Part 3: Social Infrastructure

3.1. BUILD TOURISM HOUSING FACILITIES (SARHUNTA)

3.1.1. Project Profile

The Self-Help Housing Stimulus Assistance (BSPS) development was first included in the list of National Strategic Projects (PSNs) in 2016 and as of the end of 2022, the BSPS is still included in the list, as regulated by the Minister of Economic Affairs' Regulation Number 21 of 2022 (Ministry of Economic Affairs, 2022). During 2016–21, BSPS has been implemented nationwide with three themes: Sail Karimata, Wonderful Indonesia, and BSPS Tourism Housing Facilities (Sarhunta), which has spent Rp739.91 billion and upgraded 25,385 houses (Directorate of Self-Help Housing, 2023b). Details of the achievements of BSPS are presented in Table 3.20.

Table 3.20. Achievements of BSPS 2016–2021

	2016	2017	2018	2019	2020	2021
Theme	Sail Karimata	Wonderful Indonesia	Wonderful Indonesia	Wonderful Indonesia	Sarhunta	Sarhunta
Project Location	West Kalimantan	North Sumatera, Central Java, East Java, West Nusa Tenggara, East Nusa Tenggara	North Sumatera, West Sumatera, Banten, Central Java, East Java, West Nusa Tenggara, East Nusa Tenggara, South Sulawesi, Southeast Sulawesi, North Maluku	North Sumatera, West Sumatera, Central Java, East Java, West Nusa Tenggara, East Nusa Tenggara, South Sulawesi, Southeast Sulawesi, North Maluku	Lake Toba KSPN, Borobudur KSPN, Mandalika KSPN, Labuan Bajo KSPN, Likupang KSPN	Tanjung Kelayang KSPN, Bromo-Tengger-Semeru KSPN, Wakatobi KSPN, Morotai KSPN, Raja Ampat KSPN

	2016	2017	2018	2019	2020	2021
Unit	298	2,107	4,619	12,785	4,679	897
Budget (billion Rp)	4.47	30.55	69.29	228.4	353.27	53.93

BSPS = Self-Help Housing Stimulus Assistance, KSPN = National Tourism Strategic Areas.
Source: Adapted from Directorate of Self-Help Housing, 2023b.

BSPS adopted the theme of Sarhunta in 2020 and 2021 to support the development of 10 key National Tourism Strategic Areas (KSPN) as could be seen in Figure 3.77. In 2020, BSPS Sarhunta focused on five super-priority KSPNs: Danau Toba, Borobudur, Mandalika, Labuan Bajo, and Likupang. Then, in 2021, it continued in five other priority KSPNs: Tanjung Kelayang, Bromo-Tengger-Semeru, Wakatobi, Morotai, and Raja Ampat. Based on data from Directorate of Self-Help Housing, BSPS Sarhunta spread across 21 districts/cities and 227 villages within those 10 KSPNs.

Figure 3.77. Distribution Map of BSPS Sarhunta

BSPS = Self-Help Housing Stimulus Assistance, KSPN = National Tourism Strategic Areas.
Source: Adapted from the Directorate of Self-Help Housing, 2023b.

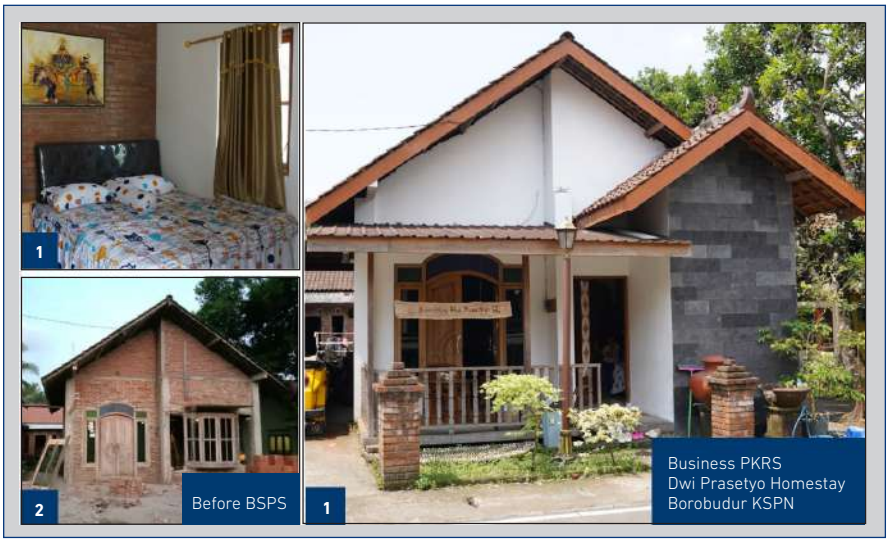
BSPS Sarhunta included improving the quality of self-help houses (PKRS) with or without business functions, as well as environmental management. PKRS business addressed repairing or adding to housing space for businesses' functions, such as homestays, creative production galleries, souvenir shops, culinary services, transportation rentals, and others. PKRS businesses were dominated by homestays, i.e., 2,029 units, or 88.41% of the total PKRS business units (Directorate of Self-Help Housing, 2023b).

