

COMPOSITION OF FINAL REPORT

Volume 1	SUMMARY
Volume 2	MAIN REPORT
Volume 3	SUPPORTING REPORT
Sector A	General Physical Conditions
Sector B	Socioeconomic Conditions
Sector C	Land Use and Watershed Management
Sector D	Natural Environment
Sector E	Water Quality
Sector F	Social Environment
Sector G	Hydrological Analysis
Sector H	River Conditions, Flooding and Inundation
Sector I	Water Use
Sector J	Inland Waterway Transport
Sector K	Organization, Institution and Legal Systems
Sector L	Database
Volume 4	DATA BOOK

**THE STUDY ON COMPREHENSIVE WATER MANAGEMENT
OF MUSI RIVER BASIN
IN THE REPUBLIC OF INDONESIA**

FINAL REPORT

VOLUME 2

MAIN REPORT

TABLE OF CONTENTS

LOCATION MAP

COMPOSITION OF FINAL REPORT	i
TABLE OF CONTENTS	iii
LIST OF TABLES	viii
LIST OF FIGURES	xi
LIST OF ANNEXES	xiii
ABBREVIATIONS	xiv
MEASUREMENT UNITS	xx

CHAPTER 1 INTRODUCTION..... 1

1.1 Background of the Study.....	1
1.2 Objectives of the Study	2
1.3 Study Area.....	2
1.4 Study Flow	2
1.5 Implementation Organization of the Study	3

**CHAPTER 2 POLICY BACKGROUND FOR BASIN WATER
MANAGEMENT 5**

2.1 National and Regional Development Plans.....	5
2.2 Basic Laws	7
2.3 Water Resources Sector Adjustment Program (WATSAP) and Related Programs	9
2.3.1 WATSAP.....	9
2.3.2 Related Programs	12
2.4 Leading Actors in Water Sector for Musi River Basin	14

**CHAPTER 3 PRESENT CONDITION OF THE BASIN AND BASIC
ANALYSIS 17**

3.1 General Natural Conditions.....	17
-------------------------------------	----

3.1.1	Topography.....	17
3.1.2	Geology	17
3.1.3	Meteorology.....	18
3.1.4	Hydrology	18
3.1.5	Groundwater	19
3.1.6	Soils	19
3.2	Socioeconomic Conditions.....	20
3.2.1	Administrative System	20
3.2.2	Population and Labor Force	20
3.2.3	National and Regional Accounts	21
3.2.4	Industries	24
3.2.5	Projection of Socioeconomic Framework to the Target Year	26
3.3	Land Use and Watershed Management.....	29
3.3.1	Land Classification	29
3.3.2	Historical Changes in Land Use	29
3.3.3	The Processes of Forest Disappearance.....	30
3.3.4	Present Watershed Management Conditions.....	31
3.3.5	Future Spatial Plan.....	33
3.4	Natural Environment	34
3.4.1	Natural Ecosystems and Human Impacts	34
3.4.2	Urban and Industrial Environment	36
3.4.3	Laws and Institutions for Environmental Management	37
3.4.4	Existing and Potential Environmental Issues	40
3.5	Water Quality	41
3.5.1	Relevant Information of Water Quality	41
3.5.2	Pollution Sources	42
3.5.3	Present Water Quality Condition.....	43
3.5.4	Specific Issues to be Solved	45
3.6	Social Environment	47
3.6.1	Social Environment Overview.....	47
3.6.2	Results of Questionnaire Survey	47
3.6.3	Issues on Spatial Planning	49
3.6.4	Conservation of Forest Area.....	49
3.6.5	Water Allocation between Irrigation and Fishpond	51
3.6.6	Development and Conservation in Swamp Area.....	52
3.6.7	Komerling Irrigation Project and Its Social Impacts	53
3.6.8	Survey on Water Level Increase in the Lake Ranau and the Regulation Dam.....	55
3.7	Hydrological Analysis	56
3.7.1	Hydrological Observation Condition.....	56

