Technical Assistance Consultant's Report

Project Number: 49154-001
August 2018

Indonesia: Sewerage System Development Project

Part 1: Main Report

Prepared by Finnish Consulting Group-Asia Pte Ltd in Joint venture with FCG International Ltd and SCE and in association with OSANA International Indonesia

For Asian Development Bank

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Asian Development Bank

ADB TRTA-9198 INO:

Sewerage System Development Project for the Cities of Banda Aceh, Bekasi and Mataram

TA Consultants (49154-001)

FINAL REPORT
Volume 1 – Main Report

August 2018

FCG sce Aménagement & environnement OSANA

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REPORT

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ACRONYMS & ABBREVIATIONS

ADB	Asian Development Bank
AMPL	*Air Minum dan Penyehatan Lingkungan* / Sanitation Working Group
APBD	*Anggaran Pendapatan dan Belanja Daerah* / Regional Government Budget
APBN	*Anggaran Pendapatan dan Belanja Negara* / National Government Budget
AusAid	Australian Agency for International Development
BAPEDALDA	Environmental Impact Management Agency
BAPPEDA	Regional Body for Planning and Development
BAPPENAS	National Development Planning Agency
BCC	Behavior Change Communication
BKKBN	National Population and Family Planning Agency
BLH	*Biro/Badan Lingkungan Hidup*/Environmental Agency
BLUD	*Badan Layanan Umum Daerah*/Regional Public Service Agency
BOD	*Biochemical Oxygen Demand*
BPN	*Badan Pertanahan Nasional* / National Land Agency
BPS	*Badan Pusat Statistik* / Central Bureau of Statistics
CAS	Conventional Activated Sludge
CBO	Community Based Organization
CDC	Capacity Development Consultant
CDIA	Cities Development Initiative for Asia
CDP	Capacity Development Plan
CDTA	Capacity Development Technical Assistance
CFCD	Corporate Forum for Community Development
COD	Chemical Oxygen Demand
CPMU	Central Project Management Unit
CSS	City Sanitation Strategy
CSWG	City Sanitation Working Group
DAK	*Dana Alokasi Khusus* / Special Allocation Fund
DAU	*Dana Alokasi Umum* / General Allocation Fund
D-B	Design-Build
DED	Detailed Engineering Design
DFAT	Department of Foreign Affairs and Trade (Australia)
DGHS	Directorate General of Human Settlements (Cipta Karya)
DKK	*Dinas Kebersihan Kota* / City Sanitation Agency
DMF	Design and Monitoring Framework
DMF	Design and Monitoring Framework
DMF	Design and Monitoring Framework
DPUPR	Agency for Public Works and Spatial Planning
EA	Executing Agency
ESP	Engineering Services Project
FGD	Focus Group Discussion
FHH	Female Headed Household
GAP	Gender Action Plan
GIS	Geographic Information System
GoI	Government of Indonesia
GPDP	Gross Regional Domestic Product
HH	Household

HRM	Human Resource Management
IA	Implementing Agency
ICB	International Competitive Bidding
IEC	Information, Education and Communication
IndII	Indonesia Infrastructure Initiative
IPAL	*Instalasi Pengolahan Air Limbah* / Wastewater Treatment Plant
IPLT	*Instalasi Pengolahan Lumpur Tinja* / Septage Treatment Plant
IPSA	Initial Poverty and Social Analysis
IRM	Indonesia Resident Mission (ADB)
IUWASH	Indonesia Urban Water, Sanitation and Hygiene Project (funded by USAID)
KSP	*Kawasan Strategis Provinsi* / Provincial Strategic Growth Zone
LG	Local Government
LH	Environmental Agency
LPMU	Local Project Management Unit
MOF	Ministry of Finance
MPWH	Ministry of Public Works and People's Housing
MSMHP	Metropolitan Sanitation Management and Health Project
MSMIP	Metropolitan Sanitation Management Investment Project
NCB	National Competitive Bidding
NGO	Non-Governmental Organization
NTB	Province of Nusa Tenggara Barat
O&M	Operations and Maintenance
PAM	Project Administration Manual
PCA	Procurement Capacity Assessment
PCM	Public Consultation Meeting
PD	*Perusahaan Daerah*/Local Government Enterprise
PDAM	*Perusahaan Daerah Air Minum* / Water Utility
PERDA	Peraturan Daerah / Local Government Regulation
PISC	Project Implementation Support Consultant
PIU	Program Implementation Unit
PKN	*Pusat Kegiatan Nasional* / National Activity Center
PMU	Project Management Unit
PP	Participation Plan
PPFM	Database of the Program for Assistance to the Poor
PPLP	Directorate of Environmental Sanitation Development, Directorate General of Human Settlements, Ministry of Public Works and Peoples' Housing
PPP	Public Private Partnership
PPSP	Acceleration of Urban Sanitation Development Program
PPTA	Project Preparation Technical Assistance
PSA	Poverty and Social Analysis
PST	Primary Settlement Tank
PUPR	Ministry of Public Works and Peoples' Housing
QCBS	Quality Cost Based Selection
RFP	Request for Proposals
RPJMN	National Medium-Term Development Plan
RRP	Report and Recommendations of the President (ADB)
RT	*Rukun Tetangga* / Neighborhood Group
RTRWN	*Rencana Tata Ruang Wilayah Nasional* / National Spatial Plan

sAIIG	Australia Indonesia Infrastructure Grants for Sanitation
SANIMAS	Community Based Sanitation Program
SATKER	*Satuan Kerja* / Work Unit
SCS	Stakeholder Communication Strategy
SDB	Sludge Drying Bed
SDO	Service Delivery Organization
SOP	Standard Operational Procedure
SOW	Scope of Works
SSDP	Sewerage System Development Project
SSK	*Strategi Sanitasi Kota* / City Sanitation Strategy
SUSENAS	*Survei Sosial Ekonomi Nasional* / National Socioeconomic Survey
TF	Trickling Filter
TNP2K	National Team for Acceleration of Poverty Alleviation
TOR	Terms of Reference
TOT	Training of Trainers
TRTA	Transaction Technical Assistance
UASB	Up-flow anaerobic sludge blanket
ULP	*Unit Layanan Pengadaan* / Procurement Unit
UPTD	*Unit Pelaksana Teknis Daerah* / Local Government Technical Implementation Unit
USAID	United States Agency for International Development
USD	United States Dollar
USDP	Urban Sanitation Development Program
USRI	Urban Sanitation and Rural Infrastructure Support to PNPM Mandiri Project
WWM	Waste Water Management
WWTP	Wastewater Treatment Plant

REPORTING SCOPE AND STRUCTURE

The current TRTA under SSDP has been carried during 2017-2018 in close collaboration with the Executing Agency (EA) Directorate of Environmental Sanitation Development, Directorate General of Human Settlements, Ministry of Public Works and Housing and the participating local Governments of the cities of Mataram (NTT), Bekasi (West Java) and Banda Aceh (Aceh), through the implementation of two separate consulting contracts, comprising:

- Component 1 (C1), funded through the Cities Development Initiative for Asia (CDIA), for preparing the technical feasibility of the sewerage components and on-site sanitation components (hereto referred to as OUTPUT 1), and
- Component 2 (C2), funded by ADB, for developing the service delivery system (hereto referred to as OUTPUT 2) and the socialization of services (social marketing) and implementation of comprehensive public awareness campaigns (hereto referred to as OUTPUT 3).

This report (Volume 1 – Main Report and the corresponding Volume 2 – Appendices Report), in conjunction with the supplementing Sector Appraisal Reports (SAR) for the cities of Mataram, Bekasi and Banda Aceh – as outlined below, represent all key activities and outputs of both assignments under Component 1 and Component 2.

The combined reporting structure comprises the following volumes:

- Volume 1: SSDP Main Report
- Volume 2: SSDP Main Appendices Report
- Volume 3: SSDP Mataram Sub-project Appraisal Report
- Volume 4: SSDP Mataram Appendices Report
- Volume 5: SSDP Bekasi Sub-project Appraisal Report
- Volume 6: SSDP Bekasi Appendices Report
- Volume 7: SSDP Banda Aceh Sub-project Appraisal Report
- Volume 8: SSDP Banda Aceh Appendices Report

This Vol. 1 – SSDP Main Report, outlines for the three SSDP partnering cities of Mataram, Bekasi, and Banda Aceh the proposed technical infrastructure investments components (Output 1) and associated cost estimates and financing plans; institutional and regulatory recommendations for driving the delivery of domestic wastewater services (Output 2), and the assessments and recommendations on sanitation marketing and community participation (Output 3). Furthermore, the report is describing anticipated implementation arrangements, as well as the relevant ‘due diligence’ assessments, finance and economics, governance, social and gender planning, and environmental and social safeguards.

I. SUMMARY

A. DEVELOPMENT CONTEXT

1. Indonesia has a stable, multi-party democracy. Government functions are decentralized with a national government, 34 provincial governments and 491 district administrations.

2. The country has a large and growing share of middle-income consumers and a vibrant private sector. Several decades of solid economic growth have resulted in noteworthy progress in poverty reduction and social development. The absolute poverty rate has fallen from 22% in the mid-1980s to just 11% in 2015. Adult literacy is at 95%; primary and secondary education coverage are at 100% and 85% respectively; and life expectancy has increased from 63 years in 1990 to 71 years in 2015.

3. However, the government faces significant challenges to deliver on its Collecting More objective. Relative to its regional and emerging market peers, Indonesia has one of the lowest revenue-to-GDP ratios (12.5 percent in 2016 from 13.1 percent in 2015) and tax-to-GDP ratios (10.4 percent in 2016 from 10.7 percent in 2015), as well as one of the widest gaps between actual and potential revenues. It is estimated that Indonesia is collecting less than 50 percent of its potential tax revenues.[1] The revised 2015 budget had set an ambitious revenue-collection target, at 15.1 percent of GDP (or a tax-to-GDP ratio of 12.7 percent of GDP), with a fiscal deficit target of 1.9 percent of GDP. However, the actual 2016 fiscal deficit grew to 2.6 percent as a result of tax revenues falling far short of this target.[2]

4. In any case, fiscal management has been prudent. The fiscal stance remains mildly expansionary, with overall fiscal deficits of 2.6 and 2.5 percent of GDP in 2015 and 2016, respectively (primary deficit of 1 percent), approaching the budget deficit cap of 3 percent of GDP. Given the fiscal rule requiring that the deficit be kept at or below the cap of 3 percent of GDP, and given the constraints to rapidly increasing revenue, increasing the overall level of public expenditure will be difficult—at least in the medium term. Overall, government spending is declining, from 17.3 percent of GDP in 2013 to 15.0 percent in 2016.

5. Line ministries are responsible and accountable for their own financial administration. Within each line ministry there are spending units, or Satker, responsible for financial control and the approval of payments, including payroll. Payment requests are then forwarded to DG Treasury's field offices for payments to be made. Ministries are also required to prepare annual financial statements to be submitted to the MOF. Each line ministry includes an internal audit unit (Inspector-General, or IG), which reports directly to the responsible minister and is responsible for performance and financial audits.

6. According to the PEFA, there are still some weaknesses related to the strategic allocation of resources, the accountability of budget implementation and the efficient delivery of public services. These are areas in which reform efforts are being made but where these

[1] Fenochietto, R. and Pessino, C., 2013, "Understanding Countries' Tax Effort", IMF Working Paper WP/13/244.

[2] The general government deficit is capped by law at 3 percent of GDP. The threshold for each level of government is determined each year in a MOF regulation. The 2015 and 2016 maximum threshold for the subnational governments has been set at 0.3 percent and for the central government at 2.7 percent of GDP.

efforts have yet to realize full performance based on this assessment. Among the most important of these ongoing efforts are: (i) improving budget credibility by strengthening the budget forecast, establishing consistent budgeting framework, and increasing revenue mobilization and compliance of tax and non-tax collection; (ii) improving the system capacity to deliver infrastructure outcomes by harmonizing the selection, implementation and monitoring of capital expenditure with formal guidelines and oversight, efficient management of public assets, as well as consolidation and monitoring of public procurement operations; (iii) the inclusion in the budget of performance information, linking resource planning in the most appropriate manner for better service delivery; (iv) promoting effective reporting of subnational budget execution; and (iv) strengthening internal audit and external audit, and control measures.

7. The financial analysis conducted by SSDP shows a very small allocation of resources to the sanitation sector – almost negligible. The PEFA[3] reports that the national budget has been allocated toward the government's priority areas. The reduction in fuel subsidies since 2015 has provided some fiscal space for the government to focus on more productive spending and fiscal decentralization. This has helped to develop priority infrastructure projects and target more efficient spending by expanding social assistance programs and fulfilling mandatory spending in education at 20% and health at 5% of total expenditure. The government showed its policy intent in the 2016 budget by maintaining low energy subsidies and sustaining the increase in pro-poor and pro-growth spending on infrastructure, health and social assistance.

8. About half of Indonesia's population of around 252 million people live in urban areas and the need for safe wastewater management services is growing rapidly. Although access to sanitation in urban Indonesia is high, about 77% in 2014, this only considers the basic criteria of access to a facility as defined by the World Health Organization Joint Monitoring Program, and not safe collection and disposal of wastewater (WW) and septage, which is low, at only 1% and 4%, respectively, leading to environmental degradation and poor health of the urban population. Due to traditional gender roles, women are exposed to poorer sanitation, often resulting in higher water borne disease incidence.

9. To date, infrastructure investments for domestic wastewater management is financed by central government, donor, local government, private sector and community contributions, although no specific amounts are targeted or monitored. The private sector role is limited to providing services only with secured revenue stream, such as sludge collection and disposal, although mostly un-regulated. Unless the sector is regulated to provide a level playing field for competing service providers and the risk of an un-secured revenue stream is mitigated, no substantial financial contribution from the private sector is expected.

10. As a consequence of restricted budget allocations, the sanitation sector reports significant inequality in 'access to improved sanitation' by wealth quintiles in urban areas: as almost 100% of the richest two quintiles have access to improved sanitation, compared to only 36% of the poorest two quintile. 28% of urban Indonesians do not have access to improved sanitation facilities and 13% (18 million) still practice open defecation. About 1% of urban dwellers are served by sewerage systems, with only 13 cities having a substantial sewerage

[3] Methodology for assessing public financial management performance

network. Nationally, over 70% of urban households discard wastewater into septic tanks or 'cubluk' (open bottom pits). This has led to effluent waste being discharged largely untreated or partially treated into open drains, canals, rivers and ponds, resulting in widespread fecal contamination of urban ground water resources. With many people still reliant on wells for their drinking water, Indonesia continues to suffer a high incidence of water- and sanitation-related diseases, particularly typhoid.

11. Under the National Medium-Term Development Plan (RPJMN) 2015-2019, Government of Indonesia (GoI) has committed to an ambitious target of eliminating slums and providing universal access to safe water and sanitation by 2019 (popularly known as 100-0-100). For meeting these targets, GoI has launched sectoral platforms for improving service delivery for urban and rural water and sanitation and invests into slum upgrading and livelihood measures. The 100-0-100 targets are introduced as a bridging objective between the MDG and the future focus on Sustainable Development.

B. PROJECT OUTLINE AND CHALLENGES

12. In compliance with GOI policies and strategies, the **Sewerage System Development Project (SSDP)**[4] aims to contribute to safe disposal of domestic wastewater in three partner cities by (i) expanding centralized sewer systems and rehabilitation of wastewater treatment facilities; (ii) facilitating regulated sludge collection, transport, treatment and disposal of on-site systems; and (iii) eliminating open defecation.

13. The SSDP complies with (i) Indonesia's Medium Term Development Plan (RPJMN) for 2015 to 2019[5], including targets in support of 100% community access to sanitation; (ii) PPSP, which provides assistance to local governments in preparation of City Sanitation Strategies and streamline of implementation into local government planning and budgeting cycles; and (iii) ADB's Indonesia Country Partnership Strategy 2016–2019[6], with the overall objective of supporting environmentally sustainable growth through improved infrastructure and the delivery of city-wide sanitation services to the communities.

14. To align the city selection with the national sanitation targets and strategies, it was agreed with the Executing Agency Directorate General Human Settlements (DGHS) of the Ministry of Public Works and Housing to select the cities of Banda Aceh (Aceh/North Sumatra), Bekasi (West Java) and Mataram (Lombok/NTT) as focus cities for SSDP.

15. The identification of viable solutions by combining various technical options for achieving the best possible service deliveries under a 'least cost' approach, takes into considerations current service levels and practices, local government capacities, regulatory and institutional settings, socio-economic and environmental, and geo-spatial conditions.

16. SSDP promotes a holistic approach to wastewater management by supporting the supply side through infrastructure development; the demand side through social marketing and awareness-raising; and the establishment of an 'enabling' environment by establishing

4 TOR TA Consultants (49154-001)

5 Access to sanitation and safe collection of wastewater is expected to remain a priority beyond 2019.

6 ADB. 2016. Country Partnership Strategy. Indonesia 2016–2019: Towards a higher, more inclusive and sustainable growth path. Manila.

effective delivery mechanisms supported by adequate legal, institutional and financial policies. Private sector investment and strong community participation is embedded in the project design.

17. SSDP aims to reach the envisioned impacts and outcomes through the achievement of three principal outputs, namely[7]:

18. **OUTPUT 1:** Wastewater and sludge management capacity increased: First priority will be to rehabilitate and optimize existing centralized and decentralized wastewater and sludge collection and treatment systems to their full installed capacity, followed by construction of new facilities. Technologies will be selected based on lifecycle costs and energy efficiency.

19. On the basis of the technical feasibility studies carried out under C1, the investment and service delivery profile for the three SSDP cities is as follows.

Table 1: City Profiles under SSDP Investments for all Stages

City / Province	Population [a] (rounded)	Estimated CAPEX (US$ million) [b]	Estimated Number of HC (Sewerage + On-site Sanitation) [c]	Planned Level of Sanitation Services (%) [d]
Kota Banda Aceh, Aceh (Zone 1 & 3)	250,000	158.4	25,000 + 2,600	44%
Kota Bekasi, West Java (Zone 1, 2, 3, 4)	2,733,000	117.9	16,400 + 5,000	3 %
Kota Mataram, NTB (Stage 1, 2, 3)	460,000	296.2	51,000 + 1,800	46%
Total	**3,433,000**	**572.5**	**92,400 + 9,400**	

[a] 2015 population census, Badan Pusat Statistik, Indonesia.

[b] Estimate based on C1 Cost Estimates - updated by C2

c Based on CDIA Component 1 reports

[d] TA estimates based on 2015 population

20. Whereas the main investments are earmarked for the development of sewered sanitation services for inhabitants which are residing in the most populated residential areas, each of the three cities will be provided with investment support for the development of 'scheduled' desludging of domestic and commercial septic tanks.

21. For the SSDP project it is expected that a significant part (21%) of the investment will come from provincial and local governments. Given that local governments generally spend less than 2% of their total development budget on sanitation (and given that many have only limited room to increase it) this will be a major challenge.

22. Having said this, complex charging systems for sanitation services do not seem appropriate under current circumstances. Moreover, most countries continue to finance domestic wastewater services from public budgets. There may be a case for continuing to finance infrastructure from taxation whilst introducing charges or some dedicated tax levy to

[7] Terms of Reference for TA-9198 INO: Sewerage System Development Project - TA Consultants

finance operations and maintenance. This would give greater assurance this vital service is adequately financed.

23. In any case, the application of a service charge should be kept simple and (for residences and small businesses) could perhaps be levied as a flat rate fee along with the solid waste charge. The option of add the wastewater tariff to the current water bills (either for individual households or as a collective 'environmental' levy under a 'polluter's-pay-principle' needs to be further addressed to increase billing efficiency and to reduce the administrative cost of collection.

24. Private sector investment will be encouraged by creating legislation to structure tariff levels, fee collections systems, secure local government contribution (budget management), and initiating good practices (regulated service contracts).

25. To date, there are varying numbers of private entrepreneurs providing emptying services for septic tanks. These service providers are typically not registered by the city administration and often dispose the septage to open space or into creeks.

26. Currently, all three cities have existing septage treatment facilities (IPLT). The IPLTs locations are typically not well maintained and utilized (with the exception of Bekasi) and too far away from the city centers, which leads to long and costly transportations. In general, the effluent quality of the existing IPLT does not comply to the standard promulgated by the Ministry of Environment (MoE) Regulation No. 68 year 2016.

27. Thus, for the purpose of improved septage management, the cities now plan for the introduction of the following elements, for improving their septage management value chain under a 'scheduled desludging' service delivery scenario, comprising:

a. Zoning: Determination and selection of the service area for the introduction of scheduled desludging.

b. Containment: Planning, design, financing and supply of standardized septic tanks to the communities.

c. Desludging: Planning of logistics, technical operation procedures, tariff collection and community engagement for the implementation of scheduled desludging of septic tanks.

d. Treatment: Septage treatment options at existing IPLT and/or Co-treatment at future WWTP facilities.

e. Sludge disposal and/or reuse: Investigation of marketing opportunities for conditioned and sterilized sludge is a viable source of minerals and organic substance suitable as a soil conditioner for agricultural land.

f. Private Desludgers: Improve the integration of currently unregistered operations.

28. Under SSDP investments about USD 9 million are earmarked for the improvement of on-site sanitation treatment and services in selected pilot areas (under the header 'scheduled desludging') for each of the three participating cities, which includes the provision of standardized septic tanks for residential and commercial use, and for the pilot areas, vacuum trucks and a three-wheeler suction vehicle for addressing the transport dimension.

29. Other elements are 'potable temporary septage storage tanks' (5 m^3), and biosolid drying machine where appropriate. Furthermore, there will be some limited upgrading to existing septage treatment plants. To support field operations, SSDP will provide GIS and MIS support (including Hardware & software), portable water quality testing kids. The overall costs and scope for the introduction of 'scheduled desludging is estimated as follows.

30. **OUTPUT 2:** Service delivery system in place: Sound legal frameworks need to be in place and a single, independent public service organization established, which is responsible for planning, implementing, operating and maintaining wastewater management, with adequate capacity and increased accountability, financial and operational responsibility and transparency.

31. In recognition of prevailing national regulations, which are further outlined under the 'Due Diligence' section, the promulgation of a sound services delivery framework is embedded in the implementation of distinct local government measures in support of the development of 'city-wide', equitable, and sustainable public domestic wastewater management services, which should comprise the following considerations:

- Permitting sector regulation in support of defining the broader purpose and targets of infrastructure and service developments, scope and level of service deliveries, rights and obligations of the parties (owner, service provider, and beneficiaries), tariff settings and regulation, and collaboration with the private sector and the civil society
- Harmonization of current sector specific planning procedures, including the local government's mid-term development plans (RPJMD), city sanitation strategy (SSK), sector Master Planning, and current spatial Plan (RTRW)
- Institutional settings, foremost the separation and development of regulatory and operational functions, the establishment and capacity development of a dedicated wastewater operator, and corresponding engagement with the community, CBOs, and the private sector in support of strengthening the service delivery chain, and
- Promulgation of fiscal policies, budget allocations, service tariff adjustments, sourcing of external funding, for sustaining the operations and maintenance of current and future infrastructure developments.

32. **OUTPUT 3:** Public awareness campaigns completed: Starting with stakeholder analysis and development of a stakeholder communication strategy and participation plans, support by the various stakeholders will be ensured.

33. Creating public awareness on benefits and stakeholders' rights & obligations on sewerage management is essential for the achievement of the SSDP objective. The proposed approach represents a combination of three innovative elements for creating public awareness and evoking behavioral change, including: (i) capacity building at implementation level, (ii) behavior change communication (BCC) and (iii) Social Marketing, both at community level.

34. Specific city related findings on general sanitation and hygiene awareness, stakeholders engaged in sanitation promotion and appropriate communication channels to reach out to communities in a city-wide scale are presented in the individual city SARs.

35. The design of public awareness and behavior change communication campaigns and related capacity building plans takes into consideration the three basic pillars of behavior change: (i) creating demand for improved sanitation – i.e. provide households with the opportunity, ability, and motivation to accept sanitation services, (ii) effective sanitation supply chain – i.e. are the service providers and suppliers able to provide affordable and desirable service that match with people's preferences and generated expectations, and (iii) enabling environment for sanitation programming – i.e. decision-makers increase their focus on improved sanitation and implementers 'buy' into the BCC approach.

C. CAPACITY DEVELOPMENT PLAN

36. There is consensus among the key SSDP stakeholders that the project needs to provide a broad capacity development program in support (i) prior and during implementations of the investment component, and, equally important, (ii) post-construction in support of sustaining asset utilization and the delivery of domestic wastewater services to the targeted communities.

37. The capacity development plan is of imminent importance as none of the three PIU-Satkers (in charge of construction activities) and the three participating cities (in charge of operation, maintenance, and service deliveries) possess any previous exposure nor experience on sewered domestic wastewater management.

38. Based on the various capacity assessments (incl. procurement, financial management, safeguards, service delivery system, and community engagement), that were implemented during the course of the TRTA assignment, the identified capacity development needs are separated into two individual lots, including the following key components:

Capacity Development Elements			
Lot 1 – Pre-Construction		**Lot 2 – Post Construction**	
A	Procurement Management	D	Local Government Enabling Environment
B	Financial Project Management	E	WWM Operations / Service Deliveries
C	Safeguards Management C.1 Environmental Safeguards C.2 Social Safeguards	F	Public Awareness Campaign

II. THE PROJECT

A. RATIONALE

1. National Development Targets and Plans

39. Under the National Medium-Term Development Plan (Rencana Pembangunan Jangka Menengah Nasional, RPJMN) 2015-2019, the Government of Indonesia (GoI) is committed to support the achievement of 'universal access', popularly known as '100-0-100', comprising: 100% community access to safe drinking water – 0% urban slum areas - 100% community access to sanitation (comprising 85% improved and 15% basic sanitation).

40. For meeting these ambitious sanitation targets, GoI launched in 2010 a sectoral platform through the Program 'Percepatan Pembangunan Sanitasi Permukiman' (PPSP) or Accelerated Sanitation Development for Human Settlements program, which set out specific goals for the three sub-sectors of wastewater, solid waste, and urban drainage services.

41. Since the outset, PPSP has been supported through the Urban Sanitation Development Program (USDP) for assisting municipalities and districts throughout Indonesia for elaborating urban Environmental Health Risk Assessments (EHRA) and for planning sanitation infrastructure improvements through the development of City Sanitation Strategies (Strategi Sanitasi Kota - SSK) on a 'city-wide' scale. So far, 489 out of 509 local governments possess a valid SSK. For a given local government, the SSK constitutes the eligibility criteria for national infrastructure funding.

2. City Selection Criteria

42. On the basis of a request of the MPWH in March 2015, ADB commissioned a study to "undertake mapping of the current sanitation access, including the conceptual outline for achieving 100% access to sanitation by 2019", which resulted in a scoping study in preparation of a multi-trance financing facility, under the "City Wide Sanitation Investment Program" (CWSIP). The study was disseminated to a wider national stakeholder audience in January 2016.

43. The following step-wise methodology was applied for the development of the wastewater management investment roadmap:

1. Non-technical ranking of cities
2. Conversion of national targets to local targets
3. City selection principles and city categorizing
4. Assess physical targets, required budget and funding sources
5. Investment needs per category of selected cities
6. Assess investment options with financing requirements from the national government, including indications for external donor support.

44. For ensuring maximum impact of the earmarked investments, CWSIP applied the following city selection principles:

- Utilize idle capacity first
- Rehabilitation/expansion of existing sewerage systems plus WWTP in selected cities
- Rehabilitation (or new construction) of existing sludge treatment facilities (IPLT)
- Construction of new central sewerage systems in prioritized cities
- Construction of new IPAL Kawasan system(s) in prioritized cities
- Application of mixed technologies, in which a 'city-wide' sanitation development approach is pursued

45. Out of a long-list of 98 local governments, CWSIP prepared shortlists for the following categories:

- 6 cities for upgrading/expansion of existing sewerage systems
- 12 cities for new central sewerage system
- 8 cities for city wide sanitation coverage (100%)

- 8 cities for rehabilitation and/or construction of new IPLT (septage treatment facilities).

46. The selection of the three SSDP cities was based on their commitment for the development of a 'city-wide' service delivery approach, and aligns with the GoI condition for nominating local governments on the availability of sanitation planning documents, including:

- Updated City Sanitation Strategy
- White Book Revision/City Sanitation Strategy 2017-2021.

47. However, it is noted that the current City Sanitation Strategies for the three cities do not yet adequately cover the domestic wastewater sector. It is, therefore, recommended that the local governments update their specific medium-term domestic wastewater planning, together with their Spatial Plans *(Rencana Tata Ruang Wilayah, RTRW)*, and also review their long-term wastewater sector Master Plan for aligning with the SSDP proposed development scenarios.

3. Community Awareness and Socio-economic Context

48. The following table presents an illustration on community awareness with regard to water-borne diseases, impacts of untreated wastewater on the environment, willingness-to-pay for a house connection, perception on the importance of a sewer connection, and the average monthly household income.

Table 2: Level of Community Awareness on Key Sanitation Issues

Level of Community Awareness on:	Water-borne Diseases (%)	Environmental Impacts of Untreated Wastewater (%)	Willingness to Pay (%)[8]	Perception of Importance of Sewer Connection (%)	Average Monthly Income (Rp)
Mataram	35	54	52	54	2,435,045
Bekasi	37	52	18	60	2,969,325
Banda Aceh	9	17	17	20	2,456,574
Average	**27**	**41**	**29**	**45**	2,620,315

Source: SES Survey 2018

49. Despite fairly high acknowledgement of the importance of connecting to the planned systems, the proportion of households willing to pay for the connection is relatively low: 17% in Banda Aceh, 18% in Bekasi and 52% in Mataram. In all cities, most respondents are willing to pay IDR 50.000. Unfortunately, this is short of the costs of connection of about IDR 8 million as determined by the preliminary engineering design completed by Component 1. The average monthly household incomes of less than IDR 3 million clearly indicates that the connection costs are far beyond reach of the households.

50. In addition, the proportion of households willing to pay monthly sewer fees roughly corresponds to the number of those willing to pay for the connection: Banda Aceh 12%, Bekasi 18% and Mataram 52%. The majority of respondents are willing to pay up to IDR 10.000 per month.

51. The basic government data on poverty within the three SSDP project cities is presented in the following table:

Table 3: Official Government Poverty Data

Indicator	Poverty Data		
	Mataram 2017[9]	**Banda Aceh 2016**[10]	**Bekasi 2015**[11]
Poor persons	44,529	188,000	153,580
Percentage of poor persons	9.55	7.41	5.46
Poverty Line (Rp)	428,754	541,732	472,148

52. The socio-economic survey (SES) implemented during this assignment found higher proportions of poor households in the samples. More detailed poverty data including several indicators besides the PS poverty line are presented in section III.D of this report.

B. IMPACT AND OUTCOME

53. Comprehensive domestic wastewater collection and treatment are contributing to improvements of the immediate environment within the service areas, and to the long-term recovery of ground aquifers and surface water quality, which positively impacts on the economy as a whole → IMPACT.

54. In South East Asia, the Water and Sanitation Program of the WB estimated that due to poor sanitation, Cambodia, Indonesia, the Philippines and Vietnam suffer aggregated economic losses in the range of USD 9 billion a year (equivalent to 2% of their combined GDP)[12].

55. Thus, the intended SSDP investment is directly contributing towards a positive impact on current environmental sanitation and hygiene conditions, which supports the reduction of waterborne deceases, and, as such, contributes to community wellbeing and economic prosperity → OUTCOME.

56. In support of the sustainability of the planned infrastructure investment measures, a comprehensive capacity development program will be implemented, which will contribute towards the development of 'city-wide' service deliveries through improved regulatory and institutional settings, enhanced operational functions and collaborations with the private sector and the communities. Wide-ranging community campaigns and social marketing efforts are planned in support of community behavior change and the promotion of centralized and decentralized domestic wastewater services.

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9 Source: *https://mataramkota.bps.go.id/dynamictable/2018/01/30/379/penduduk-miskin-menurut-garis-kemiskinan-kota-mataram-2008-2017.html*

10 Kota Banda Aceh Dalam Angka 2017. Badan Pusat Statistik Kota Banda Aceh, August 2017

11 Source: BPS Bekasi City

12 Benefits of Investing in Water and Sanitation: An OECD Perspective – © OECD 2011

C. OUTPUTS

57. SSDP aims to reach the envisioned impacts and outcomes through the achievement of three principal outputs, namely[13]:

OUTPUT 1: Wastewater and sludge management capacity increased: First priority will be to rehabilitate and optimize existing centralized and decentralized wastewater and sludge collection and treatment systems to their full installed capacity, followed by construction of new facilities. Technologies will be selected based on lifecycle costs and energy efficiency.

OUTPUT 2: Service delivery system in place: Sound legal frameworks need to be in place and a single, financially independent public service organization established which is responsible for planning, implementing, operating and maintaining wastewater management, with adequate capacity and increased accountability, financial and operational responsibility and transparency.

OUTPUT 3: Public awareness campaigns completed: Starting with stakeholder analysis and development of a stakeholder communication strategy and participation plans, support by the various stakeholders will be ensured.

Output 1: Wastewater and sludge management capacity increased

58. On the basis of the technical feasibility carried out under C1, the investment and service delivery profile for the three SSDP cities is as follows.

Table 4: City Profiles under SSDP Investments for all Stages

City / Province	Population [a] (rounded)	Estimated CAPEX (US$ million) [b]	Estimated Number of HC (Sewerage + On-site Sanitation) [c]	Planned Level of Sanitation Services (%) [d]
Kota Banda Aceh, Aceh (Zone 1 & 3)	250,000	158.4	25,000 + 2,600	44%
Kota Bekasi, West Java (Zone 1, 2, 3, 4)	2,733,000	117.9	16,400 + 5,000	3 %
Kota Mataram, NTB (Stage 1, 2, 3)	460,000	296.2	51,000 + 1,800	46%
Total	**3,433,000**	**572.5**	**92,400 + 9,400**	

[a] 2015 population census, Badan Pusat Statistik, Indonesia.

[b] Estimate based on C1 Cost Estimates - updated by C2

c Based on CDIA Component 1 reports

[d] TA estimates based on 2015 population

59. Whereas the main investments are earmarked for the development of sewered sanitation services for inhabitants which are residing in the most populated residential areas, each of the three cities will be provided with investment support for the development of 'scheduled' desludging of domestic and commercial septic tanks.

[13] Terms of Reference for TA-9198 INO: Sewerage System Development Project - TA Consultants

Domestic Wastewater Management of the City of Mataram

60. The city of Mataram is the capital of the Province of Nusa Tenggara Barat (NTB) with a current population of about 460,000 inhabitants. Mataram is located at the western part of the island of Lombok.

61. In line with the National Spatial Plan *(Rencana Tata Ruang Wilayah Nasional, RTRWN)*[14], the City of Mataram is designated as a National Activity Center *(Pusat Kegiatan Nasional, PKN)* that serves as a main hub for trade, transport and services. Meanwhile, for the of NTB Province, the Greater Mataram Metropolitan is a designated Provincial Strategic Growth Zone *(Kawasan Strategis Provinsi, KSP)*[15].

62. Mataram is the center of government, education, commerce, industry and services for the island of Lombok and the Province of NTB. The city is served by the Lombok International Airport, located near Praya in Central Lombok, the Lembar Harbour seaport in the southwest, and the Labuhan Lombok ferry port on the east coast.

63. The city water supply is sourced primarily from the slopes of Mount Rinjani and the city has a system of small dams to buffer precipitation during the seasonal raining season. West Nusa Tenggara province is largely threatened with a water crisis caused by increasing deforestation and degradation of raw water quality and quantity, which is impacting on the development of reliable public water supplies and agricultural productivity.

64. The City of Mataram has no suitable domestic wastewater management system in place to date. Currently, domestic wastewater management in Mataram comprises only septic tanks and several community managed systems. Because of substantial inefficiencies of on-site treatment, combined with low frequencies of septic tank desludging, the majority of domestic wastewater is entering untreated into groundwater aquifers, open drains and streams. Whereas the city is claiming that 99%[16] of the households have access to improved sanitation, the level of appropriate treatment of domestic wastewater is estimated to be less than 5% within the city jurisdiction.[17]

65. Current domestic wastewater management facilities in Mataram are presented in the following table.

Table 5: Existing Wastewater Infrastructures in Mataram (2016)

No	EXISTING INFRASTRUCTURE	TOTAL UNITS	TOTAL SERVED (Households)
1.	Individual Septic Tanks	38,019	38,019
2.	Communal Septic Tanks	6	46
3.	Public Washrooms	21	332
4.	Communal Systems	17	1,094
5.	Septage Treatment Plants	2 (cap. 160 m3/day)	whole city
6.	Septage Trucks	3	whole city
7.	Average Vol. of Septage Collected	24 m3/day	whole city

[14] PP 13/2017 dated 12 April 2017 – Revision of PP 26/2008

[15] PerDa Provinsi Nusan Tenggara Barat 3/2010 ttg Rencana Tata Ruang Wilayah NTB Th 2009 - 2029

[16] Statistic Health Department Kota Mataram 2016

[17] TRTA estimated on the basis of annual volume of septage treatment data

Source: Final Report "Preparation / Facilitation of Master Plan and DED of Wastewater Infrastructure of Mataram City 2016" and “Roadmap Sanitasi Prov. NTB, 2014”

66. City of Mataram owns two septage treatment facilities *(Instalasi Pengolahan Lumpur Tinja, IPLT)*, one in Ireng and one in Kongok. The operations of septage management used to be under the responsibility of the City Cleansing Agency but was moved to the Environmental Agency in November 2016.

67. The Ireng facility is not operational due to lack of maintenance. The Kongok facility was rehabilitated and upgrading works were finalized in December 2017. However, this investment needs to be complemented by regular desludging service and complementary improvements, such as the provision of standardized septic tanks, intermediary septage transfer tanks, neighborhood collection facilities *(kedoteng)*, and additional suction trucks. This provides the opportunity for integrating private sector operations into the on-site sanitation value chain.

68. In addition to limited septage treatment, there are 17 community managed systems in operation in the sub-districts of Cakranegara and Sanubaya, serving only about 1,094 households.

69. Contributing factors to the low level of domestic wastewater treatment in the city include the following:

- Wastewater management is typically not enjoying high priority on the local government development agenda during the annual planning and budgeting cycles, resulting in the past three years in the following allocations:
  - APBD: 2015: Rp 1.205.000 mio 2016: Rp 1.344.000 mio 2017: 1.359.000 mio
  - WWM: 2015: Rp 126 mio 2016: Rp 136 mio 2017: Rp 146 mio
  - Ratio: 2015: 0.01 % 2016: 0,01 % 2017: 0.01 %
- Annual local government budgets do not cater for domestic wastewater management related infrastructure investments and are insufficient for covering basic operational expenses for improved septage management
- There is no significant local regulation in support of domestic wastewater management in place yet
- The Medium-term Development Plan (RPJMD), Spatial Plan (RTRW), and City Sanitation Strategy (SSK), are not yet harmonized and are hardly recognized during annual planning and budgeting cycles
- There is no designated operator in place yet that holds the mandate for the provision of ‘city-wide’ domestic wastewater management services
- The city administration is not yet prepared for the management of large-scale domestic wastewater schemes.

70. In recognition of the prevailing constraints, the Mataram administration is requesting GoI support to improve the city’s wastewater management coverage. Other measures planned by the local government is in the improvement of supporting wastewater regulation (Perda) and building more effective communication channels with their communities for promoting awareness on good hygiene and sanitary practices.

71. Through SSDP, comprehensive domestic wastewater collection and treatment will be initiated for the City of Mataram, which will contribute to improvements of the immediate

sanitary environment within the service areas and the long-term recovery of ground aquifers and surface water quality, which will positively impact on community welfare and the economy.