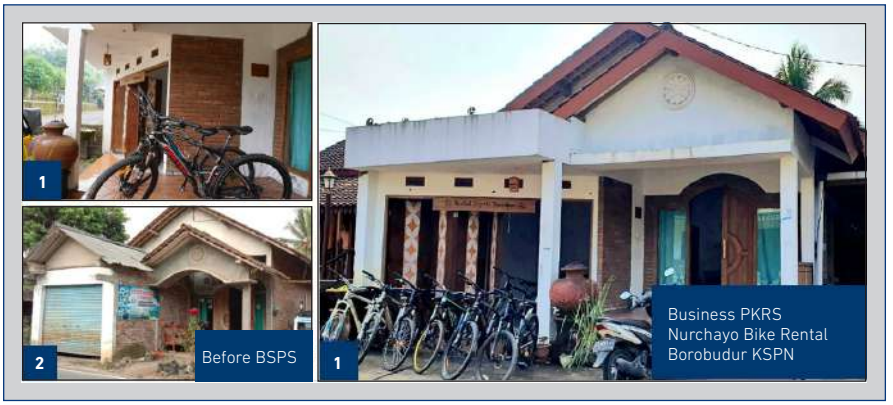
Meanwhile, non-business PKRS addressed repairing residential houses to make them liveable, including the façade to represent the local traditional house design. This activity was prioritised for residential houses that were in the main corridor to create the distinctive atmosphere of a cultured tourism area (BP2P Jawa III, 2021). Environmental management addresses developing public tourism infrastructure and facilities, amongst others. Some documentation of PKRS-unit results is presented in Figure 3.77.

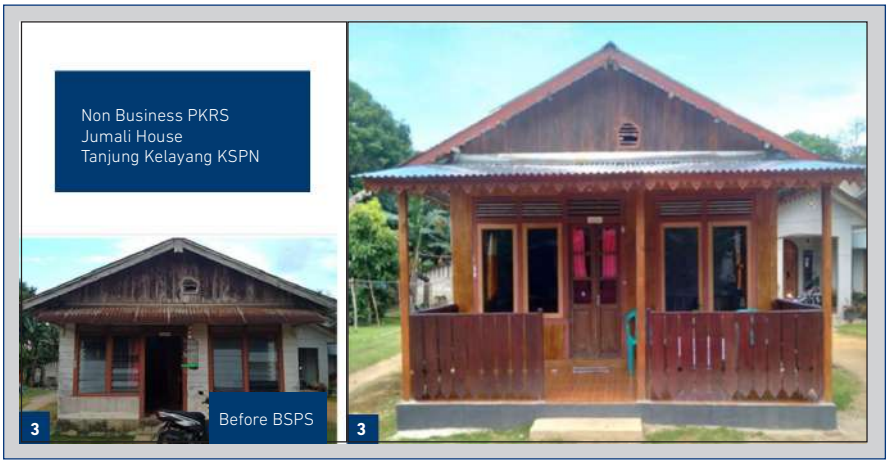
The recipients of BSPS Sarhunta were selected based on the following criteria:

a. Married Indonesian citizens;
b. Have legal possession of land with valid proof;
c. Own and occupy the proposed house;
d. Meet the income limit for assistance recipients (maximum of Rp6.5 million in Raja Ampat KSPN and Rp6 million in KSPN other than Raja Ampat);
e. Commitment to support tourism activities, including:
    1) Pledge to utilise the building for the chosen business function for the next 10 years;
    2) Adhere to the document proposal and advice/guidance of the support staff;
    3) Willingness to contribute self-help efforts;
    4) Form a group and collectively take responsibility;
    5) Participate in tourism business management training.

