

Baguio, Philippines

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PROJECT OVERVIEW

PPS period	June 2015 – April 2016
Focus sectors	Flood and drainage management; wastewater management
CDIA supported activities	(i) Preparation of medium-term urban environmental infrastructure program (ii) Pre-feasibility studies of wastewater, flood control and drainage management (iii) Linking prioritized projects to financing
Linking to finance status	Funded by National and Local Government



Background

Inadequate wastewater management infrastructure and flooding are two of the major challenges faced by Baguio City. While one-third of the city population of about 330,000 is served by the Baguio Sewage Treatment Plant (BSTP), the rest of the city residents use poorly maintained septic tanks discharging to groundwater and surface drainage thereby polluting the four river systems flowing through the city. Flooding during heavy rainfall and typhoons has become frequent and often caused by clogging of natural and man-made drainage structures. With limited sewerage coverage in the city, overflowing drainage systems coupled with

untreated sewage pose a health hazard and increase the risk of water supply contamination.

In March 2014, the City Government of Baguio submitted an application for CDIA support in the conduct of the Green and Integrated Wastewater Management (GIWM) study aimed at providing the city with sufficient justifications to make informed decisions on the most appropriate options for: (i) delivering sustainable access to improved and affordable wastewater management for all city residents; and (ii) reducing the costs and impacts of flooding caused by extreme weather events.

Following the approval of the city application, CDIA deployed a study team in Baguio with the following main tasks: (i) analysis of the existing status of sanitation, wastewater management and stormwater drainage in the city; (ii) development of a strategy for progressive improvement of sanitation wastewater management and stormwater drainage over the period 2016-2035; and (iii) project preparatory study (PPS) of priority urban infrastructure relating to wastewater management, drainage management and flood control.

Baguio City needs to address the challenges related to flooding and inadequate wastewater management.



BSTP sedimentation tanks built through Japanese grant-aid in 1986



Implementation Progress as of December 2019

In April 2016, the CDIA study team submitted its final report on the GIWM program to CDIA and City Government of Baguio recommending priority infrastructure projects that will improve wastewater management, stormwater drainage and flood control within the city. In addition, the team recommended institutional reform and capacity development actions to support the sustained development and implementation of GIWM. Total financing requirement of GIWM was estimated at Php 6.07 billion with about Php 2.46 billion to be invested in the short-term (2016-2020).

Wastewater Management Projects. The GIWM PPS prioritized the following projects: (i) expansion of the existing BSTP capacity from 8,600 cum/d to 14,600 cum/d by constructing a new plant and replacing damaged and undersized sewers within the network; (ii) expansion of decentralized sewerage systems by constructing a sewage treatment plant and a septage treatment facility at Lower Rock Quarry; (iii) construction of a decentralized wastewater management facilities at the city slaughterhouse and wet market; and (iv) preparation

of a wastewater and drainage master plan to guide future sector investments. Most of these projects were recommended for funding under the National Septage and Sewerage Management Program (NSSMP) of the Department of Public Works and Highways (DPWH). However, the large equity contribution required by NSSMP hindered the city government from availing of the program.

Using its own resources, the city allocated a total of Php 100 million from 2016 to 2019 to construct a septage treatment plant, acquire sludge dewatering



Sludge dewatering facility built by the city in 2019

equipment and septage collection trucks and rehabilitate sewer lines in the Central Business District (CBD). According to key officials of the City Environment and Parks Management Office (CEPMO), these investments are inadequate to cope with the increasing number of sewer-connected establishments in the city resulting to overloading of BSTP, treatment inefficiency and difficulty in complying with the national effluent standards. This problematic situation has prompted the Environmental Management Bureau (EMB) to issue a citation requiring the city to formulate a

Compliance Action Plan (CAP) aimed at addressing BSTP's overloading and non-compliant effluent being discharged to Balili River by 2022. The city prepared a CAP which was approved by EMB in 2018.

Aware of the urgent need to address surface and groundwater pollution affecting the city, the new City Mayor has been actively seeking external funding support for wastewater infrastructure projects. Recently, the Mayor was able to obtain a funding commitment of Php500 million from the Department of Tourism for the rehabilitation of Burnham park including its drainage and wastewater infrastructure. In collaboration with the National Economic and Development Authority (NEDA), the city government is also exploring the possibility of mobilizing funds from multilateral agencies including the ADB.

Drainage and Flood Control

Projects. Under the GIWM program, the following projects were prioritized: (i) completion of the 2.5 km sinkhole tunnel between the inlet at the City Camp Lagoon to Crystal Cave; (ii) upgrading the capacity of inflow channels and streams which discharge to the sinkholes including installation of trash racks at the upstream of sinkhole catchments; (iii) improvement of roadside drains

along national and city road networks affected by flooding; (iv) river training and flood protection works along critical sections of rivers flowing through the city; and (v) maintenance program to keep the trash racks and channels clear of debris.