3.7.2	Rainfall Analysis	57
3.7.3	Runoff Analysis on Flow Regime Estimation.....	57
3.7.4	Flood Routing Simulation for Musi River and Tributaries	59
3.7.5	Runoff and Inundation Analysis for Palembang Drainage Planning	60
3.7.6	Sedimentation.....	61
3.8	River Conditions, Flooding and Inundation.....	62
3.8.1	Present River Morphological Condition	62
3.8.2	Flooding and Bank Erosion.....	64
3.8.3	Inundation of Local Rainfall	66
3.8.4	Erosion, Sedimentation and Drought	69
3.9	Water Use.....	70
3.9.1	Estimation of Present Consumptive Water Use	70
3.9.2	Water Balance Model.....	75
3.9.3	Present Water Balance.....	75
3.9.4	Projection of Consumptive Water Use to the Target Year.....	76
3.9.5	Potential Land Resources	76
3.9.6	Existing Plans and Strategies	77
3.10	Inland Waterway Transportation.....	83
3.10.1	River Navigation Condition in South Sumatra Province	83
3.10.2	Present Inland Transport System.....	83
3.10.3	Present Inland Transport Condition	86
3.10.4	Future Project of Inland Transport.....	86
3.10.5	Issues to be Solved	87
3.11	Organization, Institution and Legal Systems	88
3.11.1	Existing Institutions and Organizational Setup for the Basin Water Management	88
3.11.2	Laws and Regulations on Water Management.....	90
3.11.3	WATSAP.....	95
3.11.4	Financial Status of Organizations Related to Water Management .	98
3.12	Database System Established in the Study.....	101
3.12.1	Existing Database	101
3.12.2	Establishment of Database System	101
CHAPTER 4	ISSUES ON WATER MANAGEMENT	103
4.1	Issues Identified through the Grasp of Present Condition	103
4.2	Public Consultation Meetings	104
4.2.1	Pre-PCMs	104
4.2.2	Results of Public Consultation Meeting (1)	105
4.2.3	Results of Public Consultation Meeting (2)	108

4.3	Issues on Water Management.....	110
CHAPTER 5	RELATED PROJECTS AND PROGRAMS.....	111
5.1	Related Projects and Programs	111
5.2	Overall Evaluation.....	111
CHAPTER 6	SKELETON OF THE COMPREHENSIVE WATER MANAGEMENT MASTER PLAN.....	113
6.1	Policy for the Master Plan Formulation	113
6.2	Prerequisite for the Master Plan Formulation	113
6.2.1	National Background and Regional Development Target.....	113
6.2.2	Target Year and Socioeconomic Framework to the Target Year	114
6.3	Super Goal for Comprehensive Water Management of the Musi River Basin.....	115
6.4	Formulation of Master Plan Component –Focusing on what should be started now-	115
CHAPTER 7	COMPREHENSIVE WATER MANAGEMENT MASTER PLAN.....	117
7.1	Component 1: Water Use Management	117
7.1.1	Identification of Programs and Objective.....	117
7.1.2	Evaluation of Major On-going and In-coming Irrigation Development Projects.....	118
7.1.3	Potential Irrigation and Swamp Area	119
7.1.4	Potential Irrigation and Swamp Development and Rice Self-Reliance	120
7.1.5	Sustainable Water Supply to Wide Area	122
7.1.6	Sustainable Irrigation and Swamp Development	124
7.1.7	Rainwater Utilization in Tidal Swamp Area	128
7.1.8	Aquaculture Water Management.....	130
7.1.9	Enhancing Water Utilization for Tourism	131
7.1.10	Modeling of Water Use Management	133
7.1.11	Selection of Priority Programs	136
7.2	Component 2: Floodplain Management	137
7.2.1	Identification of Programs and Objectives	137
7.2.2	Floodplain Management	137
7.2.3	Flood Forecasting and Warning	141
7.2.4	Sustainable River Channel Management.....	142
7.2.5	Selection of Priority Programs	143
7.3	Component 3: Watershed Rehabilitation and Conservation	145

7.3.1	Identification of Programs and Objectives.....	145
7.3.2	Soil Erosion Prevention -Reforestation on Land With Major Constraints-.....	147
7.3.3	Soil Erosion Prevention -Law Enforcement against Destruction of Forest-	151
7.3.4	Soil Erosion Prevention -Inner- and Inter-Basin Coordination-.....	155
7.3.5	Rehabilitation and Conservation of Natural Environment -Expansion of Forest Area-	156
7.3.6	Rehabilitation and Conservation of Natural Environment -Management of River Environment-	161
7.3.7	Rehabilitation and Conservation of Natural Environment -Conservation of Swamp and Mangrove Forests-	162
7.3.8	Selection of Priority Programs	165
7.4	Component 4: Urban Water Environment Improvement.....	167
7.4.1	Identification of Programs and Objectives.....	167
7.4.2	Community Drainage Management	167
7.4.3	Riverine Areas Conservation.....	169
7.4.4	Trunk Drainage Channels Rehabilitation.....	171
7.4.5	Drainage System Improvement Program	172
7.4.6	Selection of Priority Programs	176
7.5	Component 5: Monitoring Network Establishment	178
7.5.1	Identification of Programs and Objectives.....	178
7.5.2	Hydrological Monitoring.....	178
7.5.3	Water Quality Monitoring	184
7.5.4	Water Use Monitoring.....	187
7.5.5	Establishment of Database	189
7.5.6	Prioritization of the Programs	190
7.5.7	Implementation Plan.....	190
7.6	Component 6: Institutional Strengthening	191
7.6.1	Objective of the Programs.....	191
7.6.2	New Governmental Regulation on Water Resources Management (Draft).....	191
7.6.3	Institutional Development Program	196
7.6.4	Organizational Enhancement	199
7.6.5	Human Resources Development Programs	203
7.6.6	Action Plan for the Proposed Programs	205
7.6.7	Priority Programs	207
7.6.8	Preliminary Study on Institutional Arrangements for the River Basin Water Management	208