Figure 3.78. Documentation of PKRS-Unit Results







PKRS = quality improvement of self-help houses, KSPN = National Tourism Strategic Areas.

Source: [1]Authors, 2023; [2]Nurcahyo, 2021; [3]Housing Provision Unit of Bangka Belitung Islands Province, 2023.

The Directorate of Self-Help Housing under Directorate General of Housing, Ministry of Public Works and Housing, who acted as the main executor of the BSPS Sarhunta, was assisted by the Housing Provision Implementation Office (BP2P) and the Provincial Housing Provision Unit at regional level. BSPS Sarhunta also involved community, housing-related agencies, district-level authorities, and village authorities, in the potential survey process. In addition, a facilitation team was involved in the planning and physical implementation stages. Lastly, utilisation efforts were carried out in stages, from the village to the central government level.

3.1.2. Project Objectives

Tourism development has a multiplier effect on other sectors, so it is quite effective in efforts to increase foreign exchange (Sulaiman et al., 2022). Government Regulation Number 50 of 2011 concerning the National Tourism Development Master Plan regulates the 2010–25 national tourism development, which includes the construction of 88 KSPNs.

In Presidential Regulation No. 18 of 2020 concerning the 2020–24 National Medium-Term Development Plan, Indonesia prioritised tourism on 10 KSPNs: Lake Toba, Borobudur and its surroundings, Lombok-Mandalika, Labuan Bajo, Manado-Likupang, Tanjung Kelayang, Bromo-Tengger-Semeru, Wakatobi, Morotai, and Raja Ampat. The development must be accompanied by integrated infrastructure, including planning, roads, water supply, waste management, sanitation, and housing.

Hence, having the status of PSN, the 2020–21 BSPS adopted Sarhunta theme. BSPS Sarhunta has a strategic role in supporting tourism as well as improving community welfare and regional development. The objectives of BSPS Sarhunta are as follows:

a. encouraging and increasing community self-sufficiency in achieving liveable houses;
b. improving the people's welfare through the provision of accommodation and other tourism businesses;
c. optimising the housing function and cultivating connectivity through environmental management using community empowerment; and
d. facilitating self-help housing initiatives to support KSPN development.

3.1.3. Project Cost and Source of Fund

BSPS Sarhunta was allocated Rp428.4 billion by the state (KPPIP, 2022). The realisation amounted to Rp407.20 billion with an output goal of 5,576 units (Directorate of Self-Help Housing, 2023b). The details are presented in Table 3.21.

Realisation of the budget consists of assistance for PKRS activities, environmental management, and supporting activities. The maximum value of the 2020 BSPS Sarhunta assistance was Rp115 million for business PKRS, Rp35 million for non-business PKRS, and Rp10 million multiplied by the number of recipients of environmental planning assistance. In 2021, there was a change in the maximum assistance limit to:

a. Raja Ampat KSPN: Rp125 million for business PKRS and Rp45 million for non-business PKRS;
b. KSPN Tanjung Kelayang, Bromo-Tengger Semeru, Wakatobi, Morotai: Rp100 million for business PKRS and Rp35 million for non-business PKRS;
c. Environmental arrangement was calculated based on real needs and budget availability.

Apart from being funded by the state budget, the construction of the BSPS Sarhunta also involved community self-help from the beneficiaries, in the form of land, money, building materials, labour, and/or furniture.

Table 3.21. Details of Output and Budget Realisation of BSPS Sarhunta

KSPN	Business PKRS		Non-Business PKRS		Supporting	Total	
	Unit	Budget (in billion Rp)	Unit	Budget (in billion Rp)	Budget (in billion Rp)	Unit	Budget (in billion Rp)
Year 2020							
Danau Toba	607	68.44	1,192	41.72	10.96	1,799	121.12
Borobudur	382	36.79	439	13.61	7.53	821	57.93
Mandalika	398	44.13	517	18.10	7.10	915	69.33
Labuan Bajo	445	48.99	211	7.39	6.04	656	62.42
Likupang	263	28.73	225	7.87	5.87	488	42.47
Total 2020	**2,095**	**227.08**	**2,548**	**88.69**	**37.50**	**4,679**	**353.27**
Year 2021							
Tanjung Kelayang	20	2.00	70	2.45	1.25	90	5.70
Bromo-Tengger-Semeru	120	11.81	307	10.75	3.13	427	25.69
Wakatobi	20	2.00	100	3.50	1.27	120	6.77
Morotai	20	2.00	150	5.25	1.50	170	8.75
Raja Ampat	20	2.50	70	3.15	1.37	90	7.02
Total 2021	**200**	**20.31**	**697**	**25.10**	**8.52**	**897**	**53.93**
Total 2020–2021	**2,295**	**247.39**	**3,245**	**113.79**	**46.02**	**5,576**	**407.20**

BSPS = Self-Help Housing Stimulus Assistance, PKRS = quality improvement of self-help houses, KSPN = National Tourism Strategic Area.