72. In collaboration with the Directorate General Human Settlements of the Ministry of Public Works and Housing and the City of Mataram, it was agreed to develop a staggered investment plan for city-wide domestic wastewater management, as follows:

Phase	Planning Period	HH Served	Service Coverage (%)
• **Phase 1 – Short Term**	**2019 [18] - 2028**	**52,845**	**46**
▪ Stage 1: Sewerage	▪ 2019 – 2023	13,478	13
▪ Stage 2: Sewerage	▪ 2013 - 2026	29,680	29
▪ Stage 3: Sewerage plus	▪ 2026 - 2028	51,045	44
▪ Stage 1: On-site	▪ 2019 – 2023	1,800	1,6

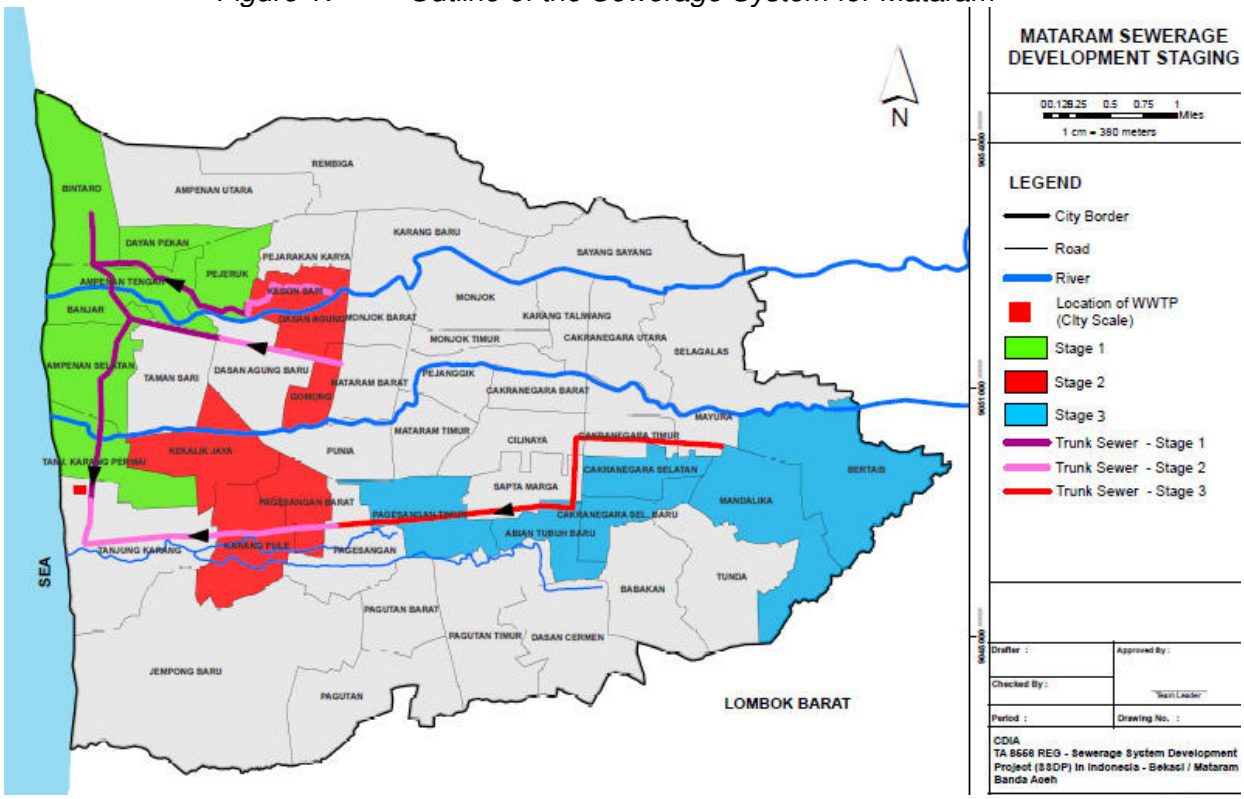
73. The rationale behind the phasing is to start with domestic wastewater collection and treatment at the most densely populated areas (>150 inhab./ha) and to spread out the investments over a longer period of time, which is in accordance with the current City Sanitation Strategy *(Strategi Sanitasi Kota, SSK)*.

Table 6: Proposed Sewerage Staging for Mataram

Staging	Kelurahan served	Population served	Main Characteristics
• **Stage 1**	**7**	60,650	• Households connections: 13,378 • Collection system length: 92.3 km • Main trunk system length: 8.4 km • Pumping stations: 2 • WWTP stage1: 8 MLD
• **Stage 2**	6	133,560	• Households connection: 16,202 • Collection system length: 86.6 km • Main trunk system length: 5.2 km • WWTP stage2: plus 8 MLD
• **Stage 3**	6	229,700	• Households connection: 21,365 • Collection system length: 96.6 • Main trunk system length: 5.8 km • WWTP stage3: plus 8 MLD
Total	**19**	**229,700**	• **Households connection: 51,045** • **Collection system length: 275 km** • **Main trunk system length: 19.5 km** • **Pumping stations: 2** • **WWTP total: 24 MLD**

[18] Whereas the commencement of field activities for SSDP Stage 1 were initially scheduled for 2019, the actual start of constructions is now anticipated in 2021.

Figure 1: Outline of the Sewerage System for Mataram



74. A site has been identified by the city administration for the centralized wastewater treatment plant (WWTP) and for each of the proposed pumping stations (PS). However, to date, the site for the wastewater treatment plant, which is located in the north-west of the city next to the shore of the ocean, is not yet owned by the city administration, and now depending on the outcome of negotiation with the national power company PLN.

75. In addition to the proposed sewerage scheme, the SSDP scope of works also comprises the initiation of 'scheduled' desludging of 2,100 septic tanks (1,800 residential and 300 commercial) in a pilot service area adjacent to the sewerage system - serving about 7,200 inhabitants or about 1.6% of the city's population.

76. In agreement with the Executing Agency (DGHS) and the ADB, the initial tranche of the SSDP loan will be limited to Stage 1 of Phase 1 of the planned infrastructure investments.

77. The CAPEX for the individual phases for the sewerage schemes are estimated as follows:

Phase (Off-site)	Planning Period	**CAPEX** (mio USD)
• **Phase 1 – Short Term**	**2019** [19] **- 2028**	**296.1**
• Financing Charges		13.8
• Contingencies		73.9

[19] Whereas the commencement of field activities for SSDP Stage 1 were initially scheduled for 2019, the actual start of constructions is now anticipated in 2021.

- Sub-total Investments 208.4
  - *Stage 1: 2023* — *2019 – 2023* — *90.1* [a)]
  - *Stage 2: 2026* — *2013 - 2026* — *77.6*
  - *Stage 3: 2028* — *2026 - 2028* — *40.7*

Note: [a)] Included in the overall estimated CAPEX for Stage 1 are the costing for the development of 'scheduled desludging' for a selected pilot area of 2.100 septic tanks, with estimated costs USD 1.45 million.

Domestic Wastewater Management of the City of Bekasi

78. The City of Bekasi is neighboring the Indonesian capital Jakarta with a current population of close to three million inhabitants. There is an ongoing influx of workforce for serving expanding local and international manufacturing industries which is also triggering the development and expansion of residential areas, including the new megacity 'Meikarta' with a projected capacity of 250,000 apartments. The construction of a new mass transportation system that is linking Bekasi with the city center of Jakarta will significantly improve mobility and pressure on land and the delivery of public services.

79. The city also operates the largest Indonesian solid waste deposit site, which is mainly catering for the city of Jakarta and a cause of long-standing discontent for city officials and local residents. Three heavily polluted rivers are crossing the city - Sungai Cakung, Sungai Bekasi and Sungai Sunter, of which the latter is a vital raw water source for domestic drinking water production and irrigation.

80. To date the city of Bekasi has no suitable domestic wastewater management system in place. Most of the households rely on septic tanks that provide very limited wastewater treatment efficiency, which leads to extensive pollution of adjacent water bodies and related water borne diseases[20].

81. Whereas the city is claiming that 99%[21] of the households have access to improved sanitation, the level of appropriate treatment of domestic wastewater is estimated to be less than 1% within the city's jurisdiction[22]. Currently existing domestic wastewater management facilities in Bekasi are as follows.

[20] City Sanitation Strategy (SSK) 2017
[21] Statistic Health Department Kota Bekasi 2016
[22] TRTA estimated on the basis of annual volume of septage treatment data

Table 7: Existing Wastewater Infrastructures in Bekasi (2016)

Name	Unhealthy Sanitation	Healthy Sanitation						
	Open Defecation / BABS (HH)	On-site System			Off-site System			
		Unsafe Toilets (HH)	Family toilets with safe septic tanks (HH)	Share Toilets (HH)	Communal System			Region/ Centralized System
					Communal Toilets	Septic Tank	Communal IPAL (HH)	Functioning House Connection
Kota Bekasi	5.607	72.885	478.801	746	331	50	2.170	-
Procentage to Total Housholds *)	**1,00%**	**13,00%**	**85,40%**	**0,13%**	**0,06%**	**0,01%**	**0,39%**	
**) Based on a total of 560,660 Households for Bekasi in 2016*								

Source: SSK Kota Bekasi 2015, Dinas Perkimtan and data processed by consultant

82. Contributing factors to the low level of domestic wastewater treatment in the city include the following:

- Wastewater management is typically not enjoying high priority on the local government development agenda during the annual planning and budgeting cycles, resulting in the past three years in the following allocations:
  - APBD: 2015 Rp 4,188,655 mio 2016 Rp 4,668,006 mio 2017 Rp 5,310,154 mio
  - WWM: 2015 Rp 3,069 mio 2016 Rp 3,300 mio 2017 Rp 3,600 mio
  - Ratio: 2015 0.07 % 2016 0,07 % 2017 0.07 %
- The Medium-term Development Plan (RPJMD), Spatial Plan (RTRW), Wastewater sector Master Plan, and City Sanitation Strategy (SSK), are not yet harmonized and are hardly recognized during annual planning and budgeting cycles
- The city administration is not yet prepared for the management of large-scale domestic wastewater schemes.

83. Concerned about the low sanitation coverage and spurred by the GOI target of universal access 2019, the Bekasi Mayor promulgated a local regulation (PERWAL 45/2015) on wastewater management and established a formal wastewater operator UPTD during the same year, followed by the construction of a semi-mechanized septage treatment plant at Sumur Baru in 2016, which is now providing 'scheduled' septic tank desludging services to about 6,000 customers.

84. Through SSDP, the construction of limited sewered domestic wastewater collection and treatment will be initiated, which will contribute to improvements of the immediate sanitary environment within the service areas and the long-term recovery of ground aquifers and surface water quality, which will positively impact on community welfare and the economy.

85. However, it is important to note that the prevailing land shortage in Bekasi is the driving force behind the proposed SSDP investments. Decentralized facilities (serving individually between 9,000 to 32,000 inhabitants) are now considered as an immediate approach. However, the size of the city (estimated at about 4 million inhabitants in 2037) would require numerous of these decentralized facilities being spread all over the city with associated multiple land-acquisition and resettlement issues.

86. For SSDP, the city administration has opted for the development of sewered domestic wastewater management in four zones which are located in the northern part of the city, including: Zone 1: Rawapasung; Zone 2: Perumnas 1; Zone 3: Rusuwana; and Zone 4: Halim with the following design features:

87. The Perumnas 1 location is still owned by the District of Bekasi for which a separate agreement would need to be put in place between the two local governments for utilizing this area for the construction of a WWTP. The land for the sewerage system in Rusanawa and Rawapasung is owned by the Bekasi administration and can be used for the construction of a wastewater treatment plant. The designated land for Halim is still owned by the national air force (TNI).

88. In any case, the city administration still needs to revise in 2019 the special plan (RTRW) for providing the formal legality for the land-use of all four designated wastewater treatment plants.

89. The number of potential beneficiaries for the proposed four off-site systems in combination with 'scheduled' desludging of household septic tanks in 2022/23 is in the order of 21,400 households or about 1,1% of the total population, as follows:

Phase	Planning Period	HH Served	Pop Served
• **Phase 1 – Short Term**	**2019 [23] - 2022/23**	**21,400**	**85,600**
▪ Zone 1: Rawapasung	▪ 2019 – 2022/23	8,000	32,000
▪ Zone 2: Perumnas		3,000	12,000
▪ Zone 3: Rusuwana		2,400	9,600
▪ Zone 4: Halim		3,000	12,000
▪ Scheduled Desludging	▪ 2019 – 2022/23	5,000 [24]	20,000

90. In addition to the proposed new sewered service areas, an extension of the current 'scheduled' desludging activities is proposed under SSDP, comprising the installation of 5,000 septic tanks for residential use and 1,000 septic tanks for commercial use. For these additional scheduled desludging services, three vacuum trucks, a three-wheeler suction vehicles, and two portable septage storage tanks (@ 5 m^3) are proposed for addressing the transport dimension of improved on-site management. The investments will also cater for the construction of a new septage treatment facility (IPLT) with a capacity of 150 m^3/day at Harapan Baru, located in the northern part of the city. To support the operations the project will provide GIS and MIS development (including hardware & software).

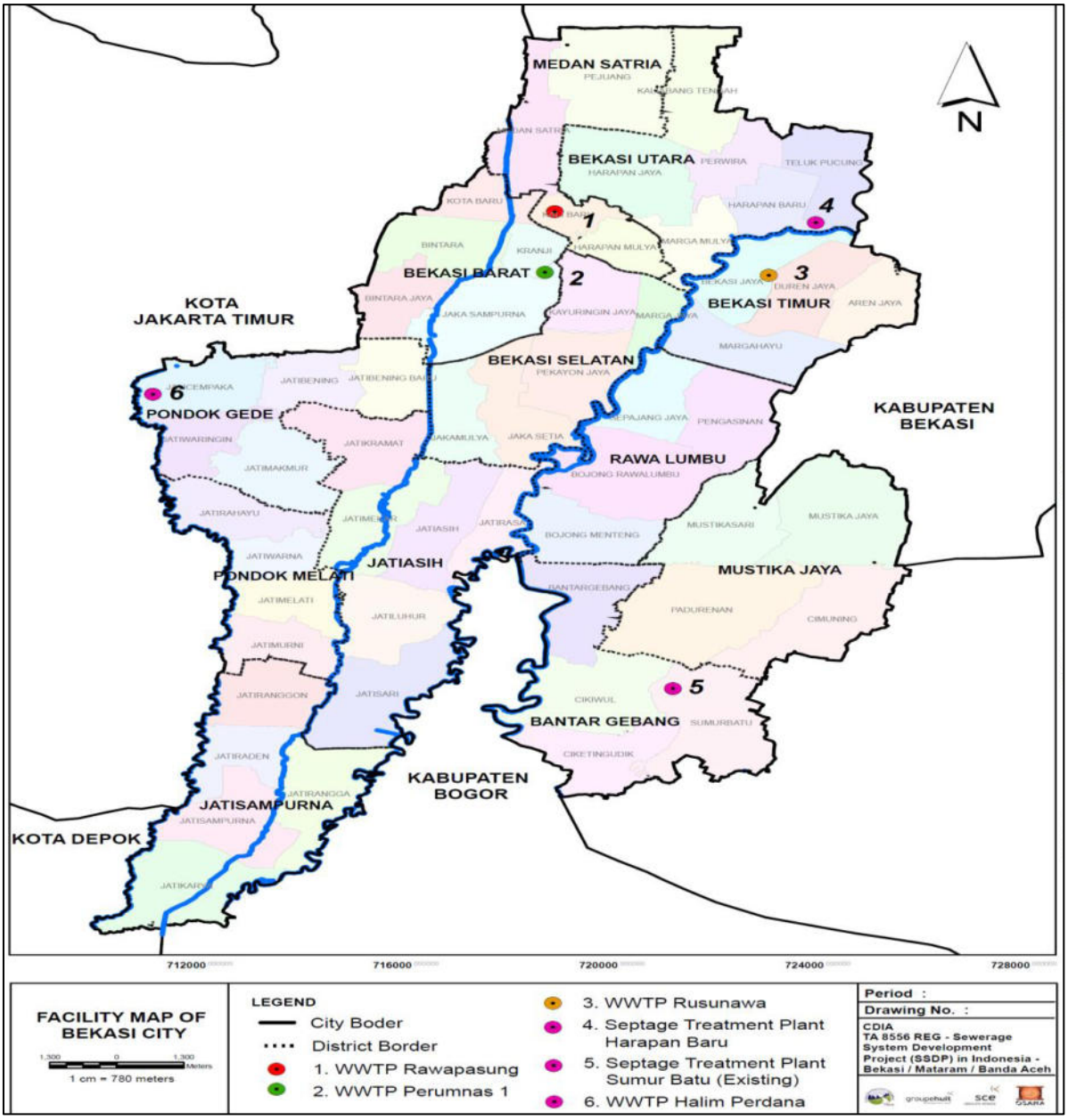
[23] Whereas the commencement of field activities for SSDP Stage 1 were initially scheduled for 2019, the actual start of constructions is now anticipated in 2021.

[24] In addition to 5,000 domestic Septic Taks, the SSDP investment program includes 1,000 Commercial Septic Tanks

Table 8: Proposed Sewerage Planning for Bekasi

Location	Population served	Sewer system main characteristics
Zone 1 Rawapasung	32,000	• Households connections: 8,000 • Collection system length: 45,000 m • Main trunk system length: 1,925 m • WWTP Zone 1: 3,200 m^3/day
Zone 2 Perumnas 1	12,000	• Households connection: 3,000 • Collection system length: 18,000 m • Main trunk system length: 1,811 m • WWTP Zone 2: 1,200 m^3/day
Zone 3 Rusuwana	9,600	• Households connection: 2,400 • Collection system length: 14,400 m • Main trunk system length: 1,449 m • WWTP Zone 3: 960 m^3/day
Zone 4: Halim	12,000	• Households connection: 3,000 • Collection system length: 18,000 m • Main trunk system length: 1,800 m • WWTP Zone 4: 1,200 m^3/day
Total	**65,600**	• **Households connection: 16,400** • **Collection system length: 95,400 m** • **Main trunk system length: 6,3685 m** • **4 WWTPs total: 6,360 m^3/day**

Figure 2: City Map Bekasi and Proposed SSDP Project Components and Facilities



91. The CAPEX for the four sewerage schemes combined with the 'scheduled' desludging initiative is estimated as follows:

Item	Planning Period	**CAPEX** (mio USD)
• **Phase 1 – Short Term**	**2019 – 2022/23**	**117.9**
• Financing Charges		3.7
• Contingencies		19.5
• Sub-total Investments		94.8
▪ *Sewer Systems*	▪ *2019 – 2022/23*	*89.2*
▪ *Scheduled Desludging*	▪ *2019 – 2022/23*	*5.6*

Domestic Wastewater Management of the City of Banda Aceh

92. The city of Banda Aceh is the capital of Indonesia's Aceh province located at the most northern part of Sumatra. The current population of Aceh is below 250,000. After a long civil war, a peace agreement was signed in Finland in 2004, which granted Aceh a special autonomy status. The signing took place after a major earthquake with 9.2 magnitude that caused a Tsunami that killed 230,000 – 280,000 people and left 500,000 people homeless in Aceh, the Andaman and Nicobar Islands, Sri Lanka and Thailand.

93. Currently, there is no proper sewage management in place in Banda Aceh City. Most of the households rely on septic tanks, which provide very limited wastewater treatment and leads to strong pollution of water bodies in the city[25].

Table 9: Existing Wastewater Infrastructures in Banda Aceh (2016)

No	EXISTING INFRASTRUCTURE	TOTAL UNITS	TOTAL SERVED (Households)
1.	Individual Septic Tanks	38,019	68,617
2.	Communal Systems	9	1,700
3.	MCK Mandi Cuci Kakus (communal toilets)	17	450
4.	Septage Treatment Plants (56 + 75 m^3/day)	2	whole city

Source: collected from various source (Profil Kesehatan Kota Banda Aceh, 2015)

94. Contributing factors to the low level of domestic wastewater treatment in the city include the following:

- Wastewater management is typically not enjoying high priority on the local government development agenda during the annual planning and budgeting cycles, resulting in the past three years in the following allocations:
  - APBD: 2015 Rp 1,168,955 mio 2016 Rp 1,315,853 mio 2017 1,248,393 mio
  - WWM: 2015 Rp 325 mio 2016 Rp 350 mio 2017 Rp 351 mio
  - Ratio: 2015 0.03 % 2016 0,03 % 2017 0.03 %
- The Medium-term Development Plan (RPJMD), Spatial Plan (RTRW), Wastewater sector Master Plan, and City Sanitation Strategy (SSK), are not yet harmonized and are hardly recognized during annual planning and budgeting cycles
- The city administration is not yet prepared for the management of large-scale domestic wastewater schemes.

95. In response, the GOI started funding in 2015 the construction of a US $7.5 million wastewater treatment plant within the so-called service Zone 2. The plant was scheduled for completion in 2017. However, the discovery of a graveyard near the planned wastewater treatment plant brought the construction activities to a standstill. Unless the issue is clarified, and solutions are agreed upon, the DGHS apprehends any further national fund transfers to the city of Banda Aceh.

96. In collaboration with the DGHS (EA) and the City Government of Banda Aceh, it was agreed to phase for SSDP investments in four phases (from 2019 to 2037) for allowing an

[25] City Sanitation Strategy (SSK) 2017

incremental enhancement of domestic wastewater services that can be managed by the city administration.

97. The development plan for Banda Aceh city divides the service area into three zones with zone 1 located in the northern part of the city, zone 2 in the center and zone 3 in the southern part.

98. During the course of the study, wastewater treatment plant sites have been identified for the two remaining centralized WWTPs (zone 1 and 3) and for all pumping stations.

99. Whereas the land for the construction of the WWTP for zone 3 is owned by the City, the land for the WWTP for zone 1 has multiple private owners.

Figure 3: Outline of Sewerage Systems for Banda Aceh

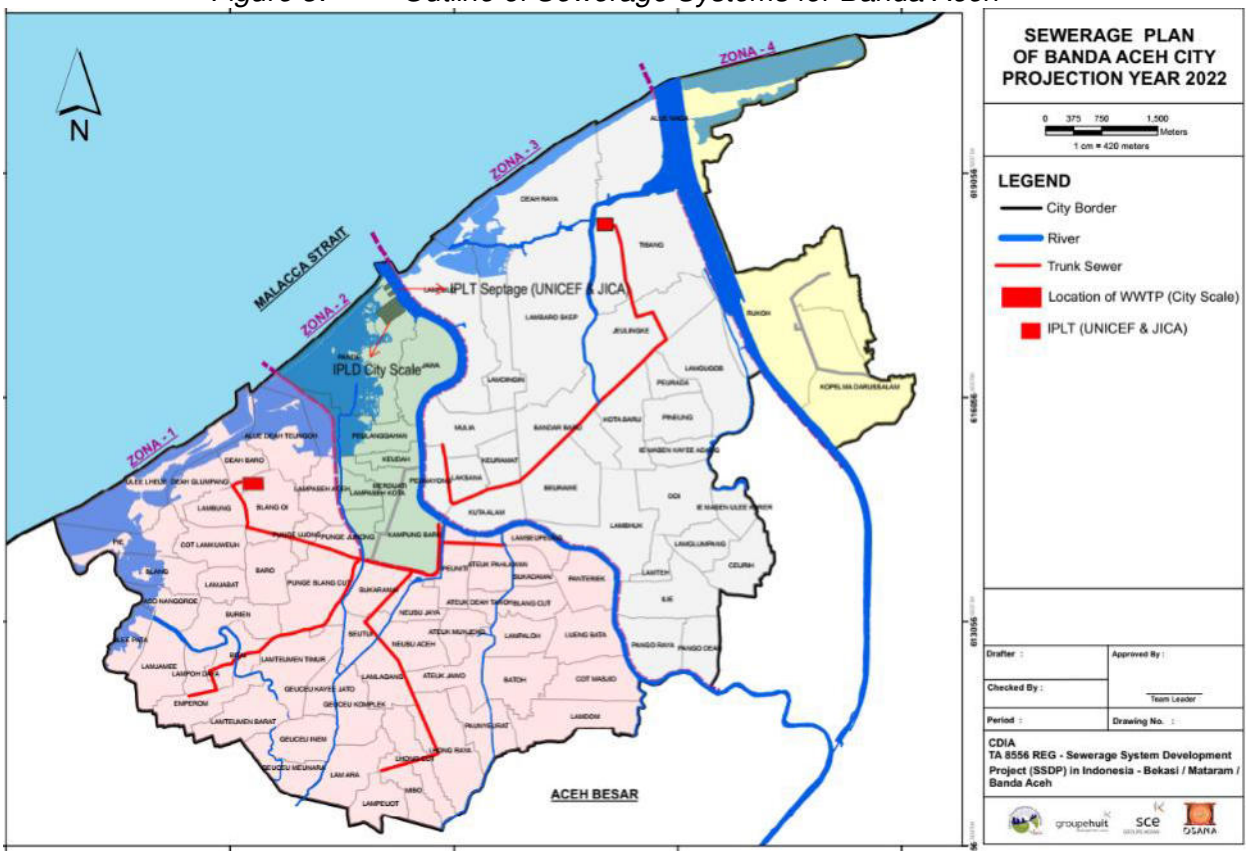


Table 10: Proposed Sewerage Planning for Banda Aceh

Date	Population served *)	System Components
Zone 1 – 2022/23	70,000	• Households connections: 15,647 • Collection system length: 109.5 km • Main trunk system length: 10.9 km • Pumping stations: 4 • WWTP Zone 1: 8,000 m³/day
Zone 3 - 2025	30,000	• Households connection: 6,566 • Collection system length: 46 km • Main trunk system length: 6.4 km • Pumping station: 1 • WWTP Zone 3: 3,400 m³/day
Total	**100,000**	• **Households connection: 22,213** • **Collection system length: 155 km** • **Main trunk system length: 17.3 km** • **Pumping stations: 5** • **2 WWTPs total: 11.4 MLD**

*) rounded figures

100. Total CAPEX for Zone 1 sewerage system (planning horizon 2022/23) and Zone 3 sewerage system (planning horizon 2025), including 'scheduled' septage management for about 2,600 households and 500 commercial customers is estimated at USD158.4 million, as follows.

Item	Planning Period	**CAPEX** (mio USD)
• **Zone 1 & 3**	**2019 – 2022/23 & 25**	**158.4**
• Financing Charges		5.2
• Contingencies		27.4
• Sub-total Investments		125.9
▪ *Sewer Systems*	▪ *2019 – 2022/23 & 25*	*123.9*
▪ *Scheduled Desludging6*	▪ *2019 – 2022/23*	*5.6*

Overall On-site Sanitation Development Scenario

101. The majority of the septic tanks in Mataram, Aceh and Bekasi do not appear to be in line with the Indonesian Standard, the SNI 03-2398-2002 concerning the Design and Construction of Septic Tanks with associated effluent percolation. A great number of septic tanks are situated under the buildings or outside building and without inspection hole. Also, some houses are located more than 30 m from the main road and cannot be accessed by a vacuum truck.

102. There are varying numbers of private entrepreneurs providing emptying services for septic tanks. These service providers are typically not registered by the city administration and often dispose the septage to open space or into creeks.

103. Currently, all three cities have existing septage treatment facilities (called IPLT). The IPLTs locations are typically too far away from the central city which leads to long transportation time. In general, the effluent quality of the existing IPLT does not comply to the standard promulgated by the Ministry of Environment (MoE) Regulation No. 68 year 2016.

104. Thus, for the purpose of improved septage management, the cities now plan for the introduction of the following elements, for improving the septage management value chain:

g. Zoning: Determination and selection of the service area for the introduction of scheduled desludging.

h. Containment: Planning, design, financing and supply of standardized septic tanks to the communities.

i. Desludging: Planning of logistics, technical operation procedures, tariff collection and community engagement for the implementation of scheduled desludging of septic tanks.

j. Treatment: Septage treatment options at existing IPLT and/or Co-treatment at future WWTP facilities.

k. Sludge disposal and/or reuse: Investigation of marketing opportunities for conditioned and sterilized sludge is a viable source of minerals and organic substance suitable as a soil conditioner for agricultural land.

l. Private Desludgers: Improve the integration of currently unregistered operations.

Scheduled Desludging

105. For the purpose of the SSDP investment program, and in agreement with the cities' stakeholders, one pilot location was selected for scheduled desludging services.

106. Regular desludging, which comprises adequate septage containment, collection, and transportation, also requires appropriate treatment and the final disposal and/or reuse of conditioned sludge, which is planned to be done at the existing septage treatment and/or co-treatment at future WWTP facilities.

107. A septage transfer station of a size of 5 m^3 must be provided for the temporary storage of septage collected from densely populated residential areas, which cannot be accessed by a standard 5m^3 desludging truck; instead, these areas will be served by smaller 3-wheeler vehicles with a limited operational range. Such septage transfer stations consist of easily transportable containers or vacuum tankers, temporarily located at a site where multiple trips by a 3-wheeler vehicle are required for emptying a series of septic tanks. Once the transfer station is filled-up it needs to be either directly transported to the septage treatment plant or transferred to a lager suction truck.

108. For operationalizing scheduled desludging, some essential preconditions need to be established at the local government level and within the intended piloting zone, including:

- Promulgation of supporting local government regulation
- Establishment of census/data-base and registration for all existing septic tanks located within the pilot area
- Program for replacement and construction of new standardized septic tanks
- Establishment of service tariff and modus of tariff collection

- Comprehensive operational planning and logistics
- Extensive community campaigning and participation

109. Under the title '*Layanan Lumpur Tinja Terjadwal (LLTT)* the DGHS published in 2015 a comprehensive guideline on the introduction and operations of scheduled desludging of septic tanks in support of their 'city-wide' sanitation strategy.

Improved 'on-call' Septage Management'

110. Improved 'on-call' septage management constitutes a vital long-term goal for the remainder of those residential areas that are neither going to be served by the future sewerage systems nor 'scheduled desludging' activities. Under such scenario, the formal integration of currently illegally operating desludging providers into the service chain embodies a very important element for both improvement of regulated and controlled desludging services coverage, and the reduction of open-dumping of septage into the environment.

111. The domestic wastewater management agency will be assisted to improve a strategy for registering all private desludging operators, a process that needs to be reinforced through a future local government regulation (PERDA). Furthermore, law enforcement must be tightened in support of controlling open dumping of septage.

112. For the treatment of septage, desludging operators may use existing septage treatment facilities and/or co-treatment at future WWTP facilities.

113. For the purpose of the current SSDP investment program, no specific cost allocations are made for improved 'on-call' services, as the focus of this activity lies in the formal integration of private desludging providers into the service value chain.

114. The details of the proposed SSDP investment components are further described in the individual city SARs.

Output 2: Service Delivery System in Place

115. In recognition of prevailing national regulations, which are further outlined under the 'Due Diligence' section, the promulgation of a sound services delivery framework is embedded in the implementation of distinct local government measures in support of the development of 'city-wide', equitable, and sustainable public domestic wastewater management services, which should comprise the following considerations:

- Permitting sector regulation in support of defining the broader purpose and targets of infrastructure and service developments, scope and level of service deliveries, rights and obligations of the parties (owner, service provider, and beneficiaries), tariff settings and regulation, and collaboration with the private sector and the civil society
- Harmonization of current sector specific planning procedures, including the local government's mid-term development plans (RPJMD), city sanitation strategy (SSK), sector Master Planning, and current spatial Plan (RTRW)
- Institutional settings, foremost the separation and development of regulatory and operational functions, the establishment and capacity development of a dedicated wastewater operator, and corresponding engagement with the community, CBOs, and the private sector in support of strengthening the service delivery chain, and

- Promulgation of fiscal policies, budget allocations, service tariff adjustments, sourcing of external funding, for sustaining the operations and maintenance of current and future infrastructure developments.

Permitting Sector Regulation

116. The basis for the development of sustainable domestic wastewater management is the promulgation of a forward-looking local government regulation (PERDA) in support of the development of integrated 'city-wide' sanitation services. The Ministerial Decree No 4/2017 of the Ministry of Public Works and People's Housing (MPWH) is providing essential guidance on the drafting process of the sector regulation.

117. Recent donor experiences (IUWASH [USAID], MSMIP [ADB] and IndII [DFAT]) indicate that there is comprehensive and consistent assistance required to local governments during the formulation of their domestic wastewater management specific regulation. Thus, most of the current PERDAs are lacking considerations with regard to institutional, operational, and financial/tariff settings, which are essential elements for long-term delivery of domestic wastewater services.

118. However, there are a few comprehensive PERDAs existing, e.g. the draft domestic wastewater management PERDA for the District of Gresik provides a respectable reference. Also, ADB has recently published a comprehensive concept document for guiding the preparation of wastewater regulations, specific for Indonesia.[26]

119. In principle, the drafting process for a PERDA, following MOHA regulation No. 80 of 2015, is requiring typically one to two years in the making until legislative approval is obtained. In addition, the promulgation of a new local regulation comes with a high price tag, as members of the legislative branch need to conduct at least two national comparative studies before they are entitled for providing their commentary on the draft regulation.

120. Having said this, it makes it even more important for providing the necessary assistance to those local governments that decided to embark on their long journey of domestic wastewater services developments, which would necessitate the promulgation of broad and forward-looking regulatory guidance at the outset of local governments' endeavors.

Harmonizing Mid-term Planning

121. Typical local government planning tools comprise amongst others, the mid-term development plan (RPJMD), the city sanitation strategy (SSK), a domestic wastewater Master Plan, and the Spatial Plan (RTRW).

122. The majority of current SSKs outline a broader road map for the physical development of sanitation infrastructure, including solid waste management, drainage and domestic wastewater management, which constitutes local government's eligibility for receiving central government funding for infrastructure development. However, the SSKs of Mataram, Bekasi and Banda Aceh do neither address the various technical options of a 'city-wide' service delivery approach nor the requirements for the promulgation of an enabling environment, such

[26] Urban Wastewater Management in Indonesia: Key Principles and Issues in Drafting Local Regulations. Asian Development Bank, December 2017

as the regulatory, institutional, operational, and tariff requirements and procedures for contributing to the development of sustainable wastewater service deliveries.

123. It is therefore recommended to include in the next revision of the individual SSKs forward looking technical planning and a path for the development of a permitting regulation and an enabling environment for thriving improved service deliveries.

124. For the development of a local service development strategy, the TA Consultant supported the implementation of 2-days workshops with all three participating local governments, which resulted in the elaboration of individual Domestic Wastewater Development Road Maps.

125. The three basic elements of this Road Map comprise (i) an inventory of existing service conditions, (ii) formulation of expected future domestic wastewater management conditions and services (planning horizon 2023 – which is coinciding with the finalization of the first stage of the SSDP program), and (iii) the development of a 5-years action plan that is outlining the intended activities for improving the service delivery path (road map).

126. The Road Map provides guidance for bridging between the physical infrastructure development plans (service coverage) and the associated quality of service deliveries, through the development of an 'enabling environment' at local government level, which comprises the elements of (i) sector planning, (ii) regulatory development, (iii) institutional settings, (iv) technical operations, and (v) finance / customer tariffs management, under a 'one-door' service delivery scenario, which includes strong community and private sector participation, and further improvements of gender equality and social inclusion into the service delivery value chain.

Figure 4: Enabling Environment

Institutional Settings

127. An essential factor towards the formation of an 'enabling environment', comprises the separation of policy, regulatory, and operational functions, followed by appropriate allocation of tasks and responsibilities amongst the immediate stakeholders at local government level.

128. Thus, successful deliveries of domestic wastewater services are very much dependent on the promulgation of a 'conducive' enabling environment; foremost, a comprehensive regulatory framework, for setting the institutional and operational scene and for aligning all immediate stakeholders into a structured service delivery scheme. A key consideration is to reduce prevailing fragmented institutional responsibilities and to provide a platform for all concerned actors to collaborate in a regulated manner.

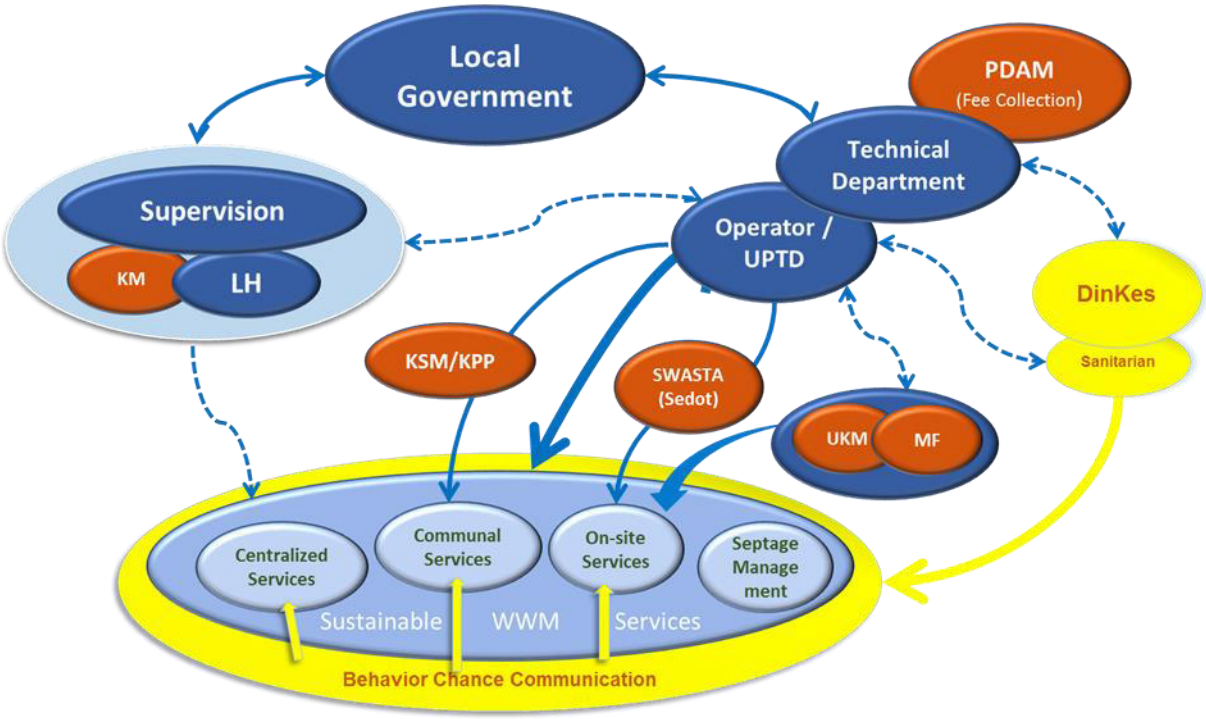
129. The following chart presents an illustration of basic institutional settings and the operational modus for delivering effective long-term domestic wastewater services under a

'one-door' management approach, by integrating various technical delivery modalities under a common operational framework. The principle consideration is the separation of three distinct functions of (i) policy delivery (local government), (ii) supervisory functions (formal and informal representation), and (iii) operations and service deliveries for a range of options, including centralized sewerage, neighborhood and communal systems, and on-site sanitation.

130. The integration of the private sector and community managed small-scale systems is essential under a 'one-door' service delivery approach, for which a designated operator is in 'charge' of all available service options; however, the operator is collaborating with other parties for getting services effectively delivered to the communities.

131. Under such scenario, current activities of the Department of Health and community organizations will collaborate with the wastewater operator for promoting services and behavior change.

Figure 5: Conceptual Operational Framework



132. Notwithstanding the generic validity of the above outlined institutional and operational arrangements, there are viable alternatives that need to be investigated, defined, and promulgated on a case-by-case basis.

133. With regard to operational functions and service deliveries, an UPTD[27] constitutes the initial formal organizational form that receives a service delivery mandate from the Head of the local government through consultations with the provincial Governor. Thus, the operations

[27] Designated technical units that operates under a technical local government department

of an UPTD are fully funded through the department's budget, whilst any operational income of the UPTD is transferred to the local government's treasury.

134. In practice, a UPTD represents the embryo of the commencement of regular service deliveries that should develop, over time, into a more independent organization, such as a Local Public Service Agency *(Badan Layanan Umum Daerah, BLUD)*[28], once the UPDT's service provisions are established and a steady income stream is generated. Even though a BLUD is still entitled to local government OPEX funding, this form of organization enjoys a higher level of financial responsibilities by solely managing their generated operational income.

135. The final level of organizational development is a Local Government Enterprise *(Perusahan Daerah, PD)*, which represents a semi-autonomous local government owned institution that is no longer entitled to operational subsidies, and fully responsible for their technical and operational management.

136. DGHS has recently assessed the capacities of local government owned water supply enterprises *(Perusahaan Daerah Air Minum - PDAM)* by looking into a range of performance criteria in support of merging domestic wastewater services with water supply services, comprising the following weighting: (i) finance (25%), (ii) customer services (25%), operational performance (35%), and human resource management (HRM) (15%). On the basis of these indicators, the PDAMs of the three participating SSDP cities are eligible for managing domestic wastewater services.

137. However, currently there is no visible political will at all three participating local governments for merging water supply services and domestic wastewater management under one roof, rather than developing the capacities of the existing operators (UPTD -PAL for Bekasi and the Department of Environment for Mataram and Banda Aceh).

Fiscal Policies

138. The delivery of sanitation services constitutes a local government obligation, which requires the allocation of sufficient funding for implementing routine operations and maintenance alike, including the replacement of ailing assets. Suitable local regulation provides the legal basis for accelerating two essential sources of OPEX funding, comprising annual local government allocations (APBD), and the establishment of a stable service-based revenue stream. For both elements, a local regulation (Major's Decree) constitutes the legal basis for securing a sufficient revenue stream.