CHAPTER 8	IMPLEMENTATION PLAN, COST ESTIMATES , EVALUATION AND ACTION PLAN	211
8.1	Implementation Plan.....	211
8.1.1	Implementation Schedule	211
8.1.2	Implementation Organization and Tasks	213
8.1.3	Necessary Preconditions.....	219
8.2	Cost Estimates	219
8.3	Evaluation of the Program.....	219
8.4	Action Plan for the Start of Management Implementation	228
8.4.1	Action Plan for Each Priority Program.....	228
8.4.2	Key Actions for the Start of Management Implementation	228
8.5	Program Summary for Priority Projects	229
CHAPTER 9	TECHNOLOGY TRANSFER THROUGH THE STUDY	271
9.1	Technology Transfer Plan	271
9.2	Overall Evaluation of Technology Transfer.....	272
CHAPTER 10	CONCLUSION AND RECOMMENDATION	273
10.1	Conclusion	273
10.2	Recommendation	274

LIST OF TABLES

Table 3.2.1	Restructuring of Autonomy in South Sumatra Province	20
Table 3.2.2	Area by Kab.	20
Table 3.2.3	Population Density, and Average Family Size of South Sumatra.....	21
Table 3.2.4	Population by Sub-basin of the Musi River Basin.....	21
Table 3.2.5	Per Capita GRDP without Oil/Gas by Regency	22
Table 3.2.6	Drinking Water Distribution in 2001	25
Table 3.2.7	Source of Drinking Water in 2000 (%).....	26
Table 3.2.8	Foreign Currency Exchange Rate	26
Table 3.2.9	Population Projection and Annual Growth Rates (1,000 people)	27
Table 3.2.10	Economic Growth Target of the Scenarios	28
Table 3.2.11	Results of Future GRDP Estimation (without oil/gas, 2000 constant price).....	28

Table 3.2.12	Future Per Capita GRDP (without oil/gas, 2000 constant price)	28
Table 3.3.1	Reduction in Forest Area from 1980 to 2000	31
Table 3.4.1	Definition of Forest Areas in South Sumatra Province	37
Table 3.4.2	Protected Areas in South Sumatra Province	38
Table 3.4.3	Designated Forest Area in South Sumatra Province.....	39
Table 3.4.4	Forest Cover Decrease 1995-2000 (ha)	39
Table 3.5.1	Divided River Systems and Sub-basins.....	41
Table 3.5.2	Classification of River Systems.....	41
Table 3.5.3	Domestic Pollution Load Generation	42
Table 3.5.4	BOD Pollution Load Generation of River System	42
Table 3.5.5	Total BOD Pollution Load Runoff	43
Table 3.5.6	Average River Water Quality	44
Table 3.5.7	Existing Specific Issues	46
Table 3.7.1	Probable 12-hour Rainfall (Kenten Station at Palembang)	57
Table 3.7.2	Catchment Area of Sub-Basins.....	58
Table 3.7.3	Natural Flow Regime Resulting from Simulation	59
Table 3.7.4	Probable Discharge Resulting from Simulation	59
Table 3.7.5	Estimation Result of Sediment Load at Martapura.....	61
Table 3.8.1	Drainage Areas at Major Points of the Musi River	62
Table 3.8.2	Dimensions of Major Drainage Channels.....	67
Table 3.8.3	Dimensions of Detention Ponds	67
Table 3.9.1	Present Domestic Water Use in the Province, 2000	70
Table 3.9.2	Classification of Irrigation Systems in Indonesia	71
Table 3.9.3	Harvested Irrigation Area in South Sumatra Province	72
Table 3.9.4	Irrigation Water Requirement by Irrigation Type	72
Table 3.9.5	Harvested Area in Swamp in South Sumatra Province	73
Table 3.9.6	Water Requirement in Swamp Paddy	73
Table 3.9.7	Present Consumptive Water Uses of the Basin	75
Table 3.9.8	Present Water Balance	76
Table 3.9.9	Consumptive Water Demand in the Basin (million m ³ /year).....	76
Table 3.9.10	Classification of Potential Irrigation Area.....	77
Table 3.9.11	Classification of Potential Swamp Area	77
Table 3.9.12	Developed Swamp Area of South Sumatra Province	80
Table 3.9.13	Potential Microhydro Power Stations in South Sumatra Province	82
Table 3.10.1	Existing River Navigation Condition in South Sumatra Province	83
Table 3.10.2	Record of Pre-dredge Sounding: 1997-2002	85
Table 3.11.1	Law Revenue Sharing Rates (%).....	98