Source: Adapted from Directorate of Self-Help Housing, 2023b.

3.1.4. External and Internal Factors

A survey was conducted to measure stakeholders' perspectives. The survey respondents included the central government, local government, village apparatus, academics, entrepreneurs, and the community. However, due to time and resource constraints, respondents other than those from the central government only came from two KSPN regions. The first area was Sarhunta KSPN Borobudur, reflecting project implementation in 2020 with a relatively large number of units. The second area was Sarhunta KSPN Tanjung Kelayang, representing project implementation in 2021 with a relatively small number of units.

Then, their perception of various external and internal factors – the perceived reality and the perceived importance – was analysed. Perceived reality measures the stakeholders' perception of the facts observed, whilst the perceived level of importance scores factors that respondents feel are important to the success of the project. Both are scored on a scale of 1 to 6, where 1 indicates a very negative perception and a score of 6 a very positive perception.

3.1.4.1. External Factors

The identified external factors are the level of smoothness in the process of determining and validating recipients of Sarhunta PSN assistance (E_1); availability of competent human resources to implement Sarhunta PSN housing development (E_2); availability of land for Sarhunta PSN development (E_3); the level of support from the surrounding community for Sarhunta PSN (E_4); the level of fairness of accommodation rates in Sarhunta PSN homestays (E_5); the organisation of national and/or international-scale activities in the area of the Sarhunta PSN location to attract visitors (E_6); the level of suitability of the functionality of Sarhunta PSN results (E_7); the level of ability of Sarhunta PSN homestay managers in managing tourist accommodations (hospitality, cleanliness, communication, and publicity) (E_8); the level of job creation and/or new business opportunities for the community through Sarhunta PSN development (E_9); the level of impact of Sarhunta PSN on attracting investors to the surrounding area (E_{10}); the level of increase in tourists to the KSPN location with the presence of Sarhunta PSN (E_{11}); the level of improvement in the welfare of the surrounding community through Sarhunta PSN (E_{12}); the level of increase in national/regional revenue with the presence of Sarhunta PSN (E_{13}); and the level of potential for Sarhunta PSN implementation to be free from disputes or legal constraints (E_{14}).

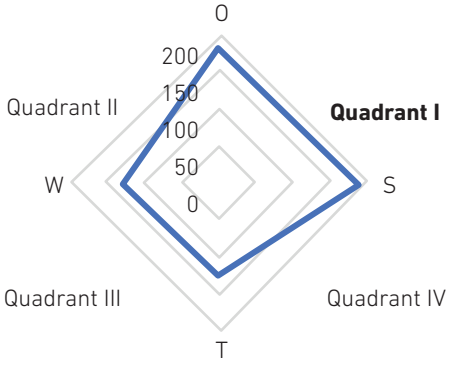
3.1.4.2. Internal Factors

The identified internal factors are the deregulation/issuance of regulations to support Sarhunta PSN implementation (I_1); suitability of the location for the development of Sarhunta PSN (I_2); compatibility of Sarhunta PSN development with spatial planning and land use (I_3); availability of infrastructure that supports Sarhunta PSN, such as road access, transportation, electricity installation, and clean water installation (I_4); support from the central and/or regional governments in financing Sarhunta PSN (I_5); ease of the permitting process in preparing for Sarhunta PSN implementation (I_6); the level of technical smoothness in the construction of Sarhunta PSN (I_7); the level of utilisation of local architectural components or elements in Sarhunta PSN development (I_8); timeliness in the completion of Sarhunta PSN (I_9); adequacy of supporting facilities for Sarhunta PSN homestays according to tourism housing standards (furniture, bathroom equipment, Wi-Fi, parking area, garden area, and restaurants) (I_{10}); compliance with regulations in the procurement process of goods/services (PBJ) for Sarhunta PSN (I_{11}); the level of concern for environmental sustainability in Sarhunta PSN development (I_{12}); timeliness of fund disbursement for Sarhunta PSN construction (I_{13}); and the level of physical quality of Sarhunta PSN outcomes (I_{14}).