139. The cities are encouraged take advantage of the tariff assessment, presented in chapter lll.A.3 "Affordability and Tariff" of this report, as the basis for the formulation of their fiscal planning and the determination of an appropriate customer tariff structure and associated categorization of services charges. Whereas the target of a cost-covering customer tariff is understood as a long-term performance goal, emphasis needs to be given by the local government at the outset of operations and service deliveries to the provision of favorable

[28] Peraturan Menteri Dalam Negeri Nomor 61 Tahun 2007 Tentang Pedoman Teknis Pengelolaan Keuangan Badan Layanan Umum Daerah

conditions for enabling poor and vulnerable households to benefit from the service delivery chain.

OUTPUT 3: Public awareness campaigns completed:

140. Creating public awareness on benefits and stakeholders' rights & obligations on sewerage management is essential for the achievement of the SSDP objective. We elaborate on a combination of three common approaches for creating public awareness and evoking behavioral change, including: (i) Capacity building at implementation level, and (ii) Behavior Change Communication (BCC), as well as (iii) Social Marketing at community level. City-level findings on general sanitation and hygiene awareness, stakeholders engaged in sanitation promotion and the channels to reach out to communities in city-wide scale are presented in the city reports.

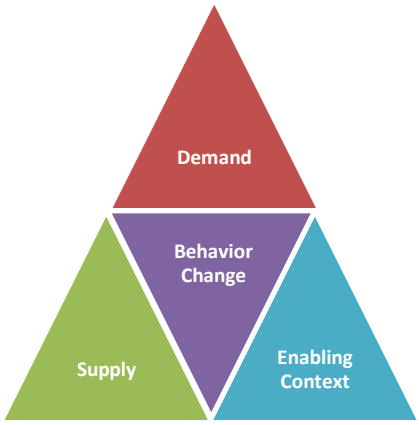


Figure 6: BCC Concept

141. The design of public awareness and behavior change communication campaigns and related capacity building plans takes into consideration the three pillars of behavior change: (i) demand for improved sanitation – i.e. do the households have opportunity, ability and motivation to change, (ii) effective sanitation supply chain – i.e. are the service providers and suppliers able to provide affordable and desirable service that match with people's preferences and (iii) enabling environment for sanitation programming – i.e. do decision-makers prioritize sanitation and do implementers 'buy' into the BCC approach.

142. The design and proposed implementation modality of the output builds on the assessment of two major urban sanitation programs in Indonesia, namely:

- Metropolitan Sanitation Management Investment Project (MSMIP), which supports development of city sewerage systems in Jambi, Makassar and Pekanbaru with funding from ADB and in Palembang with funding from the Indonesian Australia Partnership for Infrastructure; and
- The Indonesian Urban Water, Sanitation and Hygiene (IUWASH) program funded by USAID, i.e. their guidelines 'Improving lifestyle and health – A Guide to Urban Sanitation Promotion', which is referred to by the Public Works and many other development partners.
- Additionally, also the Community Based Sanitation Project 'SANIMAS' and the Ministry of Health's 'Community-led Total Sanitation' approaches have influenced Public Awareness design, although these approaches are less compatible in the context of promoting central sewerage systems.

143. Previous experience in Indonesia has shown that reaching out to the urban communities, drawing their attention to the sanitation and sewerage management issues and bringing about behavior and social change on the city scale is a challenge, and to be successful, sanitation promotion requires commitment from leaders from the provincial and city levels to the grassroots level. To be effective, sanitation promotion must be embedded within the local institutional context, and therefore collaboration and timely coordination of different agencies, and particularly between the technical designers & constructors and the

social promoters, is vital. The proposed Local Government Advocacy and Capacity Development Program for the Public Awareness component address these challenges.

144. **Enabling context**: The relevant departments (SKPD) and city administrators in all three SSDP cities expressed their concern that sanitation is not considered as a priority issue by the city government, which is reflected in low budget allocation for sanitation programming and promotion, as well as inactivity of the Sanitation Working Group (Pokja AMPL), the main body for sanitation stakeholder coordination to align sanitation & hygiene related activities and awareness raising with the prevailing city sanitation strategy (SSK). One of the main recommendations from the stakeholders was to conduct advocacy and 'socialization' activities for city parliament members, Secretary and top government officers.

145. An essential element and prerequisite for effective social marketing is to anchor within the city level wastewater regulation (PERDA) mandatory property connections for sewered service areas and regular desludging of household septic tanks (outside the sewered service areas). Currently such regulation is only partially in place in the three cities.

146. **Demand and willingness to pay:** The default notion at the community level is that wastewater services are low in the hierarchy of daily needs when associated with regular expenditures, which is resulting in a low level of readiness for acceptance of a 'new' type of public services. The benefits of wastewater management services, such as reduction of water-borne disease, improvement of environmental conditions and economic savings take time to materialize and are not tangible enough to trigger behavior change.

147. As often cited by community members, general public services (water, solid waste, drains, roads), provided through local government agencies are often recognized to be of mediocre quality and standard. There are simply not sufficient visible success stories for spurring households' appetite for more public services. The attitude towards quality of public services is likely to hinder the acceptance of sewerage systems as well, even though these services are not in place yet.

148. **Affordability** is a major determining factor for scaling up property connections. The Socio-economic Survey has provided information on affordability for different income groups. It is expected that at least part of the connection cost is subsidized through funds from donors, Local Government or CSR funds, and this is also part of the pro-poor strategy (refer to chapters on social due diligence and economic analysis). Further, households can be linked to micro-financing institutes for credits to cover part of the investment cost.

149. **Barriers:** Experience from previous sewerage projects in Indonesia shows that there are potentially numerous barriers, other than affordability, that prevent households from making a deliberate decision to connect to a sewerage system or the uptake of regular desludging service. Most common cited main barriers and ➔ potential mitigation measures to be incorporated in the design of public awareness campaigns are:

a. Limited facilitation and support for households to connect, such as timely information, technical and financial support ➔ The 'customer journey'[29] to connect to sewerage system requires several steps and decisions and it is important that the process is made as effortless as possible to potential beneficiaries.

29 Ariely, Dan (2018): Map your Customer's Behaviour Journey. Behaviour Change Design Guide

b. Even though steadily growing, but still limited community awareness on the relations between hygiene / sanitation practices / safe water and community health and wellbeing ➔ Targeted awareness raising on health and sanitation responding to people's core beliefs, concerns and perceptions within the context of their living conditions.

c. Limited knowledge or misinformation on the cost of the sewerage connection and wastewater fee, cost of desludging services and technical works at the household level that prevents people from requesting the services ➔ Consistent dissemination of information in clear and timely manner.

d. Residents are hesitant to invest in a service for which there is no guarantee that it will be sustained in the future ➔ Learn and improve, communicate success and be accountable for set-backs and mistakes to build community and customer trust alike, brand services, provide quality assurance, assure responsive and transparent customer service and complaint mechanism such as complaint hot-line, launching neighborhood / focus group discussion events hosted by the service provider, etc.

e. People living on rented premises are not responsible for the sanitation investments ➔ Measures are needed to reach out to homeowners and landlords and get them interested to invest in property connection.

f. People are unwilling to accept the nuisance caused during the period of the construction of household connections ➔ Train technical personnel to asses, on a door-by-door approach, the details of the interventions by preparing sketches and details of pipe routing and structural requirements, including bills of quantities and cost estimates, also to agree on the method of physical interventions and reinstatement caused by the works. In this way the household receives transparent and accountable information that will positively influence the decision making path.

g. Insufficient success stories and precedence of 'good practice' ➔ Setting good examples particularly by people with influence, formal and informal community leaders, helps to signal that it's time for the neighborhood to change their practices; thus, practically demonstrating the elevation of a common community vision of a pleasant, clean and modern future for their neighborhood as leading example for other neighborhoods to follow suit.

1. Public Awareness Campaigns

150. Public Awareness campaigns consist of three modules as shown in Table 11, including (i) Local Government support for sanitation program at the city level (LG Advocacy); (ii) Community support for sanitation program at pre-construction phase and (ii) Community engagement at construction and post-construction phases.

151. Sanitation advocacy and social marketing & coordination workshops at the city level (Module 1) aim at increasing Local Government commitment to the program, ensuring adequate budget allocation for community outreach and connection subsidies and well-motivated and coordinated sanitation promoters. Partnering with relevant local government agencies, leaders and CBOs present in the sub-district and neighborhood levels is vital to reach out to the communities in scale, in order to support changing the mindset of the people and to ensure information, subsidies and financing, technical assistance and feedback mechanism reach all sections of the communities. Sanitation journalists and other media can help to draw public attention to environmental sanitation issues. *Module 1 relates to Objective 1 in SCS.*

152. Community preparedness (Module 2) through mobilization of sanitation advocates and conducting sanitation promotion campaigns at the neighborhood-level aim at getting households to sign-up for property connections. Social marketing campaigns for household connections must be relevant and responsive to people in various kind of situations; this requires formative research to find out the ground realities and what triggers people to adapt new practices, as well as preparation of promotion and marketing messages and approaches to respond to different target groups. Promotion of improved wastewater management/household sewerage connections in the community level is done by local leaders, sanitation volunteers and other opinion influencers, who are first socialized to wastewater issues and provided with tools for sanitation promotion and community triggering. Trusted local leaders and community representatives have more influence on households' decisions than outside staff. These community level sanitation advocates are supported by the project's Social Facilitators and LG Socialization teams. *Module 2 relates to Objective 2 in SCS.*

153. Community engagement during the HH connection construction and post-construction phases (Module 3) aim at maintaining customer satisfaction. Construction of the sewerage connections causes nuisance to the households, and to prevent households from rejecting connections it is vital to train the constructors on how to minimize the disturbance and damage to people's properties and provide a mechanism to report and respond to complaints. Post-construction phase customer service will be the responsibility of the future wastewater operator/utility, including a complaint mechanism and timely response to service failure in order to maintain customer satisfaction and willingness to pay for the services.

Table 11: Design of Public Awareness Campaigns

Module	1. Local Government support for sanitation programme (LG Advocacy)			2. Community support for sanitation programme			3. Community engagement at construction and post-construction phases		
Activity	1.1. Sanitation advocacy/ socialization workshops and coordination meetings with leaders	1.2. Social Marketing & coordination workshops for sanitation promotion	1.3. Training sanitation journalists, press conferences	2.1 Identification and training of local leaders, public health and sanitation volunteers and other opinion influencers	2.2 Formative research, design and preparation of BCC materials with messages tailored to specific target groups	2.3. Social marketing campaigns at neighborhood level	3.1 Training for local contractors on quality standards	3.2. Construction phase complaint mechanism	3.2. Post-construction phase customer service
Target audience	DPRD (parliament), Mayor's office, Pokja Sanitasi, LG agencies, UPTD (and local leaders)	Pokja Sanitasi, UPTD and other LG agencies, local leaders (Camat, Lurah, RW, RT, PKK, CBO leaders/volunteers)	Journalists and other media personnel	Local leaders (RW, RT, PKK, kader/volunteers, CBO leaders) and sanitation volunteers (sanitarians and public health volunteers)	Different target groups/exposure points, i.e. high income/ low income groups, men, women, teenagers, public & health offices etc.	Households under the project coverage	Contractors, supervision engineers, inspectors	LG and community socialization teams, contractors & consultant, UPTD	UPTD
Output	Annual workshops, starting at pre-construction phase	Bi-annual workshops, starting at pre-construction phase	Annual training events and press conferences, starting at construction phase	Stakeholder analysis to identify local sanitation advocates Training workshops to train the local leaders and sanitation advocates	BCC/Social marketing materials for mass media and direct consumer contact events	- Mass-media such tv & radio, billboards, wall paintings for setting behaviour expectations - Direct consumer contact events with neighborhood	Training sessions on quality standards for workers Site preparedness for construction	Complaint mechanism incl. community meetings, 'hotline' facility and problem solving team	Customer complaint and feedback mechanism (hotline/ application) Education campaigns on proper use Bi-annual customer

Module	1. Local Government support for sanitation programme (LG Advocacy)			2. Community support for sanitation programme			3. Community engagement at construction and post-construction phases		
						groups or focus groups - direct consumer contact in HH level (door-to-door)			satisfaction surveys
Outcome	-Adequate budget allocation for community outreach and subsidized connections - Agreed mechanism to make services affordable in particular to poor and vulnerable people -Sanitation regulations updated and enforced	-Committed and motivated sanitation promotion partners; sharing best practices from other cities -LG Socialization teams formed/ strengthened; action plans prepared (year 1), reviewed and updated periodically (LG and local leaders/sanitation advocates)	-Increased publicity on city-wide sanitation	- Capacitated sanitation advocates/ promoters of wastewater management services	- BCC/Social marketing materials that resonate with the target audiences and are relevant to their situation & needs - Branding of wastewater services	- Customers have opportunity, ability & motivation to change - Wastewater utility is viewed as a wanted and trusted service provider -Households sign up for sewerage connections	-Contractors and workers communicate clearly with HHs on technical issues (e.g. pipe installation) and take necessary steps to minimize the construction nuisance	-Contractor and community agree on working methods, traffic management and possible cuts to other services	-High level customer satisfaction and perception on receiving value for money

154. **Local Government Advocacy** (Module/Stage 1) is included in the 'Public Awareness' component as an own item due to its importance for creating an enabling environment for the development of sanitation infrastructure and services, and for promoting sanitation services to customers city-wide. The need for high level advocacy and socialization was highlighted by SKDPs, whose work is hindered by outdated regulations, inactivity of Pokja AMPL and resulting lack of coordination between relevant agencies, and cuts to their sanitation program budgets.

- Annual high level Sanitation Workshops/coordination meetings to review status of LG regulations, plans and strategies, such as Perda Air Limbah, SSK, Master Plan Air Limbah and UPTD Air Limbah. Other proposed means include for example exchange visits to exemplary cities or utilization of peer-to-peer networks, such as AKKOPSI, for advocating the importance of universal access under the 100-0-100 target;
- Social Marketing workshops to build commitment and motivation of sanitation promotion partners (including e.g. recognition of best performers) and share best practices and success stories, including key note speakers from other cities. The workshops are also a venue for progress review of collective efforts and discussing problems and solutions to common issues;
- Training of journalists and media personnel on environmental sanitation issues, followed by media events/press conferences. Local media provides an effective means of drawing public attention to the environmental and health issues and to disseminate information on project benefits and progress.

155. **Identification and training of community leaders** is essential for reaching out to the communities and promoting improved sanitation services in scale (Module/Stage 2). Formal and informal community leaders and institutions to be involved in the sanitation promotion will be identified through a stakeholder analysis; leaders will include a combination of Kelurahan, RW and RT leaders, RT Kader/volunteers, religious and CBO leaders and other opinion influencers[30]. Promotion is often most likely to lead to behavior change when the messages are shared by opinion influencers that are trusted and respected by the residents. Advocacy to community leaders is initiated in 'socialization/training' workshops, and is continued throughout the project period to ensure their commitment.

156. **Social Marketing** is the approach used for increasing public demand for new sanitation services, for making households to realize that the benefits of standardized and properly implemented wastewater service outweigh their monthly contributions. Social marketing approach is grounded on having a sound 'product' or service with social and public benefits for sale, ensuring the affordability and customers' access to the product/service and then promoting the product/service and its benefits to the people. The four 'P's of the social marketing are (Figure 7):

- Appealing product, which benefits (environmental, economic, social status,

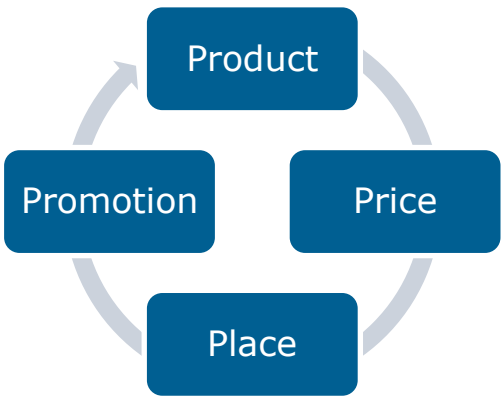


Figure 7: Social Marketing Concept

[30] Refer to the city reports for assessment of potential partners for community outreach

health etc.) must outweigh the cost of the product in order to be attractive to the customer. The product package includes physical aspects and services such as installation, desludging, customer service and billing, but also emotional values and beliefs such as pride, comfort, cleanliness, safety and modernity.

- Price is the investing costs (money, time, effort, amount of behavioural change that is needed, risk of social embarrassment) for the customer in order to obtain the product.
- The product must be made available in places that the audience can easily reach and which fit into their life situation.
- Run campaigns that promote the product in a way that attracts the consumers' attention. Promotion tools may include for example direct 'customer' contact events, media advocacy and events, advertising, public service announcements, radio shows etc.

157. **Social Marketing campaigns** that aim at behavior change need to be contextualized in order to be effective. Formative research is a commonly used tool to learn about the behavior deteminants and drivers that trigger different target groups to change behavior. The design of targeted behavior change messages and promotion materials is recommended to be done in collaboration with the agencies and authorities that will be responsible for their distribution and dissemination. Messages that trigger emotions and resonate among the audience are proven to be more effective for behavior change than informative messages. Both IUWASH and the Health Ministry are in the process of updating their social marketing and behavior change communication materials related to urban sanitation, which could provide material for SSDP promotion.

158. Various types of **information** are also required to support household decision making and taking the action. This includes information on financing options and access to subsidies, cost of the investment and tariff setting, design and construction process, complaint mechanism, technical support, regulations and obligations as well as proper use of the sewerage system. These topics will be covered in the trainings at relevant stages and passed to households through community meetings and household visits.

159. It is recommended to use a **mix of communication channels** to promote and provide information on the improved sewerage management services. While mass media can be effective tool for introducing new ideas, providing behavior examples and enforcing social norms, it is not as effective in triggering actual behavior change as interpersonal communication. A mix of different channels with targeted messages is proven to bring out the best results. A snapshot of different LG agencies' involvement in sanitation and hygiene promotion campaigns is provided in the three city reports.

- Mass- or public communication methods that have a wide reach and long-term presence provide a useful tool for setting behaviour expectations and thereby enforcing social norms. Use of social media for social marketing and other behavior change communication is found to have big potential, which can also reach poor households[31].
- Direct consumer contact during large community assemblies, including targeted community members and local authorities and opinion influencers, is the main venue for getting households committed to sign up for the service. The meetings

[31] USAID (2018): Final Report: Behaviour Change Formative Research.

can be either purposefully organized for sanitation promotion, or the promotion can be done on side of another community meeting.

- Direct consumer contact at group level takes place during community triggering events that are usually conducted by sanitarians, together with the social facilitators. Examples of triggering events are social mapping and transect walks to illustrate and observe different sanitation conditions and demonstration of fecal-oral transmission. The effectiveness of triggering is based on the realization and emotions it raises in the participants when they are exposed to the method first time, and can lose its effectiveness if the same method is used several times.
- If the above channels have not resulted in households signing up for the service, then direct contact through household visits may be necessary.

160. Fear of 'construction nuisance' caused to the households can cause households to reject joining the system altogether. The technical personnel must be able to provide households with sketches of pipe routing and structural requirements, bills of quantities and cost estimates, and also agree on the method of physical interventions and reinstatement caused by the works. **Training of technical personnel** on how to engage with the customer households is included in the capacity development plan.

161. Construction phase '**complaint and feedback mechanism'** is equally important to ensure construction quality, address quality and management issues and gain peoples' trust. Methods include e.g. community meetings, telephone hotline and a problem solving team; Complaints that cannot be resolved through local mediation are recommended to be managed through the LG Secretariat.

162. **Post-construction customer service**, including feedback- and complaint mechanism, is also included in the capacity development of the wastewater operator. The complaint mechanism is usually a telephone 'hotline' or a mobile application, provided with a certain response time guarantee. Customer satisfaction surveys and focus group discussions with specific target groups (e.g. technically challenging neighborhoods, disadvantaged people) and publication of their results and 'action for improvement' provide another example of a feedback mechanism.

2. Organization and staffing

- Project implementation Unit (PIU) will be responsible for implementing the public awareness activities in coordination with local government agencies. A national Social Marketing Specialist will support the PIU in implementation of the activities, such as training of Social Facilitators, design of sanitation promotion and behavior change communication campaigns, design and procurement of promotion materials and organization of city-level capacity building/advocacy events and workshops.
- The 'Community Outreach' branch of PIU will have an allocation for 'Social Facilitators' to facilitate the implementation of community level promotion campaigns together with local leaders and opinion influencers who make up the Community Socialization Teams. The Social Facilitators work under the supervision of a Social Marketing Officer, whose task is to coordinate and supervise the implementation of community and city-level campaigns.
- The requirement for Social Facilitators depends on the intended sewerage network construction rate. Based on previous experience, if it is assumed that the construction rate of sewerage network allows for 6,000 new property connections per year, the estimated number of social facilitators to catalyze the sanitation promotion at neighbourhood level would be around twenty.

D. INVESTMENT PROGRAM

163. On the basis of the technical conventional elaborations, as presented in chapter II.C.1 (Output 1) of this report, the agreed investment program is twofold, comprising (i) the design and construction of centralized sewerage services in the three partnering city's most densely populated residential areas, which represents about USD **563.4 mio** or 98.5 % of the total investment portfolio, and (ii) the development of 'scheduled desludging' of residential and commercial septic tanks, which represents about USD **9.1 mio** or 1.5 % of the total investment portfolio. In total the estimated CAPEX amounts to **USD 572.5 mio**.

164. Table 4 in chapter II.C.1 summarizesthe intended investments and corresponding number of house connections for both, the sewerage systems and on-site 'scheduled desludging' activities.

1. Cost Estimate

Overall Investment Portfolio

165. Cost estimates have been completed for SSDP with a view to calculating the Financial Internal Rate of Return (FIRR) reflecting ADB's *Examples of Good Practice Cost Estimates and Financing Plans February* 2015, and ADB's *Handbook for Borrowers on the Financial Management and Analysis of Projects* 2006 (in particular Section 3).

166. Component 1, funded by ADB and implemented under CDIA, provided the technical input to the project and compiled the base costs for the Preliminary Engineers Design (PED). The Detailed Engineering Design (DED) will be completed under ADB Loan Funded Technical Assistance (TA) project ADB TA 3455-INO: Accelerating Infrastructure Delivery through Better Engineering Services Project (ESP), this includes procurement documentation for civil works, equipment and Project Implementation Support Consultant (PISC). All of the financial and economic analysis is based on the PED cost estimates for civil works and equipment.

167. The other costs are formulated under this ADB TA 9198-INO Sewerage System Development Project (SSDP), such as: land acquisition, environment and social mitigation, construction supervision (although for civil works procurement documentation, terms of reference and recruitment will be the responsibility of ESP), capacity building program, project management and recurrent costs.

168. Cost Estimates are in 2018 prices:

- Physical contingencies are computed on the basis of civil works 7.0%, equipment 5%, administration costs 2.0%, land acquisition 5.0%, environmental and resettlement 5.0%, project management 5% and consulting services at 5%.
- Price contingencies are based on Work Bank Commodities index April, 2018 MUV rates for foreign inflation, and Bank of Indonesia for local inflation rate forecasts.
- Financing charges are based on all civil works and equipment estimated costs at LIBOR (January 29, 2018) 1.9672%, Indonesian Loan Spread 0.5000%, Maturity Loan Premium 0.2000%, Interest Rate 2.6672%, Commitment Fee 0.1500%, no Front-End Fee 0.0000% resulting in IDC on Foreign Loan of 2.6672%.
- For the sake of the analysis the commencement date for implementation is 2019.

169. Cost estimates provide the following results:

Table 12: Project Investment Plan

D. Detailed Cost Estimates by Outputs/Components									
Item			($ million)						
			Total Cost	C1: Banda Aceh		C2: Bekasi		C3: Mataram	
				Amount	% of Cost Category	Amount	% of Cost Category	Amount	% of Co Catego
A.	**Investment Costs**[b]								
	1	Civil Works	262.7	72.6	60.14%	49.0	53.30%	141.1	68.8
	2	Mechanical and Equipment	45.6	12.4	10.26%	18.7	20.31%	14.6	7.1
	3	Environment and Social Mitigation	1.7	0.6	0.46%	0.56	0.61%	0.6	0.2
	4	Consulting Services	44.9	15.9	13.19%	10.9	11.83%	18.1	8.8
		a. Construction Supervision	17.4	3.4	2.82%	2.43	2.64%	11.6	5.6
		b. Detailed Design	14.0	4.7	3.88%	4.7	5.09%	4.7	2.2
		b. Capacity Building	13.4	7.8	6.50%	3.76	4.09%	1.8	0.8
	5	Project Management	15.7	7.2	5.99%	3.45	3.75%	5.0	2.4
	6	Land Acquisition and Resettlement Cost	14.1	2.0	1.67%	3.66	3.99%	8.4	4.0
	7	Taxes & Duties	32.9	10.0	8.28%	5.72	6.22%	17.2	8.3
		Subtotal (A)	**417.4**	**120.8**	**28.93%**	**91.9**	**22.01%**	**204.8**	**49.0**
B.	**Recurrent Costs**								
	1	Salaries	11.1	4.9	95.76%	2.73	31.00%	3.4	94.0
	2	Operations	0.5	0.2	3.83%	0.11	1.77%	0.2	5.3
	3	Equipment Operation and Maintenance	0.1	0.0	0.41%	0.02	0.19%	0.0	0.5
		Subtotal (B)	**11.7**	**5.1**	**44.09%**	**3**	**24.54%**	**3.7**	**31.3**
		Total Base Cost	**429.1**	**125.9**	**29.34%**	**94.8**	**22.08%**	**208.4**	**48.5**
C.	**Contingencies**								
	1	Physical[c]	24.2	6.9	25.08%	5.1	26.08%	12.3	16.6
	2	Price[d]	96.5	20.5	74.92%	14.4	73.92%	61.6	83.3
		Subtotal (C)	**120.7**	**27.4**	**22.66%**	**19.5**	**16.12%**	**73.9**	**61.2**
D.	**Financing Charges During Implementation**[e]								
	1	Interest During Implementation	19.7	4.1	78.49%	3.2	86.52%	12.4	89.6
	2	Commitment Charges	3.0	1.1	21.51%	0.5	13.48%	1.4	10.3
		Subtotal (D)	**22.7**	**5.2**	**3.27%**	**3.7**	**3.11%**	**13.9**	**61.0**

a	Preparation notes:		
	1	Civil works & mechanical and equipment costs are provided from Component 1 funded by CDIA	
	2	Environment and Social Mitigation includes all costs associated with implementing relevant safeguards, gender and social dimension action plans, but at this stage are only estimated - no study completed yet.	
b	In 2018 prices.		
c	Computed at :		
		Civil Works	7.0%
		Equipment	5.0%
		Admin Costs	2.0%
		Land Acquisition	5.0%
		Environmental and Resettlement	5.0%
		Project Management	5.0%
		Consulting Services	5.0%
d	Computed using national & international inflation estimates		
e	Includes interest and commitment charges. Interest during construction has been computed at the five-year forward London interbank-offered rate plus a spread of 0.5%.		

170. The cost estimates include the construction of sewer networks in all three cities of Mataram, Bekasi and Banda Aceh, together with required pumping stations, and mechanical and equipment needs.

171. Items of civil works are itemized and costed on a quantity and unit cost rate in United States of America Dollars (USD).

172. It is assumed, unless otherwise identified that all construction activities has at least 10% foreign content, being transport or imported tools, materials and equipment. Any trucks or vacuum pumps are assumed to be 100% foreign content. Any electrical supplies, transport and handling, pipes and fittings are assumed to have 60% foreign content.

173. Duties are calculated according to the official schedule of duties as per the following Table:

Table 13: Duties levied by Customs Department

Duties and Taxes	
CIF	Base Cost
In Indonesia, the exchange rate for imported goods is following rate from Customs office.	
http://www.beacukai.go.id/btki.html	
Import Duty	
Import duty tariff x CIF	
Tax & duties varies from 0%-5%, 5%-10% and more than 10% following HS code.	
VAT & Income tax	
VAT 10% x (CIF + Import Duty)	
Income Tax = 2.5% with API or 7.5% without API	
Tubes or pipes	5%
Stainless steel pipes and tubes	15%
Water pumps	10%
Vacuum pumps	5%
Tanker vehicles; bulk-cement lorries (trucks) 87042123	50%
Prefabricated structural components for building or civil engineeri	10%
Other articles, of a kind used for building construction	5%
8535 Electrical apparatus for switching or protecting electrical circuits, or for making connections to or in electrical circuits (for example, switches, fuses, lightning arresters, voltage limiters, surge suppressors, plugs and other connectors, junction boxes), for a voltage exceeding 1,000 volts.	0%
Total Duty	
VAT on FX + LC	10%
Income Tax	2.50%

174. VAT and Income Tax is calculated on all project costs at 10% and 2.5% as per the above Table.

175. Household connections are costed at $600 per connection on the advice of PED and the number of connections are assessed to be:

Table 14: Number of Beneficiaries for the Project

Location	Number of Households	Population

Mataram		
Stage 1 [year 2023]	11,678	43,210
Stage 2 [year 2026]	16,257	60,152
Stage 3 [year 2028]	21,365	79,052
Total for Mataram	**49,301**	**182,413**
Bekasi		
Rawapasung	8,967	34,075
Perumnas	3,586	13,627
Total for Bekasi	**12,533**	**47,702**
Banda Aceh		
Zone 1	15,647	70,412
Zone 2	6,566	29,547
Total for Banda Aceh	**22,213**	**99,959**
Grand total	**84,047**	**330,074**

Table 15: Per Capita cost of investment

Location	Amount of Investment ($ million)	Investment per capita ($)
Mataram	296.2	1,438
Bekasi	117.9	2,472
Banda Aceh	158.4	1,585
Total Project	**572.5**	**1,734**

176. When considering the total per capita cost it should be noted that this includes the total cost of the project divided by the number of beneficiaries for the sewer network connections, there are still the on-site sanitation pilots to consider.

177. The project will be phased over 10-years as designed by Component 1 and the PED.

Table 16: Detailed Cost Estimates by Year

E. Detailed Cost Estimates by Year ($ million)												
Item			Total Cost	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
A.	**Investment Costs**												
	1	Civil Works	262.7	-	15.9	49.6	70.9	27.4	26.3	19.3	23.4	25.3	4.6
	2	Mechanical and Equipment	45.6	-	5.1	13.2	15.1	6.8	1.4	1.0	1.6	1.4	-
	3	Environment and Social Mitigation	1.7	0.2	0.4	0.4	0.4	0.4	-	-	-	-	-
	4	Consulting Services	-	-	-	-	-	-	-	-	-	-	-
		a. Construction Supervision	17.4	-	1.4	1.6	2.7	2.5	2.4	1.9	1.9	1.4	1.4
		b. Detailed Design	14.0	14.0	-	-	-	-	-	-	-	-	-
		C. Capacity Building	13.4	0.9	3.4	2.9	2.4	2.0	1.1	0.3	0.3	0.0	0.0
	5	Project Management	15.7	0.4	2.9	2.8	2.7	2.5	2.3	0.5	0.5	0.5	0.4
	6	Land Acquisition and Resettlement Cost	14.1	14.1	-	-	-	-	-	-	-	-	-
	7	Taxes & Duties	32.9	-	1.6	3.6	5.1	5.5	3.5	3.0	3.9	5.0	1.7
		Subtotal (A)	**417.4**	**29.6**	**30.7**	**74.1**	**99.4**	**47.1**	**37.0**	**26.0**	**31.6**	**33.6**	**8.2**
B.	**Recurrent Costs**												
	1	Salaries	11.1	-	1.1	1.1	1.1	1.6	1.6	1.1	1.1	1.1	1.1
	2	Operations	0.5	-	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0
	3	Equipment Operation and Maintenance	0.1	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		Subtotal (B)	**11.7**	**-**	**1.2**	**1.2**	**1.2**	**1.7**	**1.7**	**1.1**	**1.1**	**1.1**	**1.1**
		Total Base Cost	**429.1**	**29.6**	**32.0**	**75.4**	**100.6**	**48.8**	**38.7**	**27.2**	**32.8**	**34.8**	**9.3**
C.	**Contingencies (C)**		**120.7**	**2.9**	**4.6**	**14.5**	**24.6**	**13.1**	**13.3**	**10.7**	**14.6**	**17.4**	**5.0**
		Physical	24.2	1.2	1.8	4.5	6.1	2.6	2.2	1.5	1.9	2.0	0.4
		Price	96.5	1.7	2.8	10.0	18.5	10.5	11.1	9.2	12.7	15.4	4.6
D.	**Financing Charges During Implementation (D)**		**22.8**	0.5	1.2	2.0	3.3	3.2	2.7	2.2	2.4	2.7	2.7
	1	Interest During Implementation	19.7	0.2	0.7	1.6	3.0	2.9	2.4	1.9	2.1	2.4	2.4
	2	Commitment Charges	3.1	0.3	0.5	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.2
	Total Project Cost (A+B+C+D)		**572.6**	**33.0**	**37.8**	**91.9**	**128.5**	**65.1**	**54.7**	**40.1**	**49.8**	**54.8**	**17.0**
	% Total Project Cost		**100%**	**6%**	**7%**	**16%**	**22%**	**11%**	**10%**	**7%**	**9%**	**10%**	**3%**

On-Site Sanitation only

178. The Cost estimates provided above include both the sewerage system and on-site sanitation.

179. There are 3 key elements to on-site sanitation systems; (i) Containment, in the form of HH Septic tanks and community holding tanks, (ii) Transport – vacuum trucks and water trucks and (iii) Treatment - Septage Treatment Plants (STP).

180. There is one scheme for each of the three cities. Each system proposed under this project will provide Septic Tanks for residential use and tanks for commercial use for containment. For the pilot vacuum trucks and a three-wheeler suction vehicles will be provided to address the transport dimension. In most of the cases it will also provide for treatment in Co-Septage treatment units (100 m^3/d), Potable Temporary Septage Storage tanks (5 m^3), and Biosolid drying machine where appropriate. Furthermore, there will be some Upgrading to existing treatment plants. To support the operations the project will provide GIS and MIS Development (including Hardware & software), portable Water Quality Testing Instrument and conduct Marketing and Socialization. The costs are (USD):

Table 17: Cost of on-site systems

Location	Estimated Cost (US$)	Households (private)	Commercial Units	Number of Beneficiaries	Per capita Cost (US$)
Mataram	1,453,000	1,800	300	7,700	189
Bekasi	5,555,700	5,000	1,000	22,800	244
Banda Aceh	2,103,000	2,600	500	13,950	150
Grand Total	9,111,700	9,400	1,800	44,450	205

181. It is assumed for this calculation that the commercial establishments have the same number of beneficiaries as the households, but in reality, the beneficiaries should be more.

182. Operation and maintenance calculations on the septage management system were made with assumptions on Managers, operators, administration staff, security and labor. Other maintenance cost included water quality testing, supplies and protective gear

2. Financing Plan

183. The team has consulted widely with all stakeholders on the various methods of financing for the SSDP. The project will be financed using ADB's Ordinary Capital Reserves (OCR) for loan monies. For the "soft components" ADB is exploring co-financing options for grant funding of the capacity building elements and environmental and social safeguards initiatives. Part of the loan may be used for these soft components.

184. In summary the financing sources for the project will include: (i) funds from ADB equivalent to around 69% of total investment cost, the counterpart funds include (ii) contribution from the National Government of around 13%, (iii) funding from ADB's ESP project amounting to around 2% covering PISC, (iv) funds from provincial budget will contribute 8% of total investment cost, (v) contribution from beneficiaries, usually in cash and kind equivalent to 6% of total investment cost, and (vi) a co-financier to fund the capacity building components at around 2% of the total investment cost.

Table 18: Detailed Cost Estimates by Financier

C. Detailed Cost Estimates by Financier ($ million)														
			Asian Development Bank		Government of Indonesia		ADB ESP		Local Government		Beneficaries		Co-Financier		
			Amount	% of Cost Category	Amount	% of Cost Category	Amount	% of Cost Category	Amount	% of Cost Category	Amount	% of Cost Category	Amount	% of Cost Category	Total Cost
		Item	{A}	{A/G}	{B}	{B/G}	{C}	{C/G}	{D}	{D/G}	{H}	{H/G}	{I}	{I/G}	{G}
A.	**Investment Costs**														
	1	Civil Works	191.48	72.90%	21.28	8.10%	-	0.00%	23.64	9.00%	26.27	10.00%	-	0.00%	262.66
	2	Mechanical and Equipment	36.95	81.00%	4.11	9.00%	-	0.00%	4.56	10.00%	-	0.00%	-	0.00%	45.62
	3	Environment and Social Mitigation	1.35	81.00%	0.15	9.00%	-	0.00%	0.17	10.00%	-	0.00%	-	0.00%	1.67
	4	Consulting Services	11.63	25.93%	1.29	2.88%	14.04	31.30%	4.49	10.00%	-	0.00%	13.41	29.89%	44.86
		a. Construction Supervision	14.10	81.00%	1.57	9.00%	-	0.00%	1.74	10.00%	-	0.00%	-	0.00%	17.41
		b. Detailed Design	- 1.26	-9.00%	- 0.14	-1.00%	14.04	100.00%	1.40	10.00%	-	0.00%	-	0.00%	14.04
		c. Capacity Building	- 1.21	-9.00%	- 0.13	-1.00%	-	0.00%	1.34	10.00%	-	0.00%	13.41	100.00%	13.41
	5	Project Management	12.69	81.00%	1.41	9.00%	-	0.00%	1.57	10.00%	-	0.00%	-	0.00%	15.67
	6	Land Acquisition and Resettlement Cost	-	0.00%	-	0.00%	-	0.00%	14.07	100.00%	-	0.00%	-	0.00%	14.07
	7	Taxes & Duties	-	0.00%	32.89	100.00%	-	0.00%	-	0.00%	-	0.00%	-	0.00%	32.89
		Subtotal (A)	**254.11**	85.36%	**61.12**	14.64%	**14.04**	3.36%	**48.49**	11.62%	**26.27**	6.29%	**13.41**	3.21%	**417.44**
B.	**Recurrent Costs**														
	1	Salaries	-	0.00%	11.09	100.00%	-	0.00%	-	0.00%	-	0.00%	-	0.00%	11.09
	2	Equipment Operation and Maintenance	-	0.00%	0.50	100.00%	-	0.00%	-	0.00%	-	0.00%	-	0.00%	0.50
		Subtotal (B)	-	0.00%	**11.59**	100.00%	-	0.00%	-	0.00%	-	0.00%	-	0.00%	11.59
		Total Base Cost (A+B)	**254.11**	59.23%	**72.72**	16.95%	**14.04**	3.27%	**48.49**	11.30%	**26.27**	6.12%	**13.41**	3.13%	**429.03**
C.	**Contingencies**		120.72	100.00%	-	0.00%	-	0.00%	-	0.00%	-	0.00%	-	0.00%	120.72
D.	**Financing Charges During Implementation**		22.71	100.00%	-	0.00%	-	0.00%	-	0.00%	-	0.00%	-	0.00%	22.71
	Total Project Cost (A+B+C+D)		**397.53**		**72.72**		**14.04**		**48.49**		**26.27**		**13.41**		**572.45**
	% Total Project Cost			**69.44%**		**12.70%**		**2.45%**		**8.47%**		**4.59%**		**2.34%**	**100%**

185. The affordability and ability to match the funding requirements of the various contributors to the financing plan, such as the 3 cities and the beneficiaries, is analyzed in section III.A, sub-paragraph 3 below.

186. Annual Accounts for Mataram City Administration have been collected and are analyzed. The past years' financial performance and the extent of budget allocations to the wastewater sector from the city administration level have been assessed.

187. At a National Level analysis shows that capital expenditures in the wastewater sector has increased over recent years from 0.025% of National Budget to 0.074% or US$34 million in 2014 to US$117 million in 2017.

188. At the City level, in Mataram there is a similar increase in budget allocation to departments involved in wastewater, however this does not mean that the money is allocated to wastewater and this is not the main activity of those departments. It does highlight the low budgets for the sector and what the city administrations have to play with in terms of affordability of subsidies.

Table 19: Expenditures Mataram

Expenditure on Departments involved in Waste Water Services: City of Mataram

Field Sector	2013	2014	2015	2016	2017	Total	Growth	% of Total
Environmental	52.5	n/a	70.5	77.4	38.2	**238.5**	13.85%	28.38%
Housing & public facilities	138.7	n/a	62.0	194.8	206.4	**601.8**	11.99%	71.62%
Total	**191.1**	**0.0**	**132.5**	**272.2**	**244.6**	**840.38**	**12.51%**	**100.00%**
% of the total to Total Expenditure	21.63%	0.00%	11.15%	20.45%	18.00%			

189. The analysis for the financial capacity of each city, including Mataram, is assessed by indicators such as (i) operating ratio, (ii) cash to O&M per month, (iii) debt to equity, (iv) debt coverage ratio (DCR - for loan-related activities) and borrowing capacity. One of the potential challenges could be that these cities may not be operating on a viable fiscal basis with arrears in debt servicing and the like; in 2006 during ADB *PPTA 4763-INO Metropolitan Sanitation Management and Health* it was found that only 2 cities out of 9 cities did not have debt arrears. The limits and formulae in Local Government (LG) law for either incurring debt or calculating the extent of debt will be used as the baseline. ADB's ability to fund City administrations directly could be constrained by under-performing administrations from a fiscal point of view.