Table 3.11.2	Rates of General and Specific Allocation Funds (%)	98
Table 3.11.3	Budget of Water Resources Office of South Sumatra Province in 2002	99
Table 3.11.4	Development Budget and Budget for Water Management by Regency in 2002 (APBD only, Unit: Rp. billion).....	100
Table 4.2.1	Outlines of Pre-PCMs	104
Table 4.2.2	Outline of PCM (1)	105
Table 4.2.3	Outline of PCM (2)	108
Table 5.1.1	Related Projects and Programs.....	112
Table 6.2.1	Population Projection and Annual Growth Rates (1,000 people)	114
Table 6.2.2	Results of Future GRDP Estimation (without oil/gas, 2000 constant price).....	115
Table 7.1.1	Potential Irrigation and Swamp Area in the Basin.....	120
Table 7.1.2	Imports of Rice of Indonesia.....	121
Table 7.1.3	Imports of Rice of South Sumatra Province	121
Table 7.1.4	Potential Irrigation and Swamp Development in the Basin.....	121
Table 7.1.5	Target Development in South Sumatra by Study for Formulation of Irrigation Development Program,1993	122
Table 7.1.6	Potential Development Area in the Basin	125
Table 7.1.7	Present Aquaculture Area of Fishpond	130
Table 7.1.8	Candidates of Tourism Resources for Program	132
Table 7.1.9	Score of Each Program	136
Table 7.2.1	Floodplain Areas by River Basin	139
Table 7.2.2	Land Use of Identified Floodplains	139
Table 7.2.3	Possible Location for Flood Forecasting and Warning System..	142
Table 7.2.4	Bank Protection Works Identified for Future Implementation ...	143
Table 7.2.5	Priority of Floodplain Management.....	144
Table 7.3.1	Land Area that has Major Constraints by Sub-Basin.....	148
Table 7.3.2	Number of Office and Staff of Agriculture Extension by Regency Year 2000.....	150
Table 7.3.3	Production Forests in South Sumatra Province	152
Table 7.3.4	Priority Sites for Investigation for Reforestation.....	152
Table 7.3.5	Actions for Reforestation of Production Forests.....	153
Table 7.3.6	Types of Illegal Logging.....	153
Table 7.3.7	Actions for Reforestation of Production Forests.....	154
Table 7.3.8	Examples of Measures against Illegal Logging	154
Table 7.3.9	Sub-Basins and Shared Concerns	155
Table 7.3.10	Kabupatens and Sub-Basins.....	155
Table 7.3.11	Area of Sub-Basins and Ratio of Protected Forests.....	157
Table 7.3.12	Project Components for Rehabilitation of Protected Forest	158

Table 7.3.13	Number of Staff at Conservation Forest 2001	158
Table 7.3.14	Priority Area for New Designation of Protected Forest	159
Table 7.3.15	Area of Eco-Regions and Ratio of Protected Forests	159
Table 7.3.16	Land with Major Constraints by Sub-Basin	159
Table 7.3.17	Project Components for New Designation of Protected Forests	160
Table 7.3.18	Example of River Sections under Significant Human Influences	161
Table 7.3.19	Priority Areas for Conservation of Tidal Swamp Forest	163
Table 7.3.20	Scope of Study for Existing Condition at Tanjung Api Api.....	164
Table 7.3.21	Evaluation of Priorities for Each Proposed Programs	166
Table 7.4.1	Proposed Team Organization	170
Table 7.4.2	Excess Volume and Applicable Measures.....	173
Table 7.4.3	Priority of Urban Water Environment Improvement.....	177
Table 7.5.1	Existing and Proposed Water Level Gaging Stations.....	180
Table 7.5.2	Proposed Water Quality Monitoring Stations.....	185
Table 7.5.3	Sampling Number and Necessary Parameters on Annual Basis	185
Table 7.5.4	Quantities of GIS Engineers, GIS Software and Hardware.....	189
Table 7.6.1	Summary of New Governmental Regulation on Water Resources Management	191
Table 7.6.2	Selection of Priority Program	207
Table 8.1.1	Executing, Supporting and Related Agency	214
Table 8.1.2	Tasks of Each Agency for Priority Program Implementation	216
Table 8.1.3	Coordination with Other Related Projects/Programs	218
Table 8.2.1	Costs for Priority Programs	220
Table 8.2.2	Annual Budget	221
Table 8.3.1	Evaluation of Priority Programs	223
Table 8.4.1	Action Plan for Priority Program Implementation	230