3.1.5. SWOT Results and Analysis

The survey results were analysed employing Strength-Weakness-Opportunity-Threat (SWOT) analysis to depict the perceived strengths, weaknesses, opportunities, and threats of BSPS Sarhunta Programme. Next, the findings of SWOT analysis were illustrated in a radar chart, as shown in Figure 3.79.

Figure 3.79. BSPS Sarhunta SWOT Analysis Results



	Categories	Values
S	**Strengths**	**189.819**
W	Weaknesses	129.846
O	**Opportunities**	**184.498**
T	Threats	121.899

BSPS = Self-Help Housing Stimulus Assistance.
SWOT = strength-weakness-opportunity-threat.
Source: Authors, 2023.

Figure 3.79 shows that the SWOT analysis of BSPS Sarhunta is in Quadrant I, where strength values dominate internal factors while opportunity values dominate external factors. Thus, the strategy that must be implemented in this condition is to support an aggressive growth policy (growth-oriented strategy), which emphasises the optimisation of strengths to maximise opportunities.

The matrices of factors resulted by BSPS Sarhunta SWOT analysis survey can be seen in Figure 3.80. The factors are arranged in order of the average value of the respondents' perception of reality.

Figure 3.80. BSPS Sarhunta SWOT Analysis Survey Results Matrices

	Positive	Negative
Internal	***Strengths*** • Suitability of location for the development of Sarhunta PSN. • Compatibility of Sarhunta PSN development with spatial planning and land use. • Support from the central and/or regional government in financing Sarhunta PSN. • Level of concern for environmental sustainability in Sarhunta PSN development. • Timeliness of fund disbursement for Sarhunta PSN construction. • Level of utilisation of local architectural components or elements in Sarhunta PSN development. • Level of physical quality of Sarhunta PSN outcomes. • Ease of permitting process in preparing for Sarhunta PSN implementation.	***Weaknesses*** • Adequacy of supporting facilities for Sarhunta PSN homestay according to tourism housing standards (furniture, bathroom equipment, Wi-Fi, parking area, garden area, restaurant). • Deregulation/issuance of regulations to support Sarhunta PSN implementation. • Level of technical smoothness in the construction of Sarhunta PSN. • Timeliness in the completion of Sarhunta PSN. • Availability of infrastructure that supports Sarhunta PSN, such as road access, transportation, electricity installation, clean water installation. • Compliance with regulations in the procurement process of goods/ services (PBJ) for Sarhunta PSN.
External	***Opportunities*** • Level of suitability of the functionality of Sarhunta PSN results. • Level of support from the surrounding community for Sarhunta PSN. • Level of potential for Sarhunta PSN implementation to be free from disputes or legal constraints. • Level of fairness of accommodation rates in Sarhunta PSN homestays. • Level of job creation and/or new business opportunities for the community through Sarhunta PSN development. • Availability of land for Sarhunta PSN development. • Organisation of national and/or international-scale activities in the area of the Sarhunta PSN location to attract visitors. • Level of improvement in the welfare of the surrounding community through Sarhunta PSN.	***Threats*** • Level of ability of Sarhunta PSN homestay managers in managing tourist accommodations (hospitality, cleanliness, communication, publicity). • Level of impact of Sarhunta PSN on attracting investors to the surrounding area Level of increase in national/regional revenue with the presence of Sarhunta PSN. • Level of increase in tourists to the KSPN location with the presence of Sarhunta PSN. • Availability of competent human resources to implement Sarhunta PSN housing development. • Level of smoothness in the process of determining and validating recipients of Sarhunta PSN assistance.

KSPN = National Tourism Strategic Area, PSN = National Strategic Project, SWOT = strength-weakness-opportunity-threat.
Source: Authors, 2023.

Factors in the strength and opportunity categories are sorted based on the highest average perceived value, which indicates a good reality level of the factor in supporting the success of BSPS Sarhunta goals. The location of the BSPS Sarhunta development is perceived as the strongest internal factor in achieving the goals of this project, while, assessing the external factors, the level of BSPS Sarhunta results' functional suitability is the biggest opportunity. In addition, reasonable homestay price is an opportunity to attract tourists.

In the weakness and threat categories, the factors are sorted based on the lowest average value of perception, which indicates an unfavourable level of reality. The adequacy factor of homestay supporting facilities is perceived as the weakest internal factor. From external factors, respondents identified the biggest threat, namely the inability of BSPS Sarhunta homestay managers to manage tourist accommodation properly.