190. Further analysis on the financial condition and capability of the cities of Banda Aceh, Bekasi and Mataram especially in relation with waste water sanitation development is continued in the paragraphs below.

191. Analysis of the municipal government budget is undertaken to:

a. To assess if funds are available to finance public infrastructure development in Mataram especially in the field of waste water and sanitation sector;
b. To identify opportunities in increasing availability of funds for the waste water services development project by:
   - Increasing availability of city budgets by a/o, improving the financial efficiency of the city administration, developing proper wastewater services fee collection or introducing new local taxes and levies;
   - Increasing availability of city budgets by prioritizing budgets specifically for waste water and sanitation services investments.

192. The description of financial management for the cities is stipulated by Ministry of Home Affairs Regulation no.21/2011 on Local Finance Management Operation Guidelines.

City of Banda Aceh

Table 20: Actual Revenue and Expenditure of the City of Banda Aceh 2013 to 2017

(in billion Rp.)

	2013	2014	2015	2016	2017*	2018**	Growth	Contrib
a. Revenue	928.2	1,134.1	1,217.6	1,321.7	1,247.7	1,210.5	12.5%	100.0%
i. Local Income	129.1	171.8	209.9	258.6	240.4	294.5	26.0%	16.7%
ii. High level gov't transfer	631.7	686.0	680.3	801.8	763.4	771.7	8.3%	60.8%
1) Tax/non-tax sharing	33.1	36.6	25.0	30.9	35.6	34.6	-2.3%	2.7%
2) Gen. Allocation Fund	567.6	610.6	612.5	602.3	602.3	659.6	2.0%	52.0%
3) Specific Allocation Fund	31.0	38.8	42.8	168.6	125.5	77.5	75.9%	6.1%
iii. Other Income	167.4	276.4	327.4	261.3	243.9	284.6	16.0%	22.4%
b. Expenditure	893.4	1,096.2	1,189.4	1,331.6	1,248.4	1,213.7	14.2%	100.0%
i. Operating Expense	769.9	888.6	968.1	1,071.9	1,006.9	986.2	11.7%	82.0%
- Personnel	579.8	618.5	566.5	584.3	556.0	556.0	0.3%	52.1%
- Non-personnel	190.1	270.0	401.7	487.6	450.9	430.2	36.9%	29.9%
1) Goods and services	162.5	209.8	312.0	305.2	297.4	315.4	23.4%	21.9%
2) Interest expense	2.9	3.5	3.4	3.5	3.4	4.2	6.7%	0.3%
3) Subsidy, grant & aid	24.7	56.8	86.2	179.0	150.1	110.5	93.4%	7.7%
ii. Capital Expense	123.4	207.6	221.1	259.6	238.5	224.5	28.1%	18.0%
iii. Contingencies	0.2	0.0	0.1	0.1	3.0	3.1	-17.5%	0.0%
c. Surplus/(deficit)	34.8	37.9	28.2	-9.9	-0.7	-3.2		
d. Financing in	40.6	63.0	100.9	131.3	15.0	15.0		
e. Financing out	12.4	-		52.0	14.3	11.8		
f. SILPA	63.0	100.9	129.1	69.4	0.0	0.0		

Source: Actual Budget Report 2013-2016 and Budget 2017-2018; BKA Banda Aceh

193. The table above shows that the city's revenue was growing by an annual average (CAGR) of 12.5% since 2013. Growth is made up of local income of 26.0%, transfer from high level government of 8.3% and 16% of other income. Local revenue has a contribution of 16.7% out of the total income while national transfer was 60.8%. This suggests Banda Aceh still has a high dependency on national financial policy though they show significant effort in increasing its local income growth.

194. On the expenditure side the annual growth has been an average of 14.2% since 2013 which is higher than its revenue (12.5%), thus the city is not making any surplus.

195. The expenditure in the above table was divided into its operating expenses, capital expenses and contingencies. Capital expenditure has been growing by 28.1% which is almost three times that of the operating expenses growth (11.7%), however the proportion of operating

expenses is more than 4 times (82%) capital one (18%). This suggests that despite an imbalance proportion of its expenses the city has exerted significant effort to increase the budget for developing its infrastructure.

196. The operating expense made up of 82% of the total expenses and comprises personnel (52%) and non-personnel (29.9%). Non-personnel expenses has made significant increase in growth compared to the personnel expenses (36.9% versus 0.3%) which suggests that expenditure on goods and services (mostly) has been growing much faster than on it's personnel.

City of Bekasi

Table 21: Actual Revenue and Expenditure of the City of Bekasi 2013 to 2017

(in billion Rp.)

	2013	2014	2015	2016	2017*	2018**	Growth	Contrib
a. Revenue	2,962.6	3,480.4	3,949.4	4,225.3	4,533.0	5,014.8	12.6%	100.0%
i. Local Income	969.7	1,205.3	1,497.6	1,607.4	1,827.1	2,110.3	18.3%	36.1%
ii. High level gov't transfer	1,193.0	1,286.7	1,332.5	1,647.4	1,798.9	1,906.8	11.4%	37.3%
1) Tax/non-tax sharing	123.1	131.8	103.1	147.7	173.9	176.6	6.3%	3.5%
2) Gen. Allocation Fund	1,051.2	1,133.4	1,198.0	1,233.7	1,323.1	1,612.4	5.5%	31.6%
3) Specific Allocation Fund	18.7	21.4	31.4	266.0	302.0	117.9	142.4%	2.3%
iii. Other Income	799.8	988.4	1,119.3	970.6	907.0	997.7	6.7%	26.5%
b. Expenditure	2,959.9	3,107.8	3,882.2	4,404.5	5,310.2	5,720.2	14.2%	100.0%
i. Operating Expense	2,069.9	2,385.6	2,631.4	2,971.4	3,904.7	4,202.4	12.8%	70.1%
- Personnel	1,414.6	1,588.3	1,395.9	1,538.2	2,435.3	2,630.1	2.8%	41.4%
- Non-personnel	655.4	797.3	1,235.5	1,433.3	1,469.4	1,572.3	29.8%	28.7%
1) Goods and services	538.7	708.4	1,167.0	1,323.8	1,273.5	1,426.0	34.9%	26.0%
2) Interest expense	0.2	0.2	0.1	0.1	0.3	0.2	-31.3%	0.0%
3) Subsidy, grant & aid	116.5	88.8	68.4	109.5	195.6	146.1	-2.0%	2.7%
ii. Capital Expense	888.4	719.5	1,250.0	1,428.0	1,402.4	1,514.6	17.1%	29.9%
iii. Contingencies	1.5	2.8	0.9	5.0	3.0	3.2	48.6%	0.1%
c. Surplus/(deficit)	2.7	372.5	67.2	-179.2	-777.2	-705.4		
d. Financing in	429.2	410.2	747.0	786.2	859.8	827.6		
e. Financing out	21.7	35.8	27.9	19.3	82.6	122.5		
f. SILPA	410.2	747.0	786.2	587.7	0.0	0.0		

Source: Actual Budget Report 2013-2016 and Budget 2017-2018; BPKAD Kota Bekasi

197. The pattern of Bekasi's revenue and expense is similar to Banda Aceh with its revenue growth on average by 12.6%, but expenditure growth is14.2% indicating the city is in a budget shortage.

198. The city has made considerable growth of the local revenue compared to the national transfer (18.3% versus 11.4%) demonstrating a relatively balanced proportion between them (36.1% versus 37.3%)

199. The city has spent much more on operating expenditure than on the capital expenditure (70.1% versus 29.9%). However, the city has made a considerable increases in capital expense over the last couple of years (12.8% versus 17.7% of growth in an average).

200. The table above also shows that the operating expense has been dominated by personnel cost compared to the non-personnel one (41.4% versus 28.7%), the non-personnel expense – mostly goods and services - was growing much faster than of the personnel (29.8% versus 2.8%).

City of Mataram

Table 22: Actual Revenue and Expenditure of the City of Mataram 2013 to 2017

(in billion Rp.)

	2013	2014	2015	2016	2017*	2018**	Growth	Contrib
a. Revenue	865.8	1,083.1	1,188.9	1,396.4	1,307.8	1,402.6	17.3%	100.0%
i. Local Income	139.9	202.6	225.1	288.4	300.0	350.3	27.3%	18.9%
ii. High level gov't transfer	580.9	677.7	757.2	981.7	930.4	894.4	19.1%	66.1%
1) Tax/non-tax sharing	45.5	60.8	52.1	111.0	55.7	80.4	34.6%	5.9%
2) Gen. Allocation Fund	500.0	564.7	593.9	609.0	653.1	676.6	6.8%	50.0%
3) Specific Allocation Fund	35.3	52.2	111.2	261.7	221.6	137.4	94.9%	10.2%
iii. Other Income	145.0	202.9	206.6	126.3	77.4	158.0	-4.5%	15.0%
b. Expenditure	883.5	1,044.4	1,188.6	1,330.7	1,359.0	1,406.1	14.6%	100.0%
i. Operating Expense	702.7	812.2	910.2	996.4	1,046.5	1,078.0	12.3%	76.9%
- Personnel	514.1	574.0	608.0	650.4	654.0	693.3	8.2%	52.8%
- Non-personnel	188.6	238.2	302.1	346.0	392.5	384.8	22.4%	24.2%
1) Goods and services	129.8	186.0	227.3	305.2	338.7	303.7	33.0%	19.1%
2) Interest expense	-	-	-	-	-	0.0	#DIV/0!	0.0%
3) Subsidy, grant & aid	58.8	52.2	74.8	40.8	53.8	81.1	-11.5%	5.1%
ii. Capital Expense	180.4	231.8	275.4	333.4	310.4	325.9	22.7%	23.0%
iii. Contingencies	0.5	0.4	3.1	0.9	2.1	2.2	18.6%	0.1%
c. Surplus/(deficit)	-17.7	38.8	0.2	65.7	-51.2	-3.5		
d. Financing in	103.8	79.9	101.3	84.0	66.6	11.0		
e. Financing out	6.3	17.3	17.5	14.5	15.5	7.5		
f. SILPA	79.9	101.3	84.0	135.3	0.0	0.0		

Source: Actual Budget Report 2013-2016 and Budget 2017-2018; BPKAD Kota Mataram

201. Mataram's revenue has considerable growth of 17.3% compared to its expenditure (14.6%) which suggests that the city could make surpluses in the longer term.

202. The revenue itself mainly comprises local revenue, high level transfer and other revenue. Local income has the highest growth of 27.3% on annual average (since 2013 to 2016) while the higher lever transfer has been growing by 19.1%. Nevertheless, the city still has a high dependency on the national transfer compared to the local revenue (66.1% versus 18.9%).

203. Furthermore, the expenditure is mostly spent on the operating expenses (76.9% on annual average) than on capital expenditure (76.9% versus 23% on average). However, the capital expense has been growing significantly higher than operating expenses (22.7% versus 12.3%) which could be interpreted that the city has been exerting considerable effort in regional development.

204. Operating expense consisted of mainly personnel and non-personnel spending. The personnel spending made up more than twice of the non-personnel (52.8% vs 24.2% of the total spending) which mostly was made up by goods and services. Non-personnel expenditure has a higher growth rate than personnel expenditure (22.4% versus 8.2% on annual average).

3. Independency, Effectiveness and Efficiency Ratios

205. A couple of ratios have been used for assessing the financial/budget condition of the city. The Ministry of Home Affairs (MOHA) Decree No.690.900.327/1996 may still be used for the assessment in addition to other studies by Mardiasmo[32] and Brown[33] such as independency from central government funding, fiscal decentralization, effectiveness and efficiency ratios. Important financial ratios for the target cities are indicated in the tables below.

City of Banda Aceh

Table 23: Major Financial Ratios of the City of Banda Aceh 2013-2017

Ratio	2013	2014	2015	2016	2017	Average	Grade	Growth (CAGR)
Independency Local income / Higher transfer	20.4%	25.0%	30.9%	32.3%	31.5%	**28.0%**	**Low**	**11.4%**
Fiscal Decentralize Local income / Total revenue	13.9%	15.1%	17.2%	19.6%	19.3%	**17.0%**	**Low**	**8.5%**
Effectiveness Actual / Target of local income	127.3%	119.5%	125.6%	122.2%		**123.7%**	**Very High**	**-1.4%**
Effciency Capital expense / Total expenditure	13.8%	18.9%	18.6%	19.5%	19.1%	**18.0%**	**Low**	**8.5%**
Efficiency Operating expense / Total expenditure	86.2%	81.1%	81.4%	80.5%	80.7%	**82.0%**	**Low**	**-1.6%**
Efficiency Personnel expense / Total expenditure	64.9%	56.4%	47.6%	43.9%	44.5%	**51.5%**	**Low**	**-9.0%**

Source: Actual Budget Report of Kota Banda Aceh 2013-2014, Budget Plan of 2017, DJPK MOF, and Consultant Assessment

[32] Prof. Dr. Mardiasmo, MBA; Otonomi dan Manajemen Keuangan Daerah, 2015

[33] Brown, KW 1993, The 10-Point Test of Financial Condition: Toward an Easy-to-Use Assessment Tool for Smaller Cities. Government Finance Review, vol. 9, no. 6

Independency & Fiscal Decentralization

206. The table above indicates that the Independency (indicated by the ratio of local income to higher transfer) is 28% graded as 'Low' but has positive trend by 11.4%. These suggest the city government continues to increase its independency. Further, the Fiscal Decentralization (which reflects the local income as a percentage of total revenues) indicates 17% as 'Low' though there has been a considerable increase from around 14% in 2013 to around 19% in 2017 demonstrating that it has been growing on average by 8.5%.

207. When looking at these ratios, they seem to indicate that the city has high dependency on the national government to finance its development, yet it shows a significantly positive growth suggesting a longer term improvement.

208. The above analysis should raise awareness for the city to further increase local income, for example by improving collection rates of taxes and levies and enforcing appropriate policies and regulations.

Effectiveness

209. The effectiveness ratio reflects the actual local income as a percentage of the projected target income. This ratio was 123.72%, considered 'Very High'. This demonstrates that the actual income was over its target by 23.7% on average.

210. The effectiveness suggests that tax collection rates perform very well to the forecasts. However, due to decentralization ratio (local income to total revenue) previously mentioned which was relatively low at 17%, it should raise the question for more possibilities to increase local taxes and levies and what is the collection rate for each of them measured such as number of inhabitants and companies subject to tax and levy in comparison with those of paying the tax and levy.

Efficiency

211. There is no certain measurement of these ratios however, the Ministry of Home Affairs (MOHA) expects LG's to reach around 30%-35% of the expenditure allocated for capital expense. The ratio between capital expense and total expenditure shows 18% which indicates that most of the expenditure was for operating expenses (82%). The operating expense shows 75.3% went to personnel (equal to 51.5% of total expense) and 24.7% was for non-personnel. This means a maximum of 30.5% of total expenditures could have been used for maintaining local government assets and infrastructure.

212. The ratio suggests that considerable reallocation of the available budgets could be spent for the city on capital and operating expenditures to improve and maintain the city's infrastructure

City of Bekasi

Table 24: Major Financial Ratios of the City of Bekasi 2013-2017

Ratio	2013	2014	2015	2016	2017	Average	Grade	Growth (CAGR)
Independency Local income / Higher transfer	81.3%	93.7%	112.4%	97.6%	101.6%	**97.3%**	**High**	**5.7%**
Fiscal Decentralize Local income / Total revenue	32.7%	34.6%	37.9%	38.0%	40.3%	**36.7%**	**Medium**	**5.3%**

Effectiveness Actual / Target of local income	111.3%	115.6%	112.9%	99.8%		**109.9%**	**High**	**-3.6%**
Efficiency Capital expense / Total expenditure	30.0%	23.2%	32.2%	32.4%	26.4%	**28.8%**	**Medium**	**-3.1%**
Efficiency Operating expense / Total expenditure	69.9%	76.8%	67.8%	67.5%	73.5%	**71.1%**	**Medium**	**1.3%**
Efficiency Personnel expense / Total expenditure	47.8%	51.1%	36.0%	34.9%	45.9%	**43.1%**	**Medium**	**-1.0%**

Source: Actual Budget Report of Kota Bekasi 2013-2014, Budget Plan of 2017, DJPK MOF, and Consultant Assessment

Independency & Fiscal Decentralization

213. The table above indicates that the Independency ratio was around 97.3% which is considered 'High' indicating that the proportion between local income and national transfer was relatively in equilibrium yet it managed to keep growing 5.7% on average. Fiscal Decentralization shows 36.7% classified as 'Medium' on average and growing by 5.3%. This demonstrates that the city has to some extent is more dependent in providing its own sources to contribute in the local development.

Effectiveness

214. The effectiveness ratio - reflecting the actual local income as a percentage of the projected target income - was 109.9% rated as 'High' as the actual income was over its target by 9.9% on average. However, it did decrease to 99.8% in 2016. There are further possibilities to rise the target amount of local taxes and levies including collection rates measured such as number of inhabitants and companies subject to tax and levy in comparison with those of paying the tax and levy.

Efficiency

215. The ratio between capital expense and total expenditure is 28.8% rated as 'Medium' indicating that most of the expenditure is for operating/recurring expenses being 71.1%. Of this operating expenses 60.7% goes to personnel (equal to 43.1% of total expense) and 39.3% is for non-personnel. This means a maximum of 24.9% of total expenditures could have been used for maintaining local government assets and infrastructure.

City of Mataram

Table 25: Major Financial Ratios of the City of Mataram 2013-2017

Ratio	2013	2014	2015	2016	2017	Average	Grade	Growth (CAGR)
Independency Local income / Higher transfer	24.1%	29.9%	29.7%	29.4%	32.2%	**29.1%**	**Low**	**7.6%**
Fiscal Decentralize Local income / Total revenue	16.2%	18.7%	18.9%	20.7%	22.9%	**19.5%**	**Low**	**9.2%**
Effectiveness Actual / Target of local income	155.2%	169.0%	114.3%	113.1%		**137.9%**	**High**	**-10.0%**

Efficiency Capital expense / Total expenditure	20.4%	22.2%	23.2%	25.1%	22.8%	**22.7%**	**Low**	**2.9%**
Efficiency Operating expense / Total expenditure	79.5%	77.8%	76.6%	74.9%	77.0%	**77.2%**	**Low**	**-0.8%**
Efficiency Personnel expense / Total expenditure	58.2%	55.0%	51.2%	48.9%	48.1%	**52.3%**	**Low**	**-4.6%**

Source: Actual Budget Report of Kota Mataram 2013-2014, Budget Plan of 2017, DJPK MOF, and Consultant Assessment

Independency & Fiscal Decentralization

216. The table shows independency ratio was around 29.1% rated as 'Low' but there was considerable positive growth by 7.6%. This means that the city has made improvements on its capability to provide its own funds. The fiscal decentralize ratio reflects that the local revenue to total revenues was 19.5% rated as 'Low' and still keeps growing considerably by 9.2% categorized rated as 'Low'. The city has managed keeping up its local revenue to be much more dependent in providing funding for its development.

Effectiveness

217. The effectiveness ratio - reflecting the actual local revenue as a percentage of the projected target income - was 109.9%. This indicates that that the actual revenue was over its target by 9.9% on average. Though the ratio was lower in 2016 to become 99.8% due to economic downturn.

218. The effectiveness ratio indicates that tax collection rates perform very well according to the forecasts. However the decentralization ratio (local income to total revenue), previously mentioned, was relatively fair at 36.7%. This should raise question to pursue other possibilities to increase local taxes and levies and improve the collection rate for each source measured such as, number of inhabitants and companies subject to tax and levy in comparison with those of paying the tax and levy.

Efficiency

219. The ratio between capital expense and total expenditure is 22.7% and to operating total expense by 77.2% graded as 'Low' suggesting that the city was spending less in its development. Of the operating expenses, 67.7% goes to personnel (equal to 52.3% of total expense) and 32.3% for non-personnel. This means only a maximum of 24.9% of total expenditure could have been used for maintaining local government assets and infrastructure.

220. The efficiency ratio suggests that considerable remaining of the available budgets could be spent on capital and operating expenditures to improve and maintain the city's infrastructure.

4. Real Financing Capacity

221. Real financing capacity refers to the ability of the city to finance its infrastructure development needs after non-discretionary/mandatory and high priority expenses. This includes mainly personnel expenses and other high priority expenses normally included in the mid-term development plan document or it indicates the amount that can be used for flexible expenses, including investment, maintenance and operation of the municipal infrastructure including sewerage system development. The tables below shows formulation of estimates for sanitation system developments taken from part of the real financing capacity for the cities of Banda Aceh,

Bekasi and Mataram. It demonstrates that the cities allocate less than 2% to sanitation, in line with most cities in Indonesia willingness allocate for sanitation.

Banda Aceh

Table 26: Projection Estimate of Real Financing Capacity for Sanitation System Development – Banda Aceh over next 5 years

(in billion Rp.)

	2019	2020	2021	2022	2023
Revenue (excl. earmarked transfer)	**1,345.7**	**1,422.6**	**1,504.0**	**1,590.3**	**1,681.9**
Deducted by Mandatory, Bounded and High Priority exp.:					
Personnel expense (direct & indirect)	589.3	624.7	662.2	701.9	744.0
High priority expense (a/o: o/head, services, scholarships)	58.9	62.5	66.2	70.2	74.4
Current debt principal instalment	2.8	2.8	2.8	2.8	2.8
Real Financing Capacity	**694.7**	**732.6**	**772.8**	**815.4**	**860.6**
2% of RFC (as minimum required for Sanitation Development)	**13.89**	**14.65**	**15.46**	**16.31**	**17.21**

*Source: Actual Budget of Banda Aceh 2014-2016, *Budget Plan 2017 and 2018 and Analysis.*

High priority expense is assumed 10% of the personnel.

222. The table above shows that on a 2% basis Banda Aceh still has around **IDR 13.89 billion ($1.03 million) in 2019** and up to **17.21 billion IDR ($1.27 million) in 2023** in surplus funds. This figure can be allocated to sanitation development if the city had the willingness.

Bekasi

Table 27: Real Financing Capacity for Sanitation System Development – Bekasi

(in billion Rp.)

	2019	2020	2021	2022	2023
Revenue (excl. earmarked transfers)	***5,247.3***	***5,625.7***	***6,034.7***	***6,476.9***	***6,955.2***
Deducted by Mandatory, Bounded and High Priority exp.:					
Personnel expense (direct & indirect)	2,787.9	2,955.2	3,132.5	3,320.5	3,519.7
High priority expense (a/o: o/head, services, scholarships)	278.8	295.5	313.3	332.0	352.0
Current debt principal instalment	-	-	-	-	-
Real Financing Capacity	**2,180.6**	**2,375.0**	**2,588.9**	**2,824.4**	**3,083.5**
2% of RFC (as minimum required for Sanitation Development)	**43.61**	**47.50**	**51.78**	**56.49**	**61.67**

*Source: Actual Budget of Kota Bekasi 2014-2016, *Budget Plan 2017 and 2018 and Analysis.*
High priority expense is assumed 10% of the personnel.

223. As with Banda Aceh, the city of Bekasi has the real financing capacity for sanitation development of around **IDR 43.61 billion (US$3.23 million) in 2019** up to **61.67 billion IDR (US$4.57 million) in 2023**.

Mataram

Table 28: Real Financing Capacity for Sanitation System Development – Mataram

(in billion Rp.)

	2019	2020	2021	2022	2023
Revenue (excl. earmarked transfers)	***1,210.1***	***1,291.6***	***1,379.2***	***1,473.4***	***1,574.9***
Deducted by Mandatory, Bounded and High Priority exp.:					
Personnel expense (direct & indirect)	699.8	748.8	801.2	857.3	917.3
High priority expense (a/o: o/head, services, scholarships)	70.0	74.9	80.1	85.7	91.7
Current debt principal instalment	-	-	-	-	-
Real Financing Capacity	**440.4**	**467.9**	**497.8**	**530.4**	**565.9**
2% of RFC (as minimum required for Sanitation Development)	**8.81**	**9.36**	**9.96**	**10.61**	**11.32**

*Source: Actual Budget of Kota Mataram 2014-2016, *Budget Plan 2017 and 2018 and Analysis.*
High priority expense is assumed 10% of the personnel.

224. The city of Mataram has real financing capacity for sanitation of around IDR 8.81 billion (US$ 0.653 million) in 2019 up to IDR 11.32 billion (US$ 0.839 million) in 2023.

5. Debt Service Coverage Ratio and Net Borrowing Capacity

225. DSCR[34] is a ratio to measure capability of a local government to repay its outstanding debt (usually used for middle or long term debt). It is one of requirements to propose new debt (borrowing capacity) as per Government Regulation no.30/2011 which covers Local Debt. The DSCR determines the maximum debt (net borrowing capacity). The table below shows current DSCR and net borrowing capacity for the cities of Banda Aceh, Bekasi and Mataram.

226. The formula to calculate the DSCR is:

(average of audited Net Income of previous 3 years)/ (average of interest+ principle repayment+ other debt related cost of existing and proposed debt

227. The formula to calculate the potential borrowing capacity is:

- Net general income = local income + DAU Grant + sharing - reforestation - mandatory expense (direct/indirect personnel expenses of the city government and the parliament/DPRD)
- Maximum 75% of the total revenues in the previous year (audited)
- DSCR cannot go below 2.5 to propose new debt.
- Total debt does not exceed 60% of GDP.

[34] Government Regulations No 30/2011 stipulates that Cities can borrow from the National Government, financial institutions (bank or non-bank), other local government and people. The regulation stipulate that:
- DSCR > 2.5 : the local government is allowed to obtain debt
- DSCR = 2.5 : the local government is allowed to obtain debt with certain condition,
- DSCR < 2.5 : the local government is not allowed to obtain debt.

All of these loans must meet the main conditions for Local Debt such Debt Service Coverage Ratio (DSCR) of 2.5, while the total amount of loan should not exceed 75% of previous year of actual general income, no overdue with other loans from the National Government.

Banda Aceh

Table 29: Current DSCR and Borrowing Capacity of Banda Aceh 2016 to 2018

(in billion Rp.)

		2013	2014	2015	2016	2017*	2018*	Avg growth
A	**General Income**							
	Local income	129.1	171.8	209.9	258.6	240.4	294.5	**17.9%**
	Tax/Non-tax sharing	33.1	36.6	25.0	30.9	35.6	34.6	**0.9%**
	General Allocation Fund (DAU)	567.6	610.6	612.5	602.3	602.3	659.6	**3.0%**
	Total General Income	***729.9***	***818.9***	***847.5***	***891.8***	***878.3***	***988.7***	**6.3%**
B	**Mandatory Expense**							
	Personnel	579.8	618.5	566.5	584.3	619.3	625.9	**1.5%**
	Total Mandatory Expense	***579.8***	***618.5***	***566.5***	***584.3***	***619.3***	***625.9***	**1.5%**
C	**Net General Income**	**150.1**	**200.4**	**281.0**	**307.5**	**259.0**	**362.8**	**19.3%**
D	**Debt**							
	Interest + other debt cost Payment	2.9	3.5	3.4	3.5	3.4	4.2	
	Principle repayment	0.0	0.0	0.0	2.8	2.8	2.8	
E	***DSCR***				***33.6***	***42.4***	***43.3***	
F	**Net Borrowing Capacity (with current outstanding debt)**				***820.8***	***901.7***	***849.0***	
G	**Max. Debt Service**				***84.2***	***105.2***	***121.4***	

Source: Actual Budget of Banda Aceh for 2013-2016, Budget Plan of 2017 and 2018 and Analysis.

228. The table above shows that Total General Income has been growing by an average by 6.3% and Net General Income by 19.3%, supported by Local income with substantial growth of 17.9% but Transfers comprising Grant (DAU) and Tax/Non-tax Sharing are growing by 3% and 0.9%% respectively. The mandatory expenses (staff of the government and parliament) are growing at 1.5%.

229. DSCR in 2016 (and estimates for 2017 and 2018) are considerably above 2.5 (33.6, 42.4 and 43.3) thus the city's Net Borrowing Capacity is over IDR 800 billion.

230. The following table assumes conservative growth of Local Revenue (8%) and Grant and Tax/Non-tax sharing by 5% and Mandatory expenses by a maximum 6%. Assuming maximum debt was taken then the remaining DSCR would be around 2.5 the Net borrowing capacity for every year (2019 - 2020). The Net borrowing capacity and maximum debt service for year 2019 up to 2023 are estimated in the table below.

Table 30: Estimates of DSCR & Net Borrowing capacity of Banda Aceh for 2019 to 2023

(in billion Rp.)

		Growth estimate	2019	2020	2021	2022	2023
A	**General Income**						
	Local income	8%	318.1	343.5	371.0	400.7	432.7
	Tax/Non-tax sharing	5%	36.3	38.2	40.1	42.1	44.2
	General Allocation Fund (DAU)	5%	692.6	727.2	763.5	801.7	841.8
	Total General Income		***1,047.0***	***1,108.8***	***1,174.6***	***1,244.5***	***1,318.7***
B	**Mandatory Expense**						
	Personnel	6%	663.5	703.3	745.5	790.2	837.6
	Total Mandatory Expense		***663.5***	***703.3***	***745.5***	***790.2***	***837.6***
C	**Net General Income**		**383.5**	**405.6**	**429.1**	**454.2**	**481.1**
D	**Debt**						
	Beginning outstanding		86.8	811.9	773.9	919.7	974.9
	Long-term debt withdrawal		849.0	96.0	299.4	217.6	230.5
	Interest + other debt cost Payment		110.0	106.7	126.1	133.6	141.6
	Principle repayment		13.9	27.4	27.5	28.8	30.2
	Debt outstanding		811.9	773.9	919.7	974.9	1,033.5
E	***DSCR***		***2.5***	***2.5***	***2.5***	***2.5***	***2.5***
F	**Net Borrowing Capacity**		***96.0***	***299.4***	***217.6***	***230.5***	***244.3***
G	**Max. Debt Service**		***123.9***	***134.0***	***153.6***	***162.4***	***171.9***

Source: Consultant analysis; Assuming 8.25%+ 0.75% pa interest and provision rate prevail (according to 2017 State Bonds (SUN) benchmark with tenor of 20 years which comply with Decree of Directorate General of Financing and Risk no.KEP-47/PR/2016)

231. The analysis shows that the estimates of maximum debt the city of Banda Aceh have capacity to borrow would be **IDR 123.9 billion in 2019** and **maximum of IDR 171 billion in 2023**.

Bekasi

Table 31: Current DSCR and Borrowing Capacity of Bekasi 2016 to 2018

(in billion Rp.)

		2013	2014	2015	2016	2017*	2018*	Avg growth
A	**General Income**							
	Local income	969.7	1,205.3	1,497.6	1,607.4	1,827.1	2,110.3	**16.8%**
	Tax/Non-tax sharing	123.1	131.8	103.1	147.7	173.9	176.6	**7.5%**
	General Allocation Fund (DAU)	1,051.2	1,133.4	1,198.0	1,233.7	1,323.1	1,612.4	**8.9%**
	Total General Income	***2,144.1***	***2,470.5***	***2,798.7***	***2,988.8***	***3,324.0***	***3,899.3***	**12.7%**
B	**Mandatory Expense**							
	Personnel	1,414.6	1,588.3	1,395.9	1,538.2	2,435.3	2,630.1	**13.2%**
	Total Mandatory Expense	***1,414.6***	***1,588.3***	***1,395.9***	***1,538.2***	***2,435.3***	***2,630.1***	**13.2%**
C	**Net General Income**	**729.5**	**882.2**	**1,402.8**	**1,450.6**	**888.7**	**1,269.2**	**11.7%**
D	**Debt**							
	Interest + other debt cost Payment	0.2	0.2	0.1	0.1	0.3	0.2	
	Principle repayment	0.4	0.3	0.3	0.3	0.3	0.2	

E	***DSCR***	***2,675.2***	***1,975.4***	***3,342.7***
F	**Net Borrowing Capacity (with current outstanding debt)**	***2,901.1***	***3,108.4***	***3,339.3***
G	**Max. Debt Service**	***401.9***	***498.1***	***499.0***

Source: Actual Budget of City of Bekasi for 2013-2016, Budget Plan of 2017 and 2018 and Analysis.

232. The table above shows that Total General Income has been growing by an average by 12.7% and Net General Income by 11.7% while the mandatory expense comprising personnel expense has significant high growth rate (13.2%).

233. DSCR in 2016 (and estimates for 2017 and 2018) are considerably high +1,975 thus the city of Bekasi has Capacity to borrow close to IDR 500 billion (in the end of 2018).

234. The following table assumes conservative growth of Local revenue (10%) and Grant and Tax/Non-tax sharing by 5% and Mandatory expense by maximum 6%. Assuming maximum debt were taken with DSCR to around 2.5 then using the Net borrowing capacity for every year (2019 - 2020) results in the Net borrowing capacity and maximum debt service for year 2019 up to 2023 estimated as presented on the table below.

Table 32: Estimates of DSCR & Net Borrowing capacity of Bekasi for 2019 to 2023

(in billion Rp.)

		Growth estimate	2019	2020	2021	2022	2023
A	**General Income**						
	Local income	**10%**	2,321.3	2,553.5	2,808.8	3,089.7	3,398.7
	Tax/Non-tax sharing	**5%**	185.5	194.7	204.5	214.7	225.4
	General Allocation Fund (DAU)	**5%**	1,693.0	1,777.6	1,866.5	1,959.8	2,057.8
	Total General Income		***4,199.8***	***4,525.8***	***4,879.8***	***5,264.2***	***5,681.9***
B	**Mandatory Expense**						
	Personnel	**6%**	2,787.9	2,955.2	3,132.5	3,320.5	3,519.7
	Total Mandatory Expense		***2,787.9***	***2,955.2***	***3,132.5***	***3,320.5***	***3,519.7***
C	**Net General Income**		**1,411.8**	**1,570.6**	**1,747.3**	**1,943.8**	**2,162.2**
D	**Debt**						
	Beginning outstanding		60.4	2,918.6	3,285.1	3,465.8	3,695.6
	Long-term debt withdrawal		3,339.3	842.5	747.6	860.4	948.0
	Interest + other debt cost Payment		399.5	441.9	473.8	508.3	545.6
	Principle repayment		81.7	34.0	93.0	122.3	155.9
	Debt outstanding		2,918.6	3,285.1	3,465.8	3,695.6	3,942.1
E	***DSCR***		***2.5***	***2.5***	***2.5***	***2.5***	***2.5***
F	**Net Borrowing Capacity**		***842.5***	***747.6***	***860.4***	***948.0***	***1,045.0***
G	**Max. Debt Service**		***481.1***	***476.0***	***566.9***	***630.6***	***701.6***

Source: Consultant analysis; Assuming 8.25%+ 0.75% pa interest and provision rate prevail (according to 2017 State Bonds (SUN) benchmark with tenor of 20 years which comply with Decree of Directorate General of Financing and Risk no.KEP-47/PR/2016)

235. The analysis shows that the estimates of maximum the city of Banda Aceh have capacity to borrow would be **IDR 476 billion in 2020** and **maximum of IDR 701.6 billion in 2023**.

Mataram

Table 33: Current DSCR and Borrowing Capacity of Mataram 2013 to 2018

(in billion Rp.)

		2013	2014	2015	2016	2017*	2018**	Avg growth
A	**General Income**							
	Local income	139.9	202.6	225.1	288.4	300.0	350.3	**20.2%**
	Tax/Non-tax sharing	45.5	60.8	52.1	111.0	55.7	80.4	**12.0%**
	General Allocation Fund (DAU)	500.0	564.7	593.9	609.0	653.1	676.6	**6.2%**
	Total General Income	***685.5***	***828.0***	***871.1***	***1,008.4***	***1,008.8***	***1,107.2***	**10.1%**
B	**Mandatory Expense**							
	Personnel	514.1	574.0	608.0	650.4	654.0	693.3	**6.2%**
	Total Mandatory Expense	***514.1***	***574.0***	***608.0***	***650.4***	***654.0***	***693.3***	**6.2%**
C	**Net General Income**	**171.4**	**254.1**	**263.1**	**358.0**	**354.8**	**414.0**	**19.3%**
D	**Debt**							
	Interest Payment	0.0	0.0	0.0	0.0	0.0	0.0	
	Principle repayment	0.0	0.0	0.0	0.0	0.0	0.0	
E	***DSCR***				***0.0***	***0.0***	***0.0***	
F	**Net Borrowing Capacity**				***849.5***	***1,005.2***	***938.7***	
G	**Max. Debt Service**				***91.8***	***116.7***	***130.1***	

Source: Actual Budget of City of Mataram for 2013-2016, Budget Plan of 2017 and 2018 and Analysis.

236. The table above shows that total General Revenue has been growing by an average of 10.1% and Total of Net General Revenue by 19.3%. This high rate of growth of Net General Revenue has occurred since Local income had a substantial growth rate of 20.2% and where DAU has been fully spent on Personnel (as mandatory expense) which have almost the same growth (6.2%).

237. The following table assumes conservative growth of Local income (10%) and Grant by 5% and tax/non-tax sharing (excluding reforestation fund) by 10% and maximum 7% of the personnel expense. Assuming maximum debt were taken with DSCR to around 2.5 then the Nett borrowing capacity for every year (2019 - 2020) can be estimated as presented on the table below.

Table 34: Estimates of DSCR & Net Borrowing capacity of Mataram for 2019 to 2023

(in billion Rp.)

		Growth estimate	2019	2020	2021	2022	2023
A	**General Income**						
	Local income	**10%**	385.3	423.8	466.2	512.8	564.1
	Tax/Non-tax sharing	**10%**	88.4	97.2	107.0	117.7	129.4
	General Allocation Fund (DAU)	**5%**	710.4	746.0	783.3	822.4	863.6
	Total General Income		***1,184.1***	***1,267.0***	***1,356.4***	***1,452.9***	***1,557.1***
B	**Mandatory Expense**						
	Personnel	**7%**	741.8	793.7	849.3	908.7	972.3
	Total Mandatory Expense		***741.8***	***793.7***	***849.3***	***908.7***	***972.3***
C	**Net General Income**		**442.3**	**473.3**	**507.2**	**544.2**	**584.7**

D	**Debt**					
	Beginning outstanding	42.1	830.6	890.5	843.7	903.6
	Long-term debt withdrawal	938.7	221.4	130.5	249.7	267.9
	Interest + other debt cost Payment	115.2	123.6	120.0	128.5	137.7
	Principle repayment	35.0	37.9	57.3	61.2	65.6
	Debt outstanding	830.6	890.5	843.7	903.6	968.2
E	***DSCR***	***2.5***	***2.5***	***2.5***	***2.5***	***2.5***
F	**Net Borrowing Capacity**	***221.4***	***130.5***	***249.7***	***267.9***	***287.7***
G	**Max. Debt Service**	***150.2***	***161.5***	***177.3***	***189.7***	***203.3***

Source: Consultant analysis; Assuming 8.25%+ 0.75% pa interest and provision rate prevail (according to 2017 State Bonds (SUN) benchmark with tenor of 20 years which comply with Decree of Directorate General of Financing and Risk no.KEP-47/PR/2016)

238. The analysis shows that the estimates of maximum the city of Mataram has the capacity to borrow by **IDR 150 billion in 2019** and **maximum of IDR 203 billion in 2023**.

239. In the financial analysis the LGs will have to subsidize O&M costs until all household connections have been made to the sewer system and can be levied a wastewater tariff. The requirements are:

Table 35: Required Subsides during Construction for O&M (Rp million)

City	2023	2024	2025	2026
Banda Aceh	3,812	3,812	5,891	4,547
Mataram	879,138	750,222	411,485	307,731
Mataram Stage 1	0	0	0	0
Bekasi	4,903	4,903	4,903	4,903

240. So in each case the city has the ability and capacity to cover these subsidizes.

E. IMPLEMENTATION ARRANGEMENTS

1. Project Organization

241. The Directorate for Human Settlements under the Ministry of Public Works and Housing is the designated Executing Agency (EA) for SSDP implementation, in charge of general project coordination, loan management, and reporting to the National Development Planning Agency (BAPPENAS), the Ministry of Finance and to the ADB.

242. The Directorate of Environmental Sanitation (PPLP) is the designated Implementing Agency (IA) in charge of the establishment and operation of the Center Project Management Unit (CPMU). The CPMU is operating on behalf of the IA and coordinates closely with the provincial SATKER (PIU).

243. The so-called SATKER STRATEGIS, operating under the IA, will be directly responsible, through its procurement unit POKJA and in collaboration with the Ministry's procurement unit (ULP), for the recruitment and management of all SSDP related consulting services, including the Capacity Development Consultant (CDC) and the Project Implementation Support Consultant (PISC). These consultant assignments will provide all relevant support for all the three candidate SSDP cities.