LIST OF FIGURES

Figure 1.4.1	Overall Study Flow	3
Figure 1.5.1	Study Organization	4
Figure 3.1.1	Meteorological Condition at Palembang.....	18
Figure 3.3.1	Comparison of Land Use in 1980 and 2000	30
Figure 3.3.2	Current Forest Planning	32
Figure 3.3.3	Forest Estate Area and Current Forest.....	32
Figure 3.4.1	Ecoregions of Southern Sumatra.....	34
Figure 3.5.1	Concept of Pollution Load Generation and Runoff.....	43
Figure 3.8.1	Musi River Basin	62
Figure 3.8.2	Contour Map of the Musi Rive Basin	63

Figure 3.8.3	Longitudinal Profiles below 200 m, M.S.L.	63
Figure 3.12.1	Files and Folders Construction of GIS Database	102
Figure 4.2.1	Summary of Pre-PCM Results	106
Figure 7.1.1	Demand-Responsive Approach and the proposed Program	123
Figure 7.1.2	Concept Flow of Sustainable Irrigation and Swamp Development.....	125
Figure 7.1.3	Potential Irrigation & Swamp Development Area by Regency and by Sub-basin.....	126
Figure 7.1.4	Proposed Water Use Management Model	133
Figure 7.1.5	Implementation Plan of Water Use Management Programs.....	136
Figure 7.2.1	Identified Floodplain Areas	139
Figure 7.2.2	Comparison of Discharge Duration Curves with and without Floodplains	140
Figure 7.2.3	Implementation Schedule of Zoning and Land Use Control Program	141
Figure 7.2.4	Flood Forecasting and Warning System	142
Figure 7.2.5	Implementation Schedule of Flood Forecasting and Warning System	142
Figure 7.2.6	Implementation Schedule of Sustainable Channel Management Program.....	143
Figure 7.3.1	Conceptual Map of Target Areas	145
Figure 7.3.2	Overall Scheme for Rehabilitation and Conservation of the River Basin	146
Figure 7.3.3	Introduction of Agroforestry on Land with Major Constraints...	147
Figure 7.3.4	Land with Major Constraints (Not Suitable for Agricultural Use)	147
Figure 7.3.5	Land Use Types within the Constraints Area	148
Figure 7.3.6	Land Use Types within the Constraints Area by Sub-Basin.....	148
Figure 7.3.7	Conceptual Relationship of Road, River, Village and Farmer’s Plantations	149
Figure 7.3.8	Land Use Regulation on the Land with Major Constraints	150
Figure 7.3.9	Expected Function and Necessary Input for Agriculture/Estate/Forestry Extensions.....	151
Figure 7.3.10	Image of Coordination within Inter- and Inner-Basin Organization	156
Figure 7.3.11	Actions Expected for Inter- and Inner-Basin Organization	156
Figure 7.3.12	Land Use in Protected Forests	157
Figure 7.3.13	Five Steps for Designation of New Protected Forest.....	160
Figure 7.3.14	Project Schedule for Management of River Environment.....	162
Figure 7.3.15	Project Schedule for Tidal Swamp Forest Conservation	163
Figure 7.3.16	Project Schedule for Freshwater Swamp Conservation.....	165
Figure 7.4.1	Cause and Effect of the Urban Water Environment Problem.....	167

