

SECTOR ASSESSMENT (SUMMARY): WATER AND OTHER URBAN INFRASTRUCTURE AND SERVICES

Sector Road Map

1. Sector Performance, Problems, and Opportunities

a. National Context

1. **Urbanization.** Although about 70% of the population in Myanmar resides in rural areas, annual urban population growth has been around 2.3%, which is much faster than the country's total population growth of 1.8% between 2000 and 2010. The urban population in Myanmar increased from 14.6 million (29% of the total population) in 2000 to 18.4 million (31% of the total population) in 2010. Currently, 10% of Myanmar's population lives in the two major cities of Yangon and Mandalay, contributing to 30% of gross domestic product (GDP), and this share is expected to rise rapidly in the future. There is an estimation that one-quarter of Myanmar's population will live in urban areas in 2030, which will account for roughly half of Myanmar's GDP.¹ Once Myanmar has a functioning tax regime with ongoing and planned tax reform, the majority of tax revenue is also likely to come from cities. However, to ensure that urbanization is a driving force for economic growth and social development, urban planning and management need to be modernized and investments in urban infrastructure increased.

2. **Health and poverty implications.** The urgency to improve basic urban infrastructure and services is highlighted by Myanmar's poor record on health and poverty. Inadequate environmental infrastructure and underinvestment in preventive and curative medical care have contributed to severe health threats across the country. In 2010, the mortality rate of children under 5 years of age (66 per 1,000 live births), often resulting from waterborne diseases such as diarrhea, was the highest within the Association of Southeast Asian Nations.²

3. **Climate change implications.** Myanmar was considered to be the country second-hardest hit by climate-change-related extreme weather events during 1991–2010; its overall climate change vulnerability factor up to 2030 is classified *acute*.³ The government's records reflect this trend in the Mandalay region, with a shortening of the monsoon period, a lengthening of the premonsoon drought, and higher daily rainfall recordings (the four highest peak annual daily rainfall events during 1949–2013 were recorded after 2003). These changing climatic conditions, in parallel with the expanding urban area, are increasing the demand for reliable water resources, wastewater treatment, and urban drainage improvements.

4. **Development of Greater Mekong Subregion corridor towns.** The corridor town development approach aims to maximize the economic benefit of increased traffic and trade along the economic corridors by developing corridor towns as competitive growth nodes that link the outlying region and by fostering economic activity clusters. This approach will also contribute to the transformation of transport corridors into economic corridors in the Greater Mekong Subregion (GMS).

¹ H. Chhor et al. 2013. *Myanmar's moment: Unique opportunities, major challenges*. McKinsey Global Institute. .

² ADB, United Nations Development Programme, and Economic and Social Commission for Asia and the Pacific. 2012. *Asia–Pacific Regional MDG Report 2011/12: Accelerating Equitable Achievement of the MDGs*. Bangkok.

³ Germanwatch. 2012. *Global Climate Risk Index 2013*. Bonn.

b. Mandalay City Profile

5. **Institutional capacity issues.** Mandalay, with a population of about 1.25 million, is the country's second-largest city and the capital of the Mandalay region. The Mandalay regional government does not directly intervene in urban management matters in Mandalay city, but it has a significant role in approving infrastructure projects and urban service tariffs. The Mandalay City Development Committee (MCDC) is tasked with urban service delivery and infrastructure development as stated in the MCDC Law (2015); however, it does not effectively undertake all the responsibilities. Shortage of staff, skills, funds, and data are obstacles to urban planning and management. As the tariffs for water supply, sanitation, and solid waste collection are very low and these services are not managed on a corporate basis, sufficient funds are not allocated for operation and maintenance.

