Kementerian PPN/ Bappenas

SIPA
Sustainable Infrastructure Programme in Asia

UNDP

FIELD VISIT REPORT:

SUSTAINABLE WASTE MANAGEMENT SITE VISITS TO TEMANGGUNG REGENCY

19-21 November 2025

Supported by:

Federal Ministry for Economic Affairs and Climate Action

IKI INTERNATIONAL CLIMATE INITIATIVE

OECD

on the basis of a decision by the German Bundestag

ORGANIZED BY:

Ministry of National Development Planning (BAPPENAS)
in collaboration with UNDP Indonesia through the Sustainable Infrastructure Programme in Asia (SIPA)

Locations:

TPA Sanggrahan and Tanurejo Village TPS3R, Temanggung Regency

I. Background and Context

Indonesia is entering a pivotal phase in transforming its waste management system from traditional collection–disposal approaches toward integrated and circular models. The National Long-Term Development Plan (RPJPN) 2025–2045 and the Medium-Term Development Plan (RPJMN) 2025–2029 emphasize the reform of waste management from upstream to downstream as a strategic national priority.

In alignment with these national priorities, the Ministry of National Development Planning (Bappenas), in collaboration with the United Nations Development Programme (UNDP) under the Sustainable Infrastructure Programme in Asia (SIPA), is undertaking a comparative study on sustainable waste treatment technologies, particularly focusing on the performance and scalability of Refuse-Derived Fuel (RDF) and Waste-to-Energy (WtE) facilities.

Temanggung Regency is one of the study locations under the Feasibility Study Review supported by SIPA, and also serves as a pilot site for the Solid Waste Management for Sustainable Urban Development (SWMSUD) Program - Phase 1. To ensure Temanggung Regency's readiness for the planning and construction of the Sanggrahan TPST in 2026, a coordination meeting and field visit were required, involving relevant stakeholders.

Within the context of SIPA, this activity also served as a platform to present to the Temanggung Regency Government the identified gaps and recommended strategies for program preparation and implementation, based on the study that has been jointly facilitated by UNDP and the Ministry of National Development Planning (Bappenas).

II. Objectives of the Site Visit

Review the Feasibility Study (FS) for the Temanggung Regency TPST as part of the support for advancing integrated waste management reform from upstream to downstream.

Identify on the division of roles among stakeholders in the development of the TPST, including risk-mitigation measures for its implementation.

Gather technical and institutional inputs to strengthen the planning and construction readiness of the Sanggrahan TPST.

Enhance coordination and synergy between the central government, local government, and development partners in advancing sustainable waste management.

III. Participants

The visit involved representatives from ministries, UNDP-SIPA, development partners and technical experts. Key participants included:

Bappenas

- **Nur Aisyah Nasution** – Coordinator for Water Supply and Sanitation, Directorate of Housing and Settlement Infrastructure, Bappenas.
- **Faiq Yahya H** – Planner, Bappenas.
- **Zia Husnia S.** – Policy Analyst, Bappenas.
- **Daniel Hernanda S** - Individual Consultant, Bappenas.
- **Happy Tesyana W** – Individual Consultant, Bappenas.

Other Ministries

- **Kunto** - Directorate of Synchronization of Regional Planning Affairs I, Ministry of Internal Affairs.
- **Agreta** – Directorate of Synchronization of Regional Planning Affairs II, Ministry of Internal Affairs.
- **Wiwied** – Directorate of Environmental Health, Ministry of Health.
- **Yamanda** – Technical Expert, Ministry of Internal Affairs.
- **Lilik** – Technical Expert, Ministry of Public Works.
- **Malindo** – Technical Expert, Ministry of Public Works.

Development Partners and Technical Expert

- **Herawati Zetha Rahman** – Financial and Economic Expert, UNDP.
- **Ricky S** – Alliance to End Plastic Waste (AEPW).
- **Dhanang** – Enviro Solutions and Consulting (ESC).

Temanggung Regency Government

- **Agus Setyawan** – Regent of Temanggung
- **Nadia Muna** – Deputy Regent of Temanggung
- Head of the Regional Development Planning Agency
- Head of the Environmental Agency
- Representative from the Public Works Agency
- Representative from the Health Agency

IV. Agenda and Itinerary

The activities were conducted over a three-day period, from 19 to 21 November, consisting of a series of meetings with the Regent and local government officials, followed by field visit of the proposed TPST location within the Sanggrahan landfill area.

In addition, an additional field visit location was proposed by the local Environmental Agency, namely the Tanurejo Village TPS3R, which serves as a notable example of good solid waste management practices in Temanggung Regency.

V. Key Discussion Point

a. Updates on the status of the SWMSUD project.
b. Findings from the expert team's review regarding the completeness and depth of the Sanggrahan TPST Feasibility Study.
c. Progress made by the local government in preparing the Sanggrahan TPST.
d. Guidance from relevant ministries and agencies concerning technical, institutional, regulatory and policy aspects, financing, and stakeholder participation in preparing the development of the Sanggrahan TPST.
e. Joint work plan as follow-up actions for programme preparation.

