with the average annual growth rate for the period of 2010-2014 is predicted as shown in Table B1.3.5.

Table B1.3.5 Prediction of Food Crop Production for 2010-2014

Crop	2010 (‘000 tons)	2011 (‘000 tons)	2012 (‘000 tons)	2013 (‘000 tons)	2014 (‘000 tons)	Average Annual Growth Rate (%)
Paddy	66,680	68,800	71,000	73,300	75,700	3.22
Maize	19,800	22,000	24,000	26,000	29,000	10.02
Soybean	1,300	1,560	1,900	2,250	2,700	20.05
Groundnut	882	970	1,100	1,200	1,300	10.20
Green bean	360	370	390	410	430	4.55
Cassava	22,248	22,400	25,000	26,300	27,600	5.54
Sweet potato	2,000	2,150	2,300	2,450	2,600	6.78

Source: Rencana Strategis Kementerian Pertanian Tahun 2010-2014

(3) Production Targets of Horticulture Crops

The predicted production of major marketable vegetable and fruit crops is given in Table B1.3.6. High market potential fruits like mango, durian and orange are expected to increase production outputs at the average annual growth rate of more than 5.0%.

Table B1.3.6 Prediction of Major Horticulture Crop Production for 2010-2014

Crop	2010 (‘000 tons)	2011 (‘000 tons)	2012 (‘000 tons)	2013 (‘000 tons)	2014 (‘000 tons)	Average Annual Growth Rate (%)
Potato	1,121	1,152	1,185	1,220	1,261	3.00
Chili	1,240	1,290	1,342	1,400	1,462	4.20
Shallot	892	917	943	973	1,005	3.00
Mango	2,233	2,342	2,462	2,595	2,744	5.28
Banana	6,248	6,414	6,603	6,818	7,046	3.05
Durian	696	731	769	812	857	5.35
Orange	2,608	2,719	2,845	2,995	3,172	5.01

Source: Rencana Strategis Kementerian Pertanian Tahun 2010-2014

(4) Production Targets of Estate Crops

To match with the upward trend of demand for cacao beans in international markets, the annual growth rate of production outputs in the form of dry beans are expected to be nearly 14%, while crystal sugar production will be expected to increase at the average annual rate of over 17% resulting from policy efforts to expand planting areas, to raise productivity and improve sucrose content. Crude palm oil (CPO) production is predicted to increase constantly at the average annual rate of around 5% as a result of expanding oil palm tree planting areas for the period of 2005-2009. The prediction of major estate crops for the period of 2010-2014 is shown in Table B1.3.7.

Table B1.3.7 Prediction of Major Estate Crop Production for 2010-2014

Crop	Product Form	2010 (‘000 tons)	2011 (‘000 tons)	2012 (‘000 tons)	2013 (‘000 tons)	2014 (‘000 tons)	AAGR /1 (%)
Oil palm	CPO	23,200	24,429	25,710	27,046	28,439	5.22
Rubber	dry block	2,681	2,711	2,741	2,771	2,801	1.10
Coconut	copra	3,266	3,290	3,317	3,348	3,380	0.86
Cacao	dry beans	988	1,074	1,342	1,539	1,648	13.86
Coffee	dry beans	698	709	718	728	738	1.40
Cashew nut	dry bunch	145	148	152	156	159	2.36
Sugar cane	sugar	2,996	3,867	4,396	4,935	5,700	17.63
Tobacco	Dry leaf	181	182	183	183	184	0.41

Note: /1; Average annual growth rate Source; Rencana Strategis Kementerian Pertanian Tahun 2010-2014

B1.3.4 Supports to Realization of Production Targets for 2010-2014

(1) Land Development for Agriculture

In order to realize the targets of commodity production predicted for the period of 2010-2014, various supporting programs are scheduled to be executed. Among others, the existing cultivable land of 2 million ha will be newly utilized as cultivated land for the purpose of converting swampy areas to wetland paddy field, opening dry land for food and horticulture crop cultivation, extending estate crop planting areas by smallholders as well as expanding forage and grazing land for animal husbandry. The target of 2 million ha land development is predicted as depicted in Table B1.3.8. The breakdown of the total new agricultural land development areas by province is summarized in Annex B1.3.1.

Table B1.3.8 Targets of Agricultural Land Development for 2010-2014

Land Use Category	2010 (ha)	2011 (ha)	2012 (ha)	2013 (ha)	2014 (ha)	Total (ha)
Wetland paddy field	12,025	59,493	59,493	59,493	59,493	250,000
Dry land for food crops	1,050	98,950	100,000	100,000	100,000	400,000
Dry land for horticulture	3,525	96,475	100,000	100,000	100,000	400,000
Smallholders' estate crop	10,200	143,670	143,850	143,850	143,850	585,430
Forage growing field	5,705	90,000	85,295	85,000	85,000	351,000
Grazing land	1,070	2,500	3,750	3,750	2,500	13,570
Total	33,575	519,570	482,895	482,600	481,360	2,000,000

Source: Rencana Strategis Kementerian Pertanian Tahun 2010-2014

(2) Fertilizer Supply

Aiming to achieve the production targets predicted during the 2010-2014 period, one of key elements is provide farmers with necessary amount of fertilizers timely. The estimated annual requirements for fertilizers for the period of 2010-2014 are given in Table B1.3.9. As the local market prices of fertilizers are not affordable for all farmers, however, sustainable support to lower income farmers in the form of subsidy is indispensable. The required quantity of subsidized fertilizers is also shown in Table B1.3.9.

Table B1.3.9 Predicted Needs and Subsidized Quantity of Fertilizers for 2010-2014

Land Use Category	2010	2011	2012	2013	2014	Total
Fertilizer Requirement (Million tons)						
- Urea	7.10	7.07	7.03	7.00	6.96	35.15
- TSP	4.53	4.53	4.44	4.39	4.34	22.23
- ZA	1.21	1.23	1.26	1.28	1.31	6.29
- KCl	2.82	2.73	2.64	2.55	2.45	13.18
- NPK	8.07	8.63	9.20	9.74	10.35	45.99
- Organic	10.42	10.51	10.61	10.72	10.82	53.09
Total	7.10	7.07	7.03	7.00	6.96	35.15
Subsidized Fertilizer Needs (Million tons)						
- Urea	6.00	5.80	5.60	5.40	5.20	6.00
- TSP	1.00	0.97	0.80	1.00	1.00	1.00
- ZA	0.95	0.95	0.95	0.95	0.95	0.95
- KCl	2.20	2.50	3.00	3.50	4.00	2.20
- NPK	0.91	1.10	1.30	0.91	0.91	0.91
- Organic	11.06	11.32	11.65	11.76	12.06	11.06
Total	6.00	5.80	5.60	5.40	5.20	6.00

Source: Rencana Strategis Kementerian Pertanian Tahun 2010-2014

B1.3.5 Budget Requirement for Agricultural Development for 2010-2014

A substantial amount of investment for agricultural development is required for achieving the targets set for the period of 2010-2014. Most of this amount will be born from the private sector so that about 10% to 15% of required fund will be normally covered by the government in the form of national budget (APBN) and local government budget (APBD). The total budget requirement for MOA for the period of 2010-2014 is estimated to be Rp. 64.27 trillion, excluding subsidy and funds like DAK. The allocation of this amount by program is summarized in Table B1.3.10.

Table B1.3.10 Funding Requirement by APBN for Ministry of Agriculture for 2010-2014

Program	Amount (Rp Billion)
1. Improvement of Production, Productivity and Quality of Food Crops to achieve self-sufficiency and sustainable self-sufficiency	6,656.2
2. Improvement of Production, Productivity and Quality of Sustainable Horticulture Crops	2,239.5
3. Improvement of Production, Productivity and Quality of Sustainable Estate Crops	3,527.3
4. Achievement of Self-sufficiency in Beef and Improvement of the Supply of Safe, Healthy, Whole and Halal Animal-based Foods	6,571.3
5. Provision and Development of Facilities and Supporting Facilities for Agriculture	2,104.0
6. Improvement of Added Values, Competitiveness, Downstream Industry, Marketing and Export of Agriculture Products	19,725.2
7. Improvement of Food Diversification and Food Security for the Public	5,456.5
8. Invention of Technology and Competitive Supreme Varieties	6,852.1
9. Development of Agriculture Human Resources and Institutions	3,184.3
10. Improvement of the Quality of Agriculture Quarantine and Supervision of Bio-safety	2,754.7
11. Supervision and Improvement of the Accountability of Personnel at MOA	345.2
12. Management Support and Implementation of Other Technical Tasks within MOA	7,832.0
Total	67,248.3

Source: Rencana Strategis Kementerian Pertanian Tahun 2010-2014

CHAPTER B2 POSSIBILITIES ON INTRODUCTION OF NON-PADDY PRODUCTS TO IRRIGATION SERVICE AREAS

B2.1 Non-paddy Crops

B2.1.1 Land Suitability for Candidate Crops

As the Soil Research Institute of MOA studied land suitability of overall crops grown in Indonesia, the study results concerning the following candidate crops are summarized in Annex B2.1.1:

- Food crops other than paddy are maize, soybean, mung bean (green gram) and groundnut; and
- Cash crops are chili, shallot, long beans, eggplant, cucumber, amaranthus as a leaf vegetable (*bayam*) and sweet corn.

B2.1.2 Crop Profitability

The profitability of candidate non-paddy crops is compared with that of irrigated paddy based on the net return and labor productivity. Further comparison is made with major perennial crops in the country such as rubber and oil palm as well as raw material crops for bio-fuel production like cassava and sugarcane by taking economic life of each crop into account. The crop budgets used for the comparison purpose are estimated on the basis of secondary data provided by central and provincial agricultural agencies concerned. The typical crop budget estimated for each crop is presented in Annex B.2.1.2 to Annex B.2.1.5.

B2.1.3 Examination on Possibility of Introduction of Candidate Crops

Findings and results of the present field survey made aiming at confirmation on possibilities of introducing candidate non-paddy crops in service areas of such four irrigation systems as Bili-Bili, Way Sekampung, Ciujung, and Batang Hari are presented in Annexes B2.1.6 to B2.1.10.

B2.2 Bio-fuel Crops

B2.2.1 World Market Trend of Bio-fuel Crop Demand and Supply

(1) Overview

Among renewable energy sources, biomass can be directly converted into liquid fuels, called “bio-fuel.” That can help meet transportation fuel needs. There are two most common types of bio-fuels broadly utilized today. One is bio-ethanol and the other is bio-diesel.

Bio-ethanol is an alcohol and most commonly made by fermenting any biomass with high carbohydrate content through a process similar to beer brewing. Although bio-ethanol is currently made from starches and sugars, utilization of the fibrous materials that make up the bulk of most plant matters can be allowed as a result of new technology development. With regard to processing methods, bio-ethanol can be produced by gasification systems other than fermentation systems. Such systems use high temperature and a low-oxygen environment to convert biomass into synthesis gas, a mixture of hydrogen and carbon monoxide. The synthesis gas can then be chemically converted into ethanol

and other fuels. Bio-ethanol is mostly used as blending agent with gasoline to increase octane and cut down carbon monoxide as well as other smog-causing emissions. In recent three years from 2007 to 2009, the total production of bio-ethanol over the world increased from 49.57 million kiloliters to 73.95 million kiloliters as shown in Table B2.2.1.

Table B2.2.1 Bio-ethanol Production by Country from 2007 to 2009

Country	2007 (1,000 kiloliters)	2008 (1,000 kiloliters)	2009 (1,000 kiloliters)	Average Annual Growth Rate (%)
USA	40,125	34,069	24,601	31.6
Brazil	24,900	24,499	18,999	15.5
EU	3,937	2,778	2,158	41.2
China	2,052	1,900	1,840	5.8
Thailand	1,647	341	299	225.4
Canada	1,102	901	799	19.0
India	348	250	201	36.6
Colombia	314	299	284	5.3
Australia	216	98	98	60.2
Other countries	937	485	295	108.8
Total	73,948	65,620	49,574	24.6

Source: RFA (Renewable Fuels Association) USA

In 2010, the total bio-ethanol production in the world went up to 86.86 million kiloliters with a share of 59.8% by North and Central America, 31.0% by South America, 5.3% by EC, 3.4% by Asia, 0.3% by Oceania and 0.2% by Africa. The bio-ethanol production by the top three producing countries is 50.16 million kiloliters by USA, 26.20 million kiloliters by Brazil and 4.46 million kiloliters by EC.

Bio-diesel is made by combining alcohol, usually methanol, with vegetable oil, animal fat or recycled cooking grease. It can be used as an additive, typically 20%, to reduce vehicle emissions or as a renewable alternative fuel for diesel engines in its pure form. Microorganisms using the sun's energy to combine carbon dioxide with water can create biomass more efficiently and rapidly than terrestrial plants. Although the production of liquid transportation fuels in a process of microorganism is still an experimental stage, oil-rich microalgae strains are capable of producing the feedstock for a number of transportation fuels such as biodiesel, green diesel, gasoline and jet fuel, while mitigating the effect of carbon dioxide released from sources such as power plants.

At present, bio-diesel producing areas are concentrated in EU member countries, as diesel is the main fuel source of vehicle transportation. The total bio-diesel production in Europe was 1.07 million tons in 2002 and reached 9.57 million tons in 2010 as shown in Table B2.2.2.

Table B2.2.2 Bio-diesel Production by Country from 2004 to 2010

Country	2004 (1,000 t)	2005 (1,000 t)	2006 (1,000 t)	2007 (1,000 t)	2008 (1,000 t)	2009 (1,000 t)	2010 (1,000 t)
Germany	1,035	1,669	2,662	2,890	2,819	2,539	2,861
France	348	492	743	872	1,815	1,959	1,910
Spain	13	73	99	168	207	859	925
Italy	320	396	447	363	595	737	706
Belgium	0	1	25	166	277	416	435
Other countries	217	553	914	1,254	2,042	2,536	2,733
Total	1,933	3,184	4,890	5,713	7,755	9,046	9,570

Source: European Bio-ethanol Board

(2) Bio-fuel Production and Utilization Features in Major Countries

The respective countries producing bio-fuels have different sources of raw materials that are the primary crops in each country. Specific features of bio-fuel production and utilization in major countries are summarized in Table B3.1.3.

Table B2.2.3 Specific Features of Bio-fuel Production and Utilization in Major Countries

Country	Product	Raw Materials	Utilization
USA	Bio-ethanol	Maize, grain sorghum	Bio-ethanol mixed gasoline used for gasoline engine driven vehicles
Brazil	Bio-ethanol	Sugarcane juice, Molasses,	Ethanol used for flex engine driven vehicles and export
EU	Bio-diesel	Rape seed, Sunflower seed, crude palm oil imported from Indonesia	Bio-diesel mixed diesel used for diesel engine drive vehicles
	Bio-ethanol	Wheat, maize, sugar beet, rye	Gasoline (bio-ethanol mixed gasoline) used for gasoline engine driven vehicles
India	Bio-ethanol	Molasses	Gasoline mixed with bio-ethanol used for gasoline engine driven vehicles
Thailand	Bio-ethanol	Molasses, Sugarcane juice, Tapioca tips, Cassava	Bio-ethanol mixed gasoline used for gasoline engine driven vehicles

Source: Agriculture and Livestock Industries Corporation, Japan

B2.2.2 Current Situation of Fuel Supply and Consumption in Indonesia

(1) Energy Condition

It is reported by the Ministry of Energy and Mineral Resources that the total energy demand in 2009 was 645 million barrel of oil equivalent (BOE) comprising 51.8% for industry, 30.8% for transportation, 13.1% for household and 4.3% for commercial, while the total energy supply was 1,065 million BOE consisting of 43.0% from oil, 34.4% from coal, 18.5% from natural gas and 4.1% from natural resources energy. The energy condition in 2009 is outlined as follows:

- Public access to energy is still limited as featured by such facts that electrification ratio remained at 66% as of 2008 and inhabitants in rural/remote areas and outer islands generally hardly get access to energy infrastructure;
- Energy consumption is annually growing at an average of 7%, resulting in imbalance with energy supply;
- Dependence on fossil energy is 63% of energy demand, while reserves are limited and 40% of oil consumption is imported;
- Utilization of renewable energy and implementation of energy conservation is not optimal;
- Linkage to environmental issues like mitigation of climate change, carbon trading and the national commitment to reducing emissions 26% by 2020 is indispensable; and
- Funding for the development of energy sector is still very limited.

(2) Fuel Consumption and Supply

The largest user of fuel in Indonesia is transportation sector sharing around 60% of the total fuel demand followed by industry, household and electricity sectors in order as shown in Table B2.2.4.

Table B2.2.4 Fuel Consumption by Sector

Sector	2007		2008	
	(Kiloliter)	(%)	(Kiloliter)	(%)
Industry	12,860,843	24.1	5,203,479	15.2
Electricity	1,735,970	3.3	3,309,124	9.6
Household	9,055,221	17.0	5,043,051	14.7
Transportation	29,576,201	55.6	20,788,075	60.5
Total	53,228,235		34,343,729	

Source: Ministry of Energy and Mineral Resources

Among fuel products sold in the domestic markets as given in Table B2.2.5, diesel has kept the top share reflecting to the composition of fuel consumers.

Table B2.2.5 Fuel Sales by Product

Sector	2007		2008	
	(Kiloliter)	(%)	(Kiloliter)	(%)
Airplane fuel	2,145,054	4.0	-	-
Burner fuel	3,933,074	7.4	2,829,592	8.2
Diesel oil	675,008	1.3	117,646	0.3
Diesel	19,857,945	37.3	14,815,245	43.1
Kerosene	9,099,893	17.1	5,065,977	14.8
Gasoline Octane 88	16,616,343	31.2	11,283,564	32.9
Octane 92	427,671	0.8	121,735	0.4
Octane 95	473,248	0.9	109,970	0.3
Total	53,226,182		34,343,729	

Source: Ministry of Energy and Mineral Resources

B2.2.3 National Bio-fuel Policy

Aiming to realize the President Commitment on G-20 Pittsburgh and COP15 to reduce the emission by 26% in 2020, the energy conservation on demand side and the energy diversification on supply side are focused for setting up core pillars in the policy direction towards the national energy management paradigm as follows:

- Energy conservation is to improve efficiency in energy utilization from upstream up to downstream, that is industrial, transportation, household and commercial sectors; and
- Energy diversification is to increase new renewable energy share of 25% in national energy mix and to contribute to 6% of the President Commitment, that is coal bed methane, liquefied coal, gasified coal, nuclear and hydrogen as new energy resources, and geothermal, bio-energy, hydro, solar energy, wind energy and ocean as renewable energy resources.

To cope with such current global condition, the mandatory of bio-fuel utilization as stipulated by the Minister of Energy and Mineral Resources Regulation No. 32/2008 on Supply, Utilization, Guideline and Procedure for Bio-fuel Business is reduction of fossil fuel import, job creation, poverty alleviation and energy security.

B2.2.4 Bio-fuel Development

(1) Roadmap for Bio-fuel Development

Bio-fuel products are composed of bio-ethanol as gasoline substitute, bio-oil or pure plantation oil as kerosene substitute or fuel oil substitute, and bio-diesel as diesel fuel substitute. Main bio-fuel feed stocks are oil palm and jatropha curcas used for raw materials of bio-diesel and pure plantation oil as well as cassava and sugarcane used for bio-ethanol production. The roadmap for bio-fuel development set up in line with the above Regulation No. 32/2008 is drawn up as shown in Table B2.2.6.

Table B2.2.6 Roadmap for Bio-fuel Development

Product	2005 – 2010	2011 – 2015	2016 – 2025
Bio-diesel	Bio-diesel utilization: 10% of diesel fuel consumption 2.41 million kiloliter	Bio-diesel utilization: 15% of diesel fuel consumption 4.52 million kiloliter	Bio-diesel utilization: 20% of diesel fuel consumption 10.22 million kiloliter
Bio-ethanol	Bio-ethanol use: 5% of gasoline consumption 1.48 million kiloliter	Bio-ethanol use: 10% of gasoline consumption 2.78 million kiloliter	Bio-ethanol use: 15% of gasoline consumption 6.28 million kiloliter
Bio-oil - Bio-kerosene - Pure plantation oil for power plant	Bio-kerosene utilization 1.00 million kiloliter PPO utilization: 0.40 million kiloliter	Bio-kerosene utilization 1.80 million kiloliter PPO utilization: 0.74 million kiloliter	Bio-kerosene utilization 4.07 million kiloliter PPO utilization: 1.69 million kiloliter
Bio-fuel	Bio-fuel utilization: 2% of energy mix 5.29 million kiloliter	Bio-fuel utilization: 3% of energy mix 9.84 million kiloliter	Bio-fuel utilization: 5% of energy mix 22.26 million kiloliter

Source: Indonesia Bio-fuels Policy, Development and Plans, Ministry of Energy and Mineral Resources

(2) Bio-fuel Product Capacity and Supply

As of 2009, a total of 23 bio-diesel factories are currently under operation seven in Sumatra, one in Kalimantan and 15 in Java. The annual total installed capacity of bio-diesel increased from 1,588,300 tons in 2008 to 2,521,000 tons in 2009 and 3,447,000 tons and 329,440 kiloliter in 2010. On the other hand, the actual supply of bio-diesel was 723,300 tons in 2008 and 1,121,000 tons in 2009. In Indonesia, CPO of more than 18 million tons was produced for 2009, of which around 5 million tons were consumed for food in domestic markets and more than 10 million tons were exported. As around 2 to 3 million tons were used as raw materials of bio-diesel, therefore, bio-diesel production will not obstruct food security in Indonesia.

There exist seven commercial bio-ethanol factories throughout the country, comprising two in Sumatra, four in Java and one in Sulawesi, with a total installed capacity of 286,686 kiloliter/year. These factories use molasses as raw materials for producing bio-ethanol.

(3) Bio-fuel Production and Consumption

The actual situation of bio-fuel production, consumption and trade for the period of RPJM 2005-2009 is given in Table B2.2.7.

Table B2.2.7 Bio-fuel Production, Consumption and Trade for 2005-2009

Item	Bio-diesel (1,000 t)					Bio-ethanol (1,000 t)				
	2005	2006	2007	2008	2009	2005	2006	2007	2008	2009
Beginning stocks	0	0	0	0	0	0	0	0	0	0
Production	8	70	100	90	80	0	0	10	8	8
Imports	0	0	0	0	0	0	0	0	0	0
Total supply	8	70	100	90	80	0	0	10	8	8
Exports	6	46	80	80	70	0	0	0	0	0
Consumption	2	24	20	10	10	0	0	10	8	8
Ending stocks	0	0	0	0	0	0	0	0	0	0

Source: Grain Report Number: ID9017, 2009, USDA

B2.2.5 Possibility of Growing Bio-fuel Crops in Irrigation Service Areas

In line with the national bio-fuel crop policy, candidate biomasses for producing bio-diesel are oil palm and jatropha, while those for producing bio-ethanol are sugarcane and cassava in Indonesia. The possibility of growing these candidate crops in the existing irrigation service areas is examined from the technical viewpoint as follows:

- Oil palm is a permanent crop suitable for growing in a swampy area and easy to be planted without irrigation water supply. Even though many small holders have participated in oil palm planting under government support programs, most of them are migrants in either swamp areas or coastal areas. Due to sharply fluctuated CPO price in international markets, the existing bio-diesel factories have been confronted with by high and unstable raw material cost. From such point of view, therefore, oil palm is not a recommendable crop for converting irrigated paddy fields to permanent oil palm planting fields;
- Jatropha is also a permanent crop suitable for growing under dry weather condition and does not require sacrificing food crops such as oil from soybeans and corn. Although it is said that jatropha fits the Indonesian model of many small-scale producers quite well and has unique ability to adapt its environment and produce 30% to 40% oil content from its seeds, the biggest obstacle standing in the way of jatropha development in Indonesia is inconsistent yields due to uneven ripening times and variations in seeds and oil content. Also because of its low profits, a practically non-existent export market and inadequate infrastructure for production, Indonesia's expectation in jatropha is not high. Considering such condition, Jatropha is not recommendable for its planting on irrigated paddy field;
- Sugarcane is a profitable raw material for producing bio-ethanol from molasses as its residual made in refinery processing. In Indonesia, sugarcane can be grown under the both rain-fed and irrigated conditions, but the period from planting to harvesting is 12 months under irrigated condition and 13 to 14 months under rain-fed condition for securing the required level of sucrose content. As sugarcane must be processed within 24 hours after harvested, however, the existence of a sugar mill with extra processing capacity nearby sugarcane growing areas is indispensable. In irrigation service areas where all the conditions required for growing sugarcane are available, it is recommended to switch a 2-year rotation cropping pattern in combination with wet and dry season paddy cultivation; and
- Cassava is a very popular food crop in Indonesia as farmers appreciate its easy crop

management practices, suitability for dry season cultivation as well as recently increasing market demand by feed and food processing industries. At present, commercial fermenting technology for producing bio-ethanol by utilizing residuals after separating starch from cassava is still under experimental stage in the world so that cassava is still a potential crop in the future.