From 2016 to 2019, the DPWH has allocated Php150 million annually for drainage and flood control projects. Using the DPWH budget, the construction of the 2.5 km sinkhole tunnel from the City Camp Lagoon to Crystal Cave and upgrading the capacity of inflow channels discharging into the City Camp Lagoon have been completed. Likewise, major flood control projects in critical sections of Bued and Balili rivers have been completed while drainage rehabilitation and maintenance along national roads are continuously being undertaken as part of the regular functions of DPWH. The Baguio City Government, on the other hand, has allocated some Php20 million annually for maintenance of drainage channels along city roads, construction of trash racks to protect sinkholes and clearing of debris along drainage channels. Under the new city leadership, improving the city's drainage and sewerage system is one of its top priorities and forms part of the overall strategy to enhance the quality of the environment of Baguio.

Intervention Results

The CDIA-supported PPS on the Green and Integrated Wastewater Management for Baguio primarily aimed at providing the city with a sound long-term planning framework for wastewater management and drainage improvement with a view towards: (i) improving sanitation and wastewater services; and (ii) reducing incidence and duration of flooding. In line with the study objectives, the city government of Baguio has gradually implemented the prioritized projects identified in the PPS utilizing local and national funding sources. Although the major wastewater management investments have yet to be fully implemented, city officials clearly recognize the important benefits that the PPS intervention has brought to Baguio City specifically in terms of providing the city with a sound framework for planning wastewater management, drainage improvement and flood control projects.

Provision of sound framework for planning wastewater, drainage and flood control projects. Integrated wastewater management and drainage improvement and flood control are considered high priority investments by past and present administrations of Baguio City. Using a consultative approach, the CDIA intervention was able to develop a PPS document containing sector development strategies and priority projects based on a comprehensive



Completed sinkhole tunnel and trash rack at Camp City Lagoon

diagnosis of sector issues and extensive discussions with primary project stakeholders. In the absence of a wastewater and drainage masterplan, the PPS has been very useful to the CEPMO, CEO and DPWH in prioritizing and allocating resources to projects that can address urgent wastewater and drainage management issues affecting the city. In 2018, CEPMO used the PPS as its primary reference in formulating the CAP required by EMB for the BSTP to comply with national effluent standards by 2022. Likewise, DPWH has been using the PPS as a guide in prioritizing medium- to long-term flood control projects for funding by the national government. Moreover, the DPWH and CEO officials acknowledge the value of climate change resilience approach introduced by CDIA in the selection and prioritization of drainage and flood control infrastructure under the GIWM program.

Reduced incidence and duration of flooding. With most of the PPS-

recommended drainage and flood control projects implemented by DPWH and the CEO, flooding in the city has been significantly reduced.

Interviews with key city officials revealed that during last monsoon season, the depth of flooding in flood-prone areas of the city was less than 0.5 meter and floodwater subsided in less than three hours. It is estimated that some 2,000 households are currently benefiting from the avoidance of floods. These benefits include: health benefits resulting from improved sanitation, protection of property and other assets from the risk of damage due to floods, savings on medical and other household expenses related to water-borne diseases and house repairs necessitated by flood damage, reduced city government expenses in disaster response, increase in property values in previously flood-prone areas and increase in tourism-related business activities resulting in more employment opportunities.

KEYS TO INTERVENTION RESULTS:



- Alignment of projects to city and national plans
- Financial support from city and national governments
- Strong demand from city stakeholders to address their flooding problem



Conclusion and Lessons Learned

The ongoing and completed urban infrastructures related to integrated wastewater management in Baguio City are clearly linked to the PPS prepared with the assistance of CDIA back in 2015. While the implementation of wastewater management projects encountered some delays, most of the drainage infrastructure projects were funded and executed as planned. Factors that facilitated the implementation of the PPS-prioritized projects include: (i) alignment of the projects to the city and national plans; (ii) financial support from the city and national government; and (iii) strong demand from city stakeholders

to find a long-term solution to the flooding problem in the city.

The CDIA experience in Baguio City offers a number of lessons relating to preparing projects on wastewater and drainage management. These include: (i) value of incorporating a comprehensive climate change resilience approach to project designs; (ii) importance of adopting a consultative and inclusive project prioritization and design process to ensure ownership of project outputs; and (iii) importance of incorporating capacity development and institutional strengthening measures in project designs to

ensure sustainability of project operations and benefits to the city residents.

Solving the wastewater management problem in Baguio has become very urgent that the new city leadership has put this at the top of its development priorities. Four years after the CDIA intervention, the CDIA-supported PPS on green and integrated wastewater management is still being appreciated by city officials as it continues to serve as their basic guide in finding ways to solve the wastewater problem of the city.