VI. Overview of TPST Sanggrahan Development Plan

The Sanggrahan TPST is planned to be developed within the Sanggrahan landfill area, covering approximately 6 hectares and serving all 20 districts in the regency. Designed to begin development in 2026 and financed through an international loan under the Solid Waste Management for Sustainable Urban Development (SWMSUD) program, the facility will integrate a combination of technologies, including an RDF plant, composting, and a Material Recovery Facility (MRF). With a design processing capacity of 125 tons per day (tpd) out of the total regional waste generation of 405 tpd, the facility is expected to produce 48 tpd of RDF, 26.78 tpd of MRF products, and 0.78 tpd of compost, and will be operated by the local government.

The estimated financing requirements for the Sanggrahan TPST include a CAPEX of IDR 135.3 billion and an annual OPEX of IDR 12.30 billion. From a financial perspective, the project is considered viable, with a Net Present Value (NPV) of IDR 82.68 billion and an Internal Rate of Return (IRR) of 14.59%, discounted at 9%. Economically, the project is also feasible, with an Economic IRR (EIRR) of 21.12% and an NPV—discounted at 9%—of IDR 129.56 billion.

VII. Overview of Audience Meeting With The Local Government

1. The preparation for the development of the Sanggrahan TPST has been undertaken by the local government for approximately three years, and the local government expects the construction to commence soon. The Sanggrahan TPST holds a strategic role in supporting solid waste management solutions in Temanggung Regency, particularly in increasing the percentage of waste treated.
2. The local government has implemented several measures to strengthen the waste management ecosystem from upstream to downstream, including:
    a. Issuance of Regent Regulation No. 43/2023 on Village Waste Management, which promotes optimal waste segregation, reduction, and storage at the source.
    b. Preparation of regulations on plastic waste restrictions for retail business activities.
    c. Implementation of scheduled and segregated waste collection services, which will be supported by additional waste collection vehicles.
    d. Provision of separate collection services for organic waste generated by restaurants and the SPPG, as potential suppliers for maggot production at the Sanggrahan TPST.
    e. Management of the Residual Landfill Area (LUR) with attention to environmental and social aspects, supported by adequate budgeting and infrastructure.
    f. Improvement of waste reduction performance through 51 TPS3R facilities funded by the national budget (APBN), local budget (APBD), special allocation fund (DAK), and provincial budget, as well as 91 TPSD facilities funded by village budgets.
    g. Preparation of a livelihood restoration plan for affected communities, particularly informal workers.
    h. Provision of an annual operational budget allocation for the Sanggrahan TPST amounting to IDR 13,961,347,769 from the regional budget (APBD) starting from the commencement of facility operations.

3. Based on the review results, the Sanggrahan TPST Feasibility Study demonstrates good completeness and analytical depth, with an overall score of 90.2%. Several strategic issues were identified, namely: (1) the absence of primary data collection during the preparation process; (2) the lack of a mass balance illustrating the facility's projected operations; and (3) although the project is financially viable, its feasibility is highly dependent from the MRF.

4. From an institutional perspective, the local government is recommended to adopt the Public Service Agency (BLUD) management model in the short term, supported by the preparation of strategic plans, standard operating procedures (SOPs), optimization of regional assets (BMD), staff training, and pilot testing of limited partnerships.

Source Person

Nur Aisyah Nasution
Coordinator for Water Supply and Sanitation, Directorate of Housing and Settlement Infrastructure, Bappenas

Herawati Zetha Rahman
Financial and Economic Expert, UNDP.

Dhanang
Enviro Solutions and Consulting (ESC)

Representatives of Ministries/Institutions

5. In the longer term, the local government may consider a Public–Private Partnership (PPP/KPBU) to ensure a financially sustainable and competitive waste management system.

6. From a planning perspective, several recommendations should be taken into consideration by the local government:
    a. A phased enhancement of waste handling capacity is required to meet waste management targets.
    b. Considering the potential for economic displacement due to land acquisition, a comprehensive Land Acquisition Plan and, where necessary, a Resettlement Action Plan should be developed.
    c. Expansion or additional development of the TPST and residual landfill cells at the current site may be required around 2040, anticipating potential increases in waste generation.
    d. Additional TPST work shifts should be introduced as needed to ensure full processing of incoming waste. Consequently, increased offtakers or additional market absorption may be required if TPST output surges.

7. From an economic and financial standpoint, several recommendations for the local government include:
    a. Current waste service charges for the commercial sector appear too low, resulting in a disproportionate burden on residential users. The local government should rationalize commercial tariffs.
    b. Expanding the service coverage area is necessary to increase and optimize revenue.
    c. Setting residential waste charges based on social equity principles—with tariff differentiation according to user category—is highly recommended, enabling higher-income groups to pay higher rates.
    d. Technical assistance for the implementation of Ministry of Home Affairs Regulation No. 7/2021 is required to ensure appropriate tariff-setting.