Figure 7.4.2	Implementation Schedule of Community Drainage Management Program.....	169
Figure 7.4.3	Implementation Schedule of Riverine Areas Conservation Program.....	171
Figure 7.4.4	Implementation Schedule of Trunk Drainage Channel Rehabilitation Program	171
Figure 7.4.5	Design Discharge Distribution of Bendung Channel	174
Figure 7.4.6	Proposed Profile for Bendung Channel Improvement.....	174
Figure 7.4.7	Design Discharge Distribution of Buah Channel	175
Figure 7.4.8	Proposed Profile for Buah Channel Improvement.....	175
Figure 7.4.9	Implementation Schedule of Drainage System Improvement Program.....	176
Figure 7.5.1	New Instillation of Water Level Gaging Stations.....	180
Figure 7.5.2	Typical Structure of Water Level Gage.....	183
Figure 7.5.3	Data Flow of Water Use Monitoring.....	188
Figure 7.5.4	Implementation Plan for Monitoring Network Establishment ...	190
Figure 7.6.1	Structure of Water Resources Management Authorities	201
Figure 7.6.2	Structure of Proposed Programs	205
Figure 7.6.3	Program Implementation Schedule.....	206
Figure 8.1.1	Implementation Schedule for Component 1	211
Figure 8.1.2	Implementation Schedule for Component 2	211
Figure 8.1.3	Implementation Schedule for Component 3	212
Figure 8.1.4	Implementation Schedule for Component 4.....	213
Figure 8.1.5	Implementation Schedule for Component 5	213
Figure 8.1.6	Implementation Schedule for Component 6.....	213
Figure 8.1.7	Image of Related Agencies for the Implementation of Priority Programs	215

LIST OF ANNEXES

Annex 1.5.1(1/4)	Members of Steering Committee	A-1
Annex 1.5.1(2/4)	Members of Coordinating/Supervising Team.....	A-2
Annex 1.5.1(3/4)	Members of Counterpart Team of Indonesian Government.....	A-3
Annex 1.5.1(4/4)	Members of JICA Advisory Committee and the Study Team.....	A-4
Annex 3.2.1	Sub-basin and Administrative Boundaries.....	A-5
Annex 3.7.1	Basin Division for Runoff Analysis	A-6

ABBREVIATIONS

1. ENGLISH

ADB	:	Asian Development BANK
BHC	:	Benzene Hexachloride
BOD	:	Biochemical Oxygen Demand
COD	:	Chemical Oxygen Demand
CIFOR	:	Center for International Forestry Research
DDT	:	Dichloro-Diphenyl-Trichloro-ethane
DGWR	:	Directorate General of Water Resources
DO	:	Dissolved Oxygen
DOC	:	Department of Communication
DOF	:	Department of Finance
DSR	:	Debt-service ratio
EIA	:	Environmental Impact Assessment
EU	:	European Union
FAO	:	United Nations Food and Agriculture Organization
FFPCP	:	Forest Fire Prevention and Control Project
FWAF	:	Federation of Water User Association Federation
FY	:	Fiscal Year
GC	:	Gas Chromatography
GDP	:	Gross Domestic Product
GIS	:	Geographic Information System
GNI	:	Gross national income
GOI	:	Government of Indonesia
GRDP	:	Gross Regional Domestic Product
GRT	:	Gross Register Tonnage
GRT	:	Gross Registered Tonnage
HWL	:	High Water level
ICDP	:	Integrated Conservation and Development Program
IEEM	:	Irrigation Infrastructure Exploitation and Maintenance
IFAD	:	International Fund for Agricultural Development
IMPR	:	Irrigation Management Policy Reform
ISF	:	Irrigation Service Fee
ITTO	:	International Tropical Timber Organization
IUCN	:	International Union for Conservation of Nature
IWRIP	:	Indonesia Water Resources and Irrigation Reform Implementation Program
JBIC	:	Japan Bank for International Cooperation
KSNP	:	Kerinci Selabat National Park
LLW	:	Lowest Low Water Level
LPG	:	Liquefied Petroleum Gas
LWL	:	Low Water level
LWS	:	Low Water Spring
MIS	:	Management Information System
NGO	:	Non-Governmental Organization

O&M	:	Operation and Maintenance
PCM	:	Public Consultation Meeting
PCM	:	Project Cycle Management
R.E.	:	Real estate business
RePPPProT	:	Regional Physical Planning Program for Transmigration
SSSIP	:	South Sumatra Swamp Improvement Project
SWOT	:	Strengths, Weaknesses, Opportunities and Threats
TT	:	Telegraphic transfer
VCA	:	Village Conservation Agreement
VCF	:	Village Conservation Facilitator
WATSAL	:	Water Resources Sector Adjustment Loan
WATSAP	:	Water Resources Sector Adjustment Program
WISMP	:	Water Resources and Irrigation Sector Management Program
WUA	:	Water User Association
WUAF	:	Water User Association Federation
WWF	:	World Wildlife Fund