B2.3 Freshwater Fish Culture

B2.3.1 Outline of Fish Culture in Indonesia

In Indonesia, the total fish production during the period of RPJM 2005-2009 increased from 6.87 million tons in 2005 to 10.07 million tons in 2009 with an average annual growth rate of 9.3%. About aquaculture, its share of the above fish production sharply went up from 31.5% in 2005 to 47.5% in 2009. The aquaculture systems in Indonesia consist of marine water pond, brackish water pond, freshwater pond, cage, floating cage net and paddy field mixed culture. The area and production of aquaculture for the the period of 2005-2009 are given in Table B2.3.1.

Table B2.3.1 Aquaculture Production and Area for 2005-2009

Unit: Area; ha and Production; 1,000 t

Culture practice	2005		2006		2007		2008		2009
	Area	Product	Area	Product	Area	Product	Area	Product	Product
Marine	62,629	890	74,543	1,366	84,481	1,509	87,790	1,966	2,437
Brackish water	512,524	644	486,982	630	452,901	934	613,175	959	1,181
Freshwater	107,785	332	90,320	382	105,127	410	241,891	479	594
Cage	401	68	320	56	433	64	207	76	94
Floating cage net	966	109	921	143	1,058	191	736	263	336
Paddy field	125,886	120	119,069	106	118,320	85	127,944	112	138
Total	810,191	2,163	772,155	2,683	762,320	3,193	1,071,743	3,855	4,780

Source: BPS

B2.3.2 Policy Background

There is potential for development of fishing in public waters, marine cultivation consisting of: fish farming and seaweed farming; brackish water pond; fresh water culture composed of public waters (lakes, reservoirs, rivers and wetlands), freshwater ponds and paddy fields; marine biotechnology for development of marine biotechnology industries.

The program for improvement of aquaculture production under the Strategic Plan 2010-2014 aims to increase aquaculture production in volume and value. To achieve this target, activities to be implemented are:

- Development of fish culture production system;
- Development of fish seed system;
- Development of infrastructure and facilities of fish culture system;
- Development of fish culture business system;
- Development of fish health and environment of fish culture system;
- Beginning and application of adaptive applied technology of aquaculture; and

- Enhanced support for management and implementation of the other Technical Task of Directorate General of Aquaculture.

For the period of 2010-2014, the total aquaculture production is predicted to increase 5,376,200 tons in 2010 to 16,891,000 tons in 2014 with the average annual growth rate of 42.8%.

B2.3.3 Freshwater Fish Culture Potential in Batang Hari Irrigation Area

(1) Current Freshwater Fish Production

In Timpeh, Sitiung, Padang Laweh, Tiumang, Koto Baru, and Koto Salak Sub-districts where the Batang Hari Irrigation area is located, there exist freshwater fish ponds of 242 ha and mixed fish cultured paddy fields of 17.7 ha covering 61.6% and 73.1%, respectively, of the total fish culture area in Dharmasraya District. The production in 2009 was 379-ton *Ikan Nila*, 334-ton *Ikan Mas* and 128-ton *Ikan Lele* sharing 54.4%, 72.5% and 43.2%, respectively.

(2) Freshwater Fish Culture Development Potential

The present land use condition in the Batang Hari Irrigation area comprises 6,370.51 ha for irrigated paddy field, 619 ha for rain-fed paddy field, 375 ha for freshwater fish culture ponds, 2,956 ha for swamp areas and 9,834 ha for estate crop field. Housing areas and gardens/upland fields are excluded. Of these land use categories, the swamp areas are mainly distributed in valley bottoms in which development of paddy field is difficult due to very poor drainage condition. Instead, there is a potential for freshwater fish culture development from the viewpoint of land resource availability by means of converting some parts of the above swamp areas located not so far from irrigation canals to candidate sites.

Usually harvesting time of a freshwater fish culture pond is once or twice a year corresponding to the growth period of fish species up to marketable size. In this connection, fish pond owners contact middlemen or buyers in order to let them know harvesting schedule. Negotiation of selling prices between the both sides is to be made at fish pond side based on species, quantity and quality of harvested fishes. Unless the vehicle access condition is not limited, therefore, marketing of harvested fishes of freshwater fish ponds can be carried out in remote areas. As the existing Trans-Sumatra Highway runs through Batang Hari Irrigation Project area, there is also a potential for freshwater fish culture development from the market access point of view.

(3) Freshwater Fish Culture Production Target of Dharmasraya District for 2010-2014

According to the fishery sector development plan for the Second National Medium Development Plan period (2010-2014) prepared by the Marine and Fisheries Service of West Sumatra Province, the target production of freshwater fish culture in Dharmasraya District is set up as shown in Table B2.3.2.

(4) Freshwater Fish Pond Development in in Batang Hari Irrigation Area

Aiming to realize the freshwater fish culture production targets during the period of 2010-2014, freshwater fish ponds are planned to be developed at 40 new sites with a total area of 443 ha distributed throughout the Batang Hari Irrigation area. At present, these candidate sites are swamp areas situated in inland valleys and bottom areas that are not suitable for opening paddy fields.

Table B2.3.2 Freshwater Fish Culture Production Target of Dharmasraya District

Unit: ton

Fish Species	2009	2010	2011	2012	2013	2014
Ikan Nila	292	1,005	3,212	6,424	10,069	16,224
Ikan Mas	569	694	1,264	2,555	3,851	5,317
Ikan Gurami	15	78	97	145	188	225
Ikan Lele	82	402	643	1,060	1,749	2,623
Ikan Pati	50	474	867	1,517	2,882	4,611
Ikan Lainnya	40	160	180	200	220	250
Total	1,048	2,813	6,263	11,901	18,959	29,250

Source: Dinas Kelautan dan Perikanan, Sumatera Barat

(4) Freshwater Fish Pond Development in in Batang Hari Irrigation Area

Aiming to realize the freshwater fish culture production targets during the period of 2010-2014, freshwater fish ponds are planned to be developed at 40 new sites with a total area of 443 ha distributed throughout the Batang Hari Irrigation area. At present, these candidate sites are swamp areas situated in inland valleys and bottom areas that are not suitable for opening paddy fields.

Concerning water supply quantity from irrigation canal, DGWR Balai Sumatera VI temporarily sets 12.0 lit/sec. From the operational viewpoint of freshwater fish ponds, it is required to dry up a pond after harvesting for cleaning out leftovers deposited on pond bottom usually once every fish culture period of 150 days. Assuming that water depth of fish pond is 1.5 m, the water requirement becomes 15,000 m³/ha that is equivalent to 1.16 L/s/ha during the one fish culture period. Also, evaporation from pond surface, percolation loss from pond bottom and water conveyance loss from canals are assumed to be almost the same level of irrigation water requirement of 1.65 L/s/ha, a total of 4.5 L/s/ha annually is needed to be supplied to 1-ha size of fish pond in which fish culture is operated twice a year. In order to keep oxygen contents of water, there are two measures such as supply of flowing water and use of aeration equipment. The former is a prerequisite for culturing fish species that require a clean stream, while the latter is a practical system with a wide range of suitability for water quality like high turbidity water of the Batang Hari River.

Considering popular freshwater fish species like carp, tilapia and catfish cultured in lowland areas of Indonesia, the former measure is not necessary. Especially in case of Batang Hari, it increases the cost of cleaning out the deposited leftovers as well as sediment soils, while the latter measure is more effective and economically operated. It is therefore recommended to reconsider this unit water supply quantity by referring to on-going cases in other irrigation areas such as Komerang Irrigation area in South Sumatra where 6.0 L/s/ha is diverted from an irrigation canal to a fish culture pond with the official permission from DGWR.

(5) Expected Profitability

Based on expected yield and on-site selling prices, the gross income and net income are estimated as shown in Table B2.3.3 and the fish culture budget by fish species is compiled in Annex B2,3,1.

Table B2.3.3 Expected Profitability of Freshwater Fish Culture

Item	Unit	Ikan Nila	Ikan Mas	Ikan Gurami	Ikan Lele	Ik. Lainnya
Yield	kg/ha	24,000	800	4,250	10,625	20,000
On-farm selling price	Rp/kg	11,000	13,000	25,000	12,000	10,000
Gross income	Rp/ha	264,000,000	10,400,000	97,750,000	127,500,000	200,000,000
Culture cost	Rp/ha	185,400,000	7,400,000	62,900,000	104,150,000	148,470,000
Net income	Rp/ha	78,600,000	3,000,000	34,850,000	23,350,000	51,530,000

Source: Dinas Perikanan, Kabupaten Cirebon

Annex B

Annex B1.1.1 Paddy Field Areas by Province during the 2000s

(unit: ha)

Page AB-1	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Aceh	300,128	288,574	288,574	348,232	346,305	356,649	315,277	312,803	323,010	359,751
North Sumatra	517,483	524,649	471,249	538,180	502,839	462,767	460,486	453,372	478,521	464,256
West Sumatra	230,696	229,641	244,406	225,369	231,939	228,176	229,469	227,355	225,623	228,176
Riau	118,187	111,935	111,935	128,225	125,966	118,955	124,985	128,242	122,255	122,738
Jambi	142,980	141,245	128,069	120,552	122,126	117,482	119,242	117,543	116,212	116,497
South Sumtra	430,454	439,668	459,240	512,510	474,429	484,207	523,922	530,204	577,821	611,072
Bengkulu	81,259	83,113	88,362	88,432	85,641	84,164	83,885	93,779	89,244	89,614
Lampung	288,612	278,135	310,812	303,380	316,017	313,621	317,413	342,507	348,732	349,144
Kep. Bangka Belitung	2,440	979	1,815	3,186	3,773	4,111	4,048	4,176	3,506	5,017
Kepulauan Riau	0	0	0	0	0	76	82	124	133	238
<i>Sumtra Total</i>	<i>2,112,239</i>	<i>2,097,939</i>	<i>2,104,462</i>	<i>2,268,066</i>	<i>2,209,035</i>	<i>2,170,208</i>	<i>2,178,809</i>	<i>2,210,105</i>	<i>2,285,057</i>	<i>2,346,503</i>
DKI Jakarta	2,895	2,866	2,866	2,738	2,563	1,866	1,466	1,200	1,200	1,215
West Java	944,002	924,871	913,355	934,140	932,337	925,900	926,782	934,845	945,544	937,426
Central Java	991,154	991,251	985,810	995,469	996,197	964,102	963,401	962,942	963,984	960,768
DI Yogyakarta	58,834	58,542	58,253	57,612	56,982	57,188	56,218	55,540	55,332	55,325
East Java	1,154,536	1,159,592	1,147,007	1,115,239	1,108,361	1,100,574	1,096,479	1,096,605	1,108,578	1,100,517
Bantaen	192,970	202,046	209,286	207,530	196,589	194,504	196,538	196,370	195,583	195,809
<i>Java Total</i>	<i>3,344,391</i>	<i>3,339,168</i>	<i>3,316,577</i>	<i>3,312,728</i>	<i>3,293,029</i>	<i>3,244,134</i>	<i>3,240,884</i>	<i>3,247,502</i>	<i>3,270,221</i>	<i>3,251,060</i>
Bali	85,128	85,525	82,238	81,870	81,557	80,211	79,252	80,251	80,873	79,185
West Nusa Tenggara	198,485	214,576	218,496	226,627	222,968	225,708	232,851	231,129	230,986	236,420
East Nusa Tenggara	114,233	113,276	117,813	103,341	109,070	100,194	112,715	122,649	124,161	134,195
<i>Bali Nusa Total</i>	<i>397,846</i>	<i>413,377</i>	<i>418,547</i>	<i>411,838</i>	<i>413,595</i>	<i>406,113</i>	<i>424,818</i>	<i>434,029</i>	<i>436,020</i>	<i>449,800</i>
West Kalimantan	279,495	287,013	299,381	253,316	283,021	292,220	321,838	290,392	292,687	300,906
Central Kalimantan	177,810	182,556	168,717	156,645	167,776	159,516	166,703	159,059	157,406	171,428
South Kalimantan	402,935	415,828	420,377	420,086	423,884	435,940	440,720	471,042	477,336	464,581
East Kalimantan	108,187	106,768	119,950	92,982	89,769	88,846	90,786	92,934	84,235	88,308
<i>Kalimantan Total</i>	<i>968,427</i>	<i>992,165</i>	<i>1,008,425</i>	<i>923,029</i>	<i>964,450</i>	<i>976,522</i>	<i>1,020,047</i>	<i>1,013,427</i>	<i>1,011,664</i>	<i>1,025,223</i>
North Sulawesi	56,197	61,205	63,871	64,605	59,393	57,969	60,262	61,098	61,133	61,134
Central Sulawesi	133,593	128,023	120,960	121,670	120,049	113,715	119,463	128,250	129,016	130,879
South Sulawesi	684,545	661,273	628,519	619,084	626,634	558,935	552,940	560,989	567,520	565,595
Southeast Sulawesi	67,593	64,075	65,060	66,939	69,432	73,646	62,286	65,338	82,806	89,601
Gorontalo	22,508	22,508	22,427	27,598	25,955	25,561	25,668	27,794	31,327	29,062
West Sulawesi	0	0	0	0	0	60,531	48,884	50,800	53,220	56,056
<i>Sulawesi Total</i>	<i>964,436</i>	<i>937,084</i>	<i>900,837</i>	<i>899,896</i>	<i>901,463</i>	<i>890,357</i>	<i>869,503</i>	<i>894,269</i>	<i>925,022</i>	<i>932,327</i>
Maluku	8,401	8,401	8,401	8,401	8,542	8,542	8,657	10,035	11,461	11,281
North Maluku	11,867	11,867	11,867	11,867	11,867	11,867	11,867	11,782	13,630	8,890
West Papua	4,719	4,719	4,719	4,719	6,290	7,051	7,735	8,395	9,116	9,249
Papua	36,021	36,021	36,021	36,021	36,021	28,970	28,970	26,397	29,018	27,454
<i>Maluku Papua Total</i>	<i>61,008</i>	<i>61,008</i>	<i>61,008</i>	<i>61,008</i>	<i>62,720</i>	<i>56,430</i>	<i>57,229</i>	<i>56,609</i>	<i>63,225</i>	<i>56,874</i>
Indonesia Total	7,848,347	7,840,741	7,809,856	7,876,565	7,844,292	7,743,764	7,791,290	7,855,941	7,991,209	8,061,787

Source: Source: Luas Lahan Menurut Penggunaan 2009

Annex B1.1.2 Dry Field and Garden Field Areas by Province during the 2000s

(unit: ha)

Province	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Aceh	482,347	408,885	408,885	344,407	430,568	447,987	441,557	444,788	500,670	494,573
North Sumatra	503,590	724,849	373,380	376,436	469,569	486,538	415,376	429,994	446,190	480,133
West Sumatra	365,367	318,338	326,448	352,572	308,743	311,627	279,537	295,195	289,668	329,528
Riau	485,181	547,873	547,873	547,272	445,123	556,038	505,886	669,498	563,471	561,039
Jambi	354,661	334,056	408,706	403,568	406,906	406,578	405,300	373,465	363,031	383,581
South Sumtra	336,355	348,200	344,712	363,277	377,193	428,507	458,981	471,297	437,943	426,346
Bengkulu	203,628	211,041	208,635	172,479	152,562	183,942	185,912	184,039	180,750	172,754
Lampung	507,036	709,874	727,856	773,220	794,777	779,621	805,011	820,947	814,919	791,362
Kep. Bangka Belitung	117,695	107,253	106,627	144,512	142,814	136,913	133,609	128,881	134,870	120,402
Kepulauan Riau	0	0	0	0	0	65,586	68,066	49,195	47,104	44,352
<i>Sumtra Total</i>	<i>3,355,860</i>	<i>3,710,369</i>	<i>3,453,122</i>	<i>3,477,743</i>	<i>3,528,255</i>	<i>3,803,337</i>	<i>3,699,235</i>	<i>3,867,299</i>	<i>3,778,616</i>	<i>3,804,070</i>
DIK Jakarta	1,882	1,901	1,901	1,048	1,026	1,009	997	980	984	949
West Java	667,619	620,324	614,979	613,203	604,233	605,963	548,182	610,660	576,565	563,015
Central Java	755,394	763,735	759,931	763,246	759,028	752,842	744,343	741,677	732,102	730,370
DI Yogyakarta	99,263	99,183	97,346	97,559	95,912	95,574	94,772	98,773	96,061	95,762
East Java	1,160,249	1,151,928	1,137,203	1,141,014	1,138,376	1,118,596	1,123,429	1,125,567	1,118,717	1,131,247
Bantaen	176,226	185,273	191,160	184,999	174,292	171,927	180,817	181,786	185,371	170,267
<i>Java Total</i>	<i>2,860,633</i>	<i>2,822,344</i>	<i>2,802,520</i>	<i>2,801,065</i>	<i>2,772,867</i>	<i>2,745,911</i>	<i>2,692,540</i>	<i>2,759,443</i>	<i>2,709,800</i>	<i>2,691,610</i>
Bali	129,429	122,988	128,594	128,996	129,124	133,547	137,258	138,235	136,796	133,067
West Nusa Tenggara	170,289	187,745	198,205	200,061	194,206	207,648	213,504	227,755	227,208	241,606
East Nusa Tenggara	401,531	441,958	465,014	428,822	427,967	451,671	494,439	533,739	513,161	501,591
<i>Bali Nusa Total</i>	<i>701,249</i>	<i>752,691</i>	<i>791,813</i>	<i>757,879</i>	<i>751,297</i>	<i>792,866</i>	<i>845,201</i>	<i>899,729</i>	<i>877,165</i>	<i>876,264</i>
West Kalimantan	523,837	459,525	466,712	513,951	544,479	571,343	554,513	447,617	445,379	472,534
Central Kalimantan	305,138	323,511	503,622	379,148	408,926	437,966	433,427	317,154	345,504	378,374
South Kalimantan	191,143	178,176	183,719	191,373	215,794	265,049	270,844	262,021	267,726	275,271
East Kalimantan	115,400	134,512	224,131	231,687	488,410	226,780	280,897	267,934	225,259	205,701
<i>Kalimantan Total</i>	<i>1,135,518</i>	<i>1,095,724</i>	<i>1,378,184</i>	<i>1,316,159</i>	<i>1,657,609</i>	<i>1,501,138</i>	<i>1,539,681</i>	<i>1,294,726</i>	<i>1,283,868</i>	<i>1,331,880</i>
North Sulawesi	189,097	331,150	253,520	253,520	257,134	250,625	239,005	238,826	205,543	205,543
Central Sulawesi	202,338	327,293	356,154	342,120	349,667	358,464	380,547	559,615	560,778	555,258
South Sulawesi	558,501	564,367	560,362	587,373	635,187	516,283	532,637	525,431	542,006	561,384
Southeast Sulawesi	206,555	207,749	190,737	191,933	192,291	202,117	216,306	190,896	213,524	209,068
Gorontalo	81,606	81,606	82,324	104,950	88,504	96,212	103,703	116,872	132,644	136,160
West Sulawesi	0	0	0	0	0	49,108	79,754	70,659	74,652	83,386
<i>Sulawesi Total</i>	<i>1,238,097</i>	<i>1,512,165</i>	<i>1,443,097</i>	<i>1,479,896</i>	<i>1,522,783</i>	<i>1,472,809</i>	<i>1,551,952</i>	<i>1,702,299</i>	<i>1,729,147</i>	<i>1,750,799</i>
Maluku	614,387	614,387	614,387	614,387	812,940	808,140	804,599	1,324,629	1,324,543	1,289,909
North Maluku	144,368	144,368	144,368	144,368	144,368	144,368	144,368	199,497	201,531	202,585
West Papua	597	597	597	597	597	597	1,246	1,346	6,052	6,052
Papua	463,456	463,456	463,456	463,456	463,456	236,514	236,514	233,305	328,021	328,021
<i>Maluku Papua Total</i>	<i>1,222,808</i>	<i>1,222,808</i>	<i>1,222,808</i>	<i>1,222,808</i>	<i>1,421,361</i>	<i>1,189,619</i>	<i>1,186,727</i>	<i>1,758,777</i>	<i>1,860,147</i>	<i>1,826,567</i>
Indonesia Total	10,514,165	11,116,101	11,091,544	11,055,554	11,654,172	11,505,680	11,515,336	12,282,273	12,238,743	12,281,190

Source: Source: Luas Lahan Menurut Penggunaan 2009

Annex B1.1.3 Shifting Cultivation Areas by Province during the 2000s

(unit: ha)

Province	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Aceh	299,282	255,902	255,902	251,189	271,470	248,615	238,383	255,024	272,382	270,893
North Sumatra	253,680	293,139	233,951	226,778	227,497	326,458	327,496	371,924	391,466	393,205
West Sumatra	141,946	101,181	146,748	126,724	127,085	125,433	136,563	151,022	136,043	132,240
Riau	93,291	115,001	115,001	95,651	91,367	162,674	160,257	174,987	189,973	193,796
Jambi	211,084	186,197	181,788	201,269	202,293	197,469	199,141	173,459	185,212	200,921
South Sumtra	265,065	255,872	253,331	275,353	242,514	233,215	243,860	250,125	232,137	225,202
Bengkulu	78,629	78,188	83,758	69,093	96,820	91,146	86,461	91,350	88,296	81,571
Lampung	336,579	152,394	104,535	0	0	0	0	0	0	0
Kep. Bangka Belitung	21,328	11,190	11,353	11,667	10,119	24,115	25,382	34,775	33,762	45,830
Kepulauan Riau	0	0	0	0	0	24,392	25,695	24,703	23,563	33,965
<i>Sumtra Total</i>	<i>1,700,884</i>	<i>1,449,064</i>	<i>1,386,367</i>	<i>1,257,724</i>	<i>1,269,165</i>	<i>1,433,517</i>	<i>1,443,238</i>	<i>1,527,369</i>	<i>1,552,834</i>	<i>1,577,623</i>
DIK Jakarta	33	33	0	0	0	0	0	0	0	25
West Java	133,589	143,225	172,218	171,156	182,849	201,909	243,435	239,498	221,749	234,072
Central Java	5,889	5,769	8,391	9,811	9,587	10,642	12,205	10,341	13,346	13,413
DI Yogyakarta	322	322	322	322	322	322	0	0	0	0
East Java	31,876	59,249	32,898	21,124	2,596	12,770	12,774	18,106	31,953	42,564
Bantaen	80,028	75,947	74,257	72,801	75,708	88,125	92,938	85,000	88,435	85,878
<i>Java Total</i>	<i>251,737</i>	<i>284,545</i>	<i>288,086</i>	<i>275,214</i>	<i>271,062</i>	<i>313,768</i>	<i>361,352</i>	<i>352,945</i>	<i>355,483</i>	<i>375,952</i>
Bali	0	0	0	0	0	0	4	4	0	0
West Nusa Tenggara	42,481	49,520	53,895	44,919	53,487	46,237	36,462	44,653	46,559	45,102
East Nusa Tenggara	329,790	307,636	307,477	307,889	335,433	322,327	298,608	325,537	323,646	332,939
<i>Bali Nusa Total</i>	<i>372,271</i>	<i>357,156</i>	<i>361,372</i>	<i>352,808</i>	<i>388,920</i>	<i>368,564</i>	<i>335,074</i>	<i>370,194</i>	<i>370,205</i>	<i>378,041</i>
West Kalimantan	281,930	237,195	242,003	280,474	297,873	262,189	222,300	252,394	261,945	279,431
Central Kalimantan	151,215	160,372	254,347	259,194	225,349	232,454	223,504	247,804	218,446	253,960
South Kalimantan	146,167	128,896	117,185	130,695	116,629	127,612	105,525	100,567	154,346	149,728
East Kalimantan	143,562	141,976	216,698	158,540	423,649	133,574	147,361	149,486	177,523	151,610
<i>Kalimantan Total</i>	<i>722,874</i>	<i>668,439</i>	<i>830,233</i>	<i>828,903</i>	<i>1,063,500</i>	<i>755,829</i>	<i>698,690</i>	<i>750,251</i>	<i>812,260</i>	<i>834,729</i>
North Sulawesi	132,131	111,000	101,578	101,578	90,545	108,150	106,273	104,864	114,903	114,904
Central Sulawesi	182,329	140,096	198,454	183,557	168,622	344,963	229,232	208,189	206,012	213,112
South Sulawesi	153,971	144,970	170,705	149,748	136,017	97,520	90,862	90,412	96,474	102,217
Southeast Sulawesi	83,963	81,629	89,399	96,562	92,067	106,793	122,268	110,498	115,567	125,794
Gorontalo	45,767	45,767	69,061	41,066	71,427	79,678	70,132	66,591	69,619	76,606
West Sulawesi	0	0	0	0	0	23,193	40,885	42,334	39,856	46,016
<i>Sulawesi Total</i>	<i>598,161</i>	<i>523,462</i>	<i>629,197</i>	<i>572,511</i>	<i>558,678</i>	<i>760,297</i>	<i>659,652</i>	<i>622,888</i>	<i>642,431</i>	<i>678,649</i>
Maluku	176,296	176,296	176,296	176,296	278,256	271,228	267,316	310,323	310,311	309,903
North Maluku	84,353	84,353	84,353	84,353	84,353	84,353	84,353	65,383	68,000	69,205
West Papua	718,602	718,602	718,602	718,602	738,976	738,976	757,998	758,018	758,018	758,018
Papua	1,239,983	1,239,983	1,239,983	1,239,983	1,239,983	501,007	501,007	458,681	471,244	471,244
<i>Maluku Papua Total</i>	<i>2,219,234</i>	<i>2,219,234</i>	<i>2,219,234</i>	<i>2,219,234</i>	<i>2,341,568</i>	<i>1,595,564</i>	<i>1,610,674</i>	<i>1,592,405</i>	<i>1,607,573</i>	<i>1,608,370</i>
Indonesia Total	5,865,161	5,501,900	5,714,489	5,506,394	5,892,893	5,227,539	5,108,680	5,216,052	5,340,786	5,453,364