6. **Water supply issues.** The piped water supply system was mainly constructed between 1983 and 1992 under a project financed by the Asian Development Bank (ADB)⁴ which serves 55% of the city's population for 10 hours per day on average. The remaining residents use mainly private shallow wells. The piped system, fed by tube wells (90%) and untreated surface water, delivers about 100,000 cubic meters (m³) per day into the network of about 400 kilometers (km). At the moment water is not treated. Nonrevenue water is estimated at approximately 52%, of which at least 35,000 m³/day (about 70% of the total nonrevenue water) is due to physical losses from faulty meters and leaks; the remainder is due to uncertainties in meter readings and authorized unbilled consumption.⁵ The water supply and sanitation department of the MCDC is responsible for the piped water network.

7. **Wastewater challenges.** Despite high population density and high pollution levels in received water, there is neither a piped sewerage system nor a centralized wastewater treatment plant. Sanitation provision consists of septic tanks draining largely to the roadside drains, and latrines of varying designs. The MCDC's water supply and sanitation department is responsible for emptying septic tanks. Environmental impacts are consequently high, with pollution of watercourses and groundwater. The biochemical oxygen demand levels in major creeks in the city are up to 80 milligrams per liter. Results of the water quality survey conducted for sample wells during project preparation shows that more than 70% of the sample wells were contaminated by coliforms.

8. **Inadequate drainage systems.** Although Mandalay is located in the heart of the Central Dry Zone, rainstorms can be very intensive during the wet season and the city needs proper urban drainage facilities. The city has about 90 km of main canals and creeks, 115 km of secondary drains, and 850 km of tertiary drains. Seasonal floods are caused mainly by (i) lack of maintenance of canals (lots of garbage dumping occurs and there is vegetation in the whole surface water system); (ii) small bridge openings at the crossing of drains and roads, reducing the discharge capacities of the drains; (iii) insufficient capacities of the existing pumping stations to discharge excess water out of the city area; and (iv) lack of maintenance (dredging) in the storage ponds. The MCDC's road and bridge department is responsible for drainage systems.

9. **Solid waste problems.** About 780 tons per day of domestic solid wastes are collected by the MCDC, however large amounts are disposed of in drains and canals. More than 60% of the waste is organic waste, followed by plastics (15%) and paper (7%). Primary collection uses the

⁴ ADB. 1982. *Report and Recommendation of the President to the Board of Directors: Proposed Loan and Technical Assistance Grant to the Union of Burma for the Mandalay Water Supply Project*. Manila.

⁵ Includes consumption by public institutions such as monasteries and military users.

bell system and the wastes are transported to the final disposal sites through transit stations. There are about 15 transit stations in the city, typically along the streets and occupying public spaces. There are two existing dump sites without appropriate treatment. The MCDC's cleansing department is responsible for solid waste management.

2. Government's Sector Strategy

10. **National and local plans and strategies.** The government's Framework for Economic and Social Reforms recognizes that the role of urban centers as a growth engine for the nation's economic development and poverty alleviation will rapidly increase in importance.⁶ The government considers it essential to invest in urban centers, not only to efficiently utilize existing infrastructure and environmental resources but also to facilitate balanced development crucial for peace, stability, and consolidation of the nation. The framework emphasizes the imperative needs for urban development through (i) formulation of urban development strategies linking urban centers with the rural hinterland, (ii) development of necessary laws and regulatory frameworks, and (iii) institutional capacity strengthening in urban planning and management.

11. **Development partners.** Not many development partners are active in the areas of urban development and water. The United Nations Human Settlements Programme (UN Habitat) is taking a lead role in supporting capacity development of urban planning and management with the establishment of the Urban Research and Development Institute in Yangon. The Japan International Cooperation Agency completed a master plan and feasibility studies for Yangon's urban infrastructure, e.g., water, sanitation, solid waste management, and urban transport. Agence Française de Développement is supporting feasibility studies for urban infrastructure in Mandalay. The United Nations Children's Fund, along with the Japan International Cooperation Agency and the World Bank, initiated a water sector assessment that will provide updated information on access to water and sanitation services and other sector issues.