3.1.5.1. Main Challenges

The results of the SWOT analysis are reinforced by the results of interviews with stakeholders and literature studies; the main challenges are the following:

i. The inability of the beneficiaries to manage tourism businesses

The SWOT analysis survey shows that the ability of homestay managers needs to be improved. Many do not understand the importance of amenities, hospitality, hygiene standards, and promotions. This condition is a challenge to the sustainability of the management of the BSPS Sarhunta business function (Directorate of Self-Help Housing, 2023a).

This obstacle resulted in the level of tourist visits to the BSPS Sarhunta, as well as the influx of investors and the indirect impact on the state/regional revenue, not being optimal, as shown by the SWOT analysis. The results of the BP2P Jawa III survey in early 2023 found that only around 40% (152 units) of the total business PKRS units in the Borobudur area had ever been visited by tourists. In the Tanjung Kelayang area, more than 50% of the 20 homestays resulting from PKRS efforts have received visitors, but the frequency is still low.

Various trainings related to accommodation management have been conducted, but the Department of Tourism, Youth, and Sports (Disparpora) for Magelang Regency recognised that the number is still minimal and not evenly distributed due to budget constraints. In addition, several areas have formed homestay management groups, with one in Tanjung Kelayang, KSPN Tanjung Tinggi Village, agreeing on the homestay rate and to manage marketing through an online travel application.

As those efforts have not yielded optimal results, creative breakthroughs are still needed so that BSPS Sarhunta's business management can continue. The first innovation is the establishment of centralised BSPS Sarhunta business management, namely through village-owned enterprises (Kemenparekraf, 2022). Second, the training should be focused on the young generation of the BSPS Sarhunta owners who are technologically literate.

ii. The inadequate supporting facilities for homestays

BSPS Sarhunta assistance was focused on improving the physical quality of the buildings, whereas funds for supporting facilities were allocated based what was left over. As a result, beneficiaries must rely on their own self-help to complete the supporting facilities at their homestays. The condition of the different financial capabilities of the beneficiaries leads to the various completeness level of supporting facilities in each homestay, and the average is still below the standard.

The monitoring results of the BP2P Jawa III survey in the Borobudur KSPN area showed that there are still many Sarhunta homestays that have not met the standards of tourist housing facilities, including the availability of amenities, furniture, and wi-fi. In fact, even though furniture for the Tanjung Kelayang KSPN homestay was provided uniformly in the aid package, there is still a shortage of facilities such as air conditioners and water reservoirs. In both the Borobudur and Tanjung Kelayang areas, beneficiaries revealed that most tourists were looking for homestays that provided air conditioning, but only a few Sarhunta homestays were able to provide it due to financial constraints.

iii. The inadequate infrastructure in the surroundings of BSPS Sarhunta

In several BSPS Sarhunta areas, there are still some deficiencies in supporting infrastructure, such as road access, public transportation, and clean water. The Directorate of Self-Help Housing (2023a) stated that several Sarhunta were located in remote areas or with extreme conditions, such as the Raja Ampat KSPN and Morotai KSPN. Meanwhile, Sarhunta Tanjung Kelayang has transportation problems. The village of Tanjong Tinggi is located quite far from the district capital, making it difficult to find public transportation to and from the village. According to Ichsan (2022), most local people prefer to use private vehicles, causing a lack of public transportation, forcing tourists to rent vehicles. These conditions need to be addressed to assure visitors' convenience.

iv. Limited availability of competent human resources in BSPS Sarhunta development

The implementation of Sarhunta development prioritised the empowerment of local communities, including construction workers. BSPS Sarhunta in one area was constructed at the same time, so a large building workforce was needed. To overcome these obstacles, BP2P Jawa III held a

briefing and certification, which was attended by 170 construction workers at the Borobudur KSPN (Ministry of PUPR, 2020). While, in Tanjong Tinggi Village, the shortage of construction workers was covered by seeking workers from other villages or sub-districts in the KSPN area.

v. Different cultural characteristics of local communities

The character of the people in each KSPN region is very diverse and becomes a challenge in determining aid recipients and development. The people of Tanjung Kelayang, who work daily as fishermen, traders, and miners, had refused to be given BSPS Sarhunta because they felt that the tourism business was not their field. Also, the Department of Public Works and Housing for Belitung Regency said that the beneficiaries had left the BSPS Sarhunta construction work to mine tin and catch jellyfish, which were the residents' routines. These aspects demand skills from the field support team to ensure that all stages proceed smoothly and in a timely fashion, without causing social issues (Directorate of Self-Help Housing, 2023a).