Source: Source: Luas Lahan Menurut Penggunaan 2009

Annex B1.1.4 Temporarily Unused Areas by Province during the 2000s

(unit: ha)

Province	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Aceh	241,075	177,813	177,813	301,246	295,326	290,559	378,951	263,005	57,571	372,863
North Sumatra	377,350	485,367	231,475	243,715	241,497	316,337	286,045	301,695	320,613	285,824
West Sumatra	77,661	74,979	94,111	135,727	153,850	150,194	181,659	181,826	261,639	323,118
Riau	427,762	272,718	272,718	372,209	502,793	503,459	506,304	575,892	449,940	461,747
Jambi	204,155	231,906	294,903	348,943	302,147	376,032	457,695	413,632	371,822	326,753
South Sumtra	383,949	334,219	351,204	547,268	722,183	675,318	678,490	763,301	737,953	654,233
Bengkulu	181,862	185,102	181,257	165,235	158,802	181,359	145,105	238,483	311,580	150,357
Lampung	137,804	93,339	97,198	96,811	86,792	100,647	56,650	83,803	84,988	84,521
Kep. Bangka Belitung	240,668	81,406	81,444	110,294	121,736	129,423	121,429	112,636	112,019	134,587
Kepulauan Riau	0	0	0	0	0	217,056	202,869	185,127	170,410	161,265
<i>Sumtra Total</i>	<i>2,272,286</i>	<i>1,936,849</i>	<i>1,782,123</i>	<i>2,321,448</i>	<i>2,585,126</i>	<i>2,940,384</i>	<i>3,015,197</i>	<i>3,119,400</i>	<i>2,878,535</i>	<i>2,955,268</i>
DIK Jakarta	715	479	479	0	0	0	0	0	0	9
West Java	16,747	17,788	20,326	12,270	10,281	11,300	11,447	32,447	12,487	12,957
Central Java	2,844	2,686	2,633	6,022	4,896	4,874	5,114	1,819	1,772	1,628
DI Yogyakarta	991	782	772	682	675	675	535	1,196	1,147	1,079
East Java	18,984	19,088	6,509	9,574	9,067	12,990	12,105	13,874	16,644	11,788
Bantaen	25,132	26,059	28,286	26,135	24,406	23,282	30,103	30,656	23,287	19,644
<i>Java Total</i>	<i>65,413</i>	<i>66,882</i>	<i>59,005</i>	<i>54,683</i>	<i>49,325</i>	<i>53,121</i>	<i>59,304</i>	<i>79,992</i>	<i>55,337</i>	<i>47,105</i>
Bali	489	1,342	458	490	445	599	478	268	265	120
West Nusa Tenggara	161,381	76,772	58,955	56,125	56,790	57,277	55,441	54,434	53,977	53,517
East Nusa Tenggara	709,318	707,927	686,473	826,765	832,368	827,549	860,994	801,680	801,050	751,173
<i>Bali Nusa Total</i>	<i>871,188</i>	<i>786,041</i>	<i>745,886</i>	<i>883,380</i>	<i>889,603</i>	<i>885,425</i>	<i>916,913</i>	<i>856,382</i>	<i>855,292</i>	<i>804,810</i>
West Kalimantan	1,697,658	1,700,038	1,710,023	1,686,953	1,894,462	1,625,318	1,676,585	1,773,913	1,604,716	1,347,614
Central Kalimantan	1,763,980	2,199,875	1,287,513	881,845	812,083	773,694	936,319	884,590	964,630	911,286
South Kalimantan	747,443	216,969	230,924	248,953	276,311	272,511	235,457	251,096	188,102	179,871
East Kalimantan	1,269,664	1,393,614	1,787,289	1,466,375	2,088,264	1,487,906	1,299,378	1,406,138	1,207,599	1,392,699
<i>Kalimantan Total</i>	<i>5,478,745</i>	<i>5,510,496</i>	<i>5,015,749</i>	<i>4,284,126</i>	<i>5,071,120</i>	<i>4,159,429</i>	<i>4,147,739</i>	<i>4,315,737</i>	<i>3,965,047</i>	<i>3,831,470</i>
North Sulawesi	44,700	44,751	44,386	44,386	48,327	42,661	48,997	43,576	48,195	48,195
Central Sulawesi	505,521	448,440	417,468	578,668	703,791	758,326	726,156	609,772	611,224	600,323
South Sulawesi	190,494	243,533	163,385	183,522	195,845	122,251	133,610	118,686	85,800	88,870
Southeast Sulawesi	259,449	272,711	277,325	281,692	256,733	300,487	306,248	200,718	128,888	158,731
Gorontalo	32,619	32,619	29,292	111,912	116,004	97,242	106,921	101,890	106,333	91,406
West Sulawesi	0	0	0	0	0	42,234	78,679	65,779	87,450	84,872
<i>Sulawesi Total</i>	<i>1,032,783</i>	<i>1,042,054</i>	<i>931,856</i>	<i>1,200,180</i>	<i>1,320,700</i>	<i>1,363,201</i>	<i>1,400,611</i>	<i>1,140,421</i>	<i>1,067,890</i>	<i>1,072,397</i>
Maluku	699,429	699,429	699,429	699,429	798,811	780,128	773,622	864,327	863,259	871,302
North Maluku	20,701	20,701	20,701	20,701	20,701	20,701	20,701	18,495	18,495	18,814
West Papua	2,242,975	2,242,975	2,242,975	2,242,975	2,214,220	2,211,714	2,145,992	2,145,332	2,145,010	2,144,922
Papua	5,471,093	5,471,093	5,471,093	5,471,093	5,471,093	3,259,379	3,259,379	3,155,567	3,183,470	3,155,810
<i>Maluku Papua Total</i>	<i>8,434,198</i>	<i>8,434,198</i>	<i>8,434,198</i>	<i>8,434,198</i>	<i>8,504,825</i>	<i>6,271,922</i>	<i>6,199,694</i>	<i>6,183,721</i>	<i>6,210,234</i>	<i>6,190,848</i>
Indonesia Total	18,154,613	17,776,520	16,968,817	17,178,015	18,420,699	15,673,482	15,739,458	15,695,653	15,032,335	14,901,898

Source: Source: Luas Lahan Menurut Penggunaan 2009

Annex B1.1.5 Total Dry Land Areas by Province during the 2000s

(unit: ha)

Province	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Aceh	1,022,704	842,600	842,600	896,842	997,364	987,161	1,058,891	962,817	830,623	1,138,329
North Sumatra	1,134,620	1,503,355	838,806	846,929	938,563	1,129,333	1,028,917	1,103,613	1,158,269	1,159,162
West Sumatra	584,974	494,498	567,307	615,023	589,678	587,254	597,759	628,043	687,350	784,886
Riau	1,006,234	935,592	935,592	1,015,132	1,039,283	1,222,171	1,172,447	1,420,377	1,203,384	1,216,582
Jambi	769,900	752,159	885,397	953,780	911,346	980,079	1,062,136	960,556	920,065	911,255
South Sumtra	985,369	938,291	949,247	1,185,898	1,341,890	1,337,040	1,381,331	1,484,723	1,408,033	1,305,781
Bengkulu	464,119	474,331	473,650	406,807	408,184	456,447	417,478	513,872	580,626	404,682
Lampung	981,419	955,607	929,589	870,031	881,569	880,268	861,661	904,750	899,907	875,883
Kep. Bangka Belitung	379,691	199,849	199,424	266,473	274,669	290,451	280,420	276,292	280,651	300,819
Kepulauan Riau	0	0	0	0	0	307,034	296,630	259,025	241,077	239,582
<i>Sumtra Total</i>	<i>7,329,030</i>	<i>7,096,282</i>	<i>6,621,612</i>	<i>7,056,915</i>	<i>7,382,546</i>	<i>8,177,238</i>	<i>8,157,670</i>	<i>8,514,068</i>	<i>8,209,985</i>	<i>8,336,967</i>
DIK Jakarta	2,630	2,413	2,380	1,048	1,026	1,009	997	980	984	983
West Java	817,955	781,337	807,523	796,629	797,363	819,172	803,064	882,605	810,801	810,044
Central Java	764,127	772,190	770,955	779,079	773,511	768,358	761,662	753,837	747,220	745,411
DI Yogyakarta	100,576	100,287	98,440	98,563	96,909	96,571	95,307	99,969	97,208	96,841
East Java	1,211,109	1,230,265	1,176,610	1,171,712	1,150,039	1,144,356	1,148,308	1,157,547	1,167,314	1,185,599
Bantaen	281,386	287,279	293,703	283,935	274,406	283,334	303,858	297,442	297,093	275,789
<i>Java Total</i>	<i>3,177,783</i>	<i>3,173,771</i>	<i>3,149,611</i>	<i>3,130,966</i>	<i>3,093,254</i>	<i>3,112,800</i>	<i>3,113,196</i>	<i>3,192,380</i>	<i>3,120,620</i>	<i>3,114,667</i>
Bali	129,918	124,330	129,052	129,486	129,569	134,146	137,740	138,507	137,061	133,187
West Nusa Tenggara	374,151	314,037	311,055	301,105	304,483	311,162	305,407	326,842	327,744	340,225
East Nusa Tenggara	1,440,639	1,457,521	1,458,964	1,563,476	1,595,768	1,601,547	1,654,041	1,660,956	1,637,857	1,585,703
<i>Bali Nusa Total</i>	<i>1,944,708</i>	<i>1,895,888</i>	<i>1,899,071</i>	<i>1,994,067</i>	<i>2,029,820</i>	<i>2,046,855</i>	<i>2,097,188</i>	<i>2,126,305</i>	<i>2,102,662</i>	<i>2,059,115</i>
West Kalimantan	2,503,425	2,396,758	2,418,738	2,481,378	2,736,814	2,458,850	2,453,398	2,473,924	2,312,040	2,099,579
Central Kalimantan	2,220,333	2,683,758	2,045,482	1,520,187	1,446,358	1,444,114	1,593,250	1,449,548	1,528,580	1,543,620
South Kalimantan	1,084,753	524,041	531,828	571,021	608,734	665,172	611,826	613,684	610,174	604,870
East Kalimantan	1,528,626	1,670,102	2,228,118	1,856,602	3,000,323	1,848,260	1,727,636	1,823,558	1,610,381	1,750,010
<i>Kalimantan Total</i>	<i>7,337,137</i>	<i>7,274,659</i>	<i>7,224,166</i>	<i>6,429,188</i>	<i>7,792,229</i>	<i>6,416,396</i>	<i>6,386,110</i>	<i>6,360,714</i>	<i>6,061,175</i>	<i>5,998,079</i>
North Sulawesi	365,928	486,901	399,484	399,484	396,006	401,436	394,275	387,266	368,641	368,642
Central Sulawesi	890,188	915,829	972,076	1,104,345	1,222,080	1,461,753	1,335,935	1,377,576	1,378,014	1,368,693
South Sulawesi	902,966	952,870	894,452	920,643	967,049	736,054	757,109	734,529	724,280	752,471
Southeast Sulawesi	549,967	562,089	557,461	570,187	541,091	609,397	644,822	502,112	457,979	493,593
Gorontalo	159,992	159,992	180,677	257,928	275,935	273,132	280,756	285,353	308,596	304,172
West Sulawesi	0	0	0	0	0	114,535	199,318	178,772	201,958	214,274
<i>Sulawesi Total</i>	<i>2,869,041</i>	<i>3,077,681</i>	<i>3,004,150</i>	<i>3,252,587</i>	<i>3,402,161</i>	<i>3,596,307</i>	<i>3,612,215</i>	<i>3,465,608</i>	<i>3,439,468</i>	<i>3,501,845</i>
Maluku	1,490,112	1,490,112	1,490,112	1,490,112	1,890,007	1,859,496	1,845,537	2,499,279	2,498,113	2,471,114
North Maluku	249,422	249,422	249,422	249,422	249,422	249,422	249,422	283,375	288,026	290,604
West Papua	2,962,174	2,962,174	2,962,174	2,962,174	2,953,793	2,951,287	2,905,236	2,904,696	2,909,080	2,908,992
Papua	7,174,532	7,174,532	7,174,532	7,174,532	7,174,532	3,996,900	3,996,900	3,847,553	3,982,735	3,955,075
<i>Maluku Papua Total</i>	<i>11,876,240</i>	<i>11,876,240</i>	<i>11,876,240</i>	<i>11,876,240</i>	<i>12,267,754</i>	<i>9,057,105</i>	<i>8,997,095</i>	<i>9,534,903</i>	<i>9,677,954</i>	<i>9,625,785</i>
Indonesia Total	34,533,939	34,394,521	33,774,850	33,739,963	35,967,764	32,406,701	32,363,474	33,193,978	32,611,864	32,636,452

Source: Source: Luas Lahan Menurut Penggunaan 2009

Annex B1.2.1 Wetland Paddy Harvested Areas by Province during the 1970s

(unit: ha)

Province	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979
Aceh	200,712	198,970	194,611	216,823	202,417	195,935	220,860	217,041	212,877	243,098
North Sumatra	383,363	414,584	427,363	436,258	404,262	363,369	400,742	395,828	426,539	423,502
West Sumatra	247,406	245,680	235,807	237,361	254,202	248,354	240,388	252,729	255,883	266,013
Riau	84,212	91,767	85,054	85,691	85,607	87,241	89,247	88,822	86,377	83,889
Jambi	100,659	111,854	88,457	93,031	107,719	113,071	110,703	114,936	116,498	155,447
South Sumtra	179,027	198,653	166,805	184,850	227,586	229,524	234,281	235,345	250,527	240,157
Bengkulu	45,357	46,740	44,132	45,562	50,558	51,770	54,099	51,283	51,502	49,400
Lampung	75,890	87,424	90,579	100,438	106,360	130,187	121,717	128,111	128,872	130,665
Kep. Bangka Belitung	0	0	0	0	0	0	0	0	0	0
Kepulauan Riau	0	0	0	0	0	0	0	0	0	0
<i>Sumtra Total</i>	<i>1,316,626</i>	<i>1,395,672</i>	<i>1,332,808</i>	<i>1,400,014</i>	<i>1,438,711</i>	<i>1,419,451</i>	<i>1,472,037</i>	<i>1,484,095</i>	<i>1,529,075</i>	<i>1,592,171</i>
DIK Jakarta	12,963	13,164	12,740	10,348	11,178	9,043	13,050	17,764	18,863	17,112
West Java	1,525,834	1,576,871	1,555,405	1,715,531	1,755,431	1,756,004	1,700,283	1,578,176	1,732,718	1,708,084
Central Java	1,198,540	1,221,340	1,209,233	1,232,447	1,310,978	1,258,481	1,140,185	1,199,327	1,308,834	1,248,399
DI Yogyakarta	86,248	87,885	88,079	96,364	105,330	102,506	85,998	82,343	93,453	98,505
East Java	1,135,549	1,150,841	1,140,170	1,180,500	1,262,708	1,262,391	1,277,013	1,255,254	1,309,634	1,338,405
Bantaen	0	0	0	0	0	0	0	0	0	0
<i>Java Total</i>	<i>3,959,134</i>	<i>4,050,101</i>	<i>4,005,627</i>	<i>4,235,190</i>	<i>4,445,625</i>	<i>4,388,425</i>	<i>4,216,529</i>	<i>4,132,864</i>	<i>4,463,502</i>	<i>4,410,505</i>
Bali	137,833	150,842	149,964	142,737	154,560	129,414	140,189	144,878	158,830	172,996
West Nusa Tenggara	171,409	182,317	166,488	180,459	186,174	191,133	191,397	173,123	203,548	186,655
East Nusa Tenggara	34,072	39,271	29,874	39,836	36,327	45,169	45,548	58,460	54,510	47,878
<i>Bali Nusa Total</i>	<i>343,314</i>	<i>372,430</i>	<i>346,326</i>	<i>363,032</i>	<i>377,061</i>	<i>365,716</i>	<i>377,134</i>	<i>376,461</i>	<i>416,888</i>	<i>407,529</i>
West Kalimantan	178,802	182,700	182,367	188,125	186,942	187,290	191,348	194,059	192,390	187,977
Central Kalimantan	57,329	59,375	54,880	68,951	63,386	66,953	67,317	66,735	67,656	73,501
South Kalimantan	204,459	207,690	197,012	233,363	238,431	242,078	252,869	263,813	279,219	274,138
East Kalimantan	20,583	20,461	18,974	20,980	25,050	33,653	34,709	35,160	32,392	34,021
<i>Kalimantan Total</i>	<i>461,173</i>	<i>470,226</i>	<i>453,233</i>	<i>511,419</i>	<i>513,809</i>	<i>529,974</i>	<i>546,243</i>	<i>559,767</i>	<i>571,657</i>	<i>569,637</i>
North Sulawesi	43,725	45,052	42,926	50,493	63,206	58,557	60,913	62,582	61,180	56,022
Central Sulawesi	49,381	49,219	54,741	46,860	59,183	60,099	61,130	59,917	61,154	67,200
South Sulawesi	480,280	481,944	347,425	439,099	425,921	499,757	485,029	514,073	579,345	558,088
Southeast Sulawesi	24,540	27,136	17,978	15,238	15,337	11,626	9,528	11,701	14,012	12,416
Gorontalo	0	0	0	0	0	0	0	0	0	0
West Sulawesi	0	0	0	0	0	0	0	0	0	0
<i>Sulawesi Total</i>	<i>597,926</i>	<i>603,351</i>	<i>463,070</i>	<i>551,690</i>	<i>563,647</i>	<i>630,039</i>	<i>616,600</i>	<i>648,273</i>	<i>715,691</i>	<i>693,726</i>
Maluku	174	662	567	1,869	1,033	512	502	522	509	587
North Maluku	0	0	0	0	0	0	0	0	0	0
West Papua	0	0	0	0	0	0	0	0	0	0
Papua	381	321	355	368	348	357	372	378	1,087	963
<i>Maluku Papua Total</i>	<i>555</i>	<i>983</i>	<i>922</i>	<i>2,237</i>	<i>1,381</i>	<i>869</i>	<i>874</i>	<i>900</i>	<i>1,596</i>	<i>1,550</i>
Indonesia Total	6,678,728	6,892,763	6,601,986	7,063,582	7,340,234	7,334,474	7,229,417	7,202,360	7,698,409	7,675,118

Source: Data base of Ministry of Agriculture

Annex B1.2.2 Wetland Paddy Harvested Areas by Province during the 1980s

(unit: ha)

Province	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
Aceh	208,423	245,705	244,208	255,972	258,775	247,105	281,264	260,950	272,494	292,550
North Sumatra	445,323	448,443	474,086	453,702	496,252	525,431	505,937	569,454	592,775	599,523
West Sumatra	291,246	274,606	287,179	312,843	327,701	325,378	334,442	334,323	335,433	341,461
Riau	81,770	85,319	83,738	83,504	89,165	90,171	98,943	70,621	99,038	96,126
Jambi	131,680	132,054	135,403	142,519	144,456	150,075	140,047	134,831	139,536	136,241
South Sumtra	242,944	269,948	265,366	296,142	290,400	301,597	334,579	331,848	343,626	341,750
Bengkulu	48,178	46,461	50,603	57,060	60,960	62,271	65,752	68,216	67,934	68,055
Lampung	151,049	167,055	174,807	190,487	211,123	204,070	218,250	249,667	245,628	248,264
Kep. Bangka Belitung	0	0	0	0	0	0	0	0	0	0
Kepulauan Riau	0	0	0	0	0	0	0	0	0	0
<i>Sumtra Total</i>	<i>1,600,613</i>	<i>1,669,591</i>	<i>1,715,390</i>	<i>1,792,229</i>	<i>1,878,832</i>	<i>1,906,098</i>	<i>1,979,214</i>	<i>2,019,910</i>	<i>2,096,464</i>	<i>2,123,970</i>
DIK Jakarta	20,519	16,284	13,874	9,545	9,699	10,424	9,518	8,946	8,501	8,385
West Java	1,743,937	1,835,181	1,702,504	1,702,192	1,850,178	1,931,698	1,937,836	1,904,624	1,890,770	1,973,743
Central Java	1,296,298	1,371,855	1,281,641	1,268,062	1,413,024	1,433,932	1,437,736	1,407,704	1,407,559	1,494,238
DI Yogyakarta	99,679	108,347	100,369	102,765	109,844	103,393	104,189	96,973	97,605	101,551
East Java	1,368,504	1,447,825	1,403,046	1,405,868	1,478,811	1,493,539	1,507,989	1,455,494	1,455,413	1,520,975
Bantaen	0	0	0	0	0	0	0	0	0	0
<i>Java Total</i>	<i>4,528,937</i>	<i>4,779,492</i>	<i>4,501,434</i>	<i>4,488,432</i>	<i>4,861,556</i>	<i>4,972,986</i>	<i>4,997,266</i>	<i>4,873,741</i>	<i>4,859,848</i>	<i>5,098,892</i>
Bali	174,900	166,726	165,483	164,239	164,816	164,197	163,966	167,370	160,266	172,558
West Nusa Tenggara	199,624	221,805	229,872	216,462	232,598	234,823	231,798	230,331	233,511	250,509
East Nusa Tenggara	48,243	53,273	59,149	62,338	57,491	58,384	61,682	57,646	62,439	67,622
<i>Bali Nusa Total</i>	<i>422,767</i>	<i>441,804</i>	<i>454,504</i>	<i>443,039</i>	<i>454,905</i>	<i>457,404</i>	<i>457,446</i>	<i>455,347</i>	<i>456,216</i>	<i>490,689</i>
West Kalimantan	187,842	194,540	184,791	169,119	170,756	179,934	174,979	164,260	176,501	200,126
Central Kalimantan	72,116	72,955	74,004	75,484	75,482	75,976	77,597	80,507	81,526	87,800
South Kalimantan	268,582	288,126	268,422	275,581	290,150	299,392	300,484	298,481	302,468	313,007
East Kalimantan	36,321	40,281	43,251	27,320	34,199	39,761	39,374	41,694	40,405	39,314
<i>Kalimantan Total</i>	<i>564,861</i>	<i>595,902</i>	<i>570,468</i>	<i>547,504</i>	<i>570,587</i>	<i>595,063</i>	<i>592,434</i>	<i>584,942</i>	<i>600,900</i>	<i>640,247</i>
North Sulawesi	55,771	50,184	60,160	62,884	59,042	62,549	72,748	76,413	69,688	71,657
Central Sulawesi	70,248	67,558	69,806	77,946	73,459	74,114	89,338	94,291	103,110	107,618
South Sulawesi	564,896	570,758	486,530	555,348	624,950	663,300	666,410	639,952	681,093	771,493
Southeast Sulawesi	14,151	13,954	12,297	17,027	21,459	21,330	28,117	28,494	30,701	40,377
Gorontalo	0	0	0	0	0	0	0	0	0	0
West Sulawesi	0	0	0	0	0	0	0	0	0	0
<i>Sulawesi Total</i>	<i>705,066</i>	<i>702,454</i>	<i>628,793</i>	<i>713,205</i>	<i>778,910</i>	<i>821,293</i>	<i>856,613</i>	<i>839,150</i>	<i>884,592</i>	<i>991,145</i>
Maluku	516	509	616	1,067	860	1,136	3,167	3,142	3,862	3,448
North Maluku	0	0	0	0	0	0	0	0	0	0
West Papua	0	0	0	0	0	0	0	0	0	0
Papua	1,286	1,268	1,395	1,433	1,475	1,741	1,870	1,649	6,909	10,930
<i>Maluku Papua Total</i>	<i>1,802</i>	<i>1,777</i>	<i>2,011</i>	<i>2,500</i>	<i>2,335</i>	<i>2,877</i>	<i>5,037</i>	<i>4,791</i>	<i>10,771</i>	<i>14,378</i>
Indonesia Total	7,824,046	8,191,020	7,872,600	7,986,909	8,547,125	8,755,721	8,888,012	8,777,881	8,908,791	9,359,321