2. INDONESIAN (ENGLISH)

ADIPURA	:	Kota Bersih (Clean City)
ADPEL	:	Administrator Pelabuhan (Port Administrator Office)
AMDAL	:	Analisa Mengenai Dampak Lingkungan (Environmental Impact Assessment)
ANDAL	:	Analisa Dampak Lingkungan (Decision on the environmental analysis)
APBD	:	Anggaran Pemerintah Daerah (Local Government Budget)
APBN	:	Anggaran Pemerintah Nasional (National Government Budget)
Balai PSDA	:	Balai Pengelolaan Sumber Daya Air (Water Resources Management Office)
BAPEDALDA	:	Badan Pengendalian Dampak Lingkungan Daerah (Regional Environmental Impact Control Office)
BAPPEDA	:	Badan Perencanaan dan Pembangunan Daerah (Regional Planning and Development Office)
BAPPENAS	:	Badan Perencanaan Pembangunan Nasional (National Development Planning Agency)
BEPEDAS	:	Balai Pengawasan Daerah Aliran Sungai Musi (Musi River Watershed Area Office)
BKSDA	:	Balai Konservasi Sumber Daya Alam (Provincial Nature Conservation Office)
BMG	:	Badan Meteorologi dan Geofisika (Meteorological and Geophysical Agency)
BPS	:	Badan Pusat Statistik (Central Statistic Division)

BPSDA	:	Balai Pengelolaan Sumber Daya Air (Water Resources Management Office)
Cipta Karya	:	Dinas P.U.Cipta Karya (Human Resettlement Office)
DAK	:	Dana Alokasi Khusus (Special Allocation Fund)
DAU	:	Dana Alokasi Umum (General Allocation Fund)
Dinas PUP or DPUP	:	Dinas PU Pengairan (Water Resources Department)
DKI	:	Daerah Khusus Ibukota (Special Capital District)
DPMA	:	Direktorat Penyelidikan Masalah Air (Investigation Directorate of Water Problem)
DPRD	:	Dewan Perwakilan Rakyat Daerah (Regional Parliament)
G. or Gn	:	Gunung (Mountain (or Mount.))
GBHN	:	Garis-Garis Besar Haluan Negara (General Guideline for National Development)
Lamongan	:	(Greater Surabaya Region)
HIPPA	:	Himpunan Petani Pemakai Air (Water Users Association)
HK	:	Hutan Konservasi (Conservation Forest)
HL	:	Hutan Lindung (Protection Forest)
HP	:	Hutan Produksi (Production Forest)
HSA	:	Hutan Suaka Alam (Nature Protection Forest)
IKK	:	Ibu Kota Kecamatan (Semi-Urban)
IMB	:	Ijin Mendirikan Bangunan (Building Permit)
INPRES	:	Instruksi Presiden (Presidential Instruction)
IPAIR	:	Iuran Pelayanan Irigasi (Irrigation Service Fee)
IPEDA	:	Iuran Pendapatan Daerah (Village Land Tax)
K.	:	Kali (River)
Kab.	:	Kabupaten (Regency)
KANWIL	:	Kantor Wilayah (Regional Representative Office)

Kec.	:	Kecamatan (Sub-District of a city)
Kel.	:	Kelurahan (Part of Sub-District of a city)
KIMPRASWIL	:	Departemen Permukiman dan Prasarana Wilayah (Ministry of Settlement and Regional Infrastructure)
KKPP	:	Kelompok Kerja Penanganan Banjir (Flood Control Work Team)
Kodya or Kota	:	Kotamadya (Municipal City)
Kotip	:	Kota Administratip (Administrative city (semi municipal city))
Kp.	:	Kampung (Village)
LKMD	:	Lembaga Ketahanan Masyarakat Desa (Village Development Association)
MPR	:	Majelis Permusyawaratan Rakyat (People's Consultative Assembly)
MUBA	:	Musibanyuasin (place name)
MURA	:	Musirawas (Place name)
OKI	:	Ogan Komering Ilir (Place name)
OKU	:	Ogan Komering Ulu (Place name)
P3SA	:	Proyek Perancang Pengembangan Sumber-Sumber Air (Water Resources Development Planning Project Division)
PA	:	Pompa Air (Pump Station)
PBB	:	Pajak Bumi dan Bangunan (Land and Building Tax)
PBPP	:	Proyek Banjir dan Pengamanan Pantai (Flood and Seashore Safety Project)
PDAB	:	Persahaan Daerah Air Bersih (Regional Clean Water Supply Agency)
PDAM	:	Perusahaan Daerah Air Minim (Regional Drinking Water Supply Company)
PELINDO II	:	Pelabuhan Indonesia II (Indonesia Port Corporation II)
Perda	:	Peraturan Daerah (Local Regulation)
PIR	:	Perkebunan Inti Rakyat (Nuclues Estate and Small Holders)
PJM	:	Program Jangka Menengah (Medium Term Program)
PJP	:	Perencanaan Jangka Panjang (Long-term Development Plan)