3.1.5.2. Main Benefits

Based on the SWOT analysis, enhanced by interviews and literature, several benefits of BSPS Sarhunta can be summarised as follows:

i. Sarhunta homestays provide affordable accommodation options in strategic locations

BSPS Sarhunta offers additional accommodation options for tourists. Affordable lodging rates, strategic location close to tourist destinations, and authentic local wisdom provide added values. In the Borobudur KSPN area, homestay rates range from Rp150,000 to Rp400,000 per night, according to the facilities provided. In the Tanjung Kelayang KSPN area, the normal rate is Rp150,000 per night with fan facilities and Rp250,000 per night with air conditioning. This pocket-friendly price is a solution for travellers with a limited budget. Moreover, not only incorporating local architectural ornaments, BSPS Sarhunta homestays also offer ways travellers can interact directly with owners to build social hospitality.

> *'I am glad to stay at Homestay Dwi Prasetyo. The price is affordable during the Eid holiday season like this, Mr. Dwi and his wife are also friendly. We were provided with breakfast according to the children's preferences. This morning, we were also taken to Puntuk Setumbu to enjoy the sunrise.'*
> (Baskara, visitor of Sarhunta in Karangrejo Village, Borobudur, 2023)

ii. Assisting the community in accessing decent housing and organised environments

BSPS Sarhunta, as its functional objective, helps both business-owners and non-business-owners to realise their dream of having decent and comfortable housing. BSPS Sarhunta also contributes to creating well-organised settlements, which has a positive impact on the entire surrounding environment. Liveable housing and a good environment can improve people's quality of life.

'Now my family and I can sleep in a decent room with proper bathroom facilities. My hope is that the government will always pay attention to low-income communities, and I promise to take good care of this homestay.' (Epriyono, beneficiary of BSPS Sarhunta in Sengkol Village, Mandalika KSPN, as quoted in Antoro, 2020)

iii. Stimulating the local economy around the Sarhunta area

'In the past, there were hardly any tourists, both local and international, who visited this place. This had a significant impact on the income of the local community and the tourism sector, which used to be quite high. Now, more and more tourists are coming to visit and stay at Sarhunta. We express our gratitude to the Ministry of Public Works and Housing for the assistance provided through Sarhunta.'
(Arif Rahman, Sarhunta beneficiary in Labuan Bajo, Ministry of Public Works and Housing, 2021)

BSPS Sarhunta has created new job and business opportunities. Business PKRS results opened up new businesses for beneficiaries, whereas the surrounding community got jobs as construction workers during Sarhunta construction. After that, they could also open a homestay supporting business such as food stalls, laundry, vehicle rental, or tour packages. Thus, BSPS Sarhunta has contributed to driving the community's economy.

iv. Increasing community awareness of the potential for tourism business development in their region

Following the construction of BSPS Sarhunta and arrival of visitors, the local community's awareness of the tourism business potential in their area has increased. An officer of Borobudur Village stated that one of the recipients of Sarhunta Borobudur assistance had even succeeded to add the number of rooms for his homestay. The inspiration for BSPS Sarhunta's success has also encouraged other communities to open similar tourism businesses after seeing opportunities of additional income. The growing tourism business will provide sustainable economic benefits.

'They (the local community) are motivated to create homestays as well. So, the term 'Sarhunta-KW' started to emerge. I have a house, I have rooms that can be a source of income, like that.'
(Galih Reza, Sarhunta facilitator in Borobudur KSPN, 2023)

Conclusion

BSPS Sarhunta provides hope and opens opportunities for people in KSPNs to benefit from tourism development. This assistance not only provides liveable housing and an organised environment, but also plays a role in driving the economy of the surrounding community, both beneficiaries and non-beneficiaries of BSPS, through a growing tourism business sector.

However, to maximise the benefits of the BSPS Sarhunta, it is necessary to strengthen the supporting factors. This includes centralised management of businesses, intensive promotional activities, improvement of supporting facilities, and fulfilment of supporting infrastructure. By strengthening these aspects, it is hoped that BSPS Sarhunta can become a real driver of sustainable tourism and have a positive impact on the local community and environment.