Source: Data base of Ministry of Agriculture

Annex B1.2.3 Wetland Paddy Harvested Areas by Province during the 1990s

(unit: ha)

Province	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Aceh	291,598	299,903	318,834	314,887	322,759	328,846	339,785	328,123	355,087	351,148
North Sumatra	618,657	645,898	672,915	680,277	715,380	720,990	716,182	726,612	748,859	767,166
West Sumatra	351,857	361,831	374,077	381,473	366,604	384,756	411,716	376,329	398,296	419,431
Riau	102,705	112,487	106,815	106,127	115,077	115,279	116,766	106,805	99,528	121,070
Jambi	145,214	138,328	147,839	151,420	139,830	142,844	152,383	142,760	143,360	139,116
South Sumtra	353,218	304,780	372,530	346,221	320,777	355,508	395,253	379,109	435,792	443,144
Bengkulu	65,933	75,490	86,442	86,321	77,213	89,238	91,259	86,592	89,800	85,660
Lampung	264,062	254,008	314,274	313,362	304,447	361,259	370,942	329,208	384,007	372,710
Kep. Bangka Belitung	0	0	0	0	0	0	0	0	0	0
Kepulauan Riau	0	0	0	0	0	0	0	0	0	0
<i>Sumtra Total</i>	<i>2,193,244</i>	<i>2,192,725</i>	<i>2,393,726</i>	<i>2,380,088</i>	<i>2,362,087</i>	<i>2,498,720</i>	<i>2,594,286</i>	<i>2,475,538</i>	<i>2,654,729</i>	<i>2,699,445</i>
DKI Jakarta	8,255	5,776	6,569	5,945	4,803	4,006	3,576	3,349	3,024	3,251
West Java	1,969,214	1,836,954	1,998,429	2,002,967	1,814,794	1,976,161	1,957,743	1,879,464	2,008,212	2,011,818
Central Java	1,484,953	1,425,609	1,517,244	1,517,486	1,433,182	1,520,742	1,534,936	1,529,903	1,646,617	1,626,158
DI Yogyakarta	98,331	98,939	96,883	99,612	97,643	97,474	100,125	98,046	102,027	96,189
East Java	1,502,708	1,480,801	1,539,843	1,540,465	1,480,221	1,529,842	1,529,309	1,507,691	1,620,388	1,666,013
Bantaen	0	0	0	0	0	0	0	0	0	0
<i>Java Total</i>	<i>5,063,461</i>	<i>4,848,079</i>	<i>5,158,968</i>	<i>5,166,475</i>	<i>4,830,643</i>	<i>5,128,225</i>	<i>5,125,689</i>	<i>5,018,453</i>	<i>5,380,268</i>	<i>5,403,429</i>
Bali	165,033	156,303	158,890	157,762	150,510	155,535	155,964	146,007	154,317	153,279
West Nusa Tenggara	250,995	246,860	245,844	253,042	253,176	261,582	268,327	267,482	287,820	292,206
East Nusa Tenggara	68,042	79,797	80,113	84,981	84,752	93,029	101,657	99,071	93,459	106,604
<i>Bali Nusa Total</i>	<i>484,070</i>	<i>482,960</i>	<i>484,847</i>	<i>495,785</i>	<i>488,438</i>	<i>510,146</i>	<i>525,948</i>	<i>512,560</i>	<i>535,596</i>	<i>552,089</i>
West Kalimantan	185,333	179,971	194,202	208,761	209,125	227,115	242,030	231,332	248,362	306,448
Central Kalimantan	100,736	89,027	94,062	94,958	100,740	104,976	102,530	105,317	87,125	85,711
South Kalimantan	330,859	331,892	364,686	353,629	350,515	359,241	355,378	347,023	361,222	403,631
East Kalimantan	40,332	44,999	43,951	50,287	62,623	73,582	82,436	80,945	45,420	91,423
<i>Kalimantan Total</i>	<i>657,260</i>	<i>645,889</i>	<i>696,901</i>	<i>707,635</i>	<i>723,003</i>	<i>764,914</i>	<i>782,374</i>	<i>764,617</i>	<i>742,129</i>	<i>887,213</i>
North Sulawesi	76,223	82,125	67,157	86,776	86,330	87,051	103,130	84,754	75,740	78,392
Central Sulawesi	111,817	129,044	126,149	129,855	126,683	149,956	163,500	147,635	148,300	178,661
South Sulawesi	725,066	706,058	786,816	748,238	780,525	835,373	841,066	786,213	827,482	871,545
Southeast Sulawesi	39,913	42,698	54,847	54,586	62,929	74,657	77,887	66,053	74,435	87,986
Gorontalo	0	0	0	0	0	0	0	0	0	0
West Sulawesi	0	0	0	0	0	0	0	0	0	0
<i>Sulawesi Total</i>	<i>953,019</i>	<i>959,925</i>	<i>1,034,969</i>	<i>1,019,455</i>	<i>1,056,467</i>	<i>1,147,037</i>	<i>1,185,583</i>	<i>1,084,655</i>	<i>1,125,957</i>	<i>1,216,584</i>
Maluku	2,968	5,074	841	7,453	4,904	3,336	6,626	3,656	7,719	10,786
North Maluku	0	0	0	0	0	0	0	0	0	0
West Papua	0	0	0	0	0	0	0	0	0	0
Papua	5,786	9,624	9,474	11,148	13,376	13,621	13,469	9,885	17,110	23,665
<i>Maluku Papua Total</i>	<i>8,754</i>	<i>14,698</i>	<i>10,315</i>	<i>18,601</i>	<i>18,280</i>	<i>16,957</i>	<i>20,095</i>	<i>13,541</i>	<i>24,829</i>	<i>34,451</i>
Indonesia Total	9,359,808	9,144,276	9,779,726	9,788,039	9,478,918	10,065,999	10,233,975	9,869,364	10,463,508	10,793,211

Source: Data base of Ministry of Agriculture

Annex B1.2.4 Wetland Paddy Harvested Areas by Province during the 2000s

(unit: ha)

Province	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Aceh	331,009	293,323	311,062	364,943	367,537	334,049	316,912	357,269	326,678	352,006
North Sumatra	766,194	728,844	695,907	742,280	744,947	743,813	652,531	690,640	696,722	718,583
West Sumatra	387,207	370,616	425,867	403,626	413,745	418,982	405,025	415,792	413,662	432,147
Riau	117,439	109,812	108,944	116,433	123,525	114,028	114,493	120,482	120,849	127,522
Jambi	135,187	137,698	138,323	132,571	131,601	129,082	115,127	120,210	119,486	127,981
South Sumtra	454,923	435,989	494,945	486,560	553,216	553,345	575,353	607,015	645,621	679,243
Bengkulu	82,389	87,911	88,778	92,858	92,847	99,905	85,275	108,562	114,750	120,882
Lampung	388,383	398,924	396,545	394,665	425,223	426,192	429,930	459,684	446,049	506,596
Kep. Bangka Belitung	0	1,574	1,124	1,905	3,360	2,777	2,571	3,965	2,127	2,793
Kepulauan Riau	0	0	0	0	0	107	109	115	130	131
<i>Sumtra Total</i>	<i>2,662,731</i>	<i>2,564,691</i>	<i>2,661,495</i>	<i>2,735,841</i>	<i>2,856,001</i>	<i>2,822,280</i>	<i>2,697,326</i>	<i>2,883,734</i>	<i>2,886,074</i>	<i>3,067,884</i>
DIK Jakarta	3,562	3,357	2,322	1,724	2,941	2,668	1,323	1,544	1,640	1,974
West Java	2,018,155	1,728,945	1,672,478	1,532,331	1,759,938	1,778,583	1,687,836	1,715,466	1,690,894	1,825,346
Central Java	1,602,056	1,587,137	1,581,392	1,474,852	1,573,610	1,553,667	1,616,952	1,561,530	1,605,624	1,663,024
DI Yogyakarta	99,519	99,150	98,049	94,629	96,991	95,248	97,617	98,057	100,359	105,613
East Java	1,666,360	1,619,739	1,597,767	1,600,713	1,595,392	1,594,188	1,652,331	1,632,669	1,668,298	1,787,354
Bantaen	0	300,466	311,171	316,255	327,414	337,986	316,040	325,953	326,776	332,776
<i>Java Total</i>	<i>5,389,652</i>	<i>5,338,794</i>	<i>5,263,179</i>	<i>5,020,504</i>	<i>5,356,286</i>	<i>5,362,340</i>	<i>5,372,095</i>	<i>5,335,219</i>	<i>5,393,591</i>	<i>5,716,087</i>
Bali	153,814	146,980	148,027	144,278	142,777	141,577	149,390	144,166	142,806	149,269
West Nusa Tenggara	300,003	296,928	274,754	278,770	277,451	262,406	293,595	289,481	306,274	316,120
East Nusa Tenggara	104,739	108,590	108,764	118,006	118,430	104,330	110,469	114,769	124,810	127,896
<i>Bali Nusa Total</i>	<i>558,556</i>	<i>552,498</i>	<i>531,545</i>	<i>541,054</i>	<i>538,658</i>	<i>508,313</i>	<i>553,454</i>	<i>548,416</i>	<i>573,890</i>	<i>593,285</i>
West Kalimantan	266,611	259,701	247,827	253,144	260,167	242,145	267,055	294,227	330,853	331,922
Central Kalimantan	96,904	92,795	91,353	114,826	131,025	108,956	107,603	124,226	124,198	133,391
South Kalimantan	391,057	382,421	365,136	399,196	397,998	409,332	416,758	458,995	455,721	444,391
East Kalimantan	85,882	76,992	83,761	73,937	84,914	78,577	85,117	90,247	97,754	92,383
<i>Kalimantan Total</i>	<i>840,454</i>	<i>811,909</i>	<i>788,077</i>	<i>841,103</i>	<i>874,104</i>	<i>839,010</i>	<i>876,533</i>	<i>967,695</i>	<i>1,008,526</i>	<i>1,002,087</i>
North Sulawesi	111,247	66,940	75,672	79,137	87,850	88,770	89,159	94,523	98,416	103,887
Central Sulawesi	153,947	142,912	189,986	184,929	175,130	168,869	173,074	195,715	203,040	201,877
South Sulawesi	793,843	813,846	827,929	840,080	463,175	725,663	715,287	764,699	830,570	853,676
Southeast Sulawesi	75,403	65,831	72,252	81,609	74,253	79,649	82,996	95,005	90,778	87,274
Gorontalo	0	35,035	34,215	33,170	36,757	37,841	42,815	43,414	46,241	47,733
West Sulawesi	0	0	0	0	0	54,859	59,565	60,375	65,913	60,731
<i>Sulawesi Total</i>	<i>1,134,440</i>	<i>1,124,564</i>	<i>1,200,054</i>	<i>1,218,925</i>	<i>837,165</i>	<i>1,155,651</i>	<i>1,162,896</i>	<i>1,253,731</i>	<i>1,334,956</i>	<i>1,355,178</i>
Maluku	7,399	7,021	3,469	7,968	8,881	9,324	11,768	13,182	16,351	18,545
North Maluku	0	0	0	14,659	12,395	13,910	14,059	11,151	12,424	10,631
West Papua	0	0	0	0	0	6,415	7,384	7,580	10,358	9,531
Papua	24,368	19,898	29,160	14,462	15,982	16,333	17,498	20,517	21,581	24,176
<i>Maluku Papua Total</i>	<i>31,767</i>	<i>26,919</i>	<i>32,629</i>	<i>37,089</i>	<i>37,258</i>	<i>45,982</i>	<i>50,709</i>	<i>52,430</i>	<i>60,714</i>	<i>62,883</i>
Indonesia Total	10,617,600	10,419,375	10,476,979	10,394,516	10,499,472	10,733,576	10,713,017	11,041,225	11,257,753	11,797,404

Source: Data base of Ministry of Agriculture

Annex B1.2.5 Wetland Paddy Production by Province during the 1970s

(unit: t)

Province	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979
Aceh	612,796	460,852	576,602	672,901	662,645	622,961	674,512	665,856	604,571	697,692
North Sumatra	1,167,226	1,285,106	1,401,234	1,425,644	1,320,377	1,136,140	1,306,276	1,211,140	1,349,125	1,346,208
West Sumatra	597,133	622,789	611,169	669,429	714,900	697,838	721,073	809,814	828,489	898,242
Riau	198,420	164,154	148,416	154,772	178,595	172,228	195,910	191,600	196,254	176,012
Jambi	220,540	228,764	196,174	201,977	274,823	287,144	289,391	306,434	311,185	416,822
South Sumtra	393,473	442,406	338,027	387,747	533,324	545,942	576,366	624,696	647,895	681,911
Bengkulu	121,270	125,079	117,083	125,322	133,718	132,081	143,452	137,369	13,564	128,868
Lampung	186,998	230,967	226,726	258,780	295,145	384,307	404,187	408,605	411,702	424,499
Kep. Bangka Belitung	0	0	0	0	0	0	0	0	0	0
Kepulauan Riau	0	0	0	0	0	0	0	0	0	0
<i>Sumtra Total</i>	<i>3,497,856</i>	<i>3,560,117</i>	<i>3,615,431</i>	<i>3,896,572</i>	<i>4,113,527</i>	<i>3,978,641</i>	<i>4,311,167</i>	<i>4,355,514</i>	<i>4,362,785</i>	<i>4,770,254</i>
DIK Jakarta	16,175	20,010	23,139	19,931	25,206	20,148	30,729	45,672	45,541	45,852
West Java	4,082,540	4,531,510	4,316,484	4,927,653	5,066,322	5,182,332	5,353,586	4,879,058	5,567,396	5,714,113
Central Java	3,489,436	3,685,682	3,413,611	3,711,621	3,935,351	3,783,273	3,657,178	3,759,791	4,411,252	4,066,907
DI Yogyakarta	249,261	280,293	270,830	296,536	365,854	356,736	317,810	291,538	349,655	386,370
East Java	3,367,338	3,473,758	3,493,941	3,644,584	4,132,954	4,026,415	4,363,356	4,396,509	4,791,541	5,164,954
Bantaen	0	0	0	0	0	0	0	0	0	0
<i>Java Total</i>	<i>11,204,750</i>	<i>11,991,253</i>	<i>11,518,005</i>	<i>12,600,325</i>	<i>13,525,687</i>	<i>13,368,904</i>	<i>13,722,659</i>	<i>13,372,566</i>	<i>15,165,385</i>	<i>15,378,196</i>
Bali	400,785	476,378	506,500	500,100	571,160	469,079	497,636	526,375	564,060	633,822
West Nusa Tenggara	365,060	318,213	339,041	467,512	522,023	535,807	558,498	482,882	612,075	566,087
East Nusa Tenggara	56,587	64,806	50,141	90,936	76,451	107,879	106,218	129,255	114,907	115,961
<i>Bali Nusa Total</i>	<i>822,432</i>	<i>859,397</i>	<i>895,682</i>	<i>1,058,546</i>	<i>1,169,634</i>	<i>1,112,765</i>	<i>1,162,352</i>	<i>1,138,512</i>	<i>1,291,042</i>	<i>1,315,870</i>
West Kalimantan	222,000	227,439	231,448	256,026	303,755	289,849	338,112	388,118	398,824	406,970
Central Kalimantan	78,635	90,412	83,966	88,284	104,254	97,674	107,558	106,347	101,687	134,948
South Kalimantan	365,533	343,799	384,321	445,231	466,238	451,270	466,971	539,871	643,408	667,468
East Kalimantan	41,364	31,389	39,539	32,356	42,792	50,820	56,084	57,030	62,808	65,422
<i>Kalimantan Total</i>	<i>707,532</i>	<i>693,039</i>	<i>739,274</i>	<i>821,897</i>	<i>917,039</i>	<i>889,613</i>	<i>968,725</i>	<i>1,091,366</i>	<i>1,206,727</i>	<i>1,274,808</i>
North Sulawesi	108,711	118,314	97,924	138,942	171,496	165,343	165,562	169,687	177,728	164,649
Central Sulawesi	86,244	90,244	113,319	116,721	137,409	129,422	147,143	139,607	129,952	145,421
South Sulawesi	1,238,553	1,234,185	892,224	1,148,872	995,865	1,193,525	1,354,499	1,518,571	1,688,207	1,664,684
Southeast Sulawesi	41,432	46,966	28,538	27,737	28,194	18,001	17,722	20,555	24,829	25,043
Gorontalo	0	0	0	0	0	0	0	0	0	0
West Sulawesi	0	0	0	0	0	0	0	0	0	0
<i>Sulawesi Total</i>	<i>1,474,940</i>	<i>1,489,709</i>	<i>1,132,005</i>	<i>1,432,272</i>	<i>1,332,964</i>	<i>1,506,291</i>	<i>1,684,926</i>	<i>1,848,420</i>	<i>2,020,716</i>	<i>1,999,797</i>
Maluku	344	1,311	1,121	2,506	1,418	905	917	1,172	891	1,181
North Maluku	0	0	0	0	0	0	0	0	0	0
West Papua	0	0	0	0	0	0	0	0	0	0
Papua	759	644	725	777	752	721	782	788	1,735	1,766
<i>Maluku Papua Total</i>	<i>1,103</i>	<i>1,955</i>	<i>1,846</i>	<i>3,283</i>	<i>2,170</i>	<i>1,626</i>	<i>1,699</i>	<i>1,960</i>	<i>2,626</i>	<i>2,947</i>
Indonesia Total	17,708,613	18,595,470	17,902,243	19,812,897	21,061,021	20,857,840	21,851,528	21,808,340	24,049,281	24,741,872

Source: Data base of Ministry of Agriculture

Annex B1.2.6 Wetland Paddy Production by Province during the 1980s

(unit: t)

Province	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
Aceh	649,464	816,935	847,932	920,475	895,103	893,677	1,023,749	976,401	1,032,740	1,132,663
North Sumatra	1,406,457	1,497,379	1,661,931	1,641,763	1,843,080	1,977,867	1,913,325	2,152,146	2,318,139	2,369,841
West Sumatra	1,040,520	1,020,478	1,109,641	1,269,764	1,335,382	1,354,137	1,397,822	1,432,029	1,483,001	1,543,593
Riau	190,988	200,062	230,161	239,312	158,148	264,971	292,319	202,450	295,677	307,090
Jambi	368,281	374,140	398,706	410,786	418,735	437,679	414,679	421,758	447,072	439,941
South Sumtra	705,217	799,365	812,897	918,877	921,648	977,454	1,078,733	1,066,349	1,110,557	1,145,831
Bengkulu	141,772	133,530	171,291	202,895	212,263	211,784	232,295	211,376	222,518	235,248
Lampung	502,824	596,427	666,628	745,781	836,680	823,770	883,891	1,002,483	995,526	1,034,001
Kep. Bangka Belitung	0	0	0	0	0	0	0	0	0	0
Kepulauan Riau	0	0	0	0	0	0	0	0	0	0
<i>Sumtra Total</i>	<i>5,005,523</i>	<i>5,438,316</i>	<i>5,899,187</i>	<i>6,349,653</i>	<i>6,621,039</i>	<i>6,941,339</i>	<i>7,236,813</i>	<i>7,464,992</i>	<i>7,905,230</i>	<i>8,208,208</i>
DIK Jakarta	61,394	52,192	48,840	32,903	34,661	37,557	41,273	38,384	38,631	39,173
West Java	6,411,939	7,098,144	7,255,749	7,542,938	8,196,289	8,701,023	8,787,958	8,972,982	9,202,168	9,925,207
Central Java	5,105,702	5,682,587	5,698,223	6,005,988	6,774,037	6,836,637	6,877,211	6,934,395	7,048,022	7,662,364
DI Yogyakarta	425,808	481,494	478,141	511,132	550,428	517,821	525,099	493,516	506,338	540,596
East Java	6,020,254	6,740,333	6,910,243	6,983,702	7,405,885	7,413,865	7,493,434	7,388,793	7,489,029	8,004,326
Bantaen	0	0	0	0	0	0	0	0	0	0
<i>Java Total</i>	<i>18,025,097</i>	<i>20,054,750</i>	<i>20,391,196</i>	<i>21,076,663</i>	<i>22,961,300</i>	<i>23,506,903</i>	<i>23,724,975</i>	<i>23,828,070</i>	<i>24,284,188</i>	<i>26,171,666</i>
Bali	717,187	739,375	728,188	733,057	753,018	758,463	771,515	804,036	790,128	871,405
West Nusa Tenggara	643,471	501,808	859,389	746,388	920,390	913,770	907,191	925,908	981,657	1,078,900
East Nusa Tenggara	121,090	141,067	178,872	198,780	178,855	182,975	192,706	166,646	185,485	204,281
<i>Bali Nusa Total</i>	<i>1,481,748</i>	<i>1,382,250</i>	<i>1,766,449</i>	<i>1,678,225</i>	<i>1,852,263</i>	<i>1,855,208</i>	<i>1,871,412</i>	<i>1,896,590</i>	<i>1,957,270</i>	<i>2,154,586</i>
West Kalimantan	414,755	462,811	474,474	458,038	439,867	442,998	447,844	420,452	453,545	526,738
Central Kalimantan	142,790	160,063	163,964	159,701	151,643	163,728	163,447	164,430	168,310	187,089
South Kalimantan	696,723	739,872	683,921	709,831	781,664	914,862	818,441	816,432	859,354	879,921
East Kalimantan	76,020	93,976	109,093	66,256	79,410	93,836	95,876	104,566	101,217	104,004
<i>Kalimantan Total</i>	<i>1,330,288</i>	<i>1,456,722</i>	<i>1,431,452</i>	<i>1,393,826</i>	<i>1,452,584</i>	<i>1,615,424</i>	<i>1,525,606</i>	<i>1,505,880</i>	<i>1,582,426</i>	<i>1,697,752</i>
North Sulawesi	185,271	166,661	229,837	249,126	243,194	258,265	304,014	301,584	280,573	298,466
Central Sulawesi	169,597	172,340	196,623	229,785	215,676	221,453	268,997	294,590	330,162	350,221
South Sulawesi	1,760,036	1,980,299	1,819,972	2,175,336	2,499,175	2,656,825	2,707,626	2,534,218	2,810,973	3,277,101
Southeast Sulawesi	31,868	33,629	36,115	53,397	66,394	65,291	87,585	90,610	99,790	135,120
Gorontalo	0	0	0	0	0	0	0	0	0	0
West Sulawesi	0	0	0	0	0	0	0	0	0	0
<i>Sulawesi Total</i>	<i>2,146,772</i>	<i>2,352,929</i>	<i>2,282,547</i>	<i>2,707,644</i>	<i>3,024,439</i>	<i>3,201,834</i>	<i>3,368,222</i>	<i>3,221,002</i>	<i>3,521,496</i>	<i>4,060,908</i>
Maluku	1,161	1,211	1,490	2,701	2,156	2,729	8,056	8,640	10,513	8,836
North Maluku	0	0	0	0	0	0	0	0	0	0
West Papua	0	0	0	0	0	0	0	0	0	0
Papua	2,517	2,623	3,303	3,551	3,528	4,006	4,534	3,923	18,531	28,916
<i>Maluku Papua Total</i>	<i>3,678</i>	<i>3,834</i>	<i>4,793</i>	<i>6,252</i>	<i>5,684</i>	<i>6,735</i>	<i>12,590</i>	<i>12,563</i>	<i>29,044</i>	<i>37,752</i>
Indonesia Total	27,993,106	30,688,801	31,775,624	33,212,263	35,917,309	37,127,443	37,739,620	37,929,097	39,279,656	42,330,872

Source: Data base of Ministry of Agriculture

Annex B1.2.7 Wetland Paddy Production by Province during the 1990s

(unit: t)