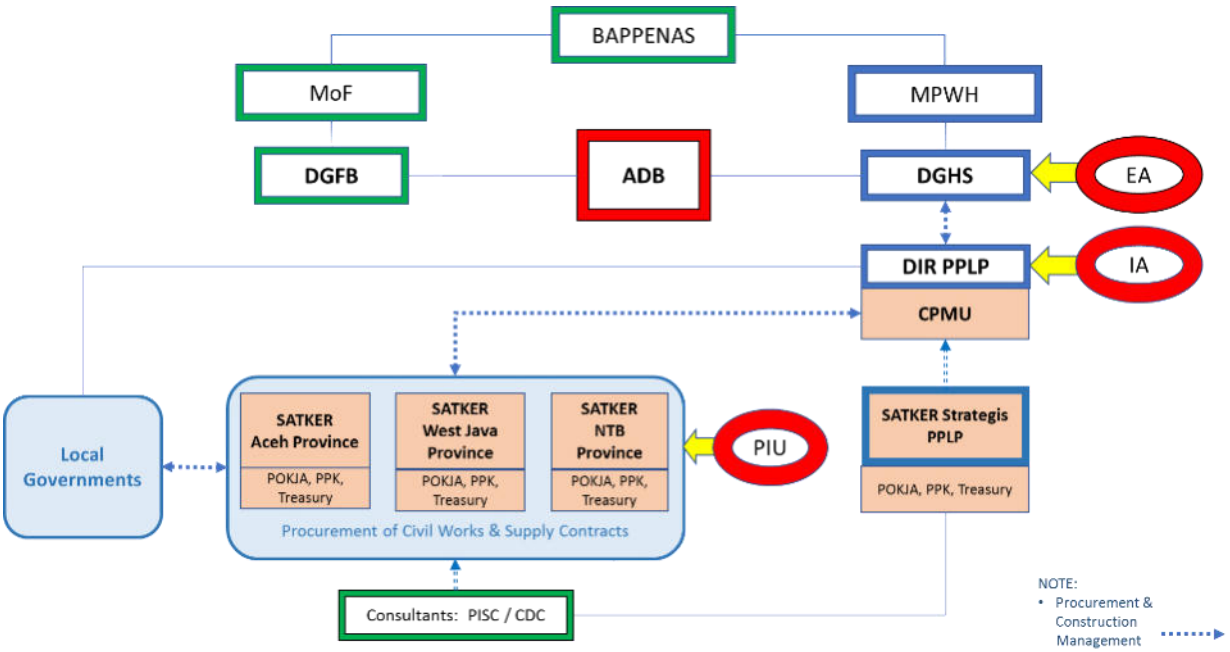
244. A SSDP specific Project Implementation Unit (PIU), "Provincial SATKER", will be appointed by the IA for supporting all SSDP loan related procurement and project management tasks. This SATKER will be responsible for the development of infrastructure for the WWTP and Sewer systems, managing the appointed contractors. The SATKER will also be supported by the PISC and CSC appointed by SATKER STRATEGIS.

245. The role of the local government comprises of (i) land acquisition for the WWTPs and Pumping Stations and the implementation of relevant social and environmental safeguards; (ii) during infrastructure development phase the establishment and empowerment of a dedicated wastewater management operator, the organization of service promotion events at community level (social marketing and behavior change communication), and the installation of house connections for individual households; and (iii) post construction the operation and maintenance of the investments and service deliveries.

246. The SSDP Implementation Structure, as currently intended, was discussed with the Director of PPLP and is as follows:

Institution	Arrangements
• Executing Agency (EA)	Directorate General of Human Settlements (DGHS)
• Implementing Agency (IA)	Directorate of Environmental Sanitation (PPLP)
• SATKER Strategis (nat. level)	Procurement and management of Consultants (CDC & PSIC)
• SATKER Provinsi (prov. level)	Procurement of Civil Works and Supply contracts
• Local Government	• Land acquisition for the WWTP and Pumping Stations • Implementation of safeguards • Establishment of a dedicated wastewater management operator • Social marketing and behavior change communication • Installation of house connections for individual households • Operation & maintenance, service delivery.

Figure 8: Preliminary Project Organizational Structure



2. Procurement Plan

Procurement Roles and Responsibilities

247. The Director General of Health and Sanitation (DGHS) as Executing Agency (EA) will have the overall responsibility of procurement and implementation of the project, with the support of Director of Environment and Sanitation (PPLP) on day-to-day basis. PPLP will act as Implementing Agency (IA) and coordinate with the implementation units (IUs), i.e. Satker Strategik, and 3 Satkers at provincial levels, for each sub-project.

248. The Satker Strategik, as one of the four Implementation Units will be responsible for procurement of consulting services. Three consultants will be recruited: Capacity Development Consultant (CDC), Project Implementation Support Consultant (PISC) and Construction supervision Consultant (CSC). The Satkers at West Nusa Tenggara, West Java province and Aceh provinces will act as the other three implementation units for procurement of works and goods for the cities of Mataram, Bekasi and Banda Aceh respectively. During the pre-contract period, each Satker at provincial level will virtually work as procurement entity. The procurement activities will be monitored by ULP, the nodal agency, working directly under Secretary General of the MPWH, with the assistance of POKJA.

Procurement Risk and Capacity

249. The procurement capacity assessment (PCA) of the all the Satkers at provincial levels that are responsible for procurement of works and goods for each sub project, and of Satker Strategik responsible for the procurement of consulting services, was carried out in accordance with ADB's Guidelines for Project Risk Assessment and Project Classifications, dated August 2015. The risk assessment study, revealed the following key weakness in their procurement capabilities:

- Satkers are mostly conversant with procurement of small works with NCB method for nationally funded projects (not exceeding US $ 2.0 million)
- The proficiency level of the staffs in Satker in written English is low

- There are no dedicated procurement divisions in any of the provincial Satker offices. All the procurement activities are monitored by ULP at provincial level with the support of POKJA setup on project need basis, which also applies to Sartker Strategik.
- Satkers have no or limited experience in foreign assisted or ADB funded projects, and
- No experience on Design-Build (D-B) contracts.

250. In view of the above weaknesses, the procurement (works and goods) capacity enhancement of all the project implementation units (PIUs) is prerequisite for successful implementation of the project. The proposed capacity development plan is outlined separately below.

3. Implementation Schedule

251. The following two schedules represent Project Readiness Activities and the Overall Implementation Plan for the City of Bekasi, comprising the assignment of the CDC and PISC consultants, relevant work packages, and associated estimated implementation periods.

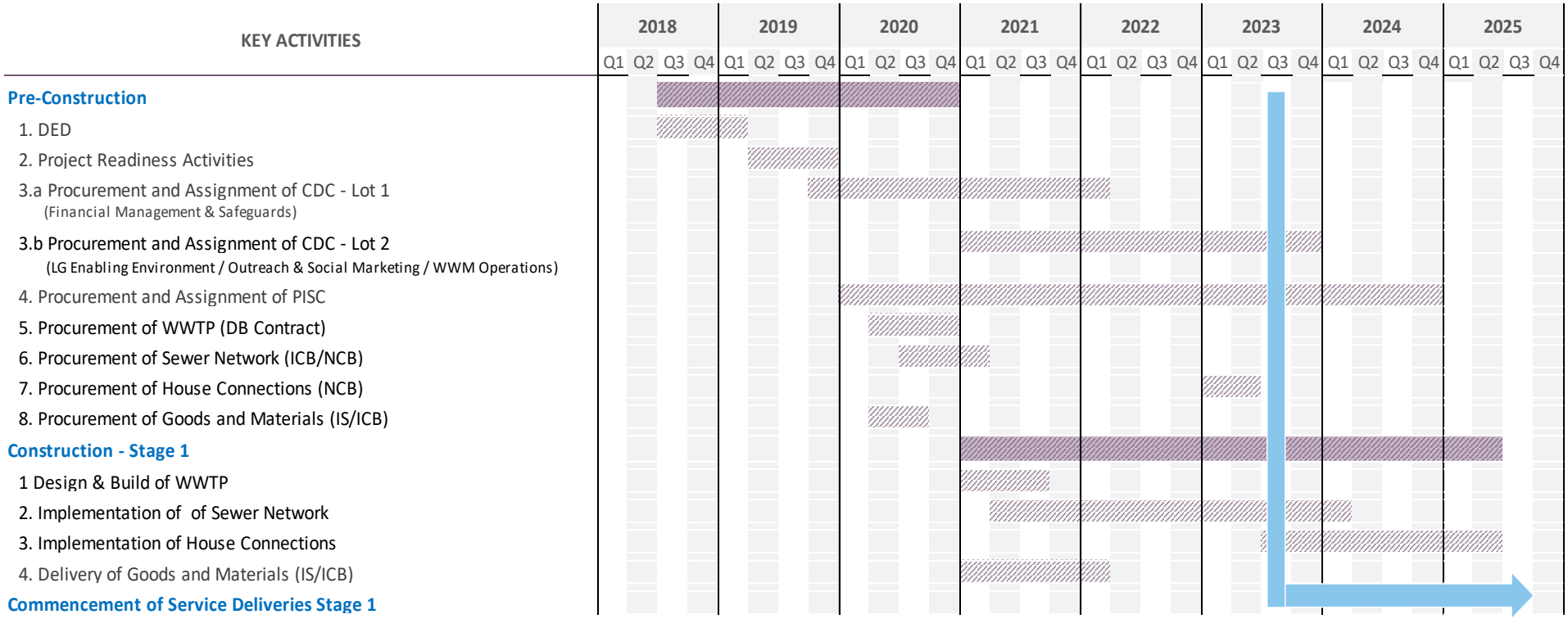
Figure 9: Provisional Project Readiness Activities

Activity	2019							Institution in Charge
	Mar	Apr	May	June	Aug	Sep	Oct	
Bappenas Green Book [35]	X							EA
Implementation Structure		X	X	X				EA
ADB Board Approval			X					ADB
Loan signing				X				ADB. MOF
GOI legal opinion					X			MOF, MOJ
GOI budget inclusion						X		EA, MOF
Loan effectiveness							X	ADB
Grant signing							X	ADB / SECO

[35] Daftar Rencana Prioritas Pinjaman / Hibah Luar Negeri - Jangka Menengah (DRPPHLN)

Figure 10: Provisional Overall Implementation Schedule

Overall Project Implementation Plan



4. Capacity Development Plan

252. The ADB is seeking grant financing the implementation of a comprehensive capacity development program in support of SSDP implementation and operations. This section outlines the intended key capacity development activities and associated estimated costs. A summary of the Scope of Works (SOW) of the Capacity Development Plan (CDP) for the assignment of a Capacity Development Consultant (CDC), are presented in Annex 12.

253. Based on the various capacity assessments (incl. procurement, financial management, safeguards, service delivery system, and community engagement), that were implemented during the course of the TRTA assignment, the identified capacity development needs are separated into two individual lots of activities, mainly for the reason that (i) content and objective of Lot 1 and Lot 2 differ substantially, and (ii) because of the time lag of implementation between the lots.

254. The main components of the intended capacity development program include:

Lot 1 - Pre-Construction:

A. Procurement Management
B. Financial Project Management
C. Safeguards Management
   C.1 Environmental Safeguards
   C.2 Social Safeguards

Lot 2 - Post-Construction:

D. Local Government Enabling Environment
E. WWM Operations / Service Deliveries
F. Public Awareness Campaign

255. The capacity development activities during the 'pre-construction' period (in support of Output 1) focus foremost on ADB relevant procedures on **procurement**, **financial management** and **safeguards**, which will be implemented though a series of class-room training and on-the-job training for managerial staff of the IA, CPMU and PIUs and selected local government agencies.

256. Capacity development activities under 'post-construction' are targeting local government stakeholders, foremost in support of the development of **service delivery mechanism** (Output 2), comprising (i) the development of a conducive local government environment in support of service delivery (ii) the enhancement of operational skills and competences, which will be implemented through a combination of class-room and on-the-job training, supported by comparative studies and limited internships for selected operational managers; and development of skills and methods for **public awareness campaigns** (Output 3), which comprises local government engagement, training of trainer (TOT) sessions on social marketing, and intensive community participation.

A. *Procurement Management*

257. The objective of the capacity development plan is to design and implement procurement related training to make the Satker familiar with ADB procurement procedures, laws and ADB's standard procurement documents as well as ICB and DB conditions of contract. The plan is intended primarily to achieve the following Impact and Outcome:

258. **Impact**: Development and implementation of sound procurement procedures to achieve time-bound deliveries of all SSDP related investment components.

259. **Outcome**: Familiarizing the Implementation Units with the procedures and objectives of the currently introduced ADB procurement reforms and enhanced urban infrastructure procurement and implementation capacity of the provincial governments. To enhance the procurement capacity of the IUs, a two stage Capacity building approach is considered to mitigate the risks. In first stage, a Capacity Development Consultant (CDC) will be recruited for SSDP, under advance contracting, prior to any procurement activities. The CDC is to provide a comprehensive training to the professional and procurement cadres of the Satker Strategik and all the IUs at provincial level. The objective of the training will be to familiarize the cadres of IUs with ADB procurement policy as well as D&B procurement, rules and guidelines, including ADB's standard procurement documents for services, works and goods. Training will be imparted to each provincial IU separately through workshops including question-answer session. The CDC will conduct workshops for training to professional cadres of each of the 3 Satkers at provincial levels for sub-project for 7 working days. In addition, the CDC will conduct workshops for training to Satker Strategik for 5 working days on procurement of consulting services as per ADB Guidelines.

260. The second stage of procurement capacity development will include on-the-job training on procurement by project implementation support consultant to the Satker, on day-to–day basis during project implementation. One PISC will be recruited to support all the IUs in bidding, contracting and contracts administration, in accordance with the provisions of Project Administration Manual (PAM).

261. The CDC will prepare hand out (both in English and Bahasa Indonesian) and distribute it to the participants during training session. The CDC will in general, impart the training with indicative training modules as follows.

Part1: Procurement of Works

Module P1: ADB Procurement Guidelines

Module P2: Preparation of Bidding Documents (ICB & NCB)

Module P3: Bid Opening, Bid Evaluation and Award of Contract

Part-2: Procurement of Goods

Module G1: Procurement with ICB

Module G2: Procurement with NCB

Module G3: Procurement with Shopping

Part-3: Procurement of Plant with Design-Build Contract

Module P1: Brief on Plant with D-B contract as per ADB Guidelines

Module P2: Preparation and Evaluation of Bid Document

Part-4: Procurement of Consulting Services

Module CS1: Appraisal of ADB guidelines for procurement of consulting services

Module CS 2: Preparation of TOR for recruitment of consultant

Module CS 3: Shortlisting of Consultants

Module CS 4: Preparation of RFP

Module CS5: Evaluation of Technical and Financial Proposals and contract award

262. The CDC will submit a report on the training, including feedback from the participants, as part of their contractual obligations.

B. *Financial Management*

Risk Assessment

263. The Project will cover three cities, Mataram, Bekasi and Banda Aceh. If the traditional method of implementing the project is employed whereby the central Executing Agency (EA) controls the procurement and funding with its implementing units based in the Provincial Government (namely the SATKER) with seconded staff from the EA, then the risk rating is classified as ***Substantial***. However, if there is a move to implement the project using the City administrations then the risk is considered ***High***.

264. The Consultant has followed ADB's Guidelines for the Financial Management and Analysis of Projects, and ADB's Financial Due Diligence: A Methodology Note and ADB's Financial Management Technical Guidance Note, May 2015, in conjunction with the FMAQ and assessed individual risks categorized the risks as follows:

- **High** - likely to occur, will have high impact if occurs
- **Substantial** - unlikely to occur, will have high impact if occurs
- **Moderate** - likely to occur, will have low impact if occurs
- **Low** - not likely to occur, will have low impact if occurs

Summary of Weaknesses and Risks Identified

265. The due diligence has focused on three main areas; (i) the major fiduciary risks facing the SSDP project arising out of the Financial Management Assessment (FMA) of Executing Agency (EA) Directorate of Environmental Sanitation (Pengembangan Penyehatan Lingkungan Permukiman, (PPLP)), (ii) the FMA of the implementing cities of Banda Aceh (North Sumatra), Bekasi (West Java) and Mataram (Lombok), and (iii) the sustainability of the project in regards to the provisional calculation of costs versus the amount of budget that is currently allocated at national and sub-national levels to the wastewater sectors.

266. There is one further dimension that needs to be considered and that is the procurement modality that will be used for this project. This is considered at the outset in this summary as it has a bearing on the fiscal robustness of the implementation – the difference between '**Substantial Risk'** and '**High Risk'**. There are two modalities being considered for implementation (i) the traditional approach in Indonesia, whereby the central government takes the lead with the creation of project management units ("CPMU" and "SATKER Strategis" for this project) and project implementation units (PIU-SATKER) down as far as the provincial government. Civil works, mechanical, equipment and other goods and services are procured by these PIUs and when the final asset is created it will be transferred to the City Governments (Banda Aceh, Bekasi and Mataram for this project) and (ii) Design-Build-Operate (DBO) contract or contracts.

267. Component 1, responsible for the technical elements of the project preparation (funded by the Cities Development Initiative for Asia (CDIA)) tasked with '*Producing a high level procurement strategy including initial identification of procurement packages and bidding procedures plus*

associated draft procurement documents (in accordance with ADB Guidelines) for Feasibility Study-prepared investments', recommended a DBO modality for SSDP. The institutional framework to facilitate this method of procurement was not however addressed, but it was simply assumed that the contract owner would be the City Administration.

268. There are significant risks associated applying the DBO modality at the City level:

- There is no legislation or existing mechanism to enable the loan/grant from ADB to be transferred either by on-lending or on-granting to the City Administration from the central government, without qualification criteria.
- The procurement packages for civil works and equipment would need to be separated according to the delivered output; Sewer network, wastewater treatment plant (WTP), on-site wastewater systems (with perhaps septage treatment plants – STP) and capacity building programs for administration and operation and environmental and social mitigate programs.

Summary of Mitigation / Management Measures to be Adopted

269. At the city level there are several challenges to mitigate for introducing project implementation at that level:(i) lack of experience of the City Administrations in the administration of lump-sum consultant contracts; (ii) lack of experience managing the selection and administration of a large number of sizable contracts with consultant firms; and (iii) budgeting process or discretionary decisions. These risks are considered manageable due to the following mitigation measures: (i) recruitment of a *Project Implementation Support Consultant* (PISC) consultant firm to support the City Administrations in all fiduciary aspects of the SSDP implementation on a daily basis and provide necessary on-the-job capacity building; (ii) engagement of TA-funded procurement advisors through ADB's ESP project to safeguard the City Administrations during the consultant selection and management processes; and (iii) suitable use of the government's e-procurement platform for the selection of project preparation consultants.

C.1 Environmental Safeguards Management

270. Given the Project is supported by Asian Development Bank, the implementation is required to follow ADB Safeguard Policy Statement (2009) principles as there are some gaps between the Indonesian environmental safeguard requirements in comparison to the coverage of ADB requirements. In order to understand, recognize and apply the more stringent ADB requirements applied in the Project, capacity building and trainings for environmental safeguards are arranged as part of the implementation.

271. The environmental safeguards are founded on the identified potential environmental impacts as well as disaster and climate risks and their mitigation in the implementation. In addition, the safeguard requirements account for potential impacts on health and safety, livelihoods, cultural resources, social concerns as well as the Grievance Redress Mechanism (GRM) set for the Project to manage complaints and issues concerning compensations.

272. Besides the main ADB safeguard principles, the Initial Environmental Examinations (IEEs) undertaken lay out the main findings regarding potential impacts, their mitigation and monitoring and provides for the Environmental Management Plan as the main framework to be applied for managing the Project according to the safeguards.

273. Following the planned institutional implementation set-up on with Project Implementation Units (PIUs) on Provincial SATKER, legal mandates for environmental management in Indonesia assigned to environmental line agencies Lingkungan Hidup (LH) in the city and provincial level

and the designed GRM, the trainings will be provided for the responsible governmental staff implementing the Project. The intended participants of the trainings include

- SSDP National Project Director
- Provincial Environment Agency
- City Environment Agency
- PIU (SATKER)
- Bekasi Public Works
- Select kelurahan chiefs or their representatives,
- District Governor and relevant agencies
- Department of Spatial Planning (for redress, acquisition, compensations)
- Select stakeholders
- Possible external service providers (eg. certified laboratories for monitoring and consultants for surveys and waste management)
- Central level directors from environment ministry as relevant

274. In Bekasi, where the City Environment Agency operations are controlled by Bappeda, it is recommended to include also Bappeda representative into the trainings.

C.2 Social Safeguards Management

National level

275. The purpose of the capacity development is to (i) achieve an understanding of ADB's Social Safeguard Policy and the National Regulatory Framework and (ii) identify regulatory gaps and reach an agreement on necessary amendments for compliance with ADB Policy.

276. Relevant subjects comprise the following:

- ADB Social Safeguard Policy
- National Social Safeguard Framework
- Identification of critical regulatory gaps
- SSDP Social Safeguard Framework.

City level

277. The purpose of the activity is to achieve an understanding of key documents and safeguard procedures, implementation competence and monitoring formats and requirements.

Relevant training modules comprise the following:

- Responsible Local Government institutions
- Budget requirements
- Information Disclosure
- Consultation and Participation
- Grievance Redress Mechanism
- Monitoring and Reporting.

D. *Service Delivery (Output 2)*

278. The objective of 'service delivery' related capacity development is to empower both city managers and their designated wastewater operator to obtain comprehensive understanding in support of the development a conducive regulatory, institutional, and fiscal framework, and to enhance the basic technical and non-technical procedures and skills that are required for the delivery of 'city-wide' and sustainable community service.

279. The design of service delivery related training activities must recognize that both the city administration and their current wastewater operator have only very limited exposure to domestic wastewater management. Thus, there is the need to embrace in the training structure the basic technical and non-technical requirements of domestic wastewater management for assuring best possible service deliveries and environmental benefits. Because of the challenges of operating a fairly complex sewer network and a mechanized wastewater treatment plan, the planned capacity development plan features a mix of classroom training, on-the-job training, comparative studies, courses, and internships.

280. The Wastewater Management Road Maps prepared for each city provide the basis for a tailor-made capacity development program for strengthening the municipal service delivery capacity (Output 2). As such, the intended capacity development program is addressing all relevant aspects of citywide domestic wastewater services, comprising:

Enabling Local Government Environment

- Regulatory development
- Sector planning
- Institutional development
- Fiscal planning and tariff setting

Operational Competence:

- Managerial skills
- Human resources development
- Asset management and collaboration with third parties (community and private sector)
- Community outreach and social marketing
- Financial Management

E. *Community Outreach/Business Development/Customer Management*

281. The objective of Community Outreach related capacity development is to provide the utility management and their staff with skills, practices and strategies necessary for facilitating public 'buy-in' of the central sewerage system and 'scheduled desludging' activities to raising household's willingness to connect to and pay for the improved wastewater services.

282. In the initial phase, 'social facilitators' will be hired and trained in social marketing activities as well as the basic technical, financial and social aspects related to promotion of household connections. The work profile of social facilitators is eventually expected to develop towards customer service and sales. The utilities are also supported in development of their customer management practices, including e.g. customer satisfaction surveys and complaint management, as well as in developing business development and marketing strategies.

F. *Public Awareness Campaign*

283. The objective of the public awareness campaigns is to increase demand and gain public support for the central sewerage system. The campaign activities in the city level include advocacy to decision makers and relevant government stakeholders to ensure their commitment and support (i.e. in terms of changes in regulations, enforcement of laws, allocation of budget and human resources etc) to improved wastewater management, social marketing workshops for campaign implementation partners as well as journalists' trainings and press conferences to increase media visibility on sanitation issues.

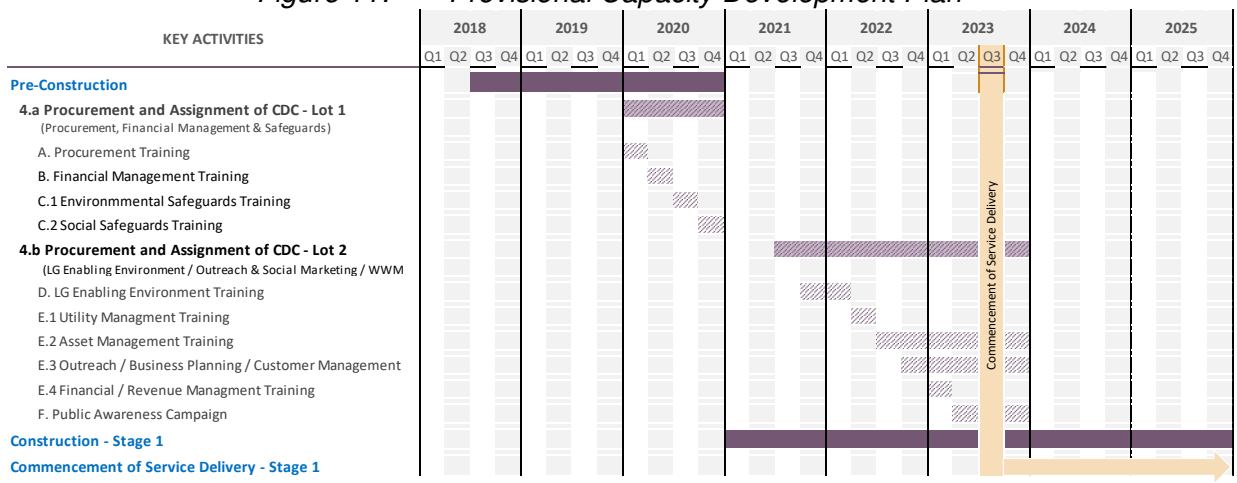
284. Community level sanitation promotion takes place through local leaders and opinion influencers, including e.g. RW and RT leaders, RT health and environment volunteers, female

volunteers, CBO leaders, Health post's sanitarians and religious leaders. The community level campaigns are steered by 'Social facilitators' hired by the PIU/wastewater utility.

G. *Capacity Development Plan and Tentative Cost Estimate*

285. The capacity building component includes three phases; (i) startup of operations for the project, (ii) capacity development needs during the project implementation and (iii) post construction capacity when the construction is complete and the facilities are handed over.

Figure 11: Provisional Capacity Development Plan



286. Project Implementation Support Consultants will be hired to assist the PMU and SATKERs in all three locations to implement the project, however the capacity of the national and local staff needs to be built in addition to this support need. The preliminary estimated costs are:

Table 36: Estimated Costs of Capacity Building Program[36]

Capacity Building Program	US$ 000's			
Category	**Banda Aceh**	**Mataram**	**Bekasi**	**Total**
International Consultants				
Months	100.0	17.9	87.0	204.9
Cost	2,367.5	435.1	1,911.2	4,713.8
National Consultants				
Months	321.6	10.5	321.6	653.6
Cost	1,693.5	76.5	1,467.0	3,236.9
Service Contracts	10.0	26.9	8.0	44.9
Workshops & Training Events	0.5	25.9	0.5	27.0
Supply Contracts	3,559.0	624.8	3,557.0	7,740.7
Educational Courses	215.0	105.6	110.0	430.6
Total Cost	**7,845.5**	**1,294.7**	**7,053.7**	**16,193.9**

287. The International consultants include advisors to team leaders and senior planners, financial management specialists, contract management specialists, CDD/ Training advisors, Infrastructure specialist/advisors, M&E specialists and resettlement experts. In Mataram the requirement is not as great with just an advisor to the team leader, a financial management specialist, an environmental specialist and a social expert required. However, in Mataram there are small inputs towards the end of construction for specialists to assist with building capacity for operations and maintenance of the facilities.

[36] There is the need to reassess the cost estimate for the Capacity Development Program once the ceiling amout for thh grant financing is determined by the ADB

288. There is a full team of national consultants budgeted for intermittent inputs in Mataram, in Bekasi there are more national consultant required on a full time basis in particular the project team leader advisor, the infrastructure engineer and contract management specialist, Banda Aceh follows the Bekasi model with more full time national consultant providing specialist advice.

289. The other major costs in the capacity building is the Public awareness campaigns which are of paramount importance to the success of the SSDP project.

III. DUE DILIGENCE

A. FINANCE AND ECONOMICS

1. Financial Analysis

290. A financial appraisal of the project and each sub project was undertaken using with- and without-project scenarios over 25 year operation period, with the residual value at the end of this period assumed as zero. Financial flows for the total project were discounted overtime using the weighted average cost of capital (WACC), which was calculated based on the after-tax real interest rate. The WACC is computed at 0.48%.

Table 37: Computation of Weighted Average Cost of Capital

Project WACC		Calculation of WACC (%)						
		Financing Component						
Item		ADB Loan	ADB ESP Loan	Grant	Central GOV	Local GOV	Beneficaries	Total
A. Amount ($'million)		397.53	14.04	13.41	72.72	48.49	26.27	572.45
B. Weighting (%)		69.44%	2.45%	2.34%	12.70%	8.47%	4.59%	100.00%
C. Nominal Cost (%)		2.82%	2.82%	12.00%	8.98%	9.75%	8.98%	
D. Tax Rate (%)		25.00%	25.00%	25.00%	0.00%	25.00%	0.00%	
E. Tax Adjusted Nominal Cos	[C x (1-D]	2.11%	2.11%	9.00%	8.98%	7.31%	8.98%	
F. Inflation Rate (%)		3.30%	3.30%	3.30%	3.7%	3.7%	3.70%	
G. Real Cost (%)	[(1+E)/(1+F)-1]	-1.15%	-1.15%	5.52%	5.09%	3.48%	5.09%	
H. Weighted Component of W	(GxB)	-0.80%	-0.03%	0.13%	0.65%	0.30%	0.23%	
Weighted Average Cost of Capital (Real Terms)								0.48%

291. The weighted average cost of capital for each city is different due to the difference in the financal plan and different start dates for inflation, such as; Mataram 0.6% , Banda Aceh 0.82% and Bekasi 0.67%.

292. The annual domestic inflation race is 3.83% for 2017, but forecast to 3.7 for 2019. Given that the ADB loan is denominated in domestic currency units, the domestic inflationary applies to the real cost of this Debt. The foreign inflation rate is the manufacturers unit value index (MUV), which is generally accepted as a proxy for the price of developing country imports of manufactured goods in US dollar terms. The international inflation rate according to the MUV index is expected to be 3.3%.

293. Since Grant funds provided to the project also have an opportunity cost, the proposed grants have been treated similarly to equity, such that the cost of the grant is assumed to be the cost of equity. The cost of equity is assumed to be 8.98%, however for the 3 cities who borrow on the open market it is assumed that the corporate rate would be charged by commercial banks at 9.75% (at this stage the funding source of the grant has not yet been determined).

294. The FIRR is the discount rate at which the financial net present value of the project's cash flow becomes zero. If the FIRR is equal to or greater than the WACC, the project is considered financially viable. The FIRR was determined from incremental cash flow, with revenues from Wastewater Fees, Connection fees for a limited time, Desludging Fees and Wastewater Disposal Fees.

295. In Mataram and Bekasi the wastewater fees are based on charging only the households connected to the system. However, in Banda Aceh the project is not financially viable unless the total households of the city are levied with fees. Justification can be the health benefits to the community as a whole as a wastewater system prevents disease, with water potentially containing bacteria and chemicals that would cause disease and death to people that consume it. The wastewater fees cover only the operation and maintenance of the sewer facilities, with a full cost recovery.

296. The desludging fees are the cost of collection by specified Vacuum trucks and Vacuum Pumps provided by the project and by private operator trucks making entries each per year to the WWTP.

297. O&M costs have been calculated for the sewer network, including pump stations, wastewater treatment plants and for Septage management. O&M costs are assumed to remain constant in real terms. The financial costs include physical contingencies, but do not consider price contingencies.

FIRR, IDR million in 2018 Constant Price				
Year	Revenues	Capital Cost	O&M Cost	Net Inflow (Outflow)
0	730	410,135	730	(410,135)
1	4,537	449,556	7,329	(452,348)
2	4,172	1,063,896	7,008	(1,066,732)
3	42,157	1,421,376	11,918	(1,391,136)
4	1,537,623	685,205	23,959	828,459
5	1,743,070	545,360	26,092	1,171,618
6	643,062	382,820	28,170	232,072
7	593,050	461,675	29,791	101,583
8	460,384	489,086	31,412	(60,113)
9	589,723	129,805	31,412	428,507
10	140,994	0	31,412	109,582
11	136,775	0	31,412	105,363
12	49,162	0	31,412	17,750
13	49,889	0	31,412	18,477
14	50,638	0	31,412	19,226
15	51,410	0	31,412	19,998
16	52,207	0	31,412	20,795
17	53,028	0	31,412	21,616
18	53,874	0	31,412	22,463
19	54,747	0	31,412	23,336
20	55,647	0	31,412	24,236
21	56,576	0	31,412	25,164
22	57,532	0	31,412	26,121
23	58,519	0	31,412	27,107
24	59,537	0	31,412	28,125
25	60,586	0	31,412	29,174
26	61,667	0	31,412	30,255
27	62,783	0	31,412	31,371
28	63,933	0	31,412	32,521
29	65,119	0	31,412	33,707
30	66,341	0	31,412	34,929
31	67,602	0	31,412	36,190
32	68,902	0	31,412	37,491
33	70,243	0	31,412	38,831
34	71,625	0	26,509	45,116
NPV (IDR Million)	6,915,291	5,902,624	891,204	
			NPV (IDR million)	121,463
			FIRR (%)	1.02%

Table 38: Financial Internal Rate of Return (FIRR)

298. Sensitivity analysis of the FIRR and FNPV was conducted under the following scenarios: (i) increasing capital costs of 10%, (ii) Increase in O&M costs of 10%, (iii) Decrease in revenues of 10% and finally (iv) construction delay of one year.

Table 39: Sensitivity Analysis of FIRR and FNPV

FIRRs:	% Change	NPV	FIRR	SI (IRR)	SV (IRR)	SI (NPV)	SV (NPV)
Base Case		121,463	1.02%				
Case 1 - Increase in Capital Costs	10%	(468,800)	-1.31%	42.86	2%	48.60	2%
Case 2 - Increase in O&M Costs	10%	32,342	0.63%	7.25	14%	7.34	14%
Case 3 - Decrease in Revenues	10%	(570,067)	-1.99%	55.18	2%	56.93	2%
Case 4 - Project Delayed by One Year		6,822,043	0.87%	0.29	-5517%	-55.17	-2%

Note:

SI = sensitivity indicator (ratio of percentage change in IRR above the cut-off rate to percentage change in selected variable).

SV = switching value (percentage change in selected variable to reduce the IRR to cut-off rate).

( ) = negative, FIRR = financial internal rate of return, FNPV = financial net present value, O&M = operation and maintenance.

Source: Asian Development Bank estimates.

	Base Case	
Each City	NPV	FIRR
Mataram	175,900	5.70%
Mataram Stage 1	6,168,654	20.91%
Bekasi	132,032	3.25%
Banda Aceh (User Pays)	(245,112)	-0.92%
Banda Aceh (City Wide)	3,165,446	12.98%

299. From a financial perspective the whole project in Mataram and 'Stage 1 only' are both viable, as is Bekasi. Banda Aceh is not viable if only the users pay a tariff, but the tariff will have to be spread to the whole city households.

2. Economic Analysis

300. The economic costs of the project comprise (i) capital investment, which includes civil works, mechanical and equipment, project management, land acquisition and resettlement, social and environmental mitigation as well as consulting services for construction supervision, detailed design and capacity development; and (ii) operation and maintenance after construction, excluding taxes, duties, and financing charges during implementation.

301. Financial costs were converted to economic costs in line with ADB's published guidelines. The economic analysis was conducted based on the world price numeraire. A distinction was made between traded (on average only 16%) and non-traded goods (applying foreign content of 10%) for all cost items. A standard conversion factor (SCF) of 0.97 was applied to non-traded goods. A shadow wage rate factor (SWRF) of 1.0 was applied for skilled labor and 0.64 for unskilled labor. The SWRF was calculated in accordance with Appendix 12 of the ADB Guidelines for the Economic Analysis of Projects (footnote 5).

302. A distinction between traded and non-traded goods and shadow pricing was carried out for maintenance costs in the same way as in case of the investment costs, with labor and mechanical cost separated. A residual salvage value of the sewer network and wastewater treament plant is assumed to be equivalent to zero percent of the investment cost.

Economic Benefits

303. The economic benefits for the wastewater and sanitation subprojects were quantified in terms of health benefits. The health benefits were measured using the disability-adjusted-life-year (DALY) approach[37]. The DALY approach measures overall disease burden and expresses it as

[37] The approach was developed by Harvard University for the World Bank in 1990 for a study that provided a comprehensive assessment of mortality and disability from diseases, injuries and risk factors. The World Health Organization (WHO) adopted the method in 1996. DALY determination is continually revised by the WHO.

the number of years lost due to ill health, disability, or early death[38]. The World Health Organization (WHO) estimated the total DALYs in Indonesia at 25,103 per 100,000 population[39]. The WHO also estimated that 5.6% of the total DALYs in Indonesia were related to water, sanitation, and hygiene issues, whilst 7.5% were due to environmental factors[40]. For this analysis the environmental factors are taken at full value on the assumption that detrimental human environment is cause substantially by water, sanitation and hygiene issues. Following the WHO approach, the analysis calculated the annual economic value of a DALY as equivalent to the country's per capita gross national income (GNI) in a given year. The country's estimated per capita GNI in 2017 was US$10,839, based on purchasing power parity. Real GNI growth was assumed at 4% per annum[41]. Savings in DALYs attributable to the project SSDP Project was assumed at 85% of the calculated economic value of DALYs.

EIRR, IDR million in 2018 Constant Price				
Year	Benefits	Capital Cost	O&M Cost	Net Inflow (Outflow)
0	0	390,925	0	(390,925)
1	0	431,184	0	(431,184)
2	0	1,019,762	0	(1,019,762)
3	150,527	1,357,603	0	(1,207,075)
4	817,151	656,568	23,534	137,049
5	1,044,079	517,025	25,622	501,433
6	1,187,498	362,359	27,663	797,476
7	1,496,652	436,475	29,249	1,030,928
8	1,883,408	461,296	30,835	1,391,276
9	2,754,933	122,471	30,835	2,601,627
10	2,865,130	0	30,835	2,834,295
11	2,979,735	0	30,835	2,948,900
12	3,098,925	0	30,835	3,068,090
13	3,222,882	0	30,835	3,192,047
14	3,351,797	0	30,835	3,320,962
15	3,485,869	0	30,835	3,455,034
16	3,625,304	0	30,835	3,594,468
17	3,770,316	0	30,835	3,739,481
18	3,921,128	0	30,835	3,890,293
19	4,077,973	0	30,835	4,047,138
20	4,241,092	0	30,835	4,210,257
21	4,410,736	0	30,835	4,379,901
22	4,587,166	0	30,835	4,556,330
23	4,770,652	0	30,835	4,739,817
24	4,961,478	0	30,835	4,930,643
25	5,159,937	0	30,835	5,129,102
26	5,366,335	0	30,835	5,335,500
27	5,580,988	0	30,835	5,550,153
28	5,804,228	0	30,835	5,773,393
29	6,036,397	0	30,835	6,005,562
30	6,277,853	0	30,835	6,247,018
31	6,528,967	0	30,835	6,498,132
32	6,790,126	0	30,835	6,759,290
33	7,061,731	0	30,835	7,030,895
34	7,344,200	0	25,979	7,318,221
NPV (IDR Million)	114,934,455	5,626,082	848,742	
			ENPV (IDR million)	108,459,630
			EIRR (%)	30.60%

Table 40: Economic Internal Rate of Return (EIRR)

Results of the economic evaluation

304. The results of the economic and sensitivity analysis are summarized in the table below. The Project is economically viable in the base case scenario and the Projects' economic performances are most sensitive to decrease in benefits and increases in Capital cost, the performances meet the required threshold levels of ADB's 9% for economic internal rate of return.

305. The project is viable giving an EIRR of 30.6%.

[38] A DALY is an indicator of life expectancy combining mortality and morbidity into one summary measure of population health to account for the number of years lived in less than optimum health.

[39] World Health Organization. 2004. World Health Report. Geneva.

[40] WHO. 2007. Environmental Burden of Disease Series No. 15 (Water, Sanitation and Hygiene). Geneva.