PJT	:	Perum Jasa Tirta (Jasa Tirta Public Corporation)
PKPI	:	Pembaharuan Kebijakan Pengelolaan Irigasi (Irrigation Management Policy Reform)
PLN	:	Perusahaan Listrik Negara (State Electricity Company)
POJ	:	Perum Otoritas Jatiluhur (Jatiluhur Authority Public Corporation)
PP	:	Peraturan Pemerintah (Government Regulation)
PPN	:	Pajak Pertambahan Nilai (Value Added Tax)
PPPLD	:	Pengendalian dan Penanggulangan, Pencemaran Limbah Domestik (Work Team for Controlling and Overcoming Domestic Waste Pollution)
PPPLI	:	Pengendalian dan Penanggulangan, Pencemaran Limbah Industri (Work Team for Controlling and Overcoming Industrial Waste Pollution)
PPTPA	:	Panitia Tata Pengaturan Air (River Basin Water Coordination Committee)
Pr.	:	Perkebunan Rakyat (Private plantation (small scale holder plantation))
PROKASIH	:	Program Kali Bersih (Clean River Program)
PROPEDA	:	Program Pembangunan Daerah (Local Government Plan)
PROPENAS	:	Program Pembangunan Nasional (Five Year National Development Program)
PBPP	:	Proyek Pengendalian Banjir dan Pengamanan Pantai (Flood Control and Coastal Protection Project)
PSAWS	:	Pengelolaan Sumber Daya Air Wilayah Sungai (River Basin Water Resources Management)
PT, or P.T.	:	Perseroan Terbatas (Co. Limited (Private Firms))
PTP	:	Perseroan Terbatas Perkebunan (State Owned Plantation)
PTPA	:	Panitia Tata Pengaturan Air (Provincial Water Coordination Committee)
PUP	:	Pekerjaan Umum Pengairan (Public Works Water Resources)
Puskesmas	:	Pusat Kesehatan Masyarakat (Community Health Center)
RDTRK	:	Rencana Detail Tata Ruang Kota (Detailed Urban Spatial Plan)
RENSTRA	:	Rencana Strategik (Strategic Plan)

REPERITA	:	Rencana Pemangunan Lima Tahun (Five Year Development Plan)
RKL	:	Rencana Kelola Lingkungan (Environmental Management Plan)
RPL	:	Rencana Pemantauan Lingkungan (Environmental Monitoring Plan)
RT	:	Rukun Tetangga (Neighborhood Fraternity, Small community belongs to RW.)
RTRK	:	Rencana Teknis Ruang Kota (Urban Spatial Plan for Engineering Needs)
RTRW	:	Rencan Tata Ruang Wilayah (Urban Spatial Plan)
RW	:	Rukun Warga (Citizen Fraternity. Small community belongs to Kampung)
SK	:	Surat Keputusan (Decree)
Susenas	:	Survei Sosial-ekonomi Nasional (National Socioeconomic Survey)
Telkom	:	Perusahaan Telekomunikasi (State Telecommunications Company)
UPTD	:	Unit Pelaksana Teknis Daerah (Regional Technical Implementation Unit)
UU	:	Undang-Undang (Laws)

MESUREMENT UNITS

(Length)

mm	:	millimeter(s)
cm	:	centimeter(s)
m	:	meter(s)
km	:	kilometer(s)

(Area)

mm ²	:	square millimeter(s)
cm ²	:	square centimeter(s)
m ²	:	square meter(s)
km ²	:	square kilometer(s)
ha	:	hectare(s)

(Weight)

g, gr	:	gram(s)
kg	:	kilogram(s)
ton	:	tonne(s)

(Time)

	:	
s, sec	:	second(s)
min	:	minute(s)
h, hr	:	hour(s)
d, dy	:	day(s)
y, yr	:	year(s)

(Volume)

cm ³	:	cubic centimeter(s)
m ³	:	cubic meter(s)
l, ltr	:	liter(s)
mcm	:	million cubic meter(s)

(Electrical Unit)

W	:	watt(s)
kW	:	kilowatt(s)
MW	:	megawatt(s)
kWh	:	kilowatt-hour
MWh	:	megawatt-hour
GWh	:	gigawatt-hour
V	:	volt(s)
kV	:	kilovolt(s)
Hz	:	Hertz

(Speed/Velocity)

cm/sec, cm/s	:	centimeter per second
m/sec, m/s	:	meter per second
km/hr, km/h	:	kilometer per hour