Province	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Aceh	1,154,225	1,209,390	1,293,314	1,280,038	1,315,662	4,680,567	1,400,425	1,360,971	1,463,314	1,459,726
North Sumatra	2,478,460	2,584,678	2,715,280	2,750,463	2,904,484	2,964,280	2,966,681	3,046,330	3,144,544	3,274,270
West Sumatra	1,619,420	1,677,776	1,737,665	1,775,828	1,709,705	1,794,501	1,929,622	1,744,036	1,777,424	1,868,741
Riau	330,877	363,578	350,610	350,810	378,994	380,160	389,776	351,126	314,564	394,775
Jambi	475,243	455,229	501,002	515,853	478,245	491,287	530,186	478,079	479,343	473,151
South Sumtra	1,203,163	1,062,638	1,300,278	1,213,075	1,136,041	1,275,521	1,456,587	1,389,181	1,562,517	1,613,935
Bengkulu	234,082	272,614	312,719	312,081	281,830	325,716	337,835	328,307	332,837	325,129
Lampung	1,110,246	1,088,578	1,350,692	1,355,447	1,321,784	1,571,975	1,620,487	1,442,193	1,640,107	1,547,867
Kep. Bangka Belitung	0	0	0	0	0	0	0	0	0	0
Kepulauan Riau	0	0	0	0	0	0	0	0	0	0
<i>Sumtra Total</i>	<i>8,605,716</i>	<i>8,714,481</i>	<i>9,561,560</i>	<i>9,553,595</i>	<i>9,526,745</i>	<i>13,484,007</i>	<i>10,631,595</i>	<i>10,140,223</i>	<i>10,714,650</i>	<i>10,957,594</i>
DIK Jakarta	39,174	27,474	31,433	28,488	22,965	19,309	17,347	16,491	14,488	15,813
West Java	10,024,554	9,529,451	10,406,341	10,453,303	9,502,006	1,035,070	10,342,690	9,958,570	9,381,777	9,585,617
Central Java	7,693,200	7,471,111	7,970,148	8,011,422	7,552,623	8,024,738	8,170,309	8,149,738	8,412,048	8,153,905
DI Yogyakarta	533,271	540,927	532,312	548,487	542,070	541,871	562,025	550,887	526,238	497,826
East Java	8,011,535	7,985,794	8,338,060	8,365,977	8,039,187	8,312,086	8,377,019	8,266,732	8,420,208	8,661,371
Bantaen	0	0	0	0	0	0	0	0	0	0
<i>Java Total</i>	<i>26,301,734</i>	<i>25,554,757</i>	<i>27,278,294</i>	<i>27,407,677</i>	<i>25,658,851</i>	<i>17,933,074</i>	<i>27,469,390</i>	<i>26,942,418</i>	<i>26,754,759</i>	<i>26,914,532</i>
Bali	848,414	818,338	836,071	832,584	796,821	826,623	836,047	787,226	823,915	833,421
West Nusa Tenggara	1,100,757	1,106,439	1,108,783	1,147,035	1,148,982	1,190,634	1,232,870	1,232,322	1,278,050	1,325,629
East Nusa Tenggara	210,772	247,916	249,475	266,804	266,717	294,629	323,246	314,451	297,724	341,331
<i>Bali Nusa Total</i>	<i>2,159,943</i>	<i>2,172,693</i>	<i>2,194,329</i>	<i>2,246,423</i>	<i>2,212,520</i>	<i>2,311,886</i>	<i>2,392,163</i>	<i>2,333,999</i>	<i>2,399,689</i>	<i>2,500,381</i>
West Kalimantan	495,487	490,392	529,336	569,882	571,143	626,136	674,537	644,060	663,567	835,149
Central Kalimantan	216,568	211,475	222,747	221,016	233,326	249,026	269,530	267,084	196,658	215,179
South Kalimantan	934,670	963,936	1,088,242	1,049,082	1,039,455	1,081,177	1,103,402	1,100,893	972,315	1,278,047
East Kalimantan	108,763	123,666	121,849	139,600	173,114	209,391	248,596	247,603	136,593	299,663
<i>Kalimantan Total</i>	<i>1,755,488</i>	<i>1,789,469</i>	<i>1,962,174</i>	<i>1,979,580</i>	<i>2,017,038</i>	<i>2,165,730</i>	<i>2,296,065</i>	<i>2,259,640</i>	<i>1,969,133</i>	<i>2,628,038</i>
North Sulawesi	318,315	347,580	285,676	370,921	369,823	373,885	446,693	370,014	290,241	347,211
Central Sulawesi	368,808	426,817	421,746	435,921	429,227	513,447	561,383	508,753	479,951	625,218
South Sulawesi	3,109,850	3,073,423	3,437,594	3,272,780	3,434,997	3,693,215	4,008,277	3,728,336	3,517,430	3,803,493
Southeast Sulawesi	135,728	146,324	187,159	187,110	217,024	259,794	276,556	235,075	253,297	323,180
Gorontalo	0	0	0	0	0	0	0	0	0	0
West Sulawesi	0	0	0	0	0	0	0	0	0	0
<i>Sulawesi Total</i>	<i>3,932,707</i>	<i>3,994,144</i>	<i>4,332,175</i>	<i>4,266,732</i>	<i>4,451,071</i>	<i>4,840,341</i>	<i>5,292,909</i>	<i>4,842,178</i>	<i>4,540,919</i>	<i>5,099,102</i>
Maluku	8,185	14,645	2,513	22,559	14,426	9,873	19,619	10,873	22,423	32,480
North Maluku	0	0	0	0	0	0	0	0	0	0
West Papua	0	0	0	0	0	0	0	0	0	0
Papua	15,391	26,155	25,946	30,601	37,069	38,077	37,675	27,605	47,262	69,009
<i>Maluku Papua Total</i>	<i>23,576</i>	<i>40,800</i>	<i>28,459</i>	<i>53,160</i>	<i>51,495</i>	<i>47,950</i>	<i>57,294</i>	<i>38,478</i>	<i>69,685</i>	<i>101,489</i>
Indonesia Total	42,779,158	42,266,344	45,356,991	45,507,167	43,917,720	40,782,988	48,139,420	46,556,936	46,448,835	48,201,136

Source: Data base of Ministry of Agriculture

Annex B1.2.8 Wetland Paddy Production by Province during the 2000s

(unit: t)

Province	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Aceh	1,392,025	1,242,374	1,305,402	1,541,506	1,544,528	1,403,142	1,342,137	1,525,603	1,396,814	1,539,448
North Sumatra	3,310,814	3,110,615	2,981,889	3,195,515	3,214,782	3,240,210	2,870,944	3,107,570	3,189,758	3,382,066
West Sumatra	1,736,878	1,655,458	1,855,659	1,802,622	1,851,231	1,882,967	1,850,727	1,912,871	1,941,280	2,088,055
Riau	385,206	368,770	356,719	381,418	407,885	380,335	382,034	430,577	433,855	478,343
Jambi	456,884	496,952	501,125	518,453	519,512	518,140	481,183	510,988	514,942	556,007
South Sumtra	1,657,555	1,564,819	1,760,078	1,791,901	2,090,849	2,148,182	2,281,333	2,532,088	2,724,921	2,945,914
Bengkulu	311,493	342,014	337,880	377,261	377,378	406,117	345,693	438,891	458,502	484,594
Lampung	1,682,337	1,739,764	1,755,553	1,762,657	1,908,190	1,939,384	1,959,426	2,131,868	2,165,179	2,487,314
Kep. Bangka Belitung	0	5,231	3,615	5,556	10,455	9,892	9,072	14,041	7,304	9,733
Kepulauan Riau	0	0	0	0	0	312	318	339	396	403
<i>Sumtra Total</i>	<i>10,933,192</i>	<i>10,525,997</i>	<i>10,857,920</i>	<i>11,376,889</i>	<i>11,924,810</i>	<i>11,928,681</i>	<i>11,522,867</i>	<i>12,604,836</i>	<i>12,832,951</i>	<i>13,971,877</i>
DKI Jakarta	16,275	16,886	11,303	7,558	13,465	13,335	6,197	8,002	8,352	11,013
West Java	10,385,323	8,733,620	8,871,381	8,491,955	9,299,506	9,480,493	9,103,490	9,562,990	9,757,168	10,924,508
Central Java	8,267,366	8,100,911	8,283,824	7,934,183	8,314,301	8,240,237	8,551,232	8,443,250	8,946,784	9,380,495
DI Yogyakarta	542,679	542,079	537,955	525,521	559,281	545,916	559,890	570,991	628,321	662,368
East Java	8,943,392	8,369,215	8,499,460	8,575,611	8,643,407	8,656,499	8,999,771	9,029,176	10,017,560	10,758,398
Bantaen	0	1,359,536	1,411,977	1,600,191	1,704,819	1,756,037	1,659,640	1,727,047	1,710,894	1,740,951
<i>Java Total</i>	<i>28,155,035</i>	<i>27,122,247</i>	<i>27,615,900</i>	<i>27,135,019</i>	<i>28,534,779</i>	<i>28,692,517</i>	<i>28,880,220</i>	<i>29,341,456</i>	<i>31,069,079</i>	<i>33,477,733</i>
Bali	824,386	787,658	807,566	791,572	785,800	785,481	838,755	838,124	838,116	876,692
West Nusa Tenggara	1,394,627	1,380,580	1,283,981	1,324,112	1,345,271	1,267,789	1,424,667	1,410,096	1,557,299	1,653,811
East Nusa Tenggara	329,322	345,820	353,163	389,334	414,307	344,716	386,386	399,124	440,999	464,703
<i>Bali Nusa Total</i>	<i>2,548,335</i>	<i>2,514,058</i>	<i>2,444,710</i>	<i>2,505,018</i>	<i>2,545,378</i>	<i>2,397,986</i>	<i>2,649,808</i>	<i>2,647,344</i>	<i>2,836,414</i>	<i>2,995,206</i>
West Kalimantan	754,888	766,100	784,967	831,242	850,674	799,620	882,822	1,007,896	1,131,009	1,131,806
Central Kalimantan	250,973	248,242	251,853	317,549	375,230	301,676	306,554	360,871	365,386	420,407
South Kalimantan	1,243,448	1,295,880	1,211,921	1,316,989	1,403,250	1,474,426	1,520,158	1,830,409	1,809,585	1,823,652
East Kalimantan	287,881	259,539	287,682	290,792	353,264	348,902	378,818	405,289	441,406	421,605
<i>Kalimantan Total</i>	<i>2,537,190</i>	<i>2,569,761</i>	<i>2,536,423</i>	<i>2,756,572</i>	<i>2,982,418</i>	<i>2,924,624</i>	<i>3,088,352</i>	<i>3,604,465</i>	<i>3,747,386</i>	<i>3,797,470</i>
North Sulawesi	490,098	298,437	335,190	357,560	396,391	417,659	441,573	473,940	492,179	522,566
Central Sulawesi	562,291	512,916	729,861	726,554	711,531	701,239	725,945	837,426	961,341	929,791
South Sulawesi	3,632,044	3,699,720	3,873,712	3,989,781	3,530,220	3,375,210	3,352,116	3,615,127	4,064,033	4,293,918
Southeast Sulawesi	292,170	251,663	281,975	314,257	294,364	311,038	323,738	385,721	376,248	377,677
Gorontalo	0	157,538	152,227	151,837	160,813	164,210	190,124	197,779	236,235	256,217
West Sulawesi	0	0	0	0	0	244,442	289,633	297,181	324,445	298,790
<i>Sulawesi Total</i>	<i>4,976,603</i>	<i>4,920,274</i>	<i>5,372,965</i>	<i>5,539,989</i>	<i>5,093,319</i>	<i>5,213,798</i>	<i>5,323,129</i>	<i>5,807,174</i>	<i>6,454,481</i>	<i>6,678,959</i>
Maluku	22,042	19,975	10,055	27,883	31,304	32,836	45,173	52,182	69,485	83,764
North Maluku	0	0	0	56,183	45,973	51,638	52,345	41,561	46,485	39,753
West Papua	0	0	0	0	0	20,896	24,302	26,102	36,518	34,475
Papua	70,594	62,978	60,092	45,918	51,452	54,782	61,294	74,573	76,972	91,986
<i>Maluku Papua Total</i>	<i>92,636</i>	<i>82,953</i>	<i>70,147</i>	<i>129,984</i>	<i>128,729</i>	<i>160,152</i>	<i>183,114</i>	<i>194,418</i>	<i>229,460</i>	<i>249,978</i>
Indonesia Total	49,242,991	47,735,290	48,898,065	49,443,471	51,209,433	51,317,758	51,647,490	54,199,693	57,169,771	61,171,223

Source: Data base of Ministry of Agriculture

Annex B1.2.9 Wetland Paddy Yield by Province during the 1970s

(unit: t/ha)

Province	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979
Aceh	3.05	2.32	2.96	3.10	3.27	3.18	3.05	3.07	2.84	2.87
North Sumatra	3.04	3.10	3.28	3.27	3.27	3.13	3.26	3.06	3.16	3.18
West Sumatra	2.41	2.53	2.59	2.82	2.81	2.81	3.00	3.20	3.24	3.38
Riau	2.36	1.79	1.74	1.81	2.09	1.97	2.20	2.16	2.27	2.10
Jambi	2.19	2.05	2.22	2.17	2.55	2.54	2.61	2.67	2.67	2.68
South Sumtra	2.20	2.23	2.03	2.10	2.34	2.38	2.46	2.65	2.59	2.84
Bengkulu	2.67	2.68	2.65	2.75	2.64	2.55	2.65	2.68	0.26	2.61
Lampung	2.46	2.64	2.50	2.58	2.77	2.95	3.32	3.19	3.19	3.25
Kep. Bangka Belitung	0	0	0	0	0	0	0	0	0	0
Kepulauan Riau	0	0	0	0	0	0	0	0	0	0
<i>Sumtra Total</i>	<i>2.66</i>	<i>2.55</i>	<i>2.71</i>	<i>2.78</i>	<i>2.86</i>	<i>2.80</i>	<i>2.93</i>	<i>2.93</i>	<i>2.85</i>	<i>3.00</i>
DIK Jakarta	1.25	1.52	1.82	1.93	2.25	2.23	2.35	2.57	2.41	2.68
West Java	2.68	2.87	2.78	2.87	2.89	2.95	3.15	3.09	3.21	3.35
Central Java	2.91	3.02	2.82	3.01	3.00	3.01	3.21	3.13	3.37	3.26
DI Yogyakarta	2.89	3.19	3.07	3.08	3.47	3.48	3.70	3.54	3.74	3.92
East Java	2.97	3.02	3.06	3.09	3.27	3.19	3.42	3.50	3.66	3.86
Bantaen	0	0	0	0	0	0	0	0	0	0
<i>Java Total</i>	<i>2.83</i>	<i>2.96</i>	<i>2.88</i>	<i>2.98</i>	<i>3.04</i>	<i>3.05</i>	<i>3.25</i>	<i>3.24</i>	<i>3.40</i>	<i>3.49</i>
Bali	2.91	3.16	3.38	3.50	3.70	3.62	3.55	3.63	3.55	3.66
West Nusa Tenggara	2.13	1.75	2.04	2.59	2.80	2.80	2.92	2.79	3.01	3.03
East Nusa Tenggara	1.66	1.65	1.68	2.28	2.10	2.39	2.33	2.21	2.11	2.42
<i>Bali Nusa Total</i>	<i>2.40</i>	<i>2.31</i>	<i>2.59</i>	<i>2.92</i>	<i>3.10</i>	<i>3.04</i>	<i>3.08</i>	<i>3.02</i>	<i>3.10</i>	<i>3.23</i>
West Kalimantan	1.24	1.24	1.27	1.36	1.62	1.55	1.77	2.00	2.07	2.16
Central Kalimantan	1.37	1.52	1.53	1.28	1.64	1.46	1.60	1.59	1.50	1.84
South Kalimantan	1.79	1.66	1.95	1.91	1.96	1.86	1.85	2.05	2.30	2.43
East Kalimantan	2.01	1.53	2.08	1.54	1.71	1.51	1.62	1.62	1.94	1.92
<i>Kalimantan Total</i>	<i>1.53</i>	<i>1.47</i>	<i>1.63</i>	<i>1.61</i>	<i>1.78</i>	<i>1.68</i>	<i>1.77</i>	<i>1.95</i>	<i>2.11</i>	<i>2.24</i>
North Sulawesi	2.49	2.63	2.28	2.75	2.71	2.82	2.72	2.71	2.91	2.94
Central Sulawesi	1.75	1.83	2.07	2.49	2.32	2.15	2.41	2.33	2.12	2.16
South Sulawesi	2.58	2.56	2.57	2.62	2.34	2.39	2.79	2.95	2.91	2.98
Southeast Sulawesi	1.69	1.73	1.59	1.82	1.84	1.55	1.86	1.76	1.77	2.02
Gorontalo	0	0	0	0	0	0	0	0	0	0
West Sulawesi	0	0	0	0	0	0	0	0	0	0
<i>Sulawesi Total</i>	<i>2.47</i>	<i>2.47</i>	<i>2.44</i>	<i>2.60</i>	<i>2.36</i>	<i>2.39</i>	<i>2.73</i>	<i>2.85</i>	<i>2.82</i>	<i>2.88</i>
Maluku	1.98	1.98	1.98	1.34	1.37	1.77	1.83	2.25	1.75	2.01
North Maluku	0	0	0	0	0	0	0	0	0	0
West Papua	0	0	0	0	0	0	0	0	0	0
Papua	1.99	2.01	2.04	2.11	2.16	2.02	2.10	2.08	1.60	1.83
<i>Maluku Papua Total</i>	<i>1.99</i>	<i>1.99</i>	<i>2.00</i>	<i>1.47</i>	<i>1.57</i>	<i>1.87</i>	<i>1.94</i>	<i>2.18</i>	<i>1.65</i>	<i>1.90</i>
Indonesia Total	2.65	2.70	2.71	2.80	2.87	2.84	3.02	3.03	3.12	3.22

Source: Data base of Ministry of Agriculture

Annex B1.2.10 Wetland Paddy Yield by Province during the 1980s

(unit: t/ha)

Province	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
Aceh	3.12	3.32	3.47	3.60	3.46	3.62	3.64	3.74	3.79	3.87
North Sumatra	3.16	3.34	3.51	3.62	3.71	3.76	3.78	3.78	3.91	3.95
West Sumatra	3.57	3.72	3.86	4.06	4.08	4.16	4.18	4.28	4.42	4.52
Riau	2.34	2.34	2.75	2.87	1.77	2.94	2.95	2.87	2.99	3.19
Jambi	2.80	2.83	2.94	2.88	2.90	2.92	2.96	3.13	3.20	3.23
South Sumtra	2.90	2.96	3.06	3.10	3.17	3.24	3.22	3.21	3.23	3.35
Bengkulu	2.94	2.87	3.38	3.56	3.48	3.40	3.53	3.10	3.28	3.46
Lampung	3.33	3.57	3.81	3.92	3.96	4.04	4.05	4.02	4.05	4.16
Kep. Bangka Belitung	0	0	0	0	0	0	0	0	0	0
Kepulauan Riau	0	0	0	0	0	0	0	0	0	0
<i>Sumtra Total</i>	<i>3.13</i>	<i>3.26</i>	<i>3.44</i>	<i>3.54</i>	<i>3.52</i>	<i>3.64</i>	<i>3.66</i>	<i>3.70</i>	<i>3.77</i>	<i>3.86</i>
DIK Jakarta	2.99	3.21	3.52	3.45	3.57	3.60	4.34	4.29	4.54	4.67
West Java	3.68	3.87	4.26	4.43	4.43	4.50	4.53	4.71	4.87	5.03
Central Java	3.94	4.14	4.45	4.74	4.79	4.77	4.78	4.93	5.01	5.13
DI Yogyakarta	4.27	4.44	4.76	4.97	5.01	5.01	5.04	5.09	5.19	5.32
East Java	4.40	4.66	4.93	4.97	5.01	4.96	4.97	5.08	5.15	5.26
Bantaen	0	0	0	0	0	0	0	0	0	0
<i>Java Total</i>	<i>3.98</i>	<i>4.20</i>	<i>4.53</i>	<i>4.70</i>	<i>4.72</i>	<i>4.73</i>	<i>4.75</i>	<i>4.89</i>	<i>5.00</i>	<i>5.13</i>
Bali	4.10	4.43	4.40	4.46	4.57	4.62	4.71	4.80	4.93	5.05
West Nusa Tenggara	3.22	2.26	3.74	3.45	3.96	3.89	3.91	4.02	4.20	4.31
East Nusa Tenggara	2.51	2.65	3.02	3.19	3.11	3.13	3.12	2.89	2.97	3.02
<i>Bali Nusa Total</i>	<i>3.50</i>	<i>3.13</i>	<i>3.89</i>	<i>3.79</i>	<i>4.07</i>	<i>4.06</i>	<i>4.09</i>	<i>4.17</i>	<i>4.29</i>	<i>4.39</i>
West Kalimantan	2.21	2.38	2.57	2.71	2.58	2.46	2.56	2.56	2.57	2.63
Central Kalimantan	1.98	2.19	2.22	2.12	2.01	2.15	2.11	2.04	2.06	2.13
South Kalimantan	2.59	2.57	2.55	2.58	2.69	3.06	2.72	2.74	2.84	2.81
East Kalimantan	2.09	2.33	2.52	2.43	2.32	2.36	2.44	2.51	2.51	2.65
<i>Kalimantan Total</i>	<i>2.36</i>	<i>2.44</i>	<i>2.51</i>	<i>2.55</i>	<i>2.55</i>	<i>2.71</i>	<i>2.58</i>	<i>2.57</i>	<i>2.63</i>	<i>2.65</i>
North Sulawesi	3.32	3.32	3.82	3.96	4.12	4.13	4.18	3.95	4.03	4.17
Central Sulawesi	2.41	2.55	2.82	2.95	2.94	2.99	3.01	3.12	3.20	3.25
South Sulawesi	3.12	3.47	3.74	3.92	4.00	4.01	4.06	3.96	4.13	4.25
Southeast Sulawesi	2.25	2.41	2.94	3.14	3.09	3.06	3.12	3.18	3.25	3.35
Gorontalo	0	0	0	0	0	0	0	0	0	0
West Sulawesi	0	0	0	0	0	0	0	0	0	0
<i>Sulawesi Total</i>	<i>3.04</i>	<i>3.35</i>	<i>3.63</i>	<i>3.80</i>	<i>3.88</i>	<i>3.90</i>	<i>3.93</i>	<i>3.84</i>	<i>3.98</i>	<i>4.10</i>
Maluku	2.25	2.38	2.42	2.53	2.51	2.40	2.54	2.75	2.72	2.56
North Maluku	0	0	0	0	0	0	0	0	0	0
West Papua	0	0	0	0	0	0	0	0	0	0
Papua	1.96	2.07	2.37	2.48	2.39	2.30	2.42	2.38	2.68	2.65
<i>Maluku Papua Total</i>	<i>2.04</i>	<i>2.16</i>	<i>2.38</i>	<i>2.50</i>	<i>2.43</i>	<i>2.34</i>	<i>2.50</i>	<i>2.62</i>	<i>2.70</i>	<i>2.63</i>
Indonesia Total	3.58	3.75	4.04	4.16	4.20	4.24	4.25	4.32	4.41	4.52

Source: Data base of Ministry of Agriculture

Annex B1.2.11 Wetland Paddy Yield by Province during the 1990s

(unit: t/ha)