8. With regard to permitting, several recommendations for the local government include:
    a. Converting the landfill (TPA) into a TPST requires several permits: principal permit, location permit, land-use change permit, and building permit, all issued by the local government in accordance with applicable regulations.
    b. The subproject must have all required technical plans, including sanitation systems and RDF waste management systems, complying with national and international standards, including Ministry of Public Works Regulation No. 03/2013 and AIIB ESS1.
    c. Issues related to the Temporary Landfill must be addressed, particularly those concerning permits, stakeholder engagement around the proposed site, and thorough technical planning to ensure the Temporary Landfill does not generate additional problems.
    d. Environmental sampling (leachate, groundwater, surface water, air, etc.) must be conducted as required for periodic UKL/UPL reporting.

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9. Regarding the SWMSUD implementation timeline, the loan is expected to become effective as early as January 2026. Given the quality of the DED and the advanced planning progress in Temanggung, the procurement process is estimated to begin in May 2026

10. Key improvement measures for the waste management system that require attention from the local government are as follows:

No	Key Points	Strategies
1.	Preparation of the Solid Waste Management Master Plan	Enforcement of regulations and implementation of guidelines, as well as the preparation of an integrated upstream–downstream Solid Waste Management Master Plan (RIPS) at the district/city level.
2.	Establishment of an end-to-end BLUD institutional framework	Enforcement of regulations and implementation of guidelines, and the acceleration of BLUD establishment as the waste management operator across the district/city.
3.	Optimization of waste service charge (retribution) collection performance	a. Enforcement by the regional head. b. Increasing the collection rate to meet 80% of operational expenditure needs. c. Introducing payment convenience mechanisms (bundled service tariff models).
4.	Improvement of the retribution payer database and development of an operator registry system	

No	Key Points	Strategies
5.	Community behavior-change interventions and end-to-end OPEX readiness	a. Ensuring the allocation of Operational Health Budget (BOK) for sanitarians. b. Engaging Village Facilitators to trigger community behavior change on waste segregation and retribution payment. c. Emphasizing the principle that organic waste must be managed at the source.
6.	Activation of the Regional Working Group (Pokja) for Housing, Settlements, Drinking Water, and Sanitatio	Coordination among local government departments (OPD) for overall waste management and specific project management.
7.	Long-term cooperation agreements with offtakers	a. Securing long-term cooperation agreements with offtakers (Greenprosa and SBI) to ensure market absorption of processed waste products. b. Ensuring detailed role and risk-sharing arrangements within the cooperation agreement, including provisions for force majeure.
8.	Comprehensive service zoning at the regency level	a. Determining comprehensive waste management service zones and defining the service area for the TPST. b. Basing zoning decisions on waste logistics analysis to ensure more effective and efficient transportation in terms of distance and travel time.

VIII. Overview of Tanurejo Village TPS3R

The Tanurejo Village TPS3R is one of the notable best practices for intermediate-level waste management in Temanggung Regency. The facility even won 2nd Place in the 2025 Central Java Provincial Innovative Village Waste Management Award. The TPS3R provides waste collection and processing services for two neighborhood units (RW), covering a total of 293 households. Activities carried out at the facility include the processing of organic waste into compost and the sorting of recyclable materials. The compost produced is sold to local farmers, while high-value inorganic materials are sold to partner collectors. A total of 12 workers are involved in operating the facility.

Several key lessons can be drawn from the facility, namely:

a. The availability of segregated and scheduled waste collection services—Sundays and Wednesdays for RW 001, and Mondays and Thursdays for RW 002.
b. Consistent and well-maintained record-keeping across ten categories: duplex, organic, cans, wood, diapers, sandals/shoes, non-recyclable plastics, glassware and bottles, cardboard, and plastic bottles.
c. The implementation of sustainable waste management practices, with village-level waste processing activities having been carried out since 2016 and further strengthened following the construction of the hangar supported by the Ministry of Public Works in early 2025.

IX. Conclusion and Next Steps

In the forum, the central government through the Ministry of National Development Planning (Bappenas) conveyed its guidance to the Local Government to follow up in the short term on at least three key points from the proposed action plan: improving user charge collection performance, establishing a BLUD, and preparing the community. These steps are expected to be initiated without waiting for the construction of the Sanggrahan TPST to begin.

On the other hand, the review findings of the Temanggung Regency FS Document by UNDP Technical Experts have also been presented and received positive responses from the Local Government for prompt follow-up. Through these activities, Bappenas and UNDP have contributed to strengthening the planning and preparation of the Sanggrahan TPST in Temanggung Regency, as part of efforts to advance a sustainable transition in solid waste management.

PARTICIPANTS & COLLABORATORS

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SIPA Project Team

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