12. **Mandalay City Development Concept Plan Vision 2040.** Upon request from the Mandalay regional government, the Department of Human Settlement and Housing Development⁷ of the Ministry of Construction helped prepare the Mandalay City Development Concept Plan Vision 2040. The plan envisages identifying special zones within the city as cultural centers, improving road links and the river port, improving public transport, developing a tourist hotel zone, improving wastewater treatment, developing a green belt for the airport, and developing a program for greening the three hills and tree planting within the city. It also envisages the upgrading and densification as appropriate of existing housing areas while creating new satellite towns and special high-cost housing areas which might help subsidize low-cost housing areas for poor people.

3. ADB Sector Experience and Assistance Program

13. **Experience and assistance in the sector.** ADB funded several projects in Myanmar prior to 1988. Of ADB's total pre-1988 lending approvals to Myanmar of \$531 million, only about \$36 million (6.8%) was for water supply and other municipal infrastructure services. Urban projects included the water supply projects in Yangon⁸ and Mandalay (footnote 4).

⁶ Government of Myanmar. 2013. *Framework for Economic and Social Reforms: Policy Priorities for 2012–15 toward the Long-Term Goals of the National Comprehensive Development Plan*. Nay Pyi Taw.

⁷ After reorganization of the Ministry of Construction in 2015, the Department of Human Settlement and Housing Development was changed to the Department of Urban and Housing Development.

⁸ ADB. 1973. *Report and Recommendation of the President to the Board of Directors on Proposed Loans to the Union of Burma for the Rangoon Water Supply Project*. Manila; and ADB. 1978. *Report and Recommendation of the*

14. **Lessons and best practices from the region.** Based on the lessons learned in other countries in Southeast Asia during the two-decade interruption of ADB operations in Myanmar, certain principles should be adopted to make future programs more efficient: (i) allow an initial period of effective policy dialogue, (ii) develop sector indicators for institutional reform and financial performance of urban service operators, and (iii) enhance borrower commitment to tariff adjustments. Examples of well-performing utilities are the Phnom Penh Water Supply Authority in Cambodia, the Manila Water Company and Manila Water Services in the Philippines, and the Hai Phong Water Supply Company in Viet Nam. These utilities have showcased best practices and tremendous improvements in various aspects of service delivery and management, such as (i) streamlining governance and institutional arrangements; (ii) improving their operational performance; (iii) reducing nonrevenue water; (iv) improving their financial performance; and (v) expanding service coverage, particularly to the poor.

15. **Priority assistance.** ADB's urban development and water strategy for Myanmar aims to support the government's objective of poverty reduction, and integration into the broader GMS. This framework is consistent with ADB's Urban Operational Plan under Strategy 2020, which promotes green development, competitiveness, and inclusiveness.⁹

16. Since 2012, ADB, in close collaboration with the Department of Human Settlement and Housing Development, the Yangon City Development Committee, and the Mandalay City Development Committee, is building up a program of urban development, and water lending and nonlending operations. Early support in particular involved (i) providing a senior advisor for urban planning and strategy development to the Ministry of Construction; (ii) implementing a grant-financed pilot demonstration activity for upgrading basic sanitation infrastructure in poor urban areas, completed in 2013;¹⁰ and (v) twinning arrangements for Yangon and Mandalay water and sanitation under the ADB-supported Water Operators Partnership Program.¹¹

17. Building on these early initiatives (many of which are ongoing), future urban development and water projects will cover in particular (i) the Green Cities initiative, starting with a loan of \$60 million for the Mandalay Urban Services Improvement Project to promote an improved environment and resilience toward a Green Mandalay, for approval in 2015; (ii) the Competitive Cities initiative, starting with a loan of \$80 million for the Third GMS Corridor Towns Development Project to develop Mawlamyine, Hpa-An, and Myawaddy as competitive economic nodes along the East–West Economic Corridor, for approval in 2016; (iii) the Inclusive Cities initiative, starting with a grant of \$4 million provided by the Japan Fund for Poverty Reduction for improving basic infrastructure in poor urban communities in Yangon and Mandalay, scaling up the results of the pilot demonstration activity implemented in Dawbon, Yangon (footnote 10); and (iv) capacity development and institutional strengthening through capacity development technical assistance of \$2 million for the Transformation of Urban Management.¹²

President to the Board of Directors on a Proposed Supplementary Loan and Technical Assistance Grant to the Union of Burma for the Rangoon Water Supply Project. Manila.