Province	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Aceh	3.96	4.03	4.06	4.07	4.08	14.23	4.12	4.15	4.12	4.16
North Sumatra	4.01	4.00	4.04	4.04	4.06	4.11	4.14	4.19	4.20	4.27
West Sumatra	4.60	4.64	4.65	4.66	4.66	4.66	4.69	4.63	4.46	4.46
Riau	3.22	3.23	3.28	3.31	3.29	3.30	3.34	3.29	3.16	3.26
Jambi	3.27	3.29	3.39	3.41	3.42	3.44	3.48	3.35	3.34	3.40
South Sumtra	3.41	3.49	3.49	3.50	3.54	3.59	3.69	3.66	3.59	3.64
Bengkulu	3.55	3.61	3.62	3.62	3.65	3.65	3.70	3.79	3.71	3.80
Lampung	4.20	4.29	4.30	4.33	4.34	4.35	4.37	4.38	4.27	4.15
Kep. Bangka Belitung	0	0	0	0	0	0	0	0	0	0
Kepulauan Riau	0	0	0	0	0	0	0	0	0	0
<i>Sumtra Total</i>	<i>3.92</i>	<i>3.97</i>	<i>3.99</i>	<i>4.01</i>	<i>4.03</i>	<i>5.40</i>	<i>4.10</i>	<i>4.10</i>	<i>4.04</i>	<i>4.06</i>
DIK Jakarta	4.75	4.76	4.79	4.79	4.78	4.82	4.85	4.92	4.79	4.86
West Java	5.09	5.19	5.21	5.22	5.24	0.52	5.28	5.30	4.67	4.76
Central Java	5.18	5.24	5.25	5.28	5.27	5.28	5.32	5.33	5.11	5.01
DI Yogyakarta	5.42	5.47	5.49	5.51	5.55	5.56	5.61	5.62	5.16	5.18
East Java	5.33	5.39	5.41	5.43	5.43	5.43	5.48	5.48	5.20	5.20
Bantaen	0	0	0	0	0	0	0	0	0	0
<i>Java Total</i>	<i>5.19</i>	<i>5.27</i>	<i>5.29</i>	<i>5.30</i>	<i>5.31</i>	<i>3.50</i>	<i>5.36</i>	<i>5.37</i>	<i>4.97</i>	<i>4.98</i>
Bali	5.14	5.24	5.26	5.28	5.29	5.31	5.36	5.39	5.34	5.44
West Nusa Tenggara	4.39	4.48	4.51	4.53	4.54	4.55	4.59	4.61	4.44	4.54
East Nusa Tenggara	3.10	3.11	3.11	3.14	3.15	3.17	3.18	3.17	3.19	3.20
<i>Bali Nusa Total</i>	<i>4.46</i>	<i>4.50</i>	<i>4.53</i>	<i>4.53</i>	<i>4.53</i>	<i>4.53</i>	<i>4.55</i>	<i>4.55</i>	<i>4.48</i>	<i>4.53</i>
West Kalimantan	2.67	2.72	2.73	2.73	2.73	2.76	2.79	2.78	2.67	2.73
Central Kalimantan	2.15	2.38	2.37	2.33	2.32	2.37	2.63	2.54	2.26	2.51
South Kalimantan	2.82	2.90	2.98	2.97	2.97	3.01	3.10	3.17	2.69	3.17
East Kalimantan	2.70	2.75	2.77	2.78	2.76	2.85	3.02	3.06	3.01	3.28
<i>Kalimantan Total</i>	<i>2.67</i>	<i>2.77</i>	<i>2.82</i>	<i>2.80</i>	<i>2.79</i>	<i>2.83</i>	<i>2.93</i>	<i>2.96</i>	<i>2.65</i>	<i>2.96</i>
North Sulawesi	4.18	4.23	4.25	4.27	4.28	4.30	4.33	4.37	3.83	4.43
Central Sulawesi	3.30	3.31	3.34	3.36	3.39	3.42	3.43	3.45	3.24	3.50
South Sulawesi	4.29	4.35	4.37	4.37	4.40	4.42	4.77	4.74	4.25	4.36
Southeast Sulawesi	3.40	3.43	3.41	3.43	3.45	3.48	3.55	3.56	3.40	3.67
Gorontalo	0	0	0	0	0	0	0	0	0	0
West Sulawesi	0	0	0	0	0	0	0	0	0	0
<i>Sulawesi Total</i>	<i>4.13</i>	<i>4.16</i>	<i>4.19</i>	<i>4.19</i>	<i>4.21</i>	<i>4.22</i>	<i>4.46</i>	<i>4.46</i>	<i>4.03</i>	<i>4.19</i>
Maluku	2.76	2.89	2.99	3.03	2.94	2.96	2.96	2.97	2.90	3.01
North Maluku	0	0	0	0	0	0	0	0	0	0
West Papua	0	0	0	0	0	0	0	0	0	0
Papua	2.66	2.72	2.74	2.74	2.77	2.80	2.80	2.79	2.76	2.92
<i>Maluku Papua Total</i>	<i>2.69</i>	<i>2.78</i>	<i>2.76</i>	<i>2.86</i>	<i>2.82</i>	<i>2.83</i>	<i>2.85</i>	<i>2.84</i>	<i>2.81</i>	<i>2.95</i>
Indonesia Total	4.57	4.62	4.64	4.65	4.63	4.05	4.70	4.72	4.44	4.47

Source: Data base of Ministry of Agriculture

Annex B1.2.12 Wetland Paddy Yield by Province during the 2000s

(unit: t/ha)

Province	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Aceh	4.21	4.24	4.20	4.22	4.20	4.20	4.24	4.27	4.28	4.37
North Sumatra	4.32	4.27	4.28	4.30	4.32	4.36	4.40	4.50	4.58	4.71
West Sumatra	4.49	4.47	4.36	4.47	4.47	4.49	4.57	4.60	4.69	4.83
Riau	3.28	3.36	3.27	3.28	3.30	3.34	3.34	3.57	3.59	3.75
Jambi	3.38	3.61	3.62	3.91	3.95	4.01	4.18	4.25	4.31	4.34
South Sumtra	3.64	3.59	3.56	3.68	3.78	3.88	3.97	4.17	4.22	4.34
Bengkulu	3.78	3.89	3.81	4.06	4.06	4.07	4.05	4.04	4.00	4.01
Lampung	4.33	4.36	4.43	4.47	4.49	4.55	4.56	4.64	4.85	4.91
Kep. Bangka Belitung	0	3.32	3.22	2.92	3.11	3.56	3.53	3.54	3.43	3.48
Kepulauan Riau	0	0	0	0	0	2.92	2.92	2.95	3.05	3.08
<i>Sumtra Total</i>	<i>4.11</i>	<i>4.10</i>	<i>4.08</i>	<i>4.16</i>	<i>4.18</i>	<i>4.23</i>	<i>4.27</i>	<i>4.37</i>	<i>4.45</i>	<i>4.55</i>
DKI Jakarta	4.57	5.03	4.87	4.38	4.58	5.00	4.68	5.18	5.09	5.58
West Java	5.15	5.05	5.30	5.54	5.28	5.33	5.39	5.57	5.77	5.98
Central Java	5.16	5.10	5.24	5.38	5.28	5.30	5.29	5.41	5.57	5.64
DI Yogyakarta	5.45	5.47	5.49	5.55	5.77	5.73	5.74	5.82	6.26	6.27
East Java	5.37	5.17	5.32	5.36	5.42	5.43	5.45	5.53	6.00	6.02
Bantaen	0	4.52	4.54	5.06	5.21	5.20	5.25	5.30	5.24	5.23
<i>Java Total</i>	<i>5.22</i>	<i>5.08</i>	<i>5.25</i>	<i>5.40</i>	<i>5.33</i>	<i>5.35</i>	<i>5.38</i>	<i>5.50</i>	<i>5.76</i>	<i>5.86</i>
Bali	5.36	5.36	5.46	5.49	5.50	5.55	5.61	5.81	5.87	5.87
West Nusa Tenggara	4.65	4.65	4.67	4.75	4.85	4.83	4.85	4.87	5.08	5.23
East Nusa Tenggara	3.14	3.18	3.25	3.30	3.50	3.30	3.50	3.48	3.53	3.63
<i>Bali Nusa Total</i>	<i>4.56</i>	<i>4.55</i>	<i>4.60</i>	<i>4.63</i>	<i>4.73</i>	<i>4.72</i>	<i>4.79</i>	<i>4.83</i>	<i>4.94</i>	<i>5.05</i>
West Kalimantan	2.83	2.95	3.17	3.28	3.27	3.30	3.31	3.43	3.42	3.41
Central Kalimantan	2.59	2.68	2.76	2.77	2.86	2.77	2.85	2.90	2.94	3.15
South Kalimantan	3.18	3.39	3.32	3.30	3.53	3.60	3.65	3.99	3.97	4.10
East Kalimantan	3.35	3.37	3.43	3.93	4.16	4.44	4.45	4.49	4.52	4.56
<i>Kalimantan Total</i>	<i>3.02</i>	<i>3.17</i>	<i>3.22</i>	<i>3.28</i>	<i>3.41</i>	<i>3.49</i>	<i>3.52</i>	<i>3.72</i>	<i>3.72</i>	<i>3.79</i>
North Sulawesi	4.41	4.46	4.43	4.52	4.51	4.70	4.95	5.01	5.00	5.03
Central Sulawesi	3.65	3.59	3.84	3.93	4.06	4.15	4.19	4.28	4.73	4.61
South Sulawesi	4.58	4.55	4.68	4.75	7.62	4.65	4.69	4.73	4.89	5.03
Southeast Sulawesi	3.87	3.82	3.90	3.85	3.96	3.91	3.90	4.06	4.14	4.33
Gorontalo	0	4.50	4.45	4.58	4.38	4.34	4.44	4.56	5.11	5.37
West Sulawesi	0	0	0	0	0	4.46	4.86	4.92	4.92	4.92
<i>Sulawesi Total</i>	<i>4.39</i>	<i>4.38</i>	<i>4.48</i>	<i>4.54</i>	<i>6.08</i>	<i>4.51</i>	<i>4.58</i>	<i>4.63</i>	<i>4.83</i>	<i>4.93</i>
Maluku	2.98	2.85	2.90	3.50	3.52	3.52	3.84	3.96	4.25	4.52
North Maluku	0	0	0	3.83	3.71	3.71	3.72	3.73	3.74	3.74
West Papua	0	0	0	0	0	3.26	3.29	3.44	3.53	3.62
Papua	2.90	3.17	2.06	3.18	3.22	3.35	3.50	3.63	3.57	3.80
<i>Maluku Papua Total</i>	<i>2.92</i>	<i>3.08</i>	<i>2.15</i>	<i>3.50</i>	<i>3.46</i>	<i>3.48</i>	<i>3.61</i>	<i>3.71</i>	<i>3.78</i>	<i>3.98</i>
Indonesia Total	4.64	4.58	4.67	4.76	4.88	4.78	4.82	4.91	5.08	5.19

Source: Data base of Ministry of Agriculture

Annex B1.3.1 Target of New Agricultural Land Development for 2010-2014

(unit: ha)

Province	Wetland Paddy Field	Dry Land for Food Crops	Dry Land for Horticulture	Smallholders' Estate Crops	Forage Land	Grazing Land	Total New Farm Land
Aceh	16,836	17,500	14,100	30,505	14,780	605	94,326
North Sumatra	8,749	14,500	13,660	16,475	12,155	400	65,939
West Sumatra	10,735	12,500	10,050	16,575	10,180	390	60,430
Riau	13,602	19,500	20,130	28,525	14,660	675	97,092
Jambi	7,251	14,500	13,680	20,500	12,180	400	68,511
South Sumtra	12,728	14,000	13,300	20,475	12,340	400	73,243
Bengkulu	2,673	14,000	13,310	20,550	12,180	400	63,113
Lampung	5,869	14,000	13,260	20,200	12,170	400	65,899
Kep. Bangka Belitung	4,442	4,000	4,060	4,150	1,600	0	18,252
Kepulauan Riau	:	4,000	4,105	4,000	1,650	0	13,755
<i>Sumtra Total</i>	82,885	128,500	119,655	181,955	103,895	3,670	620,560
Banten	750	40	1,225	1,200	1,600	0	4,815
DKI Jakarta	0	0	0	0	0	0	0
West Java	1,515	50	3,310	4,050	4,150	0	13,075
Central Java	0	0	3,330	4,000	4,170	0	11,500
DI Yogyakarta	0	60	1,175	1,200	2,000	0	4,435
East Java	0	0	4,300	4,075	4,150	0	12,525
<i>Java Total</i>	2,265	150	13,340	14,525	16,070	0	46,350
Bali	0	0	1,230	800	1,050	0	3,080
West Nusa Tenggara	1,647	12,160	11,650	12,475	8,255	510	46,697
East Nusa Tenggara	4,118	12,260	11,700	12,950	11,150	610	52,788
<i>Bali Nusa Total</i>	5,765	24,420	24,580	26,225	20,455	1,120	102,565
West Kalimantan	13,468	16,050	16,050	26,200	14,150	550	86,468
Central Kalimantan	11,109	16,000	18,075	26,850	14,630	590	87,254
South Kalimantan	10,978	16,000	18,100	26,550	14,830	550	87,008
East Kalimantan	16,415	16,000	18,130	26,000	14,760	630	91,935
<i>Kalimantan Total</i>	51,970	64,050	70,355	105,600	58,370	2,320	352,665
North Sulawesi	2,750	14,500	15,100	12,475	10,500	375	55,700
Gorontalo	2,793	12,200	7,850	12,275	8,720	375	44,213
Central Sulawesi	14,628	16,000	16,140	26,550	14,160	720	88,198
South Sulawesi	6,025	16,000	16,140	26,575	14,250	630	79,620
Southeast Sulawesi	15,434	16,000	16,150	26,450	14,170	720	88,924
West Sulawesi	17,145	16,000	18,350	26,475	14,120	600	92,690
<i>Sulawesi Total</i>	58,775	90,700	89,730	130,800	75,920	3,420	449,345
Maluku	11,882	17,500	16,080	26,000	14,075	550	86,087
North Maluku	12,226	16,000	16,000	26,150	14,075	550	85,001
West Papua	11,112	19,680	18,130	29,725	14,840	640	94,127
Papua	13,120	39,000	32,130	44,450	33,300	1,300	163,300
<i>Maluku Papua Total</i>	48,340	92,180	82,340	126,325	76,290	3,040	428,515
Indonesia Total	250,000	400,000	400,000	585,430	351,000	13,570	2,000,000

Factor	Food Crops (Tanaman Pangan)											Vegetables		
	Irrigated Paddy		Maize		Soybeans		Mungbeans		Groundnut		Cassava		Chili (cabe besar)	
Basic Characteristics of Subject Crop											(medium)	(early)		
1. Growth Duration	100 - 120 days		90 days		80 days		75 days		120 days		8 - 10 months	6 months	6 - 7 months	
2. Length of Field Occupation	90 - 100 days		90 days		80 days		75 days		120 days		8 - 10 months	6 months	5 - 6 months	
3. Crop Water Requirement														
Agro-environmental Conditions	S1 ⁺¹	S2 ⁺²	S1	S2	S1	S2	S1	S2	S1	S2	S1	S2	S1	S2
1. Average Temperature in Growing Period (°C)	24 - 29	22 - 24	20 - 26	26 - 30	23 - 25	20 - 23	12 - 24	24 - 27	25 - 27	20 - 23	22 - 28	28 - 30	12 - 24	24 - 27
		29 - 32				25 - 28		10 - 12		25 - 28				10 - 12
2. Rainfall in Growing Period (mm)			500 - 1,000	1,200 - 1,600	350 - 1,100	250 - 350	350 - 600	600 - 1,000	350 - 1,100	250 - 350	1,000 - 2,000	600 - 1,000	350 - 600	600 - 1,000
				400 - 500		1,100 - 1,600		300 - 350		1,100 - 1,600		2,000 - 3,000		300 - 350
3. Humidity (%) or Dry Spell (months)	33 - 90	30 - 33	> 42	36 - 42	24 - 80	20 - 24/80 - 85	42 - 75	36 - 42/75 - 90	24 - 80	20 - 24/80 - 85	3.5 - 5 months	5 - 6 months	42 - 75	36 - 42/75 - 90
4 Drainage	slightly poor	poor	good,	slightly rapid	good	slightly rapid	good	slightly rapid	good	slightly rapid	good	slightly rapid	good	slightly rapid
	moderate	good	slightly poor	moderate	slightly poor	moderate	slightly poor	moderate	slightly poor	moderate	slightly poor	moderate	slightly poor	moderate
5 Soil Texture	fine	medium	fine - medium	fine - medium	fine - medium	fine - medium	fine - medium	fine - medium	fine - medium	fine - medium	fine - medium	fine - m. coarse	fine - medium	fine - medium
6 Effective Soil Depth (cm)	> 50	40 - 50	> 60	40 - 60	> 75	50 - 75	> 75	50 - 75	> 75	50 - 75	> 100	75 - 100	> 75	50 - 75
7 Soil pH	5.5 - 8.2	4.5 - 5.5	5.8 - 7.8	5.5 - 5.8	5.5 - 7.5	5.0 - 5.5	5.6 - 7.6	5.4 - 5.6	5.5 - 7.5	5.0 - 5.5	5.2 - 7.0	4.8 - 5.2	5.6 - 7.6	5.4 - 5.6
		8.3 - 8.5		7.8 - 8.2		7.5 - 7.8		7.6 - 8.0		7.5 - 7.8		7.0 - 7.6		7.6 - 8.0

Factor	Vegetables										Estate Crops			
	Shallot (bawang merah)		Long Beans		Egg Plant (terung)		Cucumber (mentimun)		Amaranthus (bayam)		Sugarcane		Rubber	Oil Palm
Basic Characteristics of Subject Crop														
1. Growth Duration	65 - 72 days		90 - 100 days		6 months		60 - 70 days		28 - 30 days		2 - 3 years		> 20 years	> 20 years
2. Length of Field Occupation	65 - 72 days		90 - 100 days		5 months		45 days		28 - 30 days		2 - 3 years		> 20 years	> 20 years
3. Water Requirement for Growth														
Agro-environmental Conditions	S1 ⁺¹	S2 ⁺²	S1	S2	S1	S2	S1	S2	S1	S2	S1	S2	S1	S1
1. Average Temperature in Growing Period (°C)	20 - 25	25 - 30	12 - 24	24 - 27	18 - 26	26 - 30	22 - 30	30 - 32	40,901	24 - 27	24 - 30	30 - 32	26 - 30	25 - 28
		18 - 20		10 - 12		16 - 18		20 - 22		10 - 12		22 - 24		
2. Rainfall in Growing Period (mm)	350 - 600	600 - 800	350 - 600	600 - 1,000	400 - 700	700 - 800	400 - 700	700 - 1,000	350 - 600	600 - 1,000	> 50/ 10 days	> 50/ 10 days	2,500 - 3,000	1,700 - 2,500
		300 - 350		300 - 350		300 - 400		300 - 400		300 - 350				
3. Humidity (%) or Dry Spell (months)	-	-	42 - 75	36 - 42/75 - 90	24 - 80	20 - 24/80 - 90	24 - 80	20 - 24/80 - 90	42 - 75	36 - 42/75 - 90	< 70	> 70	1 - 2 months	< 2 months
4 Drainage	good	slightly rapid	good	slightly rapid	good	slightly rapid	good	slightly rapid	good	slightly rapid	good	slightly poor	good	good
	slightly poor	moderate	slightly poor	moderate	slightly poor	moderate	slightly poor	moderate	slightly poor	moderate	moderate			moderate
5 Soil Texture	fine - medium	fine - medium	fine - medium	fine - medium	fine - medium	fine - medium	fine - medium	fine - medium	fine - medium	fine - medium	fine - medium	fine - medium	fine - medium	fine - medium
6 Effective Soil Depth (cm)	> 50	30 - 50	> 75	50 - 75	> 50	> 50	> 50	> 50	> 75	50 - 75	> 75	> 75	> 100	> 100
7 Soil pH	6.0 - 7.8	5.8 - 6.0	5.6 - 7.6	5.4 - 5.6	6.0 - 7.5	5.5 - 6.0	5.8 - 7.6	5.5 - 5.8	5.6 - 7.6	5.4 - 5.6	5.5 - 7.5	5.0 - 5.5	5.0 - 6.0	5.0 - 6.5
		7.8 - 8.0		7.6 - 8.0		7.5 - 8.0		7.6 - 8.0		7.6 - 8.0		7.5 - 8.0		

Note: S1⁺¹; highly suitable S2⁺²; moderately suitable

Source: Petunjuk Teknis Evaluasi Lahan Untuk Komoditas Pertanian

Unit price and Amount: Rp 1,000

Item	Unit Rate (Rp.000)	Food Crop (per season) *1																Sugarcane (per year) *2							
		Irrigated Paddy		Hybrid Paddy		Maize Hybrid		Soybeans		Mungbeans		Groundnut		Cassava		Minimum Tillage		1st Year		2nd Year		3rd Year		Total	
		Q'ty	Amount	Q'ty	Amount	Q'ty	Amount	Q'ty	Amount	Q'ty	Amount	Q'ty	Amount	Q'ty	Amount	Q'ty	Amount	Q'ty	Amount	Q'ty	Amount	Q'ty	Amount	Q'ty	Amount
1. Production Cost			7,938		8,500		6,665		5,710		4,280		6,958		7,808	3,629	2,657		12,200		7,650		8,423		28,273
(1) Fam Inputs			2,638		3,200		2,745		2,110		680		2,958		3,808	1,629	657		5,800		2,530		2,783		11,113
- Seed (kg/stick)		25	188	15	750	15	675	40	500	25	375	120	2,400	10,000	1,500	500	375		3,500						3,500
- Fertilizer			2,250		2,250		1,870		1,010		205		238		1,933	529	182		1,700		1,870		2,057		5,627
Urea (kg/ha)	1.6	100	160	100	160	300	480	50	80	25	40	50	80	100	160	64	40								
SP 36 (kg/ha)	2.0									25	50	50	100	100	200										
NPK (kg/ha)	2.3	300	690	300	690	300	690	100	230	50	115			75	173	115	92								
KCl (kg/ha)	2.3												25	58											
Organic (kg/ha)	0.7	2,000	1,400	2,000	1,400	1,000	700	1,000	700					2,000	1,400	350									
- Agro-chemicals (kg or L/ha)		1	200	1	200	1	200	1	375	1	100	1	100	3	375	375	100		600		660		726		1,986
- Others								1	225			1	220			225									
(2) Labor Cost		115	4,600	115	4,600	88	3,520	80	3,200	80	3,200	90	3,600	90	3,600	2,000	2,000	160	6,400	128	5,120	141	5,640	429	17,160
- Field Management (man-day)	40	75	3,000	75	3,000	48	1,920	45	1,800	45	1,800	45	1,800	50	2,000	1,000	1,000								
- Harvesting (man-day)	40	40	1,600	40	1,600	40	1,600	35	1,400	35	1,400	45	1,800	40	1,600	1,000	1,000								
(3) Land Preparation (machinery)		2	700	2	700	1	400	1	400	1	400	1	400	1	400										
2. Gross Return																									
(1) Unit Price (Rp 1,000/t)			3,200		3,200		2,640		6,500		8,000		11,000		700	6,500	8,000								
(2) Production (t/ha) *3		6.0		6.5		6.5		1.5		1.1		1.5		25.0				100		100		100			300
(3) Gross Return (Rp 1,000)			19,200		20,800		17,160		9,750		8,800		16,500		17,500	5,850	5,600		37,620		37,620		37,620		112,860
3. Net Return																									
(1) Net Return (% & Rp 1,000) *4		59%	11,262	59%	12,300	61%	10,495	41%	4,040	51%	4,520	58%	9,543	55%	9,693	2,221	2,943	68%	25,420	80%	29,970	78%	29,197	75%	84,587
Labor Requirement (man-day)			115		115		88		80		80		90		90	50	50		160		128		141		429
Labor Productivity (gross return/labor requirement)																									
Production (Rp 1,000/man-day)			167		181		195		122		110		183		194	117	112		235		294		267		263

Note: land rent, tax and fixed costs not included; *1 ; Estimated by the JICA Study Team based on crop budget provided by Directorate of Cereal Crops and Beans & Tuber Crops, DG Food Crops, Lampung & Banten. *2 ; Source - Directorate Tanaman Perkebunan Semusim, Direktorat Jenderal Perkebunan. *3 ; Moderate yield level. *4 ; % - (Net return/growth return) x 100
Source: JICA Study Team

Unit price and Amount: Rp 1,000

Item	Unit Price (Rp 1,000)	Vegetable																	
		Chili		Shallot		Long Beans		Egg Plant		Cucumber		Amaranthus		Morning Glory ^{*1}		Sweet Corn ^{*2}		Watermelon ^{*3}	
		Q'ty	Amount	Q'ty	Amount	Q'ty	Amount	Q'ty	Amount	Q'ty	Amount	Q'ty	Amount	Q'ty	Amount	Q'ty	Amount	Q'ty	Amount
1. Production Cost			41,230		44,219		16,003		5,940		11,873		10,988		4,100		6,000		7,100
(1) Farm Inputs			29,630		30,219		11,603		1,140		4,673		7,388		1,300		2,800		3,500
- Seed (kg/ha)		20	1,700	800	16,000	14	700	0.3	300	1.0	220	5	300	50	1,000	8	1,600		450
- Fertilizer			9,600		5,020		6,950		440		620		6,024		160		800		2,490
Urea (kg/ha)	1.6			100	160	200	320	100	160	100	160	400	640	100	160			100	160
SP 36 (kg/ha)	2.0	480	960	200	400	200	400					100	200					100	200
NPK (kg/ha)	2.3	1,800	4,140					100	230	200	460								
KCl (kg/ha)	2.3			200	460	100	230					80	184					100	230
ZA (kg/ha)	1.4			150	210														0
Organic (kg/ha)		30	4,500	2,000	2,000	10,000	6,000					10,000	5,000						1,900
PPC/ZPT (L/ha)				40	2,000			2	50										
- Agro-chemicals (packet)		1	11,270	1	5,699	1	320	1	400	1	3,000				140		400		560
- Others			7,060		3,500		3,633				833		1,064						
(2) Labor Cost (man-day & Rp 1,000)	40	280	11,200	340	13,600	100	4,000	110	4,400	170	6,800	80	3,200	60	2,400	70	2,800	80	3,200
(3) Land Preparation (machinery)	400	1	400	1	400	1	400	1	400	1	400	1	400	1	400	1	400	1	400
2. Gross Return																			
(1) Unit Price (Rp 1,000/t)			7,000		8,000		3,000		1,500		1,500		3,000		1,000		1,500		1,200
(2) Production (t/ha) ^{*4}		10.0		10.0		8.0		12.0		15.0		6.0		10.0		10.0		15	
(3) Gross Return (Rp. 000)			70,000		80,000		24,000		18,000		22,500		18,000		10,000		15,000		18,000
3. Net Return																			
(1) Net Return (% & Rp 1,000) ^{*5}		41%	28,770	45%	35,781	33%	7,997	67%	12,060	47%	10,627	39%	7,012	59%	5,900	60%	9,000	61%	10,900
Labor Requirement (man-day)			280		340		100		110		170		80		60		70		80
Labor Productivity (gross return/labor requirement)																			
Production: high (Rp 1,000/man-day)			250		235		240		164		132		225		167		214		225

Note: land rent, tax & fixed cost not included; *1; Prepared by modifying data presented by Director of Vegetable Crop, DG. Horticulture *2; Prepared by modifying data presented by Banten Province Food Crops Agriculture Office *3; Prepared by modifying data presented by Director of Fruit Crop, DG. "Horticulture; Profil Sentra Produksi Tanaman Semangka" *4; Moderate yield level *5; % - (Net return/growth return) x 100

Source: Information provided in Buku Saku Sayuran, Direktorat Budidaya Tanaman Sayuran & Biofarmaka, 2010 were updated & modified based on the study of the JICA Study Team.