[41] Source: WB 2017 World Development Indicators. Source: WB 2017 World Development Indicators 2011 to 2017 Consultant Calculations

306. Sensitivity Analysis

Table 41: Sensitivity Analysis of the EIRR and ENPV

EIRRs:	% Change	NPV	EIRR	SI (IRR)	SV (IRR)	SI (NPV)	SV (NPV)
Base Case		108,459,630	30.60%				
Case 1 - Increase in Capital Costs	10%	107,897,022	28.77%	0.61	165%	0.05	1928%
Case 2 - Increase in O&M Costs	10%	108,374,756	30.57%	0.01	9415%	0.01	12779%
Case 3 - Decrease in Revenues	10%	96,966,184	28.55%	0.68	147%	1.06	94%
Case 4 - Project Delayed by One Year		108,202,510	30.59%	0.00	0%	0.00	42183%

SI = sensitivity indicator (ratio of percentage change in IRR above the cut-off rate to percentage change in selected variable).

SV = switching value (percentage change in selected variable to reduce the IRR to cut-off rate).

307. The EIRR is robust to all sensitivity analysis and is only slightly vulnerable to a decrease in benefits.

3. Affordability and Tariff Analysis

308. There are several options for applying the tariff to recover the cost of operation and maintenance of the sewer system and the wastewater treatment plant (WWTP). Whilst it is comparatively easy to mathematically apply a number to recover the costs we have to make sure that we have two items in sync (i) the tariffs have to be affordable and (ii) the cost of collection and administration should be at least cost of burden and affordable to the city administration.

309. Policy states that for SSDP to ensure financial sustainability it must have full cost recovery of O&M and look towards building funds for reinvestment in future infrastructure improvements. However, if it is assumed that waste water treatment is 100% a public good then one must apply the social policy of the central government if it entails a reduction in the extent of recovery after applying a public good subsidy.

310. The Project has taken the view and interpretation of policy that it must cover full O&M and that is reflected in the tariff structures below.

Mataram

311. Levels of cost recovery. For the total project the service area, including the pilot one-site sanitation scheme peaks at 32% of the city population in year 2028 at the end of construction and then decreases, as the population of the city naturally increases, to 19% by the year 2053.

312. The operation and maintenance costs include the sewer network, pump station 1, pump station 2, wastewater treatment station and septage management.

313. The monthly fee after construction in 2029, if the charge is restricted to only those households connected to the sewer and WWTP System is IDR 26,596 per month. This compares with a fee for wastewater of IDR 10,026 per month for a city wide charge.

314. The Socio-economic survey shows that currently 53.1% of households pay less than IDR 15,000 per month on wastewater. Household income is on average IDR 2.4 million per month. 54% of households agree that the sewerage system is very important.

315. The Willingness to Pay (WTP) to connect to a sewage system is divided between (i) 89% saying IDR 15,000, (ii) 6% agreeing to IDR 100,000, and (iii) the remainder indicating between IDR 150,000 and 550,000. Unfortunately, this is short of the costs of connection of $600 or IDR 7.9 million as determined by the preliminary engineering design completed by Component 1.

316. On a monthly basis the WTP varies almost exactly between 10% of the surveyed population saying IDR 1,000, 10% saying IDR 5,000 and 10% indicating IDR 10,000. The rest are spread

through these numbers but around 20% are at the higher level of between IDR 10,000 and IDR 25,000. It appears therefore that the tariff level of IDR 10,026 per month across the city would be acceptable and the user pay level for IDR 26,596 would be difficult to gain acceptance.

317. There is an overwhelming 97% of households willing to pay for desludging and the vast majority are willing to pay IDR 10,000. However, this does not meet the costs associated with the desludging of approximately US$100 or IDR 1.3 million.

318. The cost of household connection is included in the capital costs.

319. In order to administer a collection scheme it is suggested that the wastewater fees are added to the PDAM water fees to reduce the need for the City Administration the burden of collection and management of the fee charging system. It is recommended that the PDAM retain (say) 1.5% of the collections to cover administrative costs associated with the management of the wastewater fee. The effect of wastewater fees are:

Table 42: Current Profile of Mataram Fee Collections

PEMAKAIAN AIR				
31-Dec-17				
Wilayah Pelayanan: Mataram				
No	**Kelompok Pelanggan / Customer Groups**	**Pelanggan Aktif / Active subscribers**	**Pemakaian Air / Water Usage (m3)**	**Jumlah Pendapatan Air / total water income (Rp)**
1	Social	867	490,040	1,134,510,520
2	Household	56,842	14,174,552	47,758,723,224
3	Low Income Household	10,114	1,255,853	3,230,466,080
4	Government & Industry	6,267	1,487,327	11,609,913,221
4	Commercial			
JUMLAH		**74,090**	**17,407,772**	**63,733,613,045**

320. From the above Table the rate households are currently paying for water for the social group is IDR 109,046 per month and for the Household group is IDR 70,017. Concentrating just on the user household group a wastewater charge for users only of IDR 29,529 would result in an increase cost to the household of 27% and using a city-wide approach the increase of IDR10,024 would be equal to 14% increase in fees.

321. The following Table shows the affordability levels:

Table 43: Mataram Affordability Profile (Stage 1 only)

Affordability Test		
	2023	
	Average HH	Low Income
Monthly Wastewater Fee (IDR), 2018 Real Price	99,858	99,858
Monthly Water Charge (IDR), 2018 Real Price	6,570	2,930
Total Water and Wastewater Charges (IDR)	106,428	102,788
VAT @ 10%	10,643	10,279
Total Monthly Water and Wastewater Bill (IDR)	117,070	113,066
Average Monthly Household Income (IDR)	2,435,045	1,000,000
% of HH Income on Water & Wastewater Charges	4.8%	11.3%

322. The annual O&M costs for Stage 1 reach a peak in 2023 of US$ 593,669 per annum. The coverage area of Stage 1 is 11,678 households for the sewerage system.

323. From a user pays scenario this then means a household charge of US$51 per annum, IDR 677,229 annually or IDR 56,436 per month.

324. Using the result of the Socio-economic survey, identifying that 50% households currently pay less than IDR 15,000 per month for wastewater, this would then represent a significant

increase in cost to the household. The willingness to pay for a sewage system does not even reach these levels.

325. However, if the approach was to be a city-wide solution then the annual fee would be around IDR 19,371 annually per household and IDR 1,614 per month.

326. Using the PDAM again as the conduit for fee collection, the user charge approach would result in an increase in tariff of 59%, or using the city-wide approach the increase in tariff would be 2%.

327. The following Table shows the affordability status for Stage 1 only:

Table 44: Mataram Stage 1 Affordability

Affordability Test	2023	
	Average HH	Low Income
Monthly Wastewater Fee (IDR), 2018 Real Price	56,436	56,436
Monthly Water Charge (IDR), 2018 Real Price	6,570	2,930
Total Water and Wastewater Charges (IDR)	63,006	59,366
VAT @ 10%	6,301	5,937
Total Monthly Water and Wastewater Bill (IDR)	69,306	65,302
Average Monthly Household Income (IDR)	2,435,045	1,000,000
% of HH Income on Water & Wastewater Charges	2.8%	6.5%

Bekasi

328. Levels of cost recovery. For the project the service area, including the pilot on-site sanitation scheme peaks at 1.3% of the city population in year 2028 and then decreases, as the population of the city naturally increases, to 0.7% by the year 2053.

Table 45: Service area coverage after construction in year 2028

Year 2028		Service Area			Percentage		
		Sewer Syst	On-site	Total	Sewer Syst	On-site	Total
Forecast Population	3,648,401	65,600	20,000	85,600	2%	1%	2%
Forecast Households	912,100	16,400	5,000	21,400	2%	1%	2%

329. The operation and maintenance costs include the sewer network, with 5 pump station of the Wet Well type, wastewater treatment plant in each of the two zones 1 and 3, septage management and vehicle maintenance.

330. The monthly fee if the charge is restricted to only those households connected to the sewer and WWTP System is IDR 9,953 per month per HH. This compares with a fee for wastewater of IDR 234 per month per HH for a city wide charge.

331. HH will connect to the system during construction and would have to pay much more than this to cover the ensuing O&M, so it is suggested that the HH rate during construction will be limited at the rate to be levied when everyone is connected at IRD 17,057. This means the city will have to provide a subsidy to meet the O&M during construction of an average of IDR 524,630 per HH per annum.

332. The Socio-economic survey identified that 71 households (17.8%) currently pay around IDR 50,000 per month for wastewater. 60% of households agree that the sewerage system is urgently needed. However, only 18% are willing to pay for connecting to the service. Of those households, 87.5% would be willing to pay IDR 50,000 and 8.3% would pay IDR 100,000. In the financial analysis this revenue stream has been ignored as the suggested tariff focuses just on the recovery of O&M to the exclusion of any connection fee. The cost of household connection is included in the capital costs.

333. As to monthly fees, the 72 households expressed a willingness to pay an average of IDR 10,000. It appears therefore that a tariff level of IDR 9,953 per month would be more easily acceptable.

334. Only 67 households (16.8%) are willing to pay for septic tank desludging. 16 households are willing to pay IDR 1,000, 15 households and are willing to pay IDR 25,000, and are willing to pay IDR 10,000.

335. As in Mataram, it is suggested that the wastewater fees are added to the PDAM water fees and 1.5% of the collected fees are retained to cover administrative costs. The effect of wastewater fees are:

Table 46: Current Profile of Bekasi PDAM Fee Collections

Bekasi Water PDAM	2015	2016	2017
Number of HH			
Social	95	110	115
Household	24,620	25,995	28,406
Low income HH	1,748	1,727	554
Consumption (m3 per annum)			
Social	16,346	19,388	21,561
Household	4,825,454	4,929,147	5,371,994
Low income HH	495,524	340,332	200,002
Tariff			
Average (m3 / Rp)		Social	1,300
		Household	4,160
		Low income HH	1,400
Rervenue		Social	28
		Household	22,347
		Low income HH	280
		Total revenue (IDR Millions)	22,656

336. From the above Table the rate Households are currently paying for water is IDR 786,717 per month and for the lowest Household group is IDR 243,733 (Calculated by the average consumption per HH x the average tariff in that classification). Concentrating just on the Household group a wastewater charge for users only of IDR 9,953 would result in an increase cost to the household of around 4%.

337. Using the result of the Socio-economic survey, identifying that households currently pay between IDR 30,000 to IDR 40,000 per month for wastewater, this would then represent an affordable increase in cost to the household. The willingness to pay for a sewage system of IDR 50,000 shows the system to be viable.

Table 47: Bekasi Affordability Analysis

Affordability Test		
	2022	
	Average HH	Low Income
Monthly Wastewater Fee (IDR), 2018 Real Pri	29,333	29,333
Monthly Water Charge (IDR), 2018 Real Price	0	41
Total Water and Wastewater Charges (IDR)	29,333	29,374
VAT @ 10%	2,933	2,937
Total Monthly Water and Wastewater Bill (IDR	32,267	32,312
Average Monthly Household Income (IDR)	2,969,325	1,500,000
% of HH Income on Water & Wastewater Char	1.1%	2.2%

Banda Aceh

338. Levels of cost recovery. For the project the service area, including the pilot on-site sanitation scheme peaks at 36% of the city population in year 2027 and then decreases, as the population of the city naturally increases, to 19% by the year 2053.

Table 48: Banda Aceh coverage area after 2027

		Service Area			Percentage		
		Sewer System	On-site	Total	Sewer Syster	On-site	Total
Forecast Population	309,860	99,959	11,700	111,659	32%	4%	36%
Forecast Households	68,858	22,213	2,600	24,813	32%	4%	36%

339. The operation and maintenance costs include the sewer network, with 5 pump station of the Wet Well type, wastewater treatment plant in each of the two zones 1 and 3, septage management and vehicle maintenance.

340. The monthly fee if the charge is restricted to only those households connected to the sewer and WWTP System is IDR 17,057 per month per HH. This compares with a fee for wastewater of IDR 10,474 per month per HH for a city wide charge.

341. HH will connect to the system during construction and would have to pay much more than this to cover the ensuing O&M, so it is suggested that the HH rate during construction will be limited at the rate to be levied when everyone is connected at IRD 17,057. This means the city will have to provide a subsidy to meet the O&M during construction of an average of IDR 524,630 per HH per annum.

342. The average monthly income of respondents of the SES is IDR 2,456,574, the highest income is IDR 7,500,000 and the lowest is IDR 500,000. The majority of respondents are in the income range between 2 million to 5 million (54%) and 1 million to 2 million (34%). Respondents that are willing to pay for sewerage services are only 17% and 83% of respondents are not. Of the 69 respondents that are willing to pay for connection to the sewerage services, most are willing to pay about IDR 50,000 (81%). Unfortunately, this is short of the costs of connection of about IDR 7 million as determined by the preliminary engineering design completed by Component 1. The average monthly household incomes of about IDR 2.5 million clearly indicate that the connection costs are far beyond reach of the households. However, in the financial analysis this revenue stream has been ignored as the suggested tariff focuses just on the recovery of O&M to the exclusion of any connection fee. The cost of household connections is included in the capital costs.

343. The number of households willing to pay monthly sewer fees corresponds to the number of those willing to pay for the connection. The majority of respondents are willing to pay up to IDR 10,000. It appears therefore that the tariff level of IDR 10,024 per month would be acceptable.

344. Only 56 households included in the SES (14%) are willing to pay up to IDR 10,000 for regular septic tank desludging.

345. As in the other cities, it is suggested that the wastewater fees are added to the PDAM water fees and 1.5% of the collected fees are retained to cover administrative costs. The effect of wastewater fees are:

Table 49: Current Profile of Banda Aceh PDAM Fee Collections

Banda Aceh Water PDAM (Water Consumption)		m3	Water Supply	Administration	Total Revenue	Revenue per M3	No. HH	Revenue/HH	Per Month/HH
Dec-17	Household A	62,921	188,996,300	33,622,500	222,618,800	3,538	4,483	49,658	4,138
	Household B	325,861	1,137,466,300	144,084,500	1,281,550,800	3,933	19,209	66,716	5,560
	Household C	223,984	868,576,550	73,470,000	942,046,550	4,206	9,796	96,166	8,014
	Household D	92,953	398,203,000	21,157,500	419,360,500	4,512	2,821	148,657	12,388
		705,719	2,593,242,150	272,334,500	2,865,576,650	4,061	36,309	78,922	6,577

346. From the above Table the rate Households are currently paying for water in the largest social group B is IDR 5,560 per month and for the lowest Household group is IDR 4,138. Concentrating just on the largest Household group B a wastewater charge for users only of IDR

17,057 would result in an increase cost to the household of around 400% and using a city-wide approach the increase of IDR10,024 would be equal to around 250% increase in fees.

347. Using the result of the Socio-economic survey, identifying that households currently pay around IDR 10,000 per month for wastewater, this would then represent a significant increase in cost to the household. The willingness to pay for a sewage system does not even reach these levels.

348. However, if the approach was to be a city-wide solution then the annual fee would be around IDR 19,368 annually per household and IDR 1,614 per month.

349. Using the PDAM again as the conduit for fee collection, the user charge approach would result in an increase in tariff of 59%, or using the city-wide approach the increase in tariff would be 2%.

Table 50: Banda Aceh Affordability Analysis

Affordability Test	2022		2022	
	Average HH	Low Income	Average HH	Low Income
Monthly Wastewater Fee (IDR), 2018 Real Price	17,057	17,057	10,747	10,747
Monthly Water Charge (IDR), 2018 Real Price	92,953	62,921	92,953	62,921
Total Water and Wastewater Charges (IDR)	110,010	79,978	103,700	73,668
VAT @ 10%	11,001	7,998	10,370	7,367
Total Monthly Water and Wastewater Bill (IDR)	121,011	87,976	114,070	81,035
Average Monthly Household Income (IDR)	2,456,574	1,000,000	2,456,574	1,000,000
% of HH Income on Water & Wastewater Charges	4.9%	8.8%	4.6%	8.1%

B. GOVERNANCE

350. Water governance refers to the political, social, economic and administrative systems in place that influence policy makers, water's use and management alike.

351. It determines the equity and efficiency in water resource, usage, and services allocation and distribution, but also the dealings with the collection, treatment, and disposal, respectively its reuse, of generated wastewater, which refers in the case of SSDP to the challenges related to domestic wastewater.

352. Governing water includes the formulation, establishment and implementation of water/wastewater policies, legislation and institutions, and clarification of the roles and responsibilities of government, civil society and the private sector. The outcomes depend on how the stakeholders act in relation to the rules and roles that have been taken or assigned to them. The *four fundamental dimensions of water governance* are:

Social

353. The equitable distribution of water resources and closely related wastewater management services among various social and economic groups, and its effects on society.

Economic

354. Efficiency in water allocation, the role of water and the impacts of untreated wastewater in regard to impacts on directly affected communities and the overall economic growth. Effective poverty reduction and economic growth depend highly on the availability and affordability of reliable water and wastewater services.

Political

355. Equal rights and opportunities for stakeholders to take part in decision-making processes. Participation facilitates more informed decision making, more effective implementation and

enhances conflict resolution. A more effective involvement of commonly marginalized citizens and the recognition as legitimate stakeholders in water/wastewater related decision-making stands to greatly influence outcomes.

Environmental

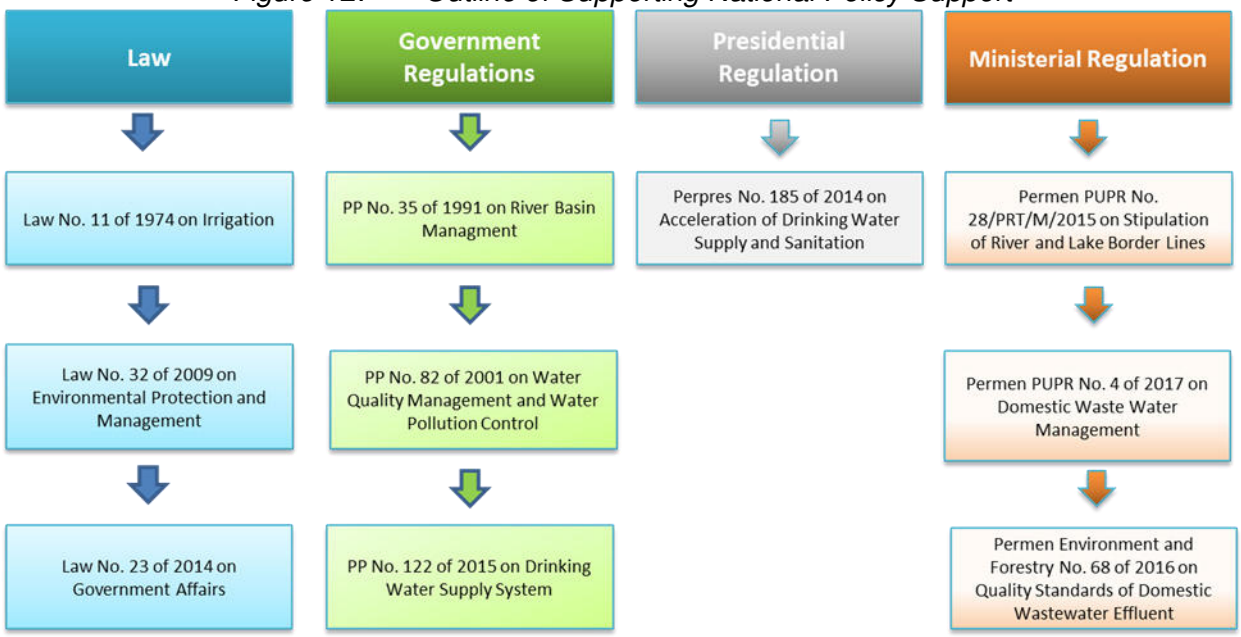
356. Sustainable use of water and related ecosystem services. Adequate collection, treatment, disposal/reuse of domestic wastewater represents a vital element of securing future raw water sources for domestic usage and irrigation purposes. About 60 to 70% of river pollution in Indonesia originates from untreated domestic wastewater and in Indonesia flow four of the 10 most polluted rivers in the world.

Current Governance Situation

357. In line with prevailing GOI regulations, local governments bear the overall responsibility for the provisions of sanitation services, which includes the collection, treatment and disposal of domestic wastewater. Several laws and national regulations are addressing environmental protection and the responsibilities for the development of domestic wastewater services. Conforming to legislative principles, these national policies address sector issues in a broader sense, leaving detailed arrangements to subsequent (and subordinate) regulation at provincial and/or local government levels, which represent the legal basis for empowering local agencies to act.

358. The immediate national policy structure for domestic wastewater management is outlined in the following chart. As such, legislation promulgated a local government level needs complying with all relevant national directions.

Figure 12: Outline of Supporting National Policy Support



359. Whilst the GOI has formulated national sector goals, such as Universal Access 2019, promulgated Law No 23 of 2014 on Local Government Affairs and the Ministerial Regulation No 4 of 2018 on Domestic Wastewater Management, the currently available strategy for the development and management of domestic wastewater services at local government level is encompassed the so-called 'City Sanitation Strategy' (SSK), which were developed, to date, for most of the Indonesian local government jurisdictions through the Bappenas driven Sanitation Development Acceleration Program (USDP). As such, the SSK is considered as the local

governments' benchmark document for gaining eligible access to central government funding for the development of sector related infrastructure and services.

360. Whereas the three participating cities have their SSKs and the so called 'memorandum' in place, which is mainly outlining their intended investment programs, the SSKs provide in all cases very limited directions on 'governance' and related directions for the development of equitable and sustainable domestic wastewater management services.

361. The following table provides a summary on current governance related conditions for the three participating local governments.

Table 51: Overview of Current Governance related Conditions

	Banda Aceh	Bekasi	Mataram
WWM Regulation (Perda)	Draft Qanun was not reviewed by DPRD because it is considered not a priority. However DLHK3 is willing to lobby for DPRD approval	Promulgated December 27, 2017	None to date
WWM Agency	Perwal in process, to be approved by Governor	UPTD PAL establish by PerWal No 18/2015, 15 April 2015	Department of Environment Perwali 53/2016 21 November 2016
RPJMD	Period of 2013 - 2018	Perda Kota Bekasi No 11 2013 for period of 2013 - 2018	Period of 2016 - 2021
Master Plan	Master Plan of 2012-2017 not approved by Ministry PUPR, but it is used for guidance	Master Plan of 2014 -2019 has approved by Ministry PUPR in November 2013 However, current SSDP planning not in compliance with Master Plan	Master Plan of 2016-2021 has not yet ratified due to communication problem between Ministry PUPR and Dinas LH
SSK	Approved in December 2013 for period of 2014 – 2019	Approved in December 2015 for period of 2016 – 2020	Approved in December 2016 for the period of 2017 -2021
RTRW	The revised RTRW for 2018 was approved by Kemen Agraria/BPN and its legalized by Qanun/Perda No 2/2018	The revised RTRW for 2019 still in process	The revised RTRW for 2018 is still reviewing by Kemen Agraria/BPN
PDAM			
Coverage	93%	32%	65%
Rating (PURP) [1)]	3.15 healthy	3.38 healthy	3.83 healthy
Other Indicators:			
Annual Budget 2017 for WWM	352 million	3.6 billion	146 million
Kota Fiscal Rating (MOF) [2)]	0.97 medium	0.68 medium	0.44 low
Sanitation Access [3)]	100% (2016)	89.72% (2014)	99.12% (2014)

[1)] max score = 5 [2)] max score= 2 [3)] LG Data

362. For advancing a 'good-governance' framework, local governments are obliged to promulgate, as a first and fundamental step, a local WWM specific domestic wastewater management regulation (Perda), which outlines the broader goals and strategies in support of the development of 'city-wide', equitable, and sustainable public domestic wastewater management services, by providing content to the following considerations:

- Permitting sector regulation in support of defining the broader purpose and targets of infrastructure and service developments, scope and level of service deliveries, rights and obligations of the parties (owner, service provider, and beneficiaries), tariff settings and regulation, and collaboration with the private sector and the civil society
- Harmonization of current sector specific planning procedures, including the local government's mid-term development plans (RPJMD), city sanitation strategy (SSK), sector Master Planning, and current spatial Plan (RTRW)
- Institutional settings, foremost the separation and development of regulatory and operational functions, the establishment and capacity development of a dedicated wastewater operator, and corresponding engagement with the community, CBOs, and the private sector in support of strengthening the service delivery chain, and
- Promulgation of fiscal policies, budget allocations, service tariff adjustments, sourcing of external funding, for sustaining the operations and maintenance of current and future infrastructure developments.

363. The most recent national governance direction is the PUPR regulation No 4 of 2017 on domestic wastewater management, which is now used by local governments as a reference for formulating their own wastewater specific Perda. The newly promulgated local government Perdas have a strong focus on technical issues and standards, without providing sufficient guidelines on necessary 'sustainability' issues, such as separation of policy, supervisory and operational functions, operations including scope of services and relevant needs for capacity building for the 'service provider', finance and tariff settings, social acceptance of services and community participation, gender and equality directions.

Immediate Governance Challenges

364. The immediate challenges for fostering the operational success and sustainable service deliveries to the communities of the intended SSDP infrastructure developments can be summarized as follows:

- **Waste water Management Perda:** Promulgation (Mataram), respectively revision of their current local regulation (Bekasi) / draft Perda (Banda Aceh on domestic wastewater management with a focus on the development of equitable 'city-wide' sanitation services for all, including the definition of institutional responsibilities, rights and obligations of involved parties - including the beneficiaries and communities at large, minimum service standards, and customer tariff structure and values. These issues are already addressed and broadly defined in the 'Domestic Wastewater Development Road Maps 2019 – 2023 for Mataram and Banda Aceh (both new) and Bekasi (update of existing Road Map).
- **PRJMD** (5-years Development Planning): As the period revisions of the RPJM represents a joint exercise of the executive and legislative branches of the local governments, a stronger focus of the development of equitable 'city-wide' sanitation services would trigger the advancement of an increased level of commitment at implementation level (technical departments and wastewater management operator alike).
- **Master Planning**: The notion of 'city-wide' sanitation services will require revisiting the current Domestic Wastewater Master Plan (Bekasi), and the Master Plan concepts for Banda Aceh and Mataram, by including, besides centralizes sewer services, the planning for decentralized systems and the gradual development of 'scheduled' desludging services for household and commercial septic tanks.
- **Institutional roles**: Address the separation of supervisory and operational responsibilities as part of regulation and development planning, including the formal establishment of supervisory functions that are also including community representation.

This would also include the establishment of joint operations between local government agencies and the civil society for fostering effective behaviour chance communication, community participation, and sanitation marketing efforts.

Other vital elements are the formal integration of the private sector into the service delivery value chain, foremost for the delivery of 'scheduled' desludging services for household and commercial septic tanks.

- **Service Delivery:** Current operation settings for the delivery of sanitation services to the communities strongly varies between the three participating local governments. Whereas a Mayor's regulation is in process in Banda Aceh, Bekasi established a distinguished wastewater operator in 2015, and the local government of Mataram assigned in 2016 sanitation service deliveries to the Department of Environment. As technical and administrative operational responsibilities will greatly increase with the construction of the intended sewered wastewater services, local governments are advised to use the newly established Wastewater Development Road Maps[42] as a reference for their respective annual planning activities.
- **Local Government Participation in SSDP:** Local governments are responsible for the provision of sanitation services to their constituents, which are currently implemented - to a limited number of households and business within the jurisdictions by their assigned domestic wastewater operator. It is therefore paramount for these operators and the related technical local government units for obtaining comprehensive insight during the SSDP design and construction stages, for gaining the necessary practical field experience that are required for the proper operations and maintenance of the scheme.

  A formal capacity development program will also comprise on-the-job training sessions for the wastewater operator for assuring their participation during critical construction activities of the SSDP project (e.g. laying of sewer, installation of mechanical and electrical equipment, and operational practices during the commissioning and handing over phase of the plants).

C. STAKEHOLDER COMMUNICATION STRATEGY AND PARTICIPATION PLAN

1. Stakeholder Communication Strategy

365. Stakeholder Communications Strategy (SCS) provides a framework for integrating strategic communication into the project, and is a requirement for the Project Administration Manual (PAM). The strategy includes advocacy, awareness raising and information dissemination, which can further serve the purposes of improved dialogue, fostering behavior change, confirming stakeholder support and mitigating risks. The project SCS (Appendix 5 of Volume 2) has been prepared according to the ADB guidelines[43], based on the findings from the Stakeholder Analysis.

The objectives of the SCS are:

366. Ensure stakeholder support for project implementation

367. Increase demand for wastewater services

368. Activities under Objective 1 include socialization and advocacy workshops and other events for leaders and government stakeholders, as well as coordination and work planning/progress review meetings within implementation partners/Pokja Sanitiasi (see the Stakeholder Analysis chapter in separate city reports and their appendices in Mataram Appendix 10 of Volume 4,

[42] Established in joint collaboration between C2 TA Consultant and LG representatives

43 ADB 2012: Strengthening participation for development results. An Asian Development Bank Guide to Participation

Bekasi Appendix 9 of Volume 6, and Banda Aceh Appendix 11 of Volume 8). Journalists and other media personnel can be engaged through press conferences and inviting the representatives to the events. Objective 2 concerns reaching out to the communities who will benefit from wastewater services. Partners for implementing these activities are presented in 'public awareness' chapter. The channels include inter-personal communication as well as mass-media; messages should be tailored for different target groups, applying behavior change communication methods. Both objectives are elaborated in detail under 'Public Awareness' chapter.

369. The analysis and implementation of objectives 1 & 2, including behavior change communication tools, are further elaborated under 'Output 3/Public Awareness' chapter in the city report and the main report. The analysis provides a snapshot of enabling environment and public demand for wastewater management services in the city, as well as the overview of stakeholder landscape for community outreach/public awareness campaigning. Proposed activities under Public Awareness/Capacity Development Plan relate directly to the SCS objectives 1 and 2, and their implementation in form of activities, timelines and cost estimates is further elaborated under the respective chapter in the city report.

2. Stakeholder Participation Plan

370. Participation of SSDP affected communities and stakeholders is essential to foster social inclusion. Participation Plan serves as a framework to guide the participation of Project stakeholders in project design and implementation. It is intended to lead to better design of projects, reduce risks and increase beneficiary impact for the targeted groups and strengthen local ownership.

371. Stakeholder Participation Plan is necessary given that:

- Social and environmental safeguards are considered significant: SSDP falls into Environmental category B[44], Resettlement category B[45];
- Level of consultation in SPRSS is 'Consultation' (M) at the least;
- Project design uses participatory elements such as partnerships for community outreach, feedback/complaint mechanisms, customer satisfaction surveys/ discussions and customer service contracts.

372. Based on the initial stakeholder analysis, we have assessed what level of participation (e.g., information generation and sharing, consultation, collaboration or partnership) is deemed appropriate for the Project, which stakeholders need be most actively involved in Project implementation, and what methods are best suited for the participation. The Participation Plan outlines the key stakeholder groups and participation methods focusing on implementation of community outreach, gaining public support and ensuring equitable treatment throughout the Project. Methods for involving negatively affected households are addressed separately in the LARP.

373. The objectives of SSDP stakeholder Participation Plan are listed below.

- Motivate households and private sector to install connections/improve facilities

[44] Project's potential adverse environmental impacts are site-specific, few if any of them are irreversible, and in most cases mitigation measures can be designed more readily than for category A projects.

[45] Project's involuntary resettlement impacts not deemed significant but requiring resettlement plans including assessment of social impacts

- Facilitate coordinated and timely outreach to communities in scale (city-wide approach)
- Improve community representation in project design and implementation

374. Participatory elements related to involuntary settlement and compensation of losses are dealt separately in the LARP.

D. POVERTY, SOCIAL AND GENDER ISSUES

1. Socio-economic Assessment

375. The project is identified as a targeted intervention Non-Income MDGs.[46] More precisely, the project falls under category MDG 7 (human development - basic infrastructure) which means that '*direct poverty alleviation measures are not part of the project design'.* [47]

376. As an integral part of the project design process, an in-depth Poverty and Social Analysis (PSA) has been carried out to assess the ways in which the eventual project could best promote inclusive growth and avoid or mitigate social risks and vulnerabilities, consistent with its technical and economic viability. The PSA has been coordinated with the technical and economic analysis, stakeholder consultations, consideration of alternative design options, and preparation of the final design.

377. Data collected for the PSA provides a basis for setting appropriate targets and indicators in the DMF and in any social action or mitigation plans. It also provides a baseline for monitoring of poverty reduction and social impacts of the project during implementation.

378. The PSA determines the socioeconomic characteristics of the target cities, including an analysis of poverty, social and gender issues and the socio-economic profiles of potential project beneficiaries. It is considered essential that the SSDP design promotes gender equality and social inclusion, enabling women and men, the poorest households, elderly, people living with disabilities and other disadvantaged groups to benefit.

379. In designing the Poverty and Social Analysis we have examined available secondary data from the Central Bureau of Statistics, the Integrated Database of the Program for Assistance to the Poor and the City Statistics Bureaus which are updated annually, and the results of the socio-economic survey. This chapter elaborates results of the Socio-Economic Survey and Focus Group Discussions.

Poverty

380. The Initial Poverty and Social Analysis of the SSDP identified the following:

a. Classification of the Project as Non-Income MDGs with regard to Poverty Targets;

b. About 80% of the target population is estimated to belong to the urban poor.

381. While the classification of the project is deemed appropriate due to the focus on centralized wastewater collection and treatment, service delivery system and public awareness campaigns, available secondary data and the results of the socio-economic survey revealed the assessment of 80% of the target population in the three cities belonging to the urban poor to be grossly overestimated. Related findings are elaborated in the following sections.

[46] Sewerage System Development Project: Initial Poverty and Social Analysis https://www.adb.org/projects/documents/ino-sewerage-system-development-project-ipsa

[47] ADB's Support for Achieving the Millennium Development Goals. Thematic Evaluation Study April 2013

Gender

382. The Project is classified as effective gender mainstreaming (EGM)[48]. Women are expected to benefit through special measures for subsidized connections and tariffs and increased participation in decision making if necessary.

383. A project is assigned EGM if the project outcome is not gender equality or women's empowerment, but project outputs are designed to directly improve women's access to social services, and/or economic and financial resources and opportunities, and/or basic rural and urban infrastructure, and/or enhancing voices and rights, which contribute to gender equality and women's empowerment.

384. The requirements for projects with an EGM classification include:

- the social analysis conducted during project preparation included careful consideration of gender issues highlighting both constraints and opportunities;
- specific gender design features are included in the majority of project outputs and/or components to facilitate and ensure women's participation and access to project benefits. Most of these outputs/components should have at least 3 gender design features and targets.

2. Design of the Poverty Reduction and Social Strategy and Gender Action Plan

Poverty concepts[49]

385. Central and local government agencies i.e., the Central Bureau of Statistics (BPS), the National Team for Acceleration of Poverty Alleviation (TNP2K), the Ministry of Social Affairs and the National Population and Family Planning Agency apply different criteria to measure poverty.

386. **The Central Bureau of Statistics** *(Badan Pusat Statistik, BPS)* uses the concept of basic needs approach. With this approach, poverty is seen as an economic inability to meet the basic food and non-food needs as measured by expenditure. The Poverty Line is the sum of the Food Poverty Line and the Non-Food Poverty Line. The population with average per capita expenditures per month under the Poverty Line is categorized as poor.

387. The Food Poverty Line represents the minimum food expenditure needs equivalent to 2,100 kilocalories per day. The basic food commodity package is represented by 52 types of commodities (whole grains, tubers, fish, meat, eggs and milk, vegetables, beans, fruits, oils and fats, etc.).

388. The Non-Food Poverty Line is the minimum requirement for housing, clothing, education and health. Commodities of non-food basic commodity packages are represented by 51 kinds of commodities in urban areas.[50]

389. Local Statistics Bureaus adapt the same methodology and use data of the National Socioeconomic Survey *(Survei Sosial Ekonomi Nasional, SUSENAS)* which is carried out every six months. They poverty line of each city is calculated based on local prices.

[48] Sewerage System Development Project: Initial Poverty and Social Analysis, see also https://www.adb.org/documents/guidelines-gender-mainstreaming-categories-adb-projects

[49] The SMERU Research Institute has carried out a study of the development of poverty indicators used by different government institutions over the past decades: Widjajanti Isdijoso, Asep Suryahadi and Akhmadi, Penetapan Kriteria dan Variabel Pendataan Penduduk Miskin yang Komprehensif dalam Rangka Perlindungan Penduduk Miskin di Kabupaten/Kota. Kertas Kerja SMERU September 2016.

[50] https://www.bps.go.id/subject/23/kemiskinan-dan-ketimpangan.html

390. **The National Team for Acceleration of Poverty Alleviation** *(Tim Nasional Percepatan Penanggulangan Kemiskinan, TNP2K)* maintains an electronic database system containing social, economic, and demographic information from about 40% of households with the lowest welfare status in Indonesia. This database is managed by the Integrated Data Management Team of the Ministry of Social Affairs *(Kemsos)*, the Coordinating Ministry of Human Development and Culture (*Kementerian Koordinator Pembangunan Manusia dan Kebudayaan Republik Indonesia)*, *BPS*, Directorate General for Population Administration and Civil Registration of the Ministry of Home Affairs *(Direktorat Jenderal Kependudukan dan Pencatatan Sipil Kementerian Dalam Negeri)* and the TNP2K Secretariat. The present Integrated Database of the Program for Assistance to the Poor *(Data Terpadu Program Penanganan Fakir Miskin, PPFM)* is the result of an update conducted in 2015 by BPS. The database contains data of approximately 92,994,742 inhabitants.[51]

391. **The Ministry of Social Affairs** defines poor households by applying a set of indicators which are not quantified.[52] As poor households:

a. have no source of livelihood and / or has a livelihood source but does not have the capability to meet basic needs;
b. have expenditures largely used to meet the consumption of staple foods very simply;
c. are unable or having difficulties to seek medical attention, except for Puskesmas or those subsidized by the government;
d. cannot afford to buy clothes once a year for every household member;
e. have the ability to only send their children to junior high school education level;
f. the house has a wall made of bamboo / wood / walls with poor condition / low quality, including obsolete / mossy walls or non-plastered walls;
g. the floor made of soil or wood / cement / ceramic with condition not good / low quality;
h. the roof is made of fibers / rumbia or tile / zinc / asbestos with conditions not good / low quality;
i. the house has no electricity or electricity without a meter;
j. the floor of the house is less than 8 m^2 / person; and
k. drinking water source are wells or unprotected springs / rivers / rainwater / others.

392. **The National Population and Family Planning Agency** *(Badan Kependudukan dan Keluarga Berencana Nasional, BKKBN)* rates families on a scale of 5 levels of prosperity based on 20 indicators:[53]

a. Pre-Prosperous Family Stage (KPS)

   A family that does not meet one of the six indicators of Family Welfare I (KS I) or indicator "basic family needs" (basic needs).
b. Stage of Prosperous Family I (KSI)

   A family that is able to meet the six KS I stage indicators but does not meet any of the eight indicators of the Prosperous Family II or the "psychological needs" indicator of the family.
c. Stage of Prosperous Family II

[51] http://www.tnp2k.go.id/id/data-indikator/data-terpadu-program-penanganan-fakir-miskin/tentang-data-terpadu/

[52] Keputusan Menteri Sosial Republik Indonesia Nomor 146/Huk/2013 tentang Penetapan Kriteria dan Pendataan Fakir Miskin dan Orang Tidak Mampu

[53] http://aplikasi.bkkbn.go.id/mdk/BatasanMDK.aspx

This is a family that is capable of fulfilling the six indicators of KS I and eight KS II indicators, but does not meet one of the five indicators of Family Welfare III (KS III), or "development needs" indicators (developmental needs) of the family.

d. Stage of Prosperous Family III

This is a family that is capable of fulfilling 6 indicators of Stage I, 8 indicators of Stage II, and five KS III indicators, but not fulfilling one of 2 indicators of Prosperous Family III Plus (KS III Plus) or the “self-actualization indicator” (self-esteem) of the family.

e. Stage of Prosperous Family III Plus

This is a family that is capable of fulfilling the overall of six KS I, eight KS II indicators, five KS III indicators, and two KS III Plus stage indicators.

393. The basic family needs indicators are:

- Generally, family members eat twice a day or more.
- Family members have different clothes for home, work / school and traveling.
- Family-occupied homes have good roofs, floors and walls.
- When a family member is sick he/she is taken to a health facility.
- If a fertile age couple wants to practice family planning they go to a contraceptive service facility.
- All children aged 7-15 years in the family attend school.

394. In carrying out the SES and related analysis we have applied the poverty concept of the Central Bureau of Statistics since it provides clear quantifiable data.

Gender Action Plan

395. The ADB guidelines for gender mainstreaming categories provide examples for gender inclusive design features[54]. We have screened the examples and identified the following features relevant to the SSDP and included relevant parts in the design of the GAP for the project:

a. Targets for women's participation and/or access to project/program benefits (e.g., education and training programs, formation of beneficiary groups such as water user groups; receipt of loans, scholarships/stipends, or other benefits); and/or for women representatives in project committees or local associations; and/or for the number or percentage of female staff in an executing agency or project implementation unit, or among extension workers, social mobilizers, nongovernmental organization (NGO) facilitators, etc.

b. Extension of equal opportunities to male and female community members to participate in project activities and benefit from skill development, employment, and/or other opportunities; and/or

c. Mobilization measures to facilitate women's participation in project activities; provision or preference for hiring women for project-related work (e.g., construction or maintenance of project facilities or labor for road construction); requirement of equal or fair pay for male and female workers.

d. Hiring of gender specialists to advise an executing agency or project implementation unit, or to work as project implementation staff.