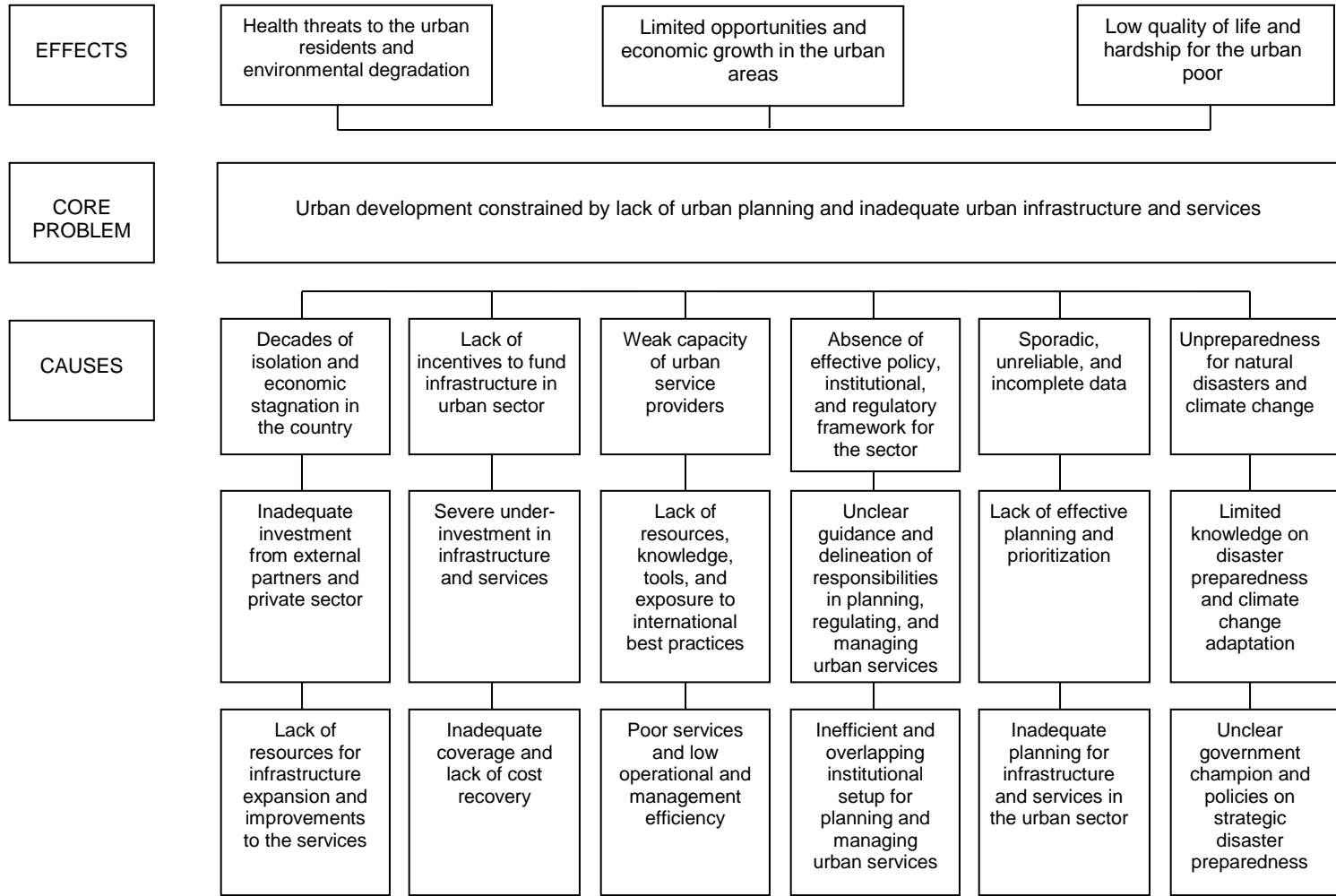
⁹ ADB. 2013. *Urban Operational Plan 2012–2020.* Manila.