Annex B2.1.4 Estimated Crop Budget of Sugarcane

Unit: Rp 1,000

Item	Year			Total	Remarks
	1	2	3		
1. Production Cost	12,200	7,650	8,423	28,273	
(1) Farm Inputs	5,800	2,530	2,783	11,113	
- Seed/Seedling	3,500			3,500	
- Fertilizer	1,700	1,870	2,057	5,627	
- Others	600	660	726	1,986	
(2) Labor Cost	6,400	5,120	5,640	17,160	
Planting	2,200			2,200	
Field Management	700	1,270	1,400	3,370	
Harvesting	3,500	3,850	4,240	11,590	
Case I: Moderate Yield Level					
2. Gross Return	37,620	37,620	37,620	112,860	
(1) Sugar					
- Production (t/ha)	100	100	100	300	
- Sugar Content (%)	6.5	6.5	6.5	20	
- Sugar Yield (kg)	6,500	6,500	6,500	19,500	
- Producers Share	4,290	4,290	4,290	12,870	66% of products
- Unit Price (Rp 1,000/kg)	8	8	8	24	
- Gross Return (Rp 1,000)	34,320	34,320	34,320	102,960	
(2) Molasses					
- Molasses Yield (kg)	3,000	3,000	3,000	9,000	3% of cane
- Unit Price (Rp 1,000/kg)	1.1	1.1	1.1	3	
- Gross Return (Rp 1,000)	3,300	3,300	3,300	9,900	
3. Net Return (Rp 1,000)	25,420	29,970	29,197	84,587	28,196/year
% to Gross Return	68	80	78	75	
Case II: Low Yield Level					
2. Gross Return	30,096	30,096	30,096	90,288	
(1) Sugar					
- Production (t/ha)	80	80	80	240	
- Sugar Content (%)	6.5	6.5	6.5	20	
- Sugar Yield (kg)	5,200	5,200	5,200	15,600	
- Producers Share	3,432	3,432	3,432	10,296	66% of products
- Unit Price (Rp 1,000)	8	8	8	24	
- Gross Return (Rp 1,000)	27,456	27,456	27,456	82,368	
(2) Molasses					
- Molasses Yield (kg)	2,400	2,400	2,400	7,200	3% of cane
- Unit Price (Rp 1,000/kg)	1.1	1.1	1.1	3	
- Gross Return (Rp 1,000)	2,640	2,640	2,640	7,920	
3. Net Return (Rp 1,000)	17,896	22,446	21,673	62,015	20,672/year
% to Gross Return	59	75	72	69	

Source: Directorate Tanaman Perkebunan Semusim, DG.

1. Rubber

Unit A: amount as Rp 1,000

Item	1st		2nd		3rd		4th		5th		6th		7th	8th	9th	10th	11th	12th	13th	14th	15th	16th	17th	18th	19th	Total	
	Qty	A	Qty	A	Qty	A	Qty	A	Qty	A	Qty	A	A	A	A	A	A	A	A	A	A	A	A	A	A		
1. Total Cost		26,899		7,239		7,389		7,779		7,779		6,189	6,189	6,189	6,189	6,189	6,189	6,189	6,189	6,189	6,189	6,189	6,189	6,189	6,189	143,731	
(1) Farm Inputs		16,432		3,449		3,599		3,989		3,989		3,239	3,239	3,239	3,239	3,239	3,239	3,239	3,239	3,239	3,239	3,239	3,239	3,239	3,239	76,804	
- Seedling (nos/ha)	612	4,590																								4,590	
- Fertilizer (kg/ha)	580	1,794	600	2,699	605	2,849	700	3,239	650	3,239	750	3,239	3,239	3,239	3,239	3,239	3,239	3,239	3,239	3,239	3,239	3,239	3,239	3,239	3,239	59,166	
- Agro-chemicals (kg or L/ha)	550	10,000	5	750	5	750	5	750	5	750																13,000	
- Others		48																								48	
(2) Farm Tools (set)	1	2,442																								2,442	
(3) Labor Cost	215	7,525	94	3,290	94	3,290	94	3,290	94	3,290	70	2,450	2,450	2,450	2,450	2,450	2,450	2,450	2,450	2,450	2,450	2,450	2,450	2,450	2,450	54,985	
(4) Transportation Cost		500		500		500		500		500		500	500	500	500	500	500	500	500	500	500	500	500	500	500	9,500	
2. Gross Return								10,780				15,510	23,100	25,300	21,065	22,220	26,730	26,125	23,562	24,090	21,780	22,495	20,625	18,249	21,890	323,521	
(1) Unit Price (Rp 1,000/kg) ^{*1}												11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	
(2) Production (kg/ha)								980				1,410	2,100	2,300	1,915	2,020	2,430	2,375	2,142	2,190	1,980	2,045	1,875	1,659	1,990	29,411	
3. Net Return		-26,899		-7,239		-7,389		-7,779		3,001		9,321	16,911	19,111	14,876	16,031	20,541	19,936	17,373	17,901	15,591	16,306	14,436	12,060	15,701	179,790	
4. Net Return after Depreciation												3,121	10,711	12,911	8,676	9,831	14,341	13,736	11,467	17,901	15,591	16,306	14,436	12,060	15,701	176,789	
(1) Depreciation of Investment Cost ^{*2}												6,200	6,200	6,200	6,200	6,200	6,200	6,200	5,906							49,306	
(2) Net Profit												3,121	10,711	12,911	8,676	9,831	14,341	13,736	11,467	17,901	15,591	16,306	14,436	12,060	15,701	176,789	
Labor Requirement (man-day)		215		94		94		94		94		70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	1,571
Labor Productivity (Rp 1,000/man-day)												222	330	361	301	317	382	373	337	344	311	321	295	261	313	206	

Note: ^{*1} : Unit price of product (FFB) based on average price in 2010 in Jambi.

^{*2} : Depreciation of initial investment costs of Rp 49,306,000 from 1st to 4th year in 8 years assumed from 6th year. Interest for the investment cost not considered.

Source: Prepared by modifying data presented in "Budidaya dan Analisa Usaha Tani, Dinas Perkebunan Provinsi Lampung, 2010" by Directorate General of Estate Crops.

2. Oil Palm

Unit A: amount as Rp 1,000

Item	1st		2nd		3rd		4th		5th	6th	7th	8th	9th	10th	11th	12th	13th	14th	15th	16th	17th	18th	19th	20th	21st	22nd	23rd	24th	Total
	Qty	A	Qty	A	Qty	A	Qty	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A		
1. Total Cost		13,807		4,001		6,219		6,326	5,576	5,576	5,576	5,576	5,576	5,576	5,576	5,576	5,576	5,576	5,576	5,576	5,576	5,576	5,576	5,576	5,576	5,576	5,576	5,576	141,873
(1) Farm Inputs		7,365		1,926		4,494		4,776	4,026	4,026	4,026	4,026	4,026	4,026	4,026	4,026	4,026	4,026	4,026	4,026	4,026	4,026	4,026	4,026	4,026	4,026	4,026	4,026	99,081
- Seedling (nos)	150	5,400			10	360																							
- Fertilizer (kg/ha)	2,091	1,176	2,091	1,176	754	3,384	878	4,026	4,026	4,026	4,026	4,026	4,026	4,026	4,026	4,026	4,026	4,026	4,026	4,026	4,026	4,026	4,026	4,026	4,026	4,026	4,026	90,282	
- Agro-chemicals (kg or L/ha)	5	750	5	750	5	750	5	750																					3,000
- Others		39																											39
(2) Farm Tools (set)		2,442																											2,442
(3) Labor Cost	100	3,500	45	1,575	35	1,225	30	1,050	1,050	1,050	1,050	1,050	1,050	1,050	1,050	1,050	1,050	1,050	1,050	1,050	1,050	1,050	1,050	1,050	1,050	1,050	1,050	1,050	28,350
(4) Transportation Cost		500		500		500		500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	12,000
2. Gross Return								7,425	8,250	9,900	14,850	14,850	15,675	16,500	16,500	19,800	19,800	19,800	19,800	19,800	19,800	16,500	16,500	16,500	16,500	11,550	9,900	7,425	314,325
(1) Unit Price (Rp 1,000/kg) ^{*1}								1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	
(2) Production (kg/ha)								6,750	7,500	9,000	13,500	13,500	14,250	15,000	15,000	18,000	18,000	18,000	18,000	18,000	18,000	15,000	15,000	15,000	15,000	10,500	9,000	6,750	285,750
3. Net Return		-13,807		-4,001		-6,219		1,099	2,674	4,324	9,274	9,274	10,099	10,924	10,924	14,224	14,224	14,224	14,224	14,224	14,224	10,924	10,924	10,924	10,924	5,974	4,324	1,849	172,452
4. Net Return after Depreciation								1,099	2,674	4,324	5,674	5,674	6,499	7,324	7,324	10,624	10,571	14,224	14,224	14,224	14,224	10,924	10,924	10,924	10,924	5,974	4,324	1,849	167,626
(1) Depreciation of Investment Cost ^{*2}																													28,853
(2) Net Profit								1,099	2,674	4,324	5,674	5,674	6,499	7,324	7,324	10,624	10,571	14,224	14,224	14,224	14,224	10,924	10,924	10,924	10,924	5,974	4,324	1,849	167,626
Labor Requirement (man-day)		100		45		35		30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	810
Labor Productivity (Rp 1,000/man-day)								248	275	330	495	495	523	550	550	660	660	660	660	660	660	550	550	550	550	385	330	248	388

Note: ^{*1} : Unit price of product (FFB) based on average price in 2010 in East Kalimantan.

^{*2} : Depreciation of initial investment costs of Rp 28,853,000 from 1st to 4th year in 8 years from 7th year assumed. Interest for the investment cost not considered.

Source: Prepared by modifying data presented in "Budidaya dan Analisa Usaha Tani, Dinas Perkebunan Provinsi Lampung, 2010" by Directorate General of Estate Crops.

Annex B2.1.6 Possibilities of Introduction of Non-paddy Crops to Bili-Bili Irrigation Area

1. Current Status of the Irrigation Project

1-1. Project area: Mostly irrigated paddy fields before the project. Some 3,700 ha of rainfed paddy fields and upland fields were converted into irrigated fields under the project

1-2. Irrigation Area, Cropping Pattern, Cropped Area and Cropping Intensity

Plan (Source: Service Completion Report, Dec. 2005 & Final Design Report, 1999)															
Project	Project Area	Cropping Intensity (%)								Cropped Area (ha)					
		Paddy			Non-paddy Crops					Paddy			Non-paddy Crops		
		Wet	Dry I	Annual	Dry I	Dry II	Annual	Overall	Wet	Dry I	Annual	Dry I	Dry II	Annual	
Bili-bili	26,230	100	100	200	0	40	40	240	26,230	26,230	52,460	0	10,492	10,492	

Current Status (2010)															
Project	Project Area	Cropping Intensity (%)								Cropped Area (ha) (cropping intensity x project area)					
		Paddy			Non-paddy Crops					Paddy			Non-paddy Crops		
		Wet	Dry I	Annual	Dry I	Dry II	Annual	Overall	Wet	Dry I	Annual	Dry I	Dry II	Annual	
Bili-bili	23,711	100	99	200	1	40	41	240	23,711	23,474	47,185	237	9,484	9,722	

*1: consist of Kampili, Bili-bili & Bissua Sub-project *2: Service Completion Report, 2005 *3: source; PSDA Gowa

*4: results of interview survey with 3 apex P3As

1-3. Paddy Yield and Production

Yield (t/ha)			Production [yield x cropped area (t)]							Yield (t/ha)		
Plan		Current	Plan		Current			% of Plan	Soybeans		Mungbeans	
Wet	Dry I	Wet/Dry I	Wet	Dry I	Annual	Wet	Dry I	Annual	Plan	Current	Plan	Current
5.5	6.5	6.1	144,300	170,500	314,800	144,600	143,200	287,800	91	1.7	1.5	1.2

*1: source; Final Design Report, 1999 *2: average yield from 2006 to 2010, Kabupaten Dalam Angka, Gowa, 2010 *3: Kabupaten Dalam Angka, Gowa, 2010

1-4. (Non-paddy Crops in Irrigation Service Areas

Major crops: mungbeans, maize, soybeans

Minor crops: groundnut, long beans, amaranthus, watermelon, morning glory, chili, mustard green, eggplant, cabbage

1-5. Other Findings

- Introduction of improved farming practices of paddy intensification system applying organic fertilizer similar to SRI is common in Kampili/Bili-bili and started in Bissua. SL-PTT is operated in around 4,000ha in Takalar.

2. Selection of Non-paddy Crops Based on Selection Criteria and Indicators

Indicator for Selection Criteria	Food Crop				Vegetables				Bio-fuel Crop		
	Maize	Soybeans	Mungbeans	Groundnut	Chili	Shallot	L. Beans	Leaf Veg	Maize	Cassava	Sugarcane
Cropped Area in project sub-districts (ha)	4,056	648	6,596	120	24	0	112	512	n.a.	80	381
Length of field occupation by crop (months)	3.0	2.7	2.5	3.0	5.0 - 7.0	3.0	2.0 - 2.5	1.5	3.0	5.0 - 11.0	24 - 36
Possibility of breaking down of plow pan	S	S	S	S	S	S	S	S	S	NS	MS
Expected yield level (t/ha)	6.0-7.0	1.2-1.8	0.9-1.3	1.2-1.8	7.5-12.5	8.0-12.0	6.0-10.0	4.0-8.0	8.0-12.0	20-30	80-120
Labor productivity compared with paddy	MS	S	S	MS	MS	MS	MS	MS	MS	MS	MS
Labor requirement compared with paddy	S	S	S	S	MS	MS	S	S	S	S	MS
Road condition to target market/distance	S	S	S	S	S	S	S	S	S	S	S
Distance (time required to target market)	S	S	S	S	S	S	S	S	S	S	S
Scale of target consumer market	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS
Annual price fluctuation (highest/lowest x 100)	S	S	S	S	NS	MS	MS	MS	MS	S	S
Production cost comparison with paddy	S	S	S	S	MS	MS	MS	MS	S	S	MS
% of net return to gross return	S	MS	MS	MS	MS	MS	MS	MS	MS	MS	S
Comparison of net return/ha to paddy	MS	NS	NS	MS	S	S	MS	NS	MS	MS	S
Extent of cultivation in project area	S	S	S	MS	S	NS	S	S	MS	NS	S
Opinion of PSDA Office	supported		supported		supported			supported		not	not
Selected Candidate Crops	○	△	△	○	○	△	○	△	○	X	X

*1: grain *2: sweet corn consumed in fresh S: supportive MS: moderately supportive NS: not supportive ○ selected △ depending X not selected

3. Possibility of Introducing Candidate Crops

- Maize, soybean and mungbean introduction has no constraint as commonly cultivated in the project area.
- Groundnut introduction is successfully expected in light to medium textured soils.
- Chili (cabe merah) cultivated in the project area is expected to get high-value at Ramadan season but is suffered from high production cost and high labor requirement and high price fluctuation. Processing of dry and powdered chili is recommended.
- Shallot cultivation in the project area is limited. Gradual expansion of production is suggested.
- Cassava and sugarcane introduction in irrigated paddy fields is supported by beneficiaries and local government

4. Approaches for Introduction of Selected Crops

- Maize, mungbean and soybean productivity improvement through SL-PTT (field school for integrated production system) or other improved farming practices/systems should be envisaged.
- High-value crop like chili and shallot introduction should be gradually promoted through SL-PTT or other improved farming practices/systems for target crops and through formation of producers groups to possible extent.
- Recommended crops for dry season I - maize, groundnut, soybean, chili, shallot, long beans, other profitable vegetables
- Recommended crops for dry season II - mungbean, soybean, leaf vegetables, other crops with shorter growth length.
- For vegetable production, formation of producers groups (farmer group) should be promoted and contract growing arrangement with private sector should be sought.
- Group shipment and group marketing in an advanced stage should be aimed at in vegetable production.

5. Recommended Cropping Pattern

Wet season - dry season I - dry season II: Paddy (100%) - paddy/HVC/MVC (100%) - field crops/vegetables (50% or more)

Source: JICA Survey Team

Annex B2.1.7 Possibilities of Introduction of Non-paddy Crops to Bekri Irrigation Area

1. Current Status of the Irrigation Project

1-1. Project area: Upland fields cropped with maize, cassava and other field crops before the project converted into irrigated paddy fields under the project. Transmigration area of settlers from Central Java, Bali and Jogjakarta.

1-2. Irrigation Area, Cropping Pattern, Cropped Area and Cropping Intensity

Plan (Source: PCR 2007)															
Scheme	Project Area ^{*1}	Cropped Area (ha)							Cropping Intensity (%)						
		Paddy			Non-paddy Crops				Paddy			Non-paddy Crops			
		Wet	Dry	Annual	Wet	Dry	Annual	Overall	Wet	Dry	Annual	Dry I	Dry II	Annual	
Bekri	6,500	6,500	5,200	11,700	1,300	2,535	3,835	15,535	100	80	180	20	39	59	

Current Status (average of 2009/10 to 2010/11) ^{*3}															
Scheme	Project Area ^{*2}	Cropped Area (ha)							Cropping Intensity (%)						
		Paddy			Non-paddy Crops				Paddy			Non-paddy Crops			
		Wet	Dry	Annual	Wet	Dry	Annual	Overall	Wet	Dry	Annual	Wet	Dry	Annual	
Bekri	4,900	3,900	1,750	5,650	1,000	2,250	3,250	8,900	80	36	115	20	46	66	

*1: irrigation command area *2: functional irrigation command area *3: source: Way Seputih-Sekampung Office, Water Resource Management Office, Lampung

1-3. Paddy Yield and Production

Yield (t/ha)		Production [yield x cropped area (t)]								Yield (t/ha)					
Plan ^{*1}		Current ^{*2}		Plan ^{*1}				Current ^{*2}				Soybeans		Maize	
Wet	Dry	Wet/Dry	Wet	Dry	Annual	Wet	Dry	Annual	% of Plan	Plan ^{*1}	Current ^{*2}	Plan ^{*1}	Current ^{*2}		
6.5	5.5	5.6	42,300	28,600	70,900	21,840	9,800	31,640	45	1.5	0.8	-	5.5		

*1: source: PCR 2007 *2: average yield levels of major project sub-districts in 2009, Kabupaten Lampung Tengah Dalam Angka, 2010

1-4. (Non-paddy Crops in Irrigation Project

Major crops: maize, groundnut, soybeans, cassava

Minor crops: mungbeans, chili, leaf vegetables, long beans, egg plant, cucumber, watermelon

1-5. Other Findings

- Insufficient water supply to the scheme is reported, especially in dry season, and irrigation water supply in dry season is once in 2 years. (irrigated in 2011 dry season)
- Cassava Thailand of short growth duration (6 months) is introduced in upland fields in limited extent.
- Introduction of Improved farming practices of paddy (SRI) is tried in Central Lampung, but area extent is still limited.
- Reportedly, shallot has not been introduced successfully in the district because it is too hot in the district.

2. Selection of Non-paddy Crops Based on Selection Criteria and Indicators

Indicator for Selection Criteria	Food Crop				Vegetables					Bio-fuel Crop		
	Maize ^{*1}	Soybeans	Mungbeans	Groundnut	Chili	Shallot	Long Beans	Leaf Veg	Maize ^{*2}	Cassava	Sugarcane	
Cropped Area in project sub-districts (ha)	5,719	33	53	189	146	n.a.	70	113	n.a.	7,179	n.a.	
Length of field occupation by crop (months)	3.0	2.7	2.5	3.0	5.0 - 7.0	3.0	2.0 - 2.5	1.5	3.0	5.0 - 11.0	24 - 36	
Possibility of breaking down of plow pan	no	no	no	no	no	no	no	no	no	serious	slight	
Expected yield level (t/ha)	6.0-7.0	1.2-1.8	0.9-1.3	1.2-1.8	7.5-12.5	8.0-12.0	6.0-10.0	4.0-8.0	8.0-12.0	20-30	80-120	
Labor productivity compared with paddy	MS	S	S	MS	MS	MS	MS	MS	MS	MS	-	
Labor requirement compared with paddy	S	S	S	S	MS	MS	S	S	S	S	-	
Road condition to target market/distance	S	S	S	S	S	S	S	S	S	S	-	
Distance (time required to target market)	S	S	S	S	S	S	S	S	S	S	-	
Scale of target consumer market	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	-	
Annual price fluctuation (highest/lowest x 100)	S	S	S	S	NS	MS	MS	MS	MS	S	-	
Production cost comparison with paddy	S	S	S	S	MS	MS	MS	MS	S	S	-	
% of net return to gross return	S	MS	MS	MS	MS	MS	MS	MS	MS	MS	-	
Comparison of net return/ha to paddy	MS	NS	NS	MS	S	S	MS	NS	MS	MS	-	
Extent of cultivation in project area	S	MS	MS	MS	S	NS	S	S	MS	S	-	
Opinion of PSDA Office	supported	supported	supported	supported	supported		supported			not	not	
Selected Candidate Crops	○	△	△	○	○	X	○	△	○	X	X	

*1: grain *2: sweet corn consumed in fresh S: supportive MS: moderately supportive NS: not supportive ○ selected △ depending X not selected

3. Possibility of Introducing Candidate Crops

- Maize has no constraint for introduction as commonly cultivated in the Project Area.
- Soybeans, mungbean and groundnut introduction for dry season is successfully expected, but profitability will be rather low in case of soybean and mungbean. Productivity improvement through SL-PTT or else should be envisaged.
- Chili (cabe merah) cultivated in the project area is expected to get high-value at Ramadan season but is suffered from high production cost high labor requirement and high price fluctuation. Processing of dry and powdered chili is recommended.
- Cassava cultivation on irrigated paddy fields is not accepted by the provincial/district agriculture offices in Lampung.

4. Approaches for Introduction of Recommendable Crops

- Maize, groundnut, mungbean and soybean productivity improvement should be aimed at through SL-PTT or other improved farming systems.
- High-value crop (chili) introduction should be gradually promoted through SL-PTT or other improved farming practices/systems..
- Recommended crops for dry season - maize, groundnut, soybean, chili, long beans, other profitable vegetables.
- Group shipment and group marketing in an advanced stage should be aimed at in vegetable production.