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3.2. THE UMBULAN DRINKING WATER SUPPLY SYSTEM (SPAM UMBULAN)

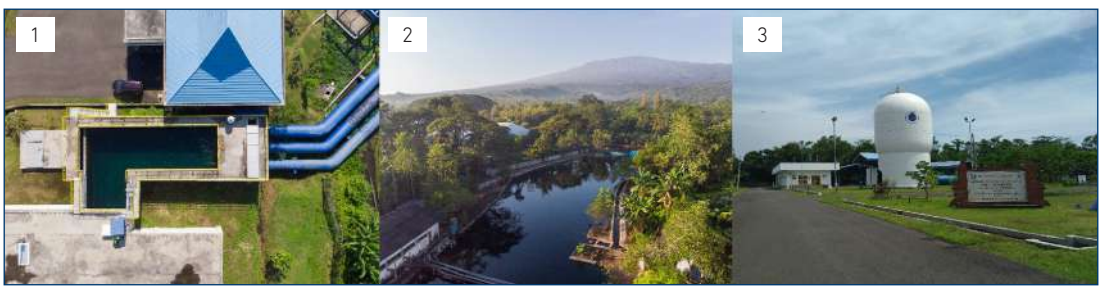
3.2.1. Project Profile

Located in East Java Province, the drinking water supply system (SPAM) Umbulan consists of a raw water unit at the Umbulan spring, a production unit in Umbulan Village, Pasuruan Regency, and transmission pipelines spanning 97.32 km with diameters ranging from 1,000 mm to 1,900 mm for bulk water distribution to 5 local water utilities (PDAM). The system distributes SPAM Umbulan water through 16 off-take points, covering areas in Pasuruan Regency, Pasuruan City, Sidoarjo Regency, Surabaya City, and Gresik Regency.

As a showcase project for public-private partnerships (PPPs), SPAM Umbulan project was delivered under a PPP contract between the East Java Provincial Government's contracting agency and PT. Meta Adhya Tirta Umbulan (PT. Meta) as the project company. The development of the SPAM Umbulan marked a significant milestone in meeting the demand for high-quality drinking water in East Java.

The project's construction commenced in 2017 and was officially inaugurated by the President on 22 March 2021. As a result of the SPAM Umbulan, the local community gained enhanced access to clean and safe drinking water, leading to improved public health and well-being by reducing the prevalence of waterborne diseases (Figure 3.81).

Figure 3.81. Meta Pond, Umbulan Spring, and Meta Area



Source: Ministry of Public Works and Housing (1 and 2), and Ali Mashduqi (3), 2023.

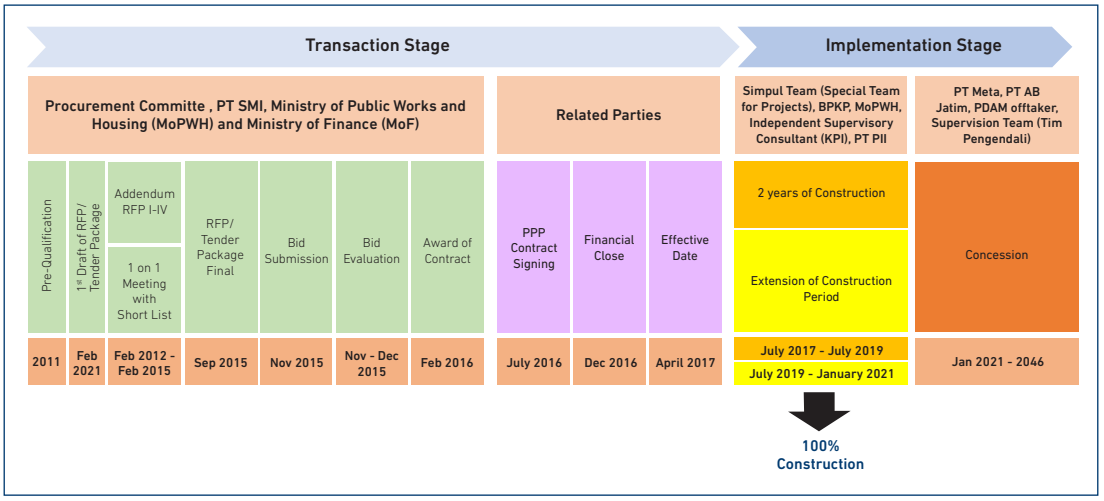
The comprehensive SPAM Umbulan project includes the development of raw water intake units, production units, a 97.32 km transmission pipeline, pumping stations, and 16 