[54] Guidelines for Gender Mainstreaming Categories of ADB Projects. Asian Development Bank 2012

e. Gender capacity-building components for executing agencies and project implementation units.

f. Use of sex-disaggregated data for project monitoring; and/or use of specific indicators to monitor and assess the gender impacts of a project/program.

3. Main Findings of the Socio-economic Survey

396. As part of the preparation of the project's Summary Poverty Reduction and Social Strategy Report, a socio-economic survey was carried out in each city to examine the socio-economic profiles of and key constraints faced by potential beneficiaries of the project within and outside the envisaged project areas, including relevant baseline data for poverty and social indicators.

397. In addition to a structured survey questionnaire, Focus Group Discussions (FGD) with selected target groups were carried out in order to provide insight on the specific issues, interests and concerns of the poor and vulnerable people as well as women and men.

398. The sample sizes for the survey were determined according to *Slovin's formula* which is widely used for calculating sample sizes with a confidence level of 95% and margin of error of 5%.

Table 52: Survey sample sizes

Banda Aceh			Sample
	Population	Hhs	95/5*
	250,303	62,322	397
Bekasi			Sample
	Population	Hhs	95/5
	2,733,240	607,387	400
Mataram			Sample
	Population	Hhs	95/5
	459,314	124,620	399
		Total	1,149

* *confidence level/margin of error*

399. A proportion of 2/3 of the total samples inside the project areas and 1/3 outside was determined. Considering the necessity to obtain relevant data for the preparation of the SPRSS and GAP, in order to ensure adequate representation of female headed and poor households for both the interviews and focus group discussions, the city coordinators consulted the respective *kelurahan* administrations to assist in identifying respondents.

400. The following paragraphs summarize the main findings of the survey and FGDs relevant to the preparation of the SPRSS and GAP. Detailed results are presented in the respective city SARs and related annexes.

Characteristics of Respondents

401. The proportion of male and female respondents varies from 52.1%/47.6% (Banda Aceh), 43%/57% (Bekasi) to 62.4%/37.6% (Mataram).

Table 53: Gender of respondents

Gender	Banda Aceh		Bekasi		Mataram	
	F	%	F	%	F	%
Male	208	52.4	172	43.0	249	62.4
Female	189	47.6	228	57.0	150	37.6

Total	397	100.0	400	100.0	399	100.0

402. The majority of respondents were heads of the household and/or the household head's spouse.

Table 54: Position of respondents in household

Position	Banda Aceh		Bekasi		Mataram	
	F	%	F	%	F	%
Household Head	199	50.13	204	51.00	296	74.19
Wife/Spouse	103	25.94	173	43.25	88	22.06
Daughter	40	10.08	10	2.50	9	2.26
Son	41	10.33	10	2.50	3	0.75
Parent of HH head	0	0	1	0.25	2	0.50
Brother/sister of HH head	10	2.52	2	0.50	0	0
Grandchild	0	0	0	0	1	0.25
Grandfather/mother	4	1.01	0	0	0	0o
Total	397	100.00	400	100.00	399	100.00

403. The majority of respondents are in the age group of 31 to 50 years.

Table 55: Age of respondents

Age interval	Banda Aceh				Bekasi				Mataram			
	Male		Female		Male		Female		Male		Female	
16 – 30	57	14.36%	25	6.30%	24	6.00%	8	2.00%	32	8.02%	3	0.75%
31 – 50	161	40.55%	52	13.10%	183	45.75%	37	9.25%	167	41.85%	33	8.27%
51 – 65	63	15.87%	29	7.30%	92	23.00%	30	7.50%	93	23.31%	42	10.53%
66+	5	1.26%	5	1.26%	14	3.50%	12	3.00%	20	5.01%	9	2.26%
Total	286	72.04%	111	27.96%	313	78.25%	87	21.75%	312	78.20%	87	21.80%

404. Average household sizes are 3.4 persons in Banda Aceh, 3.8 persons in Bekasi and 3.8 persons in Mataram with less than 10% of households with more than 5 members in all cities.

Table 56: Household size

Persons	Banda Aceh			Bekasi			Mataram		
	F	%	Total	F	%	Total	F	%	Total
1	65	16.37	65	12	3.00	12	13	3.26	13
2	78	19.65	156	52	13.00	104	67	16.79	134
3	92	23.17	276	107	26.75	321	86	21.55	258
4	97	24.43	388	130	32.50	520	111	27.82	444
5	38	9.57	190	56	14.00	280	83	20.80	415
6	19	4.79	114	37	9.25	222	23	5.76	138
7	5	1.26	35	5	1.25	35	10	2.51	70
8	3	0.76	24	0	0	0	2	0.50	16
9	0	0	0	1	0.25	9	4	1.00	36

Total	397	100.00	1,248	400	100.00	1,503	399	100.00	1,524

405. Educational levels are lowest in Mataram with 17% of respondents not having attended or graduated from primary school and 32% graduated from primary school. On the other hand the number of university graduates is highest in Banda Aceh with 17.6%.

Table 57: Education of respondents

Education	Banda Aceh		Bekasi		Mataram	
	F	%	F	%	F	%
Never School	21	5.29	23	5.75	68	17.04
Passed Elementary	22	5.54	109	27.25	127	31.83
Passed Junior High	109	27.46	111	27.75	69	17.29
Passed Senior High	170	42.82	107	26.75	93	23.31
Passed Vocational	5	1.26	37	9.25	8	2.01
S1	63	15.87	13	3.25	30	7.52
S2	7	1.76	0	0	4	1.00
Total	397	100.00	400	100.00	399	100.00

Socio-economic conditions of households

406. The most dominant main sources of household income are small trade and construction labor. Category “other” which is the most frequent consists of a wide variety such as household maid, security guard, parking attendant etc. The most common secondary source of income is small trade.

Table 58: Main household income source

Main income source	Banda Aceh		Bekasi		Mataram	
	F	%	F	%	F	%
Other	213	53.7	146	57.5	160	40.1
Small trade	77	19.4	92	36.2	82	20.6
Construction Labor	30	7.6	54	21.3	44	11.0
Big Trader	28	7.1	3	1.2	2	0.5
Pension/social protection	16	4.0	9	3.5	20	5.0
Fishery	9	2.3	1	0.4	32	8.0
No answer	9	2.3	56	22.0	0	0
Driver	8	2.0	33	13.0	27	6.8
Animal husbandry	5	1.3	0	0	1	0.3
Money from relative	2	0.5	6	2.4	31	7.8
Total	397	100.0	254	100	399	100

407. **Average** monthly household incomes are IDR 2,456,574 in Banda Aceh, IDR 2,969,325 in Bekasi and IDR 2,435,045 in Mataram. None of the households’ income exceeds IDR 10,000,000.

Table 59: Household income

	Banda Aceh	Bekasi	Mataram

Income group (IDR/month)	F	%	F	%	F	%
<=500.000	1	0.25	3	0.75	7	1.75
500.001–1.000.000	46	11.59	14	3.50	27	6.77
1.000.001–2.000.000	133	33.50	121	30.25	166	41.60
2.000.001–5.000.000	213	53.65	250	62.50	183	45.86
>5.000.000	4	1.01	12	3.00	16	4.01
Total	397	100.00	400	100.00	399	100.00
Average income	Rp 2,456,574		Rp 2,969,325		Rp 2,435,045	
Highest income	Rp 7,500,000		Rp 10,000,000		Rp 10,000,000	
Lowest income	Rp 500,000		Rp 450,000		Rp 300,000	

408. The highest **average** monthly expenditures are for food: 79.3% in Banda Aceh, 49.8% in Bekasi and 56.5% in Mataram. The highest variation as indicated by the Standard Deviation[55] was found in Banda Aceh.

Table 60: Household expenditures

Expenditures (IDR/month)	Banda Aceh	Bekasi	Mataram
	Mean	Mean	Mean
Food	903,249	1,151,250	1,242,361
Housing	58,285	311,718	22,473
Clothing	37,179	77,500	50,164
Education	86,650	193,903	155,061
Health	35,088	55,343	22,138
Water	103,664	67,156	45,403
Electricity	106,801	206,203	112,444
Gas	29,431	92,899	43,476
Transport	1,259	176,055	136,905
Body care	32,758	101,667	101,617
Communication	35,806	90,351	71,791
Debt payments	2,519	7,254	1,859,320
Credit payments	7,305	182,788	82,828
Other	37,154	120,698	17,853
Total	1,494,262	2,395,631	3,485,262

Table 61: Variation of average expenditures for food

Banda Aceh	Bekasi	Mataram

[55] The standard deviation is a measure that is used to quantify the amount of variation or dispersion of a set of data values. A low standard deviation indicates that the data points tend to be close to the mean of the set, while a high standard deviation indicates that the data points are spread out over a wider range of values.

N	Mean %	Std. Deviation	N	Mean %	Std. Deviation	N	Mean %	Std. Deviation
397	79.3671	29.07646	400	49.8166	17.68935	399	56.5870	20.47326

409. We have applied the poverty concept of the Central Bureau of Statistics for identifying poor households since it provides clear quantifiable data. According to the BPS the Poverty Line is the sum of the Food Poverty Line and the Non-Food Poverty Line. The population with average per capita expenditures per month under the Poverty Line is categorized as poor.

Table 62: Poor households

Poor	Banda Aceh		Bekasi		Mataram	
	F	%	F	%	F	%
Yes	51	12.8	64	16.0	124	31.1
No	346	87.2	336	84.0	275	68.9
Total	397	100.0	400	100.0	399	100.0

410. Compared to available official statistics, the proportion of poor households is much higher in all cities. While the official data for Bekasi are questionable, in Mataram 2/3 of the survey sample was taken in the prospective service area of the planned sewer system which comprised the *kecamatan* of Ampenan and Sukarbela where population density and poverty are relatively high.

Table 63: Official poverty data

	BandaAceh[56]	Bekasi[57]	Mataram[58.]
	2016	2015	2017
Poor persons	188,000	153,580	44,529
Percentage of poor persons	7.41	5.46	9.55
Poverty line (Rp)	541,732	472,148	428,754

411. We have applied the definition of female headed households as “households in which an adult female is the sole or main income producer”. With 12%, 9% and 19% the numbers in the samples are relatively high.

Table 64: Female headed households

Female headed	Banda Aceh		Bekasi		Mataram	
	F	%	F	%	F	%
Yes	48	12.1	36	9.0	76	19.0
No	349	87.9	364	91.0	323	81.0
Total	397	100.0	400	100.0	399	100.0

56 Kota Banda Aceh Dalam Angka 2017. Badan Pusat Statistik Kota Banda Aceh, August 2017

57 BPS Bekasi City

58 https://mataramkota.bps.go.id/dynamictable/2018/01/30/379/penduduk-miskin-menurut-garis-kemiskinan-kota-mataram-2008-2017.html

412. The proportion of poor female headed households varies substantially: Banda Aceh 2.1%, Bekasi 30.6% and Mataram 27.6%.

Table 65: Poor female headed households

			Banda Aceh			Bekasi			Mataram		
			Poor		Total	Poor		Total	Poor		Total
Female headed	Yes	Count	1	47	48	11	25	36	21	55	76
		%	2.1	97.9	100.0	30.6	69.4	100.0	27.6	72.4	100.0
	No	Count	50	299	349	53	311	364	103	220	323
		%	14.3	85.7	100.0	14.6	85.4	100.0	31.9	68.1	100.0
Total		Count	51	346	397	64	336	400	124	275	399
		%	12.8	87.2	100.0	16.0	84.0	100.0	31.1	68.9	100.0

413. Besides BPS poverty criteria, the status of the place of residence, the condition of houses and installed electricity capacity are indicators of the welfare of households. The majority of respondents own the house in which they live.

Table 66: Place of residence

Status	Banda Aceh		Bekasi		Mataram	
	F	%	F	%	F	%
Owned	263	66.25	234	58.50	363	90.98
Rental	126	31.74	152	38.00	14	3.51
Living with relatives	6	1.51	12	3.00	22	5.51
Other	2	0.50	2	0.50	0	0
Total	397	100.00	400	100.00	399	100.00

414. Most of the houses appear to be in fairly good condition.

Table 67: Condition of house

	Banda Aceh		Bekasi		Mataram	
	F	%	F	%	F	%
Walls						
Bamboo	0	0	4	1.0	8	2.0
Wood	138	34.8	35	8.8	3	0.8
Bad condition	6	1.5	128	32.0	15	3.8
Bricks not plastered	59	14.9	146	36.5	15	3.8
Plastered bricks	194	48.9	87	21.8	358	89.7
Total	397	100.0	400	100.0	399	100.0
Floor						
Wood	7	1.8	2	0.5	0	0
Concrete	292	73.6	113	28.3	147	36.8
Tiles bad condition	30	7.6	44	11.0	22	5.5
Tiles good condition	68	17.1	241	60.3	230	57.6
Total	397	100.0	400	100.0	399	100.0

	Banda Aceh		Bekasi		Mataram	
	F	%	F	%	F	%
Roof						
Palm fiber	1	0.3	11	2.8	1	0.3
Corrugated zinc	332	83.6	12	3.0	163	40.9
Asbestos bad condition	2	0.5	69	17.3	15	3.8
Asbestos good condition	62	15.6	287	71.8	28	7.0
Tiles	0	0	21	5.0	192	48.1
Total	397	100.0	400	100.0	399	100.0

415. In all cities, the vast majority of houses have installed electricity capacity in the lower level range (450VA and 900VA) with subsidized tariffs. The only city with a substantial number of households with higher capacity is Bekasi (28.8% with 1,300VA).

Table 68: Installed electricity capacity

Capacity	Banda Aceh		Bekasi		Mataram	
	F	%	F	%	F	%
450VA	164	41.3	84	21.0	167	41.9
900VA	202	50.9	197	49.3	182	45.6
1,300VA	17	4.3	115	28.8	47	11.8
2,200VA	4	1.0	4	1.0	2	0.5
3,500VA	6	1.5	0	0	1	0.3
4,400VA	3	0.8	0	0	0	0
5,500VA	1	0.3	0	0	0	0
Total	397	100.0	400	100.0	399	100.0

416. With numbers of participating households close to the proportion of poor households in the sample, implementation of the subsidized rice program appears to be adequate. This is not the case with the other welfare programs.

Table 69: Participation in welfare programs

Program	Banda Aceh		Bekasi		Mataram	
	F	%	F	%	F	%
Subsidized rice *(RASKIN)*	59	14.9	36	9.0	109	27.3
Smart Indonesia Program	5	1.3	12	3.0	10	2.5
Social Protection Card	11	2.8	4	1.0	35	8.8
Family Hope Program	1	0.3	4	1.0	22	5.5
Total	76		56		176	

Sanitation conditions and environmental health

417. Sources of drinking water vary substantially among the cities. With 65.24% bottled water is the dominant source in Banda Aceh, followed by Bekasi with 49.12%. PDAM water ranks highest in Mataram.

Table 70: Source of drinking water

Source	Banda Aceh		Bekasi		Mataram	
	F	%	F	%	F	%
Bottled water	259	65.24	196	49.12	85	21.30
Own well (Covered)	79	19.90	180	45.11	56	14.04
PDAM connection	56	14.11	2	0.50	219	54.89
Own well (Uncovered)	2	0.50	4	1.00	2	0.50
Public faucet	1	0.25	1	0.25	9	2.26
Public well	0	0	11	2.76	14	3.51
Other	0	0	5	1.25	14	3.51
Total	397	100.00	399	100.00	399	100.00

418. The vast majority of households in all cities have a water sealed toilet.

Table 71: Ownership of toilets

Toilet	Banda Aceh		Bekasi		Mataram	
	F	%	F	%	F	%
Water-sealed	344	86.65	349	87.25	367	91.98
Flush	49	12.34	14	3.50	15	3.76
Public toilet	3	0.76	27	6.75	3	0.75
Closed pit	1	0.25	4	1.00	4	1.00
None	0	0	1	0.25	5	1.25
Open pit	0	0	3	0.75	0	0
Other	0	0	2	0.50	5	1.25
Total	397	100.00	400	100.00	399	100.00

419. More than two thirds of the households have a septic tank to which black water is disposed of. On the other hand, grey water is mostly channeled to a drain near the house.

Table 72: Black water disposal

Black water disposal	Banda Aceh		Bekasi		Mataram	
	F	%	F	%	F	%
Own septic tank	289	72.80	264	66.00	359	90.0
Drainage	78	19.65	31	7.75	6	1.5
Water body	19	4.79	89	22.25	12	3.0
Other	6	1.51	9	2.25	12	3.0
Shared/communal septic tank	5	1.26	7	1.75	10	2.5
Total	397	100.00	400	100.00	399	100.0

Table 73: Grey water disposal

Grey water disposal	Banda Aceh		Bekasi		Mataram	
	F	%	F	%	F	%
Drainage	240	60.4	316	79.00	235	58.90
Own Septic tank	124	31.23	31	7.75	107	26.82

Water body	25	6.30	25	6.25	26	6.52
Other	7	1.76	27	6.75	27	6.77
Shared/communal Septic tank	1	0.25	1	0.25	4	1.00
Total	397	100.00	400	100.00	399	100.00

420. However, more than 90% of households in all cities said they never had their septic tank desludged or could not provide an answer. This clearly indicates that most of the septic tanks do not comply with standards.

Table 74: Septic tank desludging

Septic tank desludged	Banda Aceh		Bekasi		Mataram	
	F	%	F	%	F	%
Do not know/no answer	313	78.8	373	93.3	301	75.4
Never	50	12.6			70	17.5
Year specified	34	8.6	27	6.8	28	7.0
Total	397	100.0	400	100.0	399	100.0

421. The Focus Group Discussions revealed that most of the respondents were not aware of technical standards for septic tanks. Explanations provided by the moderators were welcomed. However, most of the respondents felt not being able to spend about IDR 4 million for installing a proper septic tank.

422. There are substantial differences among the cities related to perceptions of issues related to wastewater management conditions in the respondents' neighborhood. In Banda Aceh 82.6% of respondents see no problems. In Bekasi and Mataram almost one half of the respondents are of the same opinion.

Table 75: Issues pertaining to wastewater

Issue	Banda Aceh		Bekasi		Mataram	
	F	%	F	%	F	%
None	328	82.6	193	48.3	184	46.1
Bad smell	38	9.6	64	16.0	89	22.3
Many mosquitoes	10	2.5	22	5.5	91	22.8
Well contamination	7	1.8	10	2.5	9	2.3
River contamination	2	0.5	97	24.3	5	1.3
Health risk	8	2.0	3	0.8	2	0.5
Drains flooded	1	0.3	10	2.5	11	2.8
Environmental contamination	3	0.8	1	0.3	7	1.8
Other	0	0	0	0	1	0.3
Total	397	100.0	400	100.0	399	100.0

423. Most of the respondents perceiving issues are concerned, particularly about family members getting sick.

Table 76: Concern about issues

Concerned	Banda Aceh		Bekasi		Mataram	
	F	%	F	%	F	%

Very much	35	50.7	138	66.7	111	51.6
To some extent	30	43.5	66	31.9	96	44.7
Not at all	4	5.8	3	1.4	8	3.7
Total	69	100.0	207	100.0	215	100.0

Table 77: Impact on family health

Impact	Banda Aceh		Bekasi		Mataram	
	F	%	F	%	F	%
No impact	35	50.7	58	28.0	77	35.8
Family members get sick	34	49.3	149	72.0	138	64.2
Total	69	100.0	207	100.0	215	100.0

424. Contrary to these concerns, only a few family members contracted diarrhea during four months prior to the survey.

Table 78: Occurrence of diarrhea

Diarrhea	Banda Aceh		Bekasi		Mataram	
	F	%	F	%	F	%
Yes	4	1.01	16	4.00	28	7.02
No	393	98.99	384	96.00	371	92.98
Total	397	100.00	400	100.00	399	100.00

425. Respondents appear to be well informed about causes of diarrhea and measures to prevent it.

Table 79: Cause of diarrhea

Cause	Banda Aceh		Bekasi		Mataram	
	F	%	F	%	F	%
Germs	319	52.99	319	52.99	206	22.01
Dirty food	63	10.47	63	10.47	275	29.38
Poor hygiene	58	9.63	58	9.63	112	11.97
Flies	54	8.97	54	8.97	84	8.97
Dirty Hands	47	7.81	47	7.81	124	13.25
Dirty water	34	5.65	34	5.65	72	7.69
Do not know	11	1.83	11	1.83	21	2.24
Rain	7	1.16	7	1.16	17	1.82
Other	5	0.83	5	0.83	17	1.82
Part of child's growth	3	0.50	3	0.50	2	0.21
Open defecation	1	0.17	1	0.17	6	0.64

Table 80: Prevention of diarrhea

Prevention	Banda Aceh		Bekasi		Mataram	
	F	%	F	%	F	%
Wash hands with water and soap/ash	316	52.40	358	29.03	199	21.61

Prepare food properly (cooking, washing)	70	11.61	83	6.73	197	21.39
Drink clean water	53	8.79	115	9.33	178	19.33
Treating water	50	8.29	316	25.63	185	20.09
Covering food	42	6.97	282	22.87	88	9.55
Do not know	30	4.98	2	0.16	21	2.28
Prayer	22	3.65	7	0.57	0	0
Store water safely	3	0.50	23	1.87	11	1.19
Latrine use	2	0.33	28	2.27	15	1.63
No open defecation	2	0.33	6	0.49	9	0.98
Go to traditional healer	1	0.17	6	0.49	0	0
Proper wastewater management	0	0	5	0.41	11	1.19
Other	0	0	2	0.16	7	0.76

Interest in SSDP Service and Willingness to Pay

426. Knowledge about the SSDP Project: the respondents in Bekasi and Mataram mostly never heard about the SSDP project. Only in Banda Aceh 25% acknowledged to have received information about the project. Likewise, only in Banda Aceh a number of respondents have been invited to a meeting related to the project.

427. Connection to the sewer system: The vast majority of respondents in all cities acknowledged that it is very important or important to connect to the planned system. Expected benefits are better family health and no more problems with septic tanks.

Table 81: Importance of connection to the sewer system

Importance of sewer connection	Banda Aceh		Bekasi		Mataram	
	F	%	F	%	F	%
Very important	80	20.15	240	60.00	215	53.88
Important	311	78.34	144	36.00	180	45.11
Less important	3	0.76	16	4.00	3	0.75
Not important	3	0.76	0	0.00	1	0.25
Total	397	100	400	100.00	399	100.00

Table 82: Expected benefits of sewer connection

Benefits	Banda Aceh		Bekasi		Mataram	
	F	%	F	%	F	%
None	88	22.2	123	30.8	99	24.8
No problems with septic tank	237	59.7	173	43.3	107	26.8
Family healthier	72	18.1	104	26.0	193	48.4
Total	397	100.0	400	100.0	399	100.0

428. Despite acknowledging the importance of connecting to the planned systems, the proportion of households willing to pay for the connection is relatively low: 17.4% in Banda Aceh, 18% in Bekasi and 52.1% in Mataram. In all cities, most respondents are willing to pay IDR 50.000. Unfortunately, this is short of the costs of connection of about IDR 8 million as determined by the preliminary engineering design completed by Component 1. The average monthly household

incomes of less than IDR 3 million clearly indicate that the connection costs are far beyond reach of the households.

Table 83: Payment for sewer connection

IDR	Banda Aceh		Bekasi		Mataram	
	F	%	F	%	F	%
50,000	56	14.1	63	15.8	186	46.6
100,000	6	1.5	6	1.5	13	3.3
150,000					1	0.3
200,000	3	0.8			2	0.5
250,000			1	0.3	3	0.8
300,000			1	0.3	1	0.3
500,000	1	0.3	1	0.3		
550,000	3	0.8			2	0.5
Total	69	17.4	72	18.0	208	52.1

429. The proportion of households willing to pay monthly sewer fees roughly corresponds to the number of those willing to pay for the connection: Banda Aceh 12%, Bekasi 18% and Mataram 52%. The majority of respondents are willing to pay up to IDR 10.000.

Table 84: Monthly sewerage fees

IDR	Banda Aceh		Bekasi		Mataram	
	F	%	F	%	F	%
>10,000	43	91	51	71	180	87
15,000	2	4	12	17	14	7
20,000	1	2	4	6	10	5
25,000	1	2	5	7	4	2
Total	47	100	72	100	208	100

430. The proportion of households willing to pay monthly fees for scheduled septic tank desludging is also low: Banda Aceh 15%, Bekasi 17% and Mataram 50%.

Table 85: Septic tank desludging fees

IDR	Banda Aceh		Bekasi		Mataram	
	F	%	F	%	F	%
5,000	23	39	27	40	109	55
10,000	28	47	13	19	66	33
15,000	4	7	9	13	9	5
20,000	4	7	3	4	10	5
25,000			15	22	4	2
Total	59	100	67	100	198	100

431. More than half of the respondents claimed that decisions about sanitation facilities are made by both husband and wife. The highest proportion with 88% was found in Bekasi.

Table 86: Decisions on sanitation facilities at home

Making decisions	Banda Aceh		Bekasi		Mataram	
	F	%	F	%	F	%
Husband	179	45,09	33	8,25	113	28.3
Wife	5	1,26	12	3,00	65	16.3
Both	213	53,65	355	88,75	221	55.4
Total	397	100,00	400	100,00	399	100.0

432. However, approval for expenditures is clearly dominated by husbands in Banda Aceh (80%).

Table 87: Approval for wastewater expenditures

Approval	Banda Aceh		Bekasi		Mataram	
	F	%	F	%	F	%
Husband	319	80,35	24	6,00	28	7.0
Wife	3	0,76	17	4,25	41	10.3
Decide together	75	18,89	359	89,75	330	82.7
Total	397	100,00	400	100,00	399	100.0

4. Gender Aspects of Staffing of Local Government Institutions

433. We have carried out a detailed inventory of staff of Local Government institutions[59] to be involved in the implementation of the project, i.e.:

- Regional Development Planning Agency (BAPPEDA)
- Department of Public Works (Dinas Pekerjaan Umum)
- Department of Environment (Dinas Lingkungan Hidup)
- Department of Health (Dinas Kesehatan).

434. Data collected comprise:

- Gender
- Position
- Education.

435. The following table summarizes a basic breakdown of staff (civil servants, not including contract staff) of relevant LG institutions. The lowest percentage of women was found in the Public Works departments, while women dominate in the Health Departments. This summary does not account for the rank of staff. Generally, the proportion of men tends to be higher in higher ranks.

Table 88: Gender ratio of LG institutions

	Banda Aceh			Bekasi			Mataram		
	Men	Women	% of women	Men	Women	% of women	Men	Women	% of women

[59] The nomenclature of departments varies among the cities

BAPPEDA	21	27	56	18	14	44	19	13	41
Public Works Department	60	18	23	58	32	36	82	29	26
Environmental Department	14	6	30	30	14	32	122	18	13
Health Department	27	49	64	30	60	67	24	55	70

436. It has to be noted that there are clearly defined criteria for the positioning of civil servants comprising education, years of service etc.[60]

5. Basic Considerations for Poverty Reduction and Social Strategy and Gender Action Plan

Poverty Reduction and Social Strategy

437. According to official statistics, up to 10% of the population in the target cities live below the poverty line. Most, including the poor, women, and vulnerable groups, lack proper sanitation and wastewater treatment, and experience related to pollution and health problems due to the lack of infrastructure and hygiene. The SES found even higher percentages of poor households: Banda Aceh 12.8%, Bekasi 16.0% and Mataram 31.1%. More than 70% of all households covered by the SES have septic tanks but more than 90% of those do not comply with standards. Most of the grey water is disposed of to drainage channels and water bodies.

438. The project is designed to contribute to increased access of the population to adequate on- and off-site wastewater collection and treatment facilities in the three cities. Upon completion, the program will directly benefit about 330,000 people in the immediate subproject areas in the three cities (including all 3 phases of the project in Mataram) through connections to off-site wastewater treatment systems, improvements to on-site facilities, and improved hygiene, living conditions, and environmental quality. The provision of adequate off-site and on-site wastewater management facilities is expected to indirectly contribute to poverty alleviation.

439. The results of the SES and Focus Group Discussions indicate that two key issues need to be addressed to achieve the targeted number of property connections to the sewer system and improvements of on-site wastewater treatment facilities: (i) making sewer connections, improvements of on-site facilities and monthly fees affordable, and (ii) creating an understanding of technical aspects of property connections and on-site facilities and higher awareness of benefits.

440. Experience from previous wastewater projects in the country, e.g., SANIMAS shows that besides “conventional” social marketing media, involvement of members of management committees of community-based wastewater treatment systems and visits to functioning systems whereby potential beneficiaries of the new project can learn from the experience of households connected to the system can be a highly efficient promotion tool. The Stakeholder Participation Plan and Stakeholder Communication Strategy includes related activities.

441. Other poverty and socially inclusive design features are to (i) promote increased awareness of hygiene and sanitation among local residents, including the poor to foster positive behavior change that improves environmental conditions and health; (ii) promote employment opportunities

[60] Peraturan Kepala Badan Kepegawaian Negara Nomor 35 Tahun 2011 Tentang Pedoman Penyusunan Pola Karier Pegawai Negeri Sipil

during construction for poor and low-income people, and (iii) ensure participation in implementing structures or working groups on sanitation and on land acquisition and resettlement.

Gender Action Plan

442. We have examined the results of the socio-economic survey and the inventory of LG staff based on relevant ADB guidelines related to gender and come to the conclusions as follows:

a. Toilets with septic tanks or closed pits and their regular use are now widespread, and both men and women prefer household sanitation facilities to public ones.

b. There is almost no experience with piped sewerage systems and little or no public awareness of the benefits of such systems.

c. Both women and men are aware of the problems caused by inadequate wastewater management. While in the majority of households' decisions about sanitation facilities are made jointly by husband and wife, most of them are unable to afford substantial improvements.

d. The SES identified between 9 and 19 percent of female headed households in the areas surveyed, about 30% of which are categorized as poor.

e. Women are quite supportive of improvements to sanitation facilities and can be expected to participate in leadership positions during community participation.

f. The Project has potential to make a contribution to the promotion of gender equity and/or empowerment of women by providing women's access to and use of opportunities, services, resources, assets, and participation in decision making.

443. Proposing quantitative targets for increasing female staff of relevant LG institutions does not appear to be appropriate considering existing regulations explained above. Nevertheless, the detailed data compiled through the inventory of LG staff should be considered for capacity development measures during the implementation of the project.

444. The strong commitment of the Ministry of Public Works and Housing (MPWH) for gender mainstreaming is widely recognized in Indonesia due to Directorate of Human Settlements (DGHS) constant and significant contributions. In 2013, DGHS through the Secretary of the Directorate General, initiated the development of a Guidance for Gender Integration in the Institutional-Based Wastewater Management Program that is used as the main reference for infrastructure development projects financed through GOI.

Key actions

445. The SSDP gender strategy will facilitate women's participation in and benefits from the project through implementation of the Gender Action Plan (GAP). The plan was developed utilizing examples from other wastewater management projects and data from the Socio-economic survey. The common target in many GAPs of increasing the proportion of female staff in government institutions at all levels is considered inadequate since government agencies' staffing policy cannot be expected to be changed due to a single project. Moreover, the Government is already implementing gender mainstreaming policies as referred to below.

Implementation and Monitoring Arrangements

446. Implementation of the GAP shall be carried out in the wider context of existing regulations and efforts aimed at promoting gender equity. As to general gender issues, there are specific regulations on gender mainstreaming. The Presidential Decree No. 9 of 2000 *(Instruksi Presiden Republik Indonesia Nomor 9 Tahun 2000 tentang Pengarusutamaan Gender dalam*

Pembangunan Nasional) and subsequent regulations, e.g. *Peraturan Menteri dalam Negeri Nomor 15 Tahun 2008 tentang Pedoman Umum Pelaksanaan Pengarusutamaan Gender di Daerah sebagaimana telah diubah dengan Peraturan Menteri Dalam Negeri Nomor 67 Tahun 2011 tentang Peraturan Menteri Dalam Negeri Nomor 15 Tahun 2008 tentang Pedoman Pelaksanaan Pengarusutamaan Gender di Daerah (Berita Negara Republik Indonesia Tahun 2011 Nomor 927), Pedoman Teknis Perencanaan dan Penganggaran Responsif Gender Bagi Daerah. Kementerian Pemberdayaan Perempuan dan Perlindungan Anak Republik Indonesia, 2010*.

447. The PMUs and the Service Delivery Organizations will be responsible for implementing, updating and monitoring the GAP in coordination with existing LG agencies such as *Dinas Pemberdayaan Perempuan, Perlindungan Anak dan Pemberdayaan Masyarakat* responsible for overall gender mainstreaming. A national Gender and Social Development Specialist shall support the central and local project management units (PMU) and Service Delivery Organizations to ensure that the GAP and social strategy agreed between the Government and Asian Development Bank are fully implemented.

448. Sex-disaggregated baseline data and monitoring indicators will be used in quarterly reports to provide GAP progress updates. Gender issues and impacts will be discussed in mid-term reviews and regular progress reports submitted to ADB.

GAP Budget

449. The GAP is integrated into the overall cost estimates and project implementation arrangements The Government of Indonesia will provide sufficient resources to implement the GAP within the PMU and across all responsible agencies and sewerage development organizations as they are established. The budget for the GAP is integrated within the overall Project budget.

E. ENVIRONMENTAL SAFEGUARDS

450. The three Project plans in Mataram, Bekasi and Banda Aceh were assessed according to environmental safeguards set in ADB Safeguard Policy Statement (2009) and subjected to climate and disaster screenings following ADB 2016 guidelines on Climate Proofing Water Supply and Sanitation Investment Projects.

451. The assessments were conducted by undertaking Rapid Environmental Assessments (REAs) and field appraisal visits to all plan sites, collecting and analyzing existing information and data, climate screening (with AWARE and applying localized climate information from Climate Change Knowledge Portal[61] and Indonesia Climate Change Sectoral Roadmap 2010), GIS analysis (InASAFE for disaster risks and Integrated Biodiversity Assessment Tool for biodiversity), conducting agency interviews and through participatory events (Focus Group Discussions) with a total of 140 participants in five events held as part of undertaking Initial Environmental Examinations (IEEs) for all three Plan sites in July-August 2018.

452. The environmental assessments undertaken for each of the three Project plans in Mataram, Bekasi and Banda Aceh indicate that the three Project plans for building and managing wastewater treatment plants (WWTP), sewerage systems and on-site sanitation, can be implemented in an environmentally sustainable manner without significant negative impacts. Therefore SSDP falls under ADB Category B requiring IEEs for subprojects. Accordingly, three

61 http://sdwebx.worldbank.org/climateportal

IEEs were carried out, one for each the Project plan area, where the mitigation measures are set for each identified impact according to the Project implementation phase.

453. Each of the three Plan areas requires undertaking a full Indonesian EIA process (AMDAL) following GOI regulations. Following the IEE findings, the Indonesian EIAs should be amended with additional studies and recognize also the environmental safeguards set in the Environmental Management Plans (EMPs) in the three Project plan areas as defined in the IEEs in more detail with cost-estimates and main responsibilities.

454. Based on the environmental assessments, two sites in Bekasi currently suggested as WWTP sites (namely Perumnas and Rusunawa) are recommended to receive still further re-consideration aimed at finding other alternative sites due to the immediate proximity of residential housing and livelihoods, significant cultural values, spatial planning reservations and unclear landownership issues. If the planning proceeds as currently proposed for WWTPs in Perumnas and Rusunawa, the impact concerns would require full Indonesian EIA undertaken up-to ADB EIA standards including compensations due to the impacts on housing, livelihoods and cultural values.

455. The individual IEEs contain also the Grievance Redress Mechanism (GRM) proposed for SSDP and the findings of the participatory consultations analyzed and incorporated into the EMPs where relevant. Similarly, the main events for participation and consultations suggested for SSDP are outlined in the IEEs per city.

456. The climate and disaster screenings indicate that two of the Project plan areas, namely Mataram and Banda Aceh, are in high risk requiring separate Climate Risk and Vulnerability Assessment (CRVA) including preparation of TORs recommended to be conducted as a separate assessment given the insufficient resources available in this Project. In Bekasi, CRVA would be beneficial but not necessary.

457. Currently the Environmental Agencies and Public Works offices in each of the three cities have very limited capacities for ensuring conduct of the required surveys and environmental monitoring set as part of the safeguard framework in the three IEEs. The environmental management staff includes typically 3-5 staff members issuing AMDALs and undertaking environmental monitoring. Of this staff, only 1 or none have been formally accredited (the one accredited staff member works in Bekasi).

458. The EMPs are therefore recommended to be either partially or fully outsourced to service providers such as consultants and accredited laboratories. To further strengthen the institutional capacity for SSDP implementation, dedicated trainings for the set safeguards have been outlined separately as part of this SSDP preparation with cost estimations.

459. The key findings for each SSDP city can be summarized as follows:

1. Mataram

460. Based on the assessment, the Mataram WWTP site location in the rice field would cause less impacts and be less vulnerable to risk factors than the seashore site making it a preferred WWTP site. Similarly, the current WWTP system design would benefit from additional technology for methane capture and possible use as biogas (or flaring/venting), and denitrification the nitrogen gases to reduce GHG emissions of the system suggested in Component 1.

461. The IEE undertaken for Mataram identifies the main potential impacts of the Project per each component as well as climate and disaster risks to be addressed through planning, construction and operation with mitigation measures in detail. All of the potential impacts identified

can be effectively mitigated meaning that the Projects is not expected to have any adverse or irreversible negative impacts although some information needs further assessments carried out in the ESP such as terrestrial ecological surveys, marine ecology survey of the sea area and very importantly in case the seashore WWTP site will be selected, assessment of potential soil and groundwater pollution and their further remediation requirements that can become highly costly and possibly cause issues regarding remediation responsibilities.

462. With the designed EMP, the Project can be implemented in an environmentally sustainable manner and classified into Category B without full EIA being technically justified. However, in addition to AMDALs, also complementing studies are still needed in the ESP stage that are specified in the full IEE report.

463. Mataram Project plan area was subjected to Initial Climate Screening as per ADB's screening checklist and Project climate screening with AWARE where initial screening suggests high climate risk and screening with AWARE medium climate risk. The main climate concerns in Mataram are sea level rise, floods and high waves from the sea that occur already annually up to 5 meters from October to March.

464. According to ADB 2016 guidelines on Climate Proofing Water Supply and Sanitation Investment Projects, the preliminary climate screening and scoring, AWARE screening results and climate assessment based on local data and projections on rains and temperature indicate that Mataram requires a separate Climate Risk and Vulnerability Assessment (CRVA).

2. Bekasi

465. In Bekasi, based on the alternative's assessment of WWTP site locations, the Rawapasung site causes least impacts that can be all mitigated by standard construction and operational practices and technological solutions making it the preferred WWTP site.

466. WWTP implementation in the sites proposed in Perumnas and Rusunawa can cause significant impacts on housing and livelihoods as well as cultural values next to the site (Perumnas) why consideration of other alternative sites is still recommended. In case the planning proceeds for these two sites, there will be involuntary relocation and resettlement as well as compensation needs for losses of livelihoods and property that need to be addressed.

467. Of the Project components in Bekasi, the WWTP sites being less than 3 hectares including septage treatment facilities, pumping station locations and sewerage system for a population of 51,600 do not require full Indonesian EIA assessment process (AMDAL) but only UKL/UPL preparation to obtain an Environmental License. However, the on-site sanitation services require full Indonesian EIA (AMDAL) as the Project area coverage is over 3 hectares.

468. Given the WWTP site locations and main sewerage networks are all located in and next to highly populated residential areas where potential impacts can affect a large population, it is recommended that all the components will be subjected to one AMDAL to allow for more comprehensive assessment that has been costed accordingly in the Bekasi Environmental Management Plan. At the time of reporting, Bekasi is considering three site locations for the WWTP (in Rawapasung, Rusunawa, Perumnas) adding into an unclear situation concerning the complete finalized Project plan why a full Indonesian EIA is also recommended.

469. The IEE produced for Bekasi identifies the main potential impacts of the Project per each component as well as climate and disaster risks to be addressed through planning, construction and operation with mitigation measures with the set EMP. The identified potential impacts can be mitigated meaning that the Project is not expected to have adverse or irreversible negative

impacts although further studies and assessments need to be carried out in the ESP such as for example terrestrial ecological surveys.