¹⁰ In 2013, the nongovernment organization Malteser International implemented Demonstrating a Community-Led Approach to Improved Sanitation in Yangon, Myanmar. This \$50,000 pilot demonstration activity provided better latrines and waste collection equipment and infrastructure for the Dawbon ward in Yangon, and targeted awareness building and behavioral change in matters of public health and hygiene.

¹¹ Twinning arrangements for capacity development and peer-to-peer support, due for completion in 2015, are provided in (i) Mandalay by Vitens Evides International, Netherlands, to improve water supply; and (ii) Yangon by Vitens Evides International (water supply) and Hunter Water Australia (sanitation).

¹² ADB. 2013. *Technical Assistance to the Republic of the Union of Myanmar for Transformation of Urban Management.* Manila.

PROBLEM TREE FOR WATER AND OTHER URBAN INFRASTRUCTURE SERVICES



SECTOR RESULTS FRAMEWORK (WATER AND OTHER URBAN INFRASTRUCTURE SERVICES, 2012–2016)

Country Sector Outcomes		Country Sector Outputs		ADB Sector Operations	
Outcomes with ADB Contribution	Indicators with Targets and Baselines ^a	Outputs with ADB Contribution	Indicators with Incremental Targets ^b	Planned and Ongoing ADB Interventions	Main Outputs Expected from ADB Interventions
Increased access of the urban population to good-quality basic services such as water supply, sanitation, solid waste management, and drainage	<p>Number of urban households using improved water supply increased</p> <p>Number of urban households using improved wastewater management and sanitation increased</p> <p>Number of urban households using improved solid waste collection increased</p>	Water supply, wastewater management and sanitation, solid waste management, and other urban infrastructure and services expanded, improved, and sustained	<p>Water supply capacity increased</p> <p>Wastewater treatment capacity increased</p> <p>Solid waste collection and disposal capacity increased</p>	<p>Planned key activity areas Infrastructure development (water supply, wastewater, sanitation, flood protection, solid waste management) (70% of funding) Urban policy, institutional and capacity development (30% of funding)</p> <p>Pipeline projects Loan for Mandalay Urban Services Improvement Project (\$60 million) Loan for Third GMS Corridor Towns Development Project (\$80 million)</p> <p>Ongoing projects with approved amounts WOP twinning arrangement with YCDC and MCDC water and sanitation departments Capacity development technical assistance for Transformation of Urban Management (\$2 million) Grant for Pro-Poor Community Infrastructure and Basic Services Project (\$4 million)</p>	<p>Planned key activity areas^c New water treatment plants built</p> <p>Water distribution networks upgraded New wastewater treatment plants built Sewerage collection networks built or upgraded</p> <p>Sanitary landfills built</p> <p>Storm water drains built or improved</p> <p>Ongoing projects Partnership arrangements established for YCDC and MCDC</p> <p>Nine training courses implemented for government staff in six cities (Yangon, Mandalay, Mawlamyine, Patheingyi, Lashio, and Monywa)</p> <p>(By 2018)^d 2,000 sanitary latrines constructed 17 kilometers of community drains improved 4 community solid waste collection systems established</p>

ADB = Asian Development Bank, GMS = Greater Mekong Subregion, MCDC = Mandalay City Development Committee, WOP = Water Operators Partnership, YCDC = Yangon City Development Committee.

^a The baseline data will be discussed with the government and updated when available.

^b The baseline data will be discussed with the government and updated when available.

^c Quantitative targets will be completed based on information provided by feasibility studies for the pipeline projects.

^d The Pro-Poor Community Infrastructure and Basic Services Project will be completed by 2018.

Source: Asian Development Bank.