5. Recommended Cropping Pattern

In a year with irrigation water supply in dry season:

In a year without irrigation water supply in dry season:

Wet season - dry season: Paddy (100%) - paddy/promising field crops/high-value crops (100%)

Wet season - dry season: Paddy (100%) - field crops under rainfed or high-value crops under pumping irrigation to a possible extent (100%) - fallow

Source: JICA Survey Team

Annex B2.1.8 Possibilities of Introduction of Non-paddy Crops to West Rumbia Irrigation Area

1. Current Status of the Irrigation Project

1-1. Project area: Upland fields cropped with maize, cassava and other field crops before the project were converted into irrigated paddy fields under the project. Transmigration area of settlers from Central Java, Bali and Jogjakarta.

1-2. Irrigation Area, Cropping Pattern, Cropped Area and Cropping Intensity

Plan (source: PCR 2007)														
Scheme	Project Area ^{*1}	Cropped Area (ha)						Cropping Intensity (%)						
		Paddy			Non-paddy Crops			Paddy			Non-paddy Crops			
		Wet	Dry	Annual	Wet	Dry	Annual	Overall	Wet	Dry	Annual	Wet	Dry	Annual
West Rumbia	5,790	5,790	4,632	10,422	1,158	2,258	3,416	13,838	100	80	180	20	39	59

Current Status (average of 2008/9 to 2009/10) ^{*3}														
Scheme	Project Area ^{*2}	Cropped Area (ha) (cropping intensity x project area)						Cropping Intensity (%)						
		Paddy			Non-paddy Crops			Paddy			Non-paddy Crops			
		Wet	Dry	Annual	Wet	Dry	Annual	Overall	Wet	Dry	Annual	Wet	Dry	Annual
West Rumbia	4,956	4,936	1,418	6,354	20	1,686	1,706	8,060	100	29	128	0.4	34	34

*1: irrigation command area

*2: functional irrigation command area

*3: source: Way Seputih-Sekampung Office, Water Resource Management Office

1-3. Paddy Yield and Production

Yield (t/ha)				Production (yield x cropped area (t))							Yield (t/ha)			
Plan ^{*1}		Current ^{*2}		Plan ^{*1}			Current ^{*2}				Soybeans		Maize	
Wet	Dry	Wet/Dry	Wet	Dry	Annual	Wet	Dry	Annual	% of Plan	Plan ^{*1}	Current ^{*2}	Plan ^{*1}	Current ^{*2}	
6.5	5.5	5.6	37,600	25,500	63,100	27,700	7,900	35,600		56	1.5	0.8	-	6.2

*1: source: PCR 2007

*2: average yield levels of major project sub-districts in 2009, Kabupaten Lampung Tengah Dalam Angka, 2010

1-4. (Non-paddy Crops in Irrigation Project

Major crops: maize, cassava

Minor crops: soybean, mungbeas, chili, long beans, eggplant, cucumber, amaranthus, morning glory, watermelon

1-5. Other Findings

- Insufficient water supply to the scheme is reported, especially in dry season, and irrigation water supply in dry season is once in 2 years. (irrigated in 2010 dry season).
- Cassava Thailand of short growth duration (6 months) is practiced extensively in dry season after paddy.
- Introduction of improved farming practices of paddy (SRI) is tried in Central Lampung, but area extent is still limited.
- Sweet corn production under contract growing arrangement with a hybrid seed supplier is carried out by a farmer group.

2. Selection of Non-paddy Crops Based on Selection Criteria and Indicators

Indicator for Selection Criteria	(S: supportive for introduction in irrigation service areas, MS: moderately supportive, NS: not supportive)											
	Food Crop				Horticulture Crop				Bio-fuel Crop			
	Maize ^{*1}	Soybeans	Mungbeans	Groundnut	Chili	Shallot	Long Beans	Leaf Veg	Maize ^{*2}	Cassava	Sugarcane	
Cropped Area in project sub-districts (ha)	4,330	113	0	170	62	n.a.	67	80	n.a.	8,293	n.a.	
Length of field occupation (months)	3.0	2.7	2.5	3.0	5.0 - 7.0	3.0	2.0 - 2.5	1.5	3.0	5.0 - 11.0	24 - 36	
Possibility of breaking down of plow pan	no	no	no	no	no	no	no	no	no	serious	slight	
Expected yield level (t/ha)	6.0-7.0	1.2-1.8	0.9-1.3	1.2-1.8	7.5-12.5	8.0-12.0	6.0-10.0	4.0-8.0	8.0-12.0	20-30	80-120	
Labor productivity compared with paddy	MS	S	S	MS	MS	MS	MS	MS	MS	MS	-	
Labor requirement compared with paddy	S	S	S	S	MS	MS	S	S	S	S	-	
Road condition to target market/distance	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	-	
Distance (time required to target market)	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	-	
Scale of target consumer market	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	-	
Annual price fluctuation (highest/lowest x 100)	S	S	S	S	NS	MS	MS	MS	MS	S	-	
Production cost comparison with paddy	S	S	S	S	MS	MS	MS	MS	S	S	-	
% of net return to gross return	S	MS	MS	MS	MS	MS	MS	MS	MS	MS	-	
Comparison of net return/ha to paddy	MS	NS	NS	MS	S	S	MS	NS	MS	MS	-	
Extent of cultivation in project area	S	MS	NS	MS	S	MS	S	S	MS	S	-	
Opinion of PSDA Office	supported	supported	supported	supported	supported		supported			not	not	
Selected Candidate Crops	○	△	△	○	○	X	○	△	○	X	X	

*1: grain *2: sweet corn consumed in fresh

S: supportive MS: moderately supportive NS: not supportive

○ selected △ depending X not selected

3. Possibility of Introducing Candidate Crops

- Maize, soybean and groundnut have no constraint for introduction on, as commonly cultivated in the project area.
- Mungbean is expected to be successful introduced in dry season, but profitability will be rather low.
- Chili (cabe merah) cultivated in the project area is expected to get high-value at Ramadan season but is suffered from high production cost and high labor requirement and high price fluctuation. Processing of dry and powdered chili is recommended.
- Sweet corn is introduced successfully in the project area, however price fluctuation is substantial.
- Cassava cultivation on irrigated paddy fields is not accepted by the provincial/district agriculture offices in Lampung.

4. Approaches for Introduction of Recommendable Crops

- Maize, groundnut, mungbean and soybean productivity improvement should be aimed at through SL-PTT or other improved farming systems.
- High-value crop (chili) introduction should be gradually promoted through SL-PTT or other improved farming practices/systems.
- Recommended crops for dry season - maize, groundnut, soybean, chili, long beans, other profitable vegetables.
- Group shipment and group marketing in an advanced stage should be aimed at in vegetable production.

5. Recommended Cropping Pattern

In a year with irrigation water supply in dry season:

Wet season - dry season: Paddy (100%) - paddy (100%) - legume under rainfed (100%)

In a year without irrigation water supply in dry season:

Wet season - dry season: Paddy (100%) - field crops under rainfed or high-value crops under pumping irrigation to a possible extent (100%) - fallow

Source: JICA Survey Team

Annex B2.1.9 Possibilities of Introduction of Non-paddy Crops to Ciujung Irrigation Area

1. Current Status of the Irrigation Project

1-1. Project Area: Irrigated paddy fields before the project. Rehabilitation of headwork and rehabilitation of irrigation system.

1-2. Irrigation Area, Cropping Pattern, Cropped Area and Cropping Intensity

Plan (Review Report on Basic Design for Rehabilitation of Ciujung Irrigation Canal System, 1994)														
Scheme	Project Area ^{*1}	Cropped Area (ha)							Cropping Intensity (%)					
		Paddy			Non-paddy Crops				Paddy			Non-paddy Crops		
		Wet	Dry	Annual	Wet	Dry	Annual	Overall	Wet	Dry	Annual	Wet	Dry	Annual
Ciujung	21,454	21,454	18,122	39,576	0	5,742	5,742	45,318	100	84	184	0	27	27

Current Status (average of 2009/10 to 2010/11) ^{*3}														
Scheme	Project Area ^{*2}	Cropped Area (ha) (cropping intensity x project area)							Cropping Intensity (%)					
		Paddy			Non-paddy Crops				Paddy			Non-paddy Crops		
		Wet	Dry	Annual	Wet	Dry	Annual	Overall	Wet	Dry	Annual	Wet	Dry	Annual
Ciujung	20,955	20,955	15,716	36,671	0	4,191	4,191	40,862	100	75	175	0	20	20

*1: irrigation command area *2: functional irrigation command area *3: estimated based on monitoring information of Dinas Public Works Kabupaten Serang

1-3. Paddy Yield and Production

Yield (t/ha)		Production [yield x cropped area (t)]								Yield (t/ha)			
Plan ^{*1}		Current ^{*2}		Plan ^{*1}			Current ^{*2}			Maize		Soybeans	
Wet	Dry	Wet/Dry	Wet	Dry	Annual	Wet	Dry	Annual	% of Plan	Plan ^{*1}	Current ^{*3}	Plan ^{*1}	Current ^{*2}
6.0	6.0	5.4	128,700	108,700	237,400	113,200	84,900	198,100	83	6.0	3.1	-	0.7

*1: source - Review Report on Basic Design, 1994

*2: estimated based on monitoring information of Dinas Public Works Kabupaten Serang

*3: average yield levels of major project sub-districts in 2010, Kabupaten Serang Dalam Abgka, 2011

- Planned cropping intensity: paddy 184%; field crops 22% & vegetables 5%, in total 27%, in dry season; overall intensity 211%

1-4. Non-paddy Crops in Irrigation Project

Major crops: long beans, cucumber, maize

Minor crops: chili, morning glory, amaranthus, casuismo, watermelon, bitter gourd

1-5. Other Findings

- Prescribed cropping pattern is wet season - paddy (100%) and dry season - paddy (75%), however, vegetable and maize production is carried out in the dry season. Annual cropping intensity is estimated to be around 190 to 200%.

- Introduction of improved farming practices of paddy through SL-PTT is extensively carried out in the project district (Serang).

2. Selection of Non-paddy Crops Based on Selection Criteria and Indicators

Indicator for Selection Criteria	Food Crop				Horticulture Crop				Bio-fuel Crop			
	Maize ^{*1}	Soybeans	Mungbeans	Groundnut	Chili	Shallot	Long Beans	Cucumber	Maize ^{*2}	Cassava	Sugarcane	
Cropped Area in project sub-districts (ha)	174	31	11	179	927	125	158	180	n.a.	5	0	
Length of field occupation (months)	3.0	2.7	2.5	3.0	5.0 - 7.0	3.0	2.0 - 2.5	4.0	3.0	5.0 - 11.0	24 - 36	
Possibility of breaking down of plow pan	no	no	no	no	no	no	no	no	no	serious	slight	
Expected yield level (t/ha)	6.0-7.0	1.2-1.8	0.9-1.3	1.2-1.8	7.5-12.5	8.0-12.0	6.0-10.0	10.0-20.0	8.0-12.0	20-30	80-120	
Labor productivity compared with paddy	MS	S	S	MS	MS	MS	MS	MS	MS	MS	-	
Labor requirement compared with paddy	S	S	S	S	MS	MS	S	S	S	S	-	
Road condition to target market/distance	S	S	S	S	S	S	S	S	S	S	-	
Distance (time required to target market)	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	-	
Scale of target consumer market (Jakarta)	S	S	S	S	S	S	S	S	S	S	-	
Annual price fluctuation (highest/lowest x 100)	S	S	S	S	NS	MS	MS	MS	MS	MS	-	
Production cost comparison with paddy	S	S	S	S	MS	MS	MS	MS	MS	S	-	
% of net return to gross return	S	MS	MS	MS	MS	MS	MS	MS	MS	MS	-	
Comparison of net return/ha to paddy	MS	NS	NS	MS	S	S	MS	MS	MS	MS	-	
Extent of cultivation in project area	S	MS	MS	S	S	S	S	S	S	MS	NS	-
Opinion of PSDA Office	supported				supported				supported		not	not
Selected Candidate Crops	O	Δ	Δ	O	O	O	O	O	O	X	X	

*1: grain *2: sweet corn consumed in fresh

S: supportive MS: moderately supportive NS: not supportive

O selected Δ depending X not selected

3. Possibility of Introducing Candidate Crops

- Cultivation of maize, groundnut, long beans, eggplant, cucumber and leaf vegetables is common in the irrigation project and no constraint for introduction is expected. However, fluctuation of market prices of vegetables will present problems.
- Cultivation of field crops other than maize and groundnut is not common. Productivity improvement and dissemination through SL-PTT or other field extension measures will be necessary for the introduction of field crops.
- Chili (cabe merah) and shallot are high-value crop with high production cost and labor requirement. Processing of dry and powdered chili is recommended. Sweet corn could be introduced successfully in the project.
- Leaf vegetables and mungbeans with short growth duration feature can be introduced in the 2nd dry season

4. Approaches for Introduction of Recommendable Crops

- Field crop productivity should be improvement through SL-PTT or other improved farming practices/systems.
- High-value crop introduction should be gradually promoted through SL-PTT for target crops.
- Recommended crops for dry season - maize, groundnut, chili, shallot, long beans, other profitable vegetables.
- Irrigation water supply should be ensured especially for growing high-value crops through necessary water management arrangement initiated by P3A and GP3A. Group shipment and group marketing in an advanced stage should be aimed at in vegetable production.

5. Recommended Cropping Pattern

Wet season - dry season I - dry season II: Paddy (100%) - paddy (100%) - vegetables/legume (depending on water availability) and paddy (100%) - food crops/vegetables - fallow

Source: JICA Survey Team

Annex B2.1.10 Possibilities of Introduction of Non-paddy Crops to Batang Hari Irrigation Area

1. Current Status of the Irrigation Project

1-1. Project area: Some 3,665 ha of paddy fields taking irrigation water from three tributaries and another 1,318 ha of rainfed before the project. Newly developed paddy fields of 3,094 ha and the existing rainfed paddy fields became irrigated paddy fields under the Project.

1-2. Irrigation Area, Cropping Pattern, Cropped Area and Cropping Intensity

		Plan (Source: WATSAL, 2001)												
		Cropping Intensity (%)						Cropped Area (ha)						
Project	Area ^{*2}	Paddy			Non-paddy Crops			Paddy			Non-paddy Crops			
		Wet	Dry I	Annual	Dry I	Dry II	Annual	Overall	Wet	Dry I	Annual	Dry I	Dry II	Annual
Batang Hari	18,733	100	100	200	0	0	0	200	18,733	18,733	37,466	0	0	0

Current Status (2010)

		Cropping Intensity (%) ^{*4}						Cropped Area (ha) (cropping intensity x project area)						
Project	Area ^{*3}	Paddy irrigated			Paddy rainfed			Paddy irrigated			Paddy rainfed			
		Wet	Dry I	Dry II	Annual	Wet	Dry I	Dry II	Annual	Wet	Dry I	Dry II	Annual	
Bili-bili	18,936	26	23	10	60	3	3	63	4,983	4,412	1,944	11,339	620	620

*1: including *2: PCR for design (IP-419) *3: PCR for construction (IP-504) *4: Dhamasraya District Office

1-3. Paddy Yield and Production

		Yield (t/ha)				Paddy Production (t)								
Plan ^{*1}	Current Wet ^{*2}	Current Dry ^{*2}		Plan ^{*1}			Current Wet		Current Dry		Current	Realization		
		Dry I	Dry II	Wet	Dry I	Annual	Irrigated	Rainfed	Dry I	Dry II	Annual	% of Plan		
Wet	Dry I	Irrigated	Rainfed	Dry I	Dry II	Wet	Dry I	Annual	Irrigated	Rainfed	Dry I	Dry II	Annual	% of Plan
4.50	5.00	4.35	4.00	4.75	4.60	84,299	93,665	143,200	21,676	2,480	20,957	8,942	54,055	37.7

*1: source - WATSAL, 2001 *2: Dinas Pertanian Kabupaten Dhamasraya, 2011

1-4. (Non-paddy Crops in Irrigation Service Areas

Major crops: maize
Minor crops: soybean, chili

1-5. Other Findings

- Farmers transmigrated from Wonogiri in Central Java commonly practice irrigated triple and double cropping of paddy mainly in the downstream part of Batang Hari main canal command areas.
- A considerable part of rubber trees covered 5,497 ha before the project has been the peak stage of tapping trees. Such rubber tree holders need to make their decisions whether old rubber trees are replaced with young seedlings for continuation of rubber planting or new crops other than rubber are introduced with investment in land conversion for seasonal crop cultivation.

2. Selection of Non-paddy Crops Based on Selection Criteria

Indicator for Selection Criteria	Food Crop				Vegetables				Bio-fuel Crop			
	Maize ^{*1}	Soybeans	Mungbeans	Groundnut	Chili	Shallot	L. Beans	Leaf Veg.	Maize ^{*2}	Cassava	Sugarcane	
Cropped Area in project sub-districts (ha)	710	44	10	51	26	0	20	0	0	59	0	
Length of field occupation by crop (months)	3.0	2.7	2.5	3.0	5.0 - 7.0	3.0	2.0 - 2.5	1.5	3.0	5.0 - 11.0	24 - 36	
Possibility of breaking down of plow pan	S	S	S	S	S	S	S	S	S	NS	MS	
Expected yield level (t/ha)	6.0-7.0	1.2-1.8	0.9-1.3	1.2-1.8	7.5-12.5	8.0-12.0	6.0-10.0	4.0-8.0	8.0-12.0	20-30	80-120	
Labor productivity compared with paddy	MS	S	S	MS	MS	MS	MS	MS	MS	MS	MS	
Labor requirement compared with paddy	S	S	S	S	MS	MS	S	S	S	S	MS	
Road condition to target market/distance	S	S	S	S	S	S	S	S	S	S	S	
Distance (time required to target market)	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	
Scale of target consumer market	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	
Annual price fluctuation (highest/lowest x 100)	S	S	S	S	NS	MS	MS	MS	MS	S	S	
Production cost comparison with paddy	S	S	S	S	MS	MS	MS	MS	S	S	MS	
% of net return to gross return	S	MS	MS	MS	MS	MS	MS	MS	MS	MS	S	
Comparison of net return/ha to paddy	MS	NS	NS	MS	S	S	MS	NS	MS	MS	S	
Extent of cultivation in project area	S	MS	NS	NS	MS	NS	NS	NS	NS	NS	NS	
Opinion of PSDA Office	supported				supported				supported		not	
Selected Candidate Crops	○	△	X	X	△	X	X	X	X	X	X	

1/: grain 2/: sweet corn consumed in fresh S: supportive MS: moderately supportive NS: not supportive ○ selected △ depending X not selected

3. Possibility of Introducing Candidate Crops

- Maize, soybean: No constraint for introduction
- Chili (cabe merah): Cultivation promoted in the project area, high-value crop; high production cost, labor requirement, high price fluctuation, high at Ramadan season, processing to dry, powdered chili recommended.

4. Approaches for Introduction of Selected Crops

- Maize, soybean and chili productivity improvement through SL-PTT (field school for integrated production system) or other improved farming practices/systems should be envisaged.
- Recommended crops for dry season I in tributary command areas - maize and soybean
- Recommended crops for dry season II - soybean and chili in addition to irrigated paddy for Batang Hari main canal command areas and leguminous crops for tributary command areas.
- Group shipment and group marketing in an advanced stage should be aimed at in vegetable production.

5. Recommended Cropping Pattern

Wet season - dry season I - dry season II: Paddy (100%) - paddy (100%) - paddy (50%) and field crops/vegetables/legume (50%)
Wet season - dry season I - dry season II: Paddy (100%) - MVC (100%) - legume (50% or more)

Source: JICA Survey Team

Annex B2.3.1 Fish Culture Budget for Lele

Item	Unit	Lele		
		Unit Price (Rp)	Volume	Amount (Rp 1,000)
Inputs				93,150
Fish fry	kg	90	100,000	9,000
Feeding materials	kg	12,000	6,700	80,400
Chemicals (solid)	kg			0
Chemicals (liquid)	L			0
Water	m ³	3,750,000	1	3,750
Labor				4,800
Family	man-day	-		-
Hired	man-day	40,000	120	4,800
Pay Service				2,000
Pond cleaning-up after harvesting	LS/ha	2,000,000	1	2,000
Pond maintenace / repairing	LS/ha		1	0
Miscellaneous				4,200
Materials	LS/ha	3,500,000	1	3,500
Equipment / tools	LS/ha	700,000	1	700
Airation	LS/ha		1	0
Others	LS/ha		1	0
Total				104,150
Yield	kg/ha		10,625	
On-site selling price	Rp/kg	12,000		
Gross income				127,500
Net income				23,350

Note: LS; Lump sum

Source: Dinas Perikanan, Kabupaten Indramayu

Annex B2.3.2 Fish Culture Budget for Gurame

Item	Unit	Gurame		
		Unit Price (Rp)	Volume	Amount (Rp 1,000)
Inputs				51,250
Fish fry	kg	1,500	10,000	15,000
Feeding materials	kg	7,000	5,000	35,000
Chemicals (solid)	kg	0	0	0
Chemicals (liquid)	L	0	0	0
Water	m ³	1,250,000	1	1,250
Labor				7,200
Family	man-day	-		-
Hired	man-day	40,000	180	7,200
Pay Service				750
Pond cleaning-up after harvesting	LS/ha	750,000	1	750
Pond maintenace / repairing	LS/ha	0	1	0
Miscellaneous				3,700
Materials	LS/ha	200,000	1	200
Equipment / tools	LS/ha	3,500,000	1	3,500
Airation	LS/ha		1	0
Others	LS/ha		1	0
Total				62,900
Yield	kg/ha	4,250		
On-site selling price	Rp/kg	25,000		
Gross income				97,750
Net income				34,850

Note: LS; Lump sum

Source: Dinas Perikanan, Kabupaten Indramayu

Annex B2.3.3 Fish Culture Budget for Nile

Item	Unit	Nila		Amount (Rp 1,000)
		Unit Price (Rp)	Volume	
Inputs				168,400
Fish fry	kg	75	90,000	6,750
Feeding materials	kg	6,000	26,400	158,400
Chemicals (solid)	kg			0
Chemicals (liquid)	L			0
Water	m ³	3,250,000	1	3,250
Labor				12,000
Family	man-day	-		-
Hired	man-day	40,000	300	12,000
Pay Service				750
Pond cleaning-up after harvesting	LS/ha	750,000	1	750
Pond maintenace / repairing	LS/ha		1	0
Miscellaneous				4,250
Materials	LS/ha	4,250,000	1	4,250
Equipment / tools	LS/ha		1	0
Airation	LS/ha		1	0
Others	LS/ha		1	0
Total				185,400
Yield	kg/ha		24,000	
On-site selling price	Rp/kg	11,000		
Gross income				264,000
Net income				78,600

Note: LS; Lump sum

Source: Dinas Perikanan, Kabupaten Indramayu

Annex B2.3.4 Fish Culture Budget for Mas

Item	Unit	Mas		
		Unit Price (Rp)	Volume	Amount (Rp 1,000)
Inputs				5,800
Fish fry	kg	200	4,000	800
Feeding materials	kg	5,000	960	4,800
Chemicals (solid)	kg			0
Chemicals (liquid)	L			0
Water	m ³	200,000	1	200
Labor				400
Family	man-day	-	120	-
Hired	man-day	40,000	10	400
Pay Service				500
Pond cleaning-up after harvesting	LS/ha	500,000	1	500
Pond maintenace / repairing	LS/ha		1	0
Miscellaneous				700
Materials	LS/ha	200,000	1	200
Equipment / tools	LS/ha	500,000	1	500
Airation	LS/ha		1	0
Others	LS/ha		1	0
Total				7,400
Yield	kg/ha		800	
On-site selling price	Rp/kg	13,000		
Gross income				10,400
Net income				3,000

Note: LS; Lump sum

Source: Dinas Perikanan, Kabupaten Indramayu

Item	Unit	Mujaer		Amount (Rp 1,000)
		Unit Price (Rp)	Volume	
Inputs				133,720
Fish fry	kg	50	90,000	4,500
Feeding materials	kg	6,000	21,120	126,720
Chemicals (solid)	kg			0
Chemicals (liquid)	L			0
Water	m ³	2,500,000	1	2,500
Labor				12,000
Family	man-day	-		-
Hired	man-day	40,000	300	12,000
Pay Service				750
Pond cleaning-up after harvesting	LS/ha	750,000	1	750
Pond maintenace / repairing	LS/ha		1	0
Miscellaneous				2,000
Materials	LS/ha	2,000,000	1	2,000
Equipment / tools	LS/ha		1	0
Airation	LS/ha		1	0
Others	LS/ha		1	0
Total				148,470
Yield	kg/ha		20,000	
On-site selling price	Rp/kg	10,000		
Gross income				200,000
Net income				51,530

Note: LS; Lump sum

Source: Dinas Perikanan, Kabupaten Indramayu