470. With the exception of recommending further alternative sites to Rusunawa and Perumnas WWTP sites, with the designed EMP the Project can be implemented in an environmentally sustainable manner for Rawapasung WWTP site and classified into Category B without full EIA technically required. For Rusunawa and Perumnas WWTP sites, further consideration of alternative site locations and undertaking a full AMDAL meeting the requirements of ADB EIA are recommended in case the planning proceeds in these two sites. In any case, undertaking a full AMDAL covering the whole plan area with complementing studies are needed as part of ESP.

471. According to Initial Climate Screening with ADB's screening checklist and Project climate screening conducted with AWARE, Bekasi Project plan is estimated to be in moderate risk. The plan would benefit from an additional CRVA although it is not deemed necessary based on the risk class.

472. The main climate impacts in Bekasi are associated with i) increased urban flooding resulting from rain induced runoffs and the non-regulated rivers flowing through the city that were observed to be filled in their full capacities during a site visit in February (outside the rainy season), ii) runoff changes that the flooding and inundation can cause in the planning area (modified by installations and civil work excavations), that include a risk of releasing pollutants including heavy metals from the soils resulting from current industrial manufacturing operations, iii) structural damages caused by storms and increased wind velocities and iv) increased temperature change impacts through corrosion of materials and microbial reaction time changes of the waste water treatment.

473. One of the main missing mitigation and adaptation measures for climate change in the current plans noted in Bekasi is drainage solutions required for increased rainfalls and associated floods that have not been recognized in the current project plans. It is therefore recommended that that enhanced urban drainage solutions are included into the overall Bekasi plans in ESP.

3. Banda Aceh

474. In Banda Aceh, the Project plan includes WWTPs proposed to be built on two fixed planning sites (Blang Oi and Tibang) that have relatively similar potential set of impacts and risks that can be mitigated with planning, site designs, construction and maintenance why no comparison of alternative sites was conducted. In other words, both proposed sites are considered equally suited as WWTP sites where potential impacts and risks identified can be mitigated.

475. Of the Project components in Banda Aceh, the WWTP sites being over 3 hectares and associated sewerage systems require full Indonesian EIA assessment process (AMDAL). Similarly, the on-site sanitation services require full Indonesian EIA (AMDAL) as the Project area coverage is over 3 hectares.

476. One of the main environmental management issues in Banda Aceh Project plan sites is the preservation and planting of mangroves given both the WWTP sites are located in suited mangrove habitats, in areas formally classified as mangrove areas in the Banda Aceh spatial plan and currently classified as Green Open Space (RTH) requiring spatial plan revisions. As field observations indicated active removal of mangroves having occurred until recent place in the nearby sites, the WWTP site planning requiring mangrove preservation, planting and active management is likely to have a positive impact on the mangroves in the sites.

477. Tibang WWTP site has currently mangroves growing in the riverbanks and both proposed WWTP sites are suited habitats for *olive-backed sunbird,* bird species protected by Indonesian legislation recorded occurring nearby the plan sites in Banda Aceh City Forest indicating a

possible occurrence of the bird species as well as other protected or endangered species. Blang Oi site is inundated daily with seawater through channels and dam regulation requiring additional localized hydrological planning and flood prevention as part of any site design.

478. The IEE conducted in the Banda Aceh identifies the main potential impacts of the Project per each component as well as climate and disaster risks that need to be addressed through planning, construction and operation with mitigation measures. These potential impacts identified can be mitigated with the set EMP meaning that the Project is not expected to have adverse or irreversible negative impacts. However, some further assessments need to be carried out in the ESP such as terrestrial and aquatic ecological surveys.

479. With the designed EMP, the Project can be implemented in an environmentally sustainable manner and classified into Category B without full EIA being technically justified. However, in addition to the full AMDAL, also complementing studies are still needed in the ESP stage that are specified in the full IEE report.

480. The Initial Climate Screening with ADB checklists and AWARE screenings for climate and disasters suggest Banda Aceh Project plan area is in high risk. In addition to these, also further assessments with local data and projections on rains and temperature indicate that Banda Aceh requires a separate Climate Risk and Vulnerability Assessment (CRVA).

F. SOCIAL SAFEGUARDS

481. The principle objectives of the ADB policy on land acquisition and involuntary resettlement is to (i) avoid involuntary resettlement wherever feasible; and (ii) minimize resettlement where population displacement is unavoidable, and ensure that displaced people receive assistance, preferably under the project, so that they would be at least as well-off as they would have been in the absence of the project.

482. Identification and social mitigation of involuntary resettlement is a vital aspect during project preparation. The three important elements of involuntary resettlement are (i) compensation for lost assets and loss of livelihood and income, (ii) assistance for relocation including provision of relocation sites with appropriate facilities and services, and (iii) assistance for rehabilitation to achieve at least the same level of well-being with the project as without it.

483. In line with the requirements of ADB's Safeguard Policy Statement, the consultant has prepared a Resettlement Framework (see Volume 2 Appendix 10).

484. For SSDP infrastructure component locations that require relocating of people, appropriate land acquisition and resettlement planning has been prepared as an integral part of project preparation and design, which included the following steps:

1) Assessment of prospective project locations and coordination with relevant stakeholders of city government and technical expert from SSDP Consultant;
2) Public consultation meetings (PCM) with the affected households and relevant stakeholders, and also disclosure of the project plan through leaflet of project information.
3) One of the PCM objectives is to obtain an agreement to conduct a socio-economic survey (SES) and inventory of loses (IOL) to the affected households;
4) The SES and IOL result data were analyzed and included in the LARP Documents.
5) Relocation, appropriate land acquisition and resettlement planning prepared based on inputs from city governments;

6) Draft LARP Documents have been prepared and disclosed through Focus Group Discussions (FGD) to absorb inputs and corrections, followed by approval from stakeholders of city government.

485. The following is a summary of the features for the three candidate SSDP cities, comprising: location, status and number of owners, buildings, other relevant Information, and a summary of critical issues.

1. Mataram City

486. Several options for WWTP location were considered and later abandoned due to land ownership issues, presence of a sacred site or planned nearby housing developments. In November 2017 it was decided to locate the WWTP in Tanjung Karang. The location has good elevation, clear ownership, and is available because there is already a commitment / statement letter from PLN (of February 6, 2017), stating that PLN will purchase the land as Green Open Space (RTH) replacement for a land that it is using for developing a Gas and Steam Power Plant. The location in Tanjung Karang is technically the best as the elevation is low, has the least social issues and affordable for the city as the land would be purchased by PLN. However there is still a risk that no agreement between the Government of Mataram and PLN will be reached as PLN wants to participate in managing the land in Tanjung Karang as green area.

487. The initial findings of suitable land acquisition required for Mataram are presented in the following table.

Table 89: Initial findings of suitable land acquisition required for SSDP in Mataram

No	Location of Assets	Units	Remark
1. WWTP			
a.	Land at Tanjung Karang Village, Sekarbela Sub District, Mataram	7 ha	Owned by Local Company PT Varindo Lombok Inti
b.	Semipermanent structures of fishermen settlements	11 structures	
2. Pump Stations (PS)			
a.	The banks of the Jangkuk River, Ampenan Tengah Village – Sukaraja, Ampenan sub-district (PS 1)	100 m²	Land is owned by 4 people of which one refuses to sell the land.
b.	Bagik Kembar area of Tanjung Karang Permai village of Sekarbela sub-district (PS 2)	100 m²	Food crop land.
3. Along pipeline installation			
	Temporary impact during construction excavations: fences, walls along the pipeline installation Mataram City	78 temporary structures	Communities' assets along the pipeline will be disturbed by construction activities as the road sections are narrow.

Critical issues in Mataram City:

488. To make sure all related stakeholders are aware of the SSDP, Public Consultation Meetings (PCM) has been conducted on March 21, 2018. The PCM was attended by the relevant agencies (PUPR Mataram, Bappeda, LH Service), Camat, kelurahan, community leaders and the affected communities at the potential WWTP site. All stakeholders of Mataram City, including 11 households who will be relocated are very supportive of this project. Meanwhile consultations with

PLN were carried out by a special committee (Pansus) of the DPR and consultations with owners of land to be purchased by PLN was carried out by the chairman of Bappeda.

489. To clarify some critical issues addressed in the LARP document, a Focus Group Discussion (FGD) was conducted on April 24, 2018 to disclose the Draft LARP Document. This FGD was attended by the relevant agencies (PUPR Mataram, Bappeda, Environmental Department, Social Department), Camat Sekarbela, Village Heads of Tanjung Karang and Tanjung Karang Permai. Issues discussed were:

1) The land has been plotted in the revised spatial plan as RTH (open space area) which makes it possible to build the WWTP, but the spatial plan revision awaits recommendation from the Ministry of Land and Spatial Planning;
2) The project plan is in accordance with the RPJMD of Mataram City;
3) Budget for relocation 11 HHs and land acquisition for pump stations will be covered by APBD Mataram City;
4) Bappeda Mataram City will lead the land acquisition process for the WWTP;
5) The Mataram City Government is committed to finish the land acquisition process by mid-2019;
6) The 11 households in the WWTP area will be relocated to an apartment building (Rusunawa) to be builti n Fiscal Year 2019. While awaiting apartment construction, there are two options for the families:
   a. they can be temporarily transferred to Rusunawa Turida, Turida Village, Sandubaya Sub-district, Mataram City owned by Mataram City Government, or
   b. the project provides temporary houses/ camp, to be built around the WWTP site in order to enable Aps to participate in WWTP construction activities.

490. ADB and PUPR on May 11, 2018 confirmed readiness land acquisition process in Mataram City, some critical points agreed are as follows:

1) The City Government of Mataram will prepare a declaration letter of PLN (UIP Nusra) regarding commitment to purchase 9.7 ha of RTH land within it including 7 ha for the WWTP in Tanjung Karang, Sekarbela Sub-district. When it has been purchased by PLN, the right of use of that land will be assigned to the Mataram City Government.
2) According to the latest information, the land of the consortium of PT Cogindo Dayabersama and PT Penta Prima Power has already been bought by local company (PT. Varindo Lombok Inti). Therefore, the Mataram City Government will prepare a statement to PT. Varindo Lombok Inti about the land to be purchased by PLN UIB Nusra.
3) The Municipal Government of Mataram will send a letter to the Director PLP PU Cipta Karya to inform status of land acquisition progress for WWTP candidate that located in Tanjung Karang Sub-District of Sekarbela Sub-district and to inform action plan on land acquisition process for WWTP, including indicative of the time frame.

491. Land status of WWTP Mataram City is summarized in below table.

Table 90: Mataram City Land Status for WWTP

Land Requirement	Land Status	Spatial Plan Status
WWTP Tanjung Karang,	This land belongs to PT Varindo Lombok Inti and is to be purchased by State Electricity Company/*Perusahaan Listrik Negara* (PLN) cq. Master Units of Development /*Unit Induk Pembangunan (UIP) Nusa Tenggara (Nusra)* for replacement of green open space (*Ruang Terbuka*	The land has been plotted in its designated spatial plan as RTH (open space area) that possible to

Sekarbela (±7 Ha)	*Hijau (RTH)* that is used by PLN for Developing Gas and Steam Power Plant nearby.. The budget for purchasing this land is available in PLN UIP Nusra, but for execution this budget awaits legal opinion from PLN Center (Jakarta).	be built WWTP, but the spatial plan revision awaits recommendation from the Ministry of Land and Spatial Planning.

492. The LARP document for Mataram City is presented in an appendix to the SAR of Mataram City.

2. Bekasi City

493. The initial findings of land acquisition required for SSDP Bekasi City is presented in the following table.

Table 91: Initial findings of land acquisition required for SSDP Bekasi City

No.	Location of Assets Impacted	Unit	Remark
1. WWTPs			
a.	Perumnas 1 area with area of ± 3.000 m² Kranji Subdistrict, West Bekasi Subdistrict.		70 permanent and semi permanent structures and 33 empty structures (Perumnas I).
b.	Rawa Pasung	0.8 ha	Land owned by the City Government (Rawa Pasung).
2. Along pipeline installation			
	Temporarily impacted during construction excavations: Fences, wall etc along along pipeline installation of Bekasi City.	119 temporary structures	Community assets along the pipeline will be disturbed by construction activities due to the narrow roads.
Total Impacted Assets of Bekasi City		223 AHs	

494. The first WWTP in Bekasi will be located in Perumnas I by acquiring ± 3,000 m² of land located in Kelurahan Kranji, West Bekasi District. This land belongs to Perumnas Bekasi City. The land is occupied by 70 families in 25 residential units and 45 units for small shops with 50 permanent structures and 20 semi-permanent structures. There are 33 empty permanent structures, which are claimed to belong to a cooperative service and trade cooperative (KUD Perumnas I). The second WWTP is located in Rawa Pasung with an area of ± 8,000 m² in Medan Satria Village, Medan Satria and Kali Baru Sub-districts. This land belongs to Dinas Perkimtan, City Government of Bekasi, and has no structures or agricultural activity.

495. In Bekasi City there are also some other potential locations for WWTP, namely in Rusunawa Bekasi City and Halim areas. Rusunawa land is a public facility of Rusunawa that needs revision of spatial plan to become a green open area so that a WWTP can be built. The land located in Halim is owned by the Indonesian Air Force.

496. To ensure all related stakeholders are aware of the land acquisition, PCM Bekasi City has been implemented on March 16, 2018. The main issue discussed during PCM were worry about odor from the WWTP. The second issue was plotting the location of the WWTP Perumnas I in the spatial planning of Bekasi City and budgeting for the land acquisition process.

497. FGD has been held on April 19, 2018 to disclose the draft LARP document. It was attended by the relevant agencies (PUPR Bekasi City, Bappeda Bekasi City, Social Department), Camat Bekasi Barat, Kelurahan Kranji. Agreements in the FGD were:

1) WWTP land location has been proposed in the change of RTRW Bekasi City (the process is not finished yet);
2) The project plan was in the process of adjusting to the RPJMD;
3) Budgeting for land acquisition activities will be proposed in APBD 2019;
4) The land acquisition process will be handled by the Department of Housing, Settlements and Land of Bekasi City;
5) The land acquisition process will be completed in 2019;
6) There is no resettlement option so replacement compensation will be given in cash to the affected households who occupy land in Perumnas I.

498. Bekasi City Land Status for WWTPs is summarized in the following table.

Table 92: Bekasi City Land Status for WWTP

No	Land Requirement	Land Status	Spatial Plan Status
1	WWTP Perumnas I (± 0,3 Ha)	This land belongs to the National Public Housing Company. Bekasi City Government has discussed with the owner and will allocate a budget for acquiring the land in 2019.	This land is a commercial area and it is being proposed in the revision of the spatial plan to become green open area so that the WWTP can be built.
2	WWTP Rawapasung (± 0.8 Ha)	This land belongs to the Bekasi City Government.	This area has been plotted in the spatial plan as green open space so that the WWTP can be built
3	WWTP Rusunawa (± 0.3 Ha)	This land belongs to the Bekasi City Government.	This land is a public facility area and it is being proposed in revision of the spatial plan to become green open area so that the WWTP can be built
4	WWTP Halim (± 0.3 Ha)	The land located in Halim is owned by the Indonesian Air Force.	-

499. The LARP document for Bekasi is presented in an appendix to the SAR of Bekasi City.

3. Banda Aceh City

500. The summary Initial findings of land acquisition required for SSDP Banda Aceh City presented in the following table.

Table 93: Initial findings of land acquisition required for SSDP Banda Aceh City

No.	Location of Assets Impacted	Unit	Remark
1. WWTPs			
a.	Blang Oi Village (±6 ha, consist of 2 Ha RTH (open space for geen area) and 4 Ha to be acquired)	108 persons	108 land owners. There are no structures, tree, crops and business activities.

No.	Location of Assets Impacted	Unit	Remark
b.	Tibang Village	3 ha, 1 Person	Land owned by the City Government (Tibang), shrubs
2. Pump Station Location (PS)			
a.	Bandar Baru village, Kuta Alam sub-district (PS 1)	1 owner	Green open space
b.	Jl. Tengku Chik Ditiro – Peuniti village (Krueng Daroi Bridge) (PS 2)	1 owner	Owned by Department of Public Works and irrigation.
c.	Jl. Sultan Iskandar Muda, Kampung Baru Village, Baiturrahman Subdistrict (PS 3)	1 owner	Owned by Kodam Iskandar Muda.
d.	Jl. Seulawah, Setui Village, Baiturrahman sub-district (PS 4)	1 owner	Green open space
e.	Jl. University of Iskandar Muda (Unida) campus, Bitai Village, Jaya Baru sub-district (PS 5)	1 owner	Green open space
3. Along Pipeline installation			
a.	Walls etc along Pipeline installation of Banda Aceh City	51 temporary impacts	Community assets along the pipeline will be disturbed by construction activities because the road sections are too narrow.
Total	**Impacted Assets of Banda Aceh City**	165 unit	Affected Households, with 51 AHs temporary impacted/disturbed during construction.

501. There are three WWTP locations in Banda Aceh City: Zone 1 is located in Gampong Blang Oi, with an area of ± 6 Ha with details of ± 2 Ha belonging to the Banda Aceh City Government planned for Green Open Space (RTH) and ± 4 Ha owned by people. Zone 2 is located in Gampong Jawa, in this zone 2 Cipta Karya, the Ministry of Public Works and Human Settlements (PWHS) has allocated a substantial fund ± 120 billion, for construction of WWTP and pipeline installation. Unfortunately, this project was stopped because a heritage grave in the WWTP area was found. Zone 3 is located in Tibang Gampong with an area of ± 3 Ha, this land is already owned by the Banda Aceh City Government. Zones 1 and 3 are selected for SSDP.

502. The total area of the WWTP Zone 1 Blang Oi is ± 6 Ha, consisting of ± 2 Ha belonging to the Banda Aceh City Government, while the remaining ± 4 Ha belonging to people must be acquired. The land owners have been identified from a map from International Relief and Development (IRD). The map illustrates that this area is owned by 108 people, complete with name and area of ownership respectively. However, the village office, sub-district office and BPN office have no contact details for the land owners. Therefore, based on the FGD that discussed the draft LARP on April 16, 2018, the Banda Aceh City Government declared by letter that the Banda Aceh City Government would trace the owners through announcements in the national or local media for 2 – 3 months as suggested by the Head of the National Land Agency of Banda Aceh City referring to relevant regulations. The Banda Aceh City Government is also committed to allocate a budget for land acquisition in 2019. The area of the WWTP Zone 1 has been plotted in the revised spatial planning as green open space.

503. The second WWTP is in Zone 3 in Gampong Tibang arround ± 3 ha. The land has been acquired by the provincial government and being processed to become grant/hibah to the Banda Aceh City Government. This area (has been plotted in the revised spatial plann as green open space.

504. To ensure that all related stakeholders are aware of the project, a Public Consultation Meeting (PCM) was held on February 20, 2018. In that PCM voiced concerns regarding odor of the WWTP process and therefore the community requested to conduct another PCM with people living near the WWTP area. The second PCM was held on April 3, 2018.

505. The Gampong Blang Oi community agreed to the SSDP Banda Aceh City with the following notes:

1) The land should be purchased by the government at a fair and just price as stipulated in Law no. 2/2012 on Land Acquisition for Development in the Public Interest.
2) During construction of WWTP in Blang Oi is implemented, the community of Gampong Blang Oi shall be prioritized to be involved in the construction process and during operation of the WWTP hired as employees proportionally according to their qualifications.
3) If there is a connection fee for pipe installation to each house and monthly retribution fees, the community surrounding WWTP Blang Oi should receive a fee-relief dispensation.
4) If there are any leaks or accidents due to human error or other causes (eg earthquake, tsunami) of the WWTP operations, the affected population shall be properly compensated.
5) If WWTP development is to be carried out, socialization must be conducted more widely to the community surrounding WWTP location.

506. Some critical issues in the LARP document were discussed in an FGD in Banda Aceh City on April 26, 2018 to disclose the draft LARP Document and attended by the relevant agencies (PUPR Banda Aceh City, Bappeda Banda Aceh City, Environmental Department Banda Aceh City), Camat Meuraxa, Keuchik Blang Oi. Agreements in the FGD are:

1) The proposed land location has been plotted in the Spatial Planning (RTRW) Banda Aceh City;
2) The project plan is in accordance with the RPJMD;
3) Budget for land acquisition will be allocated in APBD;
4) Bappeda Banda Aceh City will lead the land acquisition process.
5) The land acquisition process will be completed in mid-2019;
6) There is no relocation, because there are no structures.

507. Banda Aceh City Land Status for WWTP is summarized in the following table.

Table 94: Banda Aceh City Land Status for WWTP

No	Land Requirement	Land Status	Spatial Plan Status
1	WWTP Blang Oi	Total area is ± 6 Ha, ± 2 Ha belong to Banda Aceh City Government, while the remaining ± 4 Ha belongs to people and must be acquired. It is difficult to find the land owners. the Banda Aceh City Government declared by letter that it would trace the owners through announcements in the national or local media	This area has been plotted on the revised Spatial plan in February 2018 as green open space so that the WWTP can be built.

		for 2 – 3 months. The Banda Aceh City Government is also committed to allocated a budget for land acquisition in 2019.	
2	WTP Tibang	The ± 30,000 m2 WWTP Tibang has been acquired by the provincial government and is in the process of grant/*hibah* to the Banda Aceh City Government.	This area has been plotted on the revised Spatial plan in February 2018 as green open space so that the WWTP can be built.

508. The Cipta Karya, Ministry of Public Work and Human Setlement (PWHS) has informed to Banda Aceh City Government that the SSDP project will be continued if the WWTP zone 2 issue is solved. However, until this report there is no clear answer/clarification from Banda Aceh City Government to Cipta Karya, Ministry PWHS regarding to status of Zone 2.

509. The LARP document for Banda Aceh is presented in an appendix of the SAR of Banda Aceh City.

IV. Conclusion and recommendations

A. TECHNICAL CONCEPTS

510. The technical concepts developed consider the long-term development needs for improved domestic wastewater management by serving the cities' highest density areas at sub-district level (>150 inh./ha), which coincides with the Sewerage System Development Strategy of the Directorate General Human Settlement. The strategy also seeks to maximize cost effectiveness and to ensure that the most environmentally-affected areas are covered.

511. Whilst this principle was maintained for the cities of Mataram and Banda Aceh, the currently proposed investment components for the city of Bekasi comprise four individual locations (located in the norther part of the city) that were chosen because of the lack of available land for staged development of a centralized sewerage system. As a result, the service coverage of these four locations cannot be extended in the future because of the limited availability of land for a centralized treatment facility.

512. As Bekasi represents a major industrial hub with almost 3 million inhabitants within the Greater Jakarta Region, the EA is supporting urgently needed sewerage developments for the city center and adjacent high-density areas. Under the current SSDP planning, the four proposed schemes are suitable for familiarizing the current wastewater operator UPTD-PAL with sewered service deliveries, but under no circumstances would these initial investments provide a significant ease to Bekasi's heavily polluted city rivers.

513. Despite these limitations, it is recommended to fund and implement the proposed investments as the first steps in advancing the centralized sewerage and gaining further experiences for expanding the approach to other cities in Indonesia.

B. PLANNING AND LAND AVAILABILITY

514. Land availability for the development of off-site wastewater treatment, no matter of which size, from community to neighborhood and sewerage systems, is a prevailing challenge for most of the Indonesian urban centers. Where the collection and treatment of domestic wastewater is

most needed, no public space is reserved for the long-term development of appropriate public wastewater services. There are several common cited reasons:

- Local governments shy away from reserving or purchasing land for 'non-productive' sectors, such as public parks/green areas, water retention, wastewater treatment, etc.
- Domestic Wastewater Master Planning under a 'city-wide' sanitation delivery scenario is complex and often not even properly grasped by the planner in charge
- The significance and 'strings' attached to long-term planning (e.g. 25-years master planning for the development of comprehensive wastewater management) is often not sufficiently disseminated nor understood by local government decision makers.

515. Principle guidelines and capacity development for long-term techncial planning, associated land use planning and land acquisition process is recommended on a national scale.

C. LOCAL GOVERNMENT READINESS

516. The 'readiness criteria' for the development of GOI funded infrastructure, which are currently applied for the selection of potential local governments, are vague, as essential 'evidence of commitment' is missing. It is recommended that the following aspects are included in the readiness criteria for future selection of cities::

- a history of at least 3% of the local government's annual budget allocation for domestic wastewater management
- land reservation and/or purchase of land for the construction of necessary future treatment works (e.g. on the basis of an approved Master Plan)
- the promulgation of specific and comprehensive wastewater management related supporting regulation, and
- the availability of a designated functional wastewater managing operator.

D. GRANTS AND SUBSIDIES

517. Intergovernmental transfers create a high budget dependence of the local government to the central government and makes local government vulnerable to political intervention. Transfers from the central government consist of three major components: the general allocation fund, the revenue-sharing fund and the specific purpose fund.

- The general allocation fund (Dana Alokasi Umum, DAU) is an equalization transfer system aiming at reducing fiscal imbalances between sub-national governments. Transfers are formula-based, consisting of a base allocation (equal to the amount of spending on personal) and a fiscal gap allocation (which can be positive or negative). This fund is allocated to the provinces (10%) and districts and municipalities (90%); it accounts on average for 50% of local revenues.
- The shared revenue fund (Dana Bagi Hasil, DBH) is sub-divided in two categories, comprising DBH from taxes is a shared tax system, based on receipts from the personal income tax, etc and DBH from natural resources is based on revenues derived from forestry, mining, oil, etc.
- Last, the special allocation fund (Dana Alokasi Khusus, DAK) is a transfer system to fund responsibilities that are considered as national priorities.

518. It is recommended that annual the DAK funding in support of domestic wastewater management is based on an agreed and tangible service development planning for contributing to an incremental expansion of service coverage.

E. LOCAL GOVERNMENT CAPEX FUNDING

519. On the basis of the technical feasibility studies carried out under C1, the investment cost and proportional local government funding for the three SSDP cities is as follows.

City / Province	Estimated CAPEX (US$ million) [a]	LG CAPEX Contribution for SSDP (USD million)	Current LG Funding for Sanitation (USD) [c]	Proportion of LG Annual Budget (%) [c]
Kota Banda Aceh, Aceh (Zone 1 & 3)	158.4	18.5	27,000	0.03%
Kota Bekasi, West Java (Zone 1, 2, 3, 4)	117.9	16.3	280,000	0.07 %
Kota Mataram, NTB (Stage 1, 2, 3)	296.2	39.0	11,000	0.01%
Total	**572.5**	**74.8**	**318.000**	

[a] Estimate based on C1 Cost Estimates - updated by C2

[b] Local government and Beneficiaries combined

[c] Annual Budget 2017

520. The above local government/beneficiaries CAPEX contributions of USD 74.8 million include the following investment items:

- Land acquisition
- Land levelling
- House connections
- Household contribution of cash and kind to civil works
- Household participation in community awareness

521. As there is a significant disparity between the value of allocated local government funding and their current capacities, is it strongly recommended to increase the ADB and/or GOI funding portion.

F. FINANCIAL MANAGEMENT AND ON-GRANTING

522. The GOI is well equipped to handle and enforce its accounting policies and procedures. It has a computerized financial system for its own transactions and for the SSDP project. The Ministry of Finance (in accordance with PP 71/2010) has developed an accounting system called Sistem Akuntansi Instansi Berbasis Akrual (SAIBA), which is an accrual-based accounting system for all government agencies. The SAIBA enables preparation of financial reports in stages starting from the SATKERs, regions, Echelon 1, and ministry level.

523. Thus, by SSDP following a conventional implementation path, the SAIBA system is satisfactory for handling ADB's financial management and reporting requirements. However, if the project is designed to on-grant the loan proceeds to the partnering local governments, there is no modality available for passing the funding down from central government to the cities. As outlined above current central government subsidies are limited to *DAU*, *DBH*, and *DAK*. Therefore, we recommend for SSDP the conventional implementation path at this stage.

G. APPROACH TO PROCUREMENT

524. Under a Design-Build-Operate (DBO) scenario the public sector owns and finances the construction of new assets. The private sector designs, builds and operates the assets to meet certain agreed outputs. The documentation for a DBO is typically simpler than a BOT or Concession and will typically consist of a turnkey construction contract plus an operating contract, or a section added to the turnkey contract covering operations. The Contractor is taking no or minimal financing risk on the capital and will typically be paid a sum for the design-build of the plant, payable in instalments on completion of construction milestones, and then an operating fee for the operating period. The Contractor is responsible for the design and the construction as well as operations and so if parts need to be replaced during the operations period prior to its assumed life span, the Contractor is likely to be responsible for replacement.

525. During the course of C1 preparation of the technical concepts, the recommendation was made to apply for the construction of the wastewater treatment plants (WWTP) a Design-Build-Operate (DBO) approach. Whilst this proposal was discussed with the EA, the current GOI infrastructure funding regulations do not allow loan financing applied for the funding of infrastructure operations. Because of these regulatory challenges, the implementation of a DBO contract would need be placed under the responsibility of the local government, which would then require on-granting of the loan to the city level.

526. From a sustainability point of view, the operational component of the DBO scheme would greatly support novice local governments in charge of long-term operations of a sewerage system, by co-managing the plant during the contractor's operational period, and achieving familiarization with the technical challenges and problem solving of wastewater collection and treatment.

527. In the following, ESP reduced in their TOR for the detailed engineering design (DED) engineer to proceed for the WWTP with a Design-Build (DB) scenario, which represents, however, its own challenges as DB represents an uncharted territory for the EA and the regional Satkers in charge of procurement and construction of the plants. As outlined in the capacity development plan, comprehensive support would be required during the pre-construction phase for educating the EA, the national Satker Strategis and the regional Satkers alike for safeguarding compliance during the procurement and financial management progressions.

528. Another concerning element is the readiness of the 'supply' side, as initial discussions with potential international contracts were citing significant costs and timing for obtaining operational licenses in Indonesia, for which a DBO or DB approach would only be attractive if the client could offer sufficient 'scale-of-economy' by bundling in number of WWTPs into a single contract package.

529. It is recommended for ESP to reassess their procurement modalities, as the current setting bears the risk of not attracting international and competent DB contractors. The inclusion of the Project Implementation Support Consultant (PISC) is recommended to support the SATKERs in procurement and facilitate attracting competent contractors.

H. TARIFF OPTIONS AND AFFORDABILITY

530. There are several options for applying a customer tariff to recover the cost of operation and maintenance of the sewer system and the wastewater treatment plant (WWTP). Whilst it is comparatively easy to determine a customer tariff value for recovering operational costs, the challenge lays in the harmonization of some key items, e.g. (i) the tariffs have to be affordable

and (ii) the local government needs to cover the revenue shortfall, and (iii) the cost and efficiency of tariff collection must be reasonable.

531. Policy states that for ensuring the financial feasibility of SSDP, the scheme must aim for full cost recovery of O&M, including the building of funds for reinvestment in future infrastructure improvements and replacements. However, under the notion that wastewater management is a 'public good', then one must apply the social policies of the central government if it entails a reduction in the extent of recovery after applying a public good subsidy.

532. The Project has taken the view and interpretation of policy that it must cover full O&M and that is reflected in the Affordability and Tariff Analysis.

533. As 3% of household income is a generically accepted threshold for water supply and sanitation services, the current percentages are generally above this threshold, which is necessitating annual local government funding for securing sufficient operation and maintenance budgets. As local government resources are already insufficient for adequately funding their CAPEX portions, the operational sustainability of the intended SSDP infrastructure investments needs to be further addressed after the actual scope and costs (CAPEX and OPEX) are defined during DED preparations.

534. An alternative tariff option would be the introduction of a (legally eligible) 'polluters-pay-principle' policy at local government, for distributing the required wastewater tariff to each city dweller, which would reduce the monthly tariff, under the current development scenario, to about IDR 2,000 per month per household. Under such scenario, the tariff would eventually gradually increase with the future expansion of the service coverage.

I. FINANCIAL MANAGEMENT COVENANTS

535. Arising out of the Financial Management Assessment (FMA), the following recommendations are made with regard to the implementation of SSDP.

536. Inherent Country Level: The financial analysis demonstrates that national and local governments' budget allocations to the sanitation sector are too small to make operations within the sector self-sustaining. It is recommended that the loan covenant stipulates an adequate level of funding for ensuring seamless implementation of the intended SSDP infrastructure investments for the partnering cities of Mataram, Bekasi and Banda Aceh. As alluded to in the PEFA, collection systems for tariffs and taxes are weak throughout the country, so it is recommended that the loan covenant includes physical and financial performance monitoring, and the setting-up of a robust collection system for customer tariffs.

537. Implementing Agency: It is extremely beneficial to both ADB and GOI to use existing implementing structures to administer ADB funded projects. The experience is demonstrated, but all staff engaged under this project should be fully trained and re-orientated as ADB has made great strides over the past 2-years to update policies, manuals and procedures. The PAM will reflect all the roles and responsibilities of each entity and all staff should be familiar with this.

538. Staffing: Staff are permanent Civil Servants and are quite stable for this project. The repercussions of losing knowledgeable staff which could be replaced by unqualified / unknowledgeable staff may result in under performance of the project. Losing well qualified and capable staff needs a robust and regular training event in ADB policies and procedures within 2 months of the new appointment. It is recommended that a covenant is inserted in all agreements that GOI must inform ADB of staff changes in the EA and/or Satker Strategis and/or provincial Satker so that ADB can then subsequently schedule training events in ADB policies and

procedures for Loan/Grant Disbursements and Financial Management and reporting within 2 months of the staff turnover. Additional staff will be employed through employment contracts and should also go through a re-training program.

539. Accounting Policies and Procedures: The risk here is mainly in the retention of documents. GOI retention period is much less than ADB's, so a covenant needs to be drafted in the loan documentation to ensure ADB's retention period is adhered to for this project.

540. Contract Management and accounting: Procurement and disbursement are sometimes very slow caused mainly by errors in billing and documentation. The SSDP should develop a user-friendly system that management can use to track contracts and make better informed decisions. It is recommended that a new Contract Management system model be used on a regular basis as a management tool by senior management.

541. Internal Audit: Internal Audit is basically on request, however in the interest of maintaining good control systems it is recommended that a loan covenant specify the periods for internal audit – every six months.

542. Accounting System: The government possesses a very viable accounting system and attained good scores in the PEFA; however, Reporting for ADB projects is still conducted by extracting information from the government system and then manipulating the data in excel to meet ADB requirements. It is recommended that an add-on module be developed to produce ADB report from the mainframe accounting system.

543. Sub-national City Administration Levels: All three partnering cities are supported by central level funding. A loan covenant should be inserted to ensure central government continue this level of fiscal support during the implementation period. The central government provides training for sub-national government in the accounting systems, the Loan should covenant that this continues.

544. If the procurement for the WWTPs is by DBO/DB then it is recommended that the city administration only performs the function of monitoring and evaluation due to lack or experience and capacity.

545. The government is well prepared for the financial management of SSDP, but there are pre-project actions that need to take place for capacity building – all noted in Capacity Building Plan (see main Appendices Report, Annex 12).

546. In summary, there are five issues that will need to be addressed in the loan documentation: (i) the retention of documents, as ADBs requirements are more stringent that the GOI, (ii) the need to request internal audit, there should be a periodic routine established, (iii) to enhance the speed of implementation and reduce the number of errors and confusions on contracts there needs to be a contract management system created for the project, (iv) the project should avoid the use of excel spreadsheets for producing ADB reports and design a computer system that produces those reports and (v) option for engaging the cities' PDAM in a co-management role by allocating the responsibility for the collection of the monthly wastewater tariff in combination with the water supply invoice.

J. INSTITUTIONALIZATION

547. An essential factor towards the formation of an 'enabling operational environment' for the long-term goal of developing 'city-wide' sanitation lays in the separation of policy, regulatory, and

operational functions, followed by appropriate allocation of tasks and responsibilities amongst the immediate sector stakeholders at local government level.

548. As successful delivery of domestic wastewater services are very much dependent on the promulgation of a 'conducive' enabling operational environment; foremost, a comprehensive regulatory framework, for setting the institutional and operational scene and for aligning all immediate stakeholders into a structured service delivery scheme. A key consideration is to reduce prevailing fragmented institutional responsibilities and to provide a platform for all concerned actors to collaborate in a regulated manner.

549. A forward-looking 'one-door' management and service delivery approach is necessary, by integrating various technical delivery modalities under a common operational framework, including centralized sewerage, neighborhood and communal systems, and on-site sanitation.

550. The integration of the private sector and community managed small-scale systems is essential under such a 'one-door' service delivery approach, for which a designated operator is in 'charge' of all available service options; however, the operator is collaborating with 3rd parties for getting services effectively delivered to the communities.

551. The immediate steps for fostering the operational success and sustainable service deliveries to the communities of the intended SSDP infrastructure developments can be summarized as follows:

- Waste water Management Regulation (Perda)**:** Promulgation (in Mataram), respectively revision of their current local regulation (in Bekasi) / draft Perda (in Banda Aceh) on domestic wastewater management with a focus on the development of equitable 'city-wide' sanitation services for all constituents, including the definition of institutional responsibilities, rights and obligations of involved parties - including the beneficiaries and communities at large, minimum service standards, and customer tariff structure and values. These issues are already addressed and broadly defined in the 'Domestic Wastewater Development Road Maps 2019 – 2023' for Mataram and Banda Aceh (both new) and Bekasi (update of existing Road Map).
- PRJMD (5-years Development Planning): As the periodic revisions of the RPJMD represents a joint exercise of the executive and legislative branches of the local government, a stronger focus of the development of equitable 'city-wide' sanitation services is recommended for trigger the advancement of an increased level of tangible commitments at implementation level (technical departments and wastewater management operator alike).
- Master Planning: The notion of 'city-wide' sanitation services will require revisiting the current Domestic Wastewater Master Plan (Bekasi), and the Master Plan concepts for Banda Aceh and Mataram, by including, besides centralized sewer services, the planning for decentralized and communal systems, and the gradual development of 'scheduled' desludging services for household and commercial septic tanks.
- Institutional allocation of roles and responsibilities: Address the separation of policy, supervisory and operational responsibilities as part of regulatory and development planning, including the formal establishment of supervisory functions that are also including community representation.

  This would also include the establishment of joint operations between local government agencies and the civil society for fostering effective behaviour chance communication, community participation, and sanitation marketing efforts.

  Other vital elements are the formal integration of the private sector into the service delivery value chain, foremost for the delivery of 'scheduled' desludging services for household and commercial septic tanks.

- Service Delivery**:** Current operation settings for the delivery of sanitation services to the communities strongly vary between the three participating local governments. Whereas a Mayor's regulation is in process in Banda Aceh, the city of Bekasi established a discrete wastewater operator in 2015, and the local government of Mataram in 2016 assigned sanitation service deliveries to the Department of Environment. As technical and administrative operational responsibilities will greatly increase with the construction of the intended sewered wastewater services, local governments are advised to use the newly established Wastewater Development Road Maps[62] as a reference for their respective annual planning activities.
- Local Government Participation in SSDP: Local governments are responsible for the provision of sanitation services to their constituents, which are currently implemented to a limited number of households and business within the jurisdictions by their assigned domestic wastewater operator. It is therefore paramount for these operators and the related technical local government units to obtain comprehensive insight during the SSDP design and construction stages, and to gain the necessary practical field experience that is required for the proper operations and maintenance of the scheme.

  A formal capacity development program will also comprise on-the-job training sessions for the wastewater operator for assuring their participation during critical construction activities of the SSDP project (e.g. laying of sewer, installation of mechanical and electrical equipment, and operational practices during the commissioning and handing over phase of the plants).

K. OPERATIONAL SUSTAINABILITY

552. PURP regulation # 4 of 2017 requires (for a good purpose) the 'certification' of domestic wastewater operators for safeguarding the achievement of tangible 'returns' of costly wastewater collection and treatment infrastructure through professional management of the plants. Industrialized countries have a long history of system development and management that has resulted in significant improvements of the quality of water bodies and related positive impacts on community well-being.

553. With the availability of common wastewater collection and treatment technologies that get 'retrofitted' into densely populated urban settings, the question needs to be answered how a novice local government, that has no history of sewered service deliveries, can (i) technically operate, (ii) finance and maintain, and (iii) deliver quality services to their constituents?

554. First and foremost, more awareness amongst stakeholders, in particular the decision makers at local government level, needs to emerge, by acknowledging that wastewater management and its delivery of public services is to be based on 'motivation, skills and knowledge' of their key people within the operator's settings.

555. Consequently, for securing the long-term success of domestic wastewater operations, it is paramount for the GOI to further develop regional training and certification facilities (the only currently operational facility in Wiyung / East Java is focusing on management aspects, without offering the necessary training for field staff). On a project basis, more intense field/on-the-job training is vital, which is best combined with comparative studies and twinning options.

556. This would also include the familiarization of operational staff with planning, design and construction principles for facilitation their understanding on operation and maintenance tasks.

[62] Established in collaboration between C2 TA Consultant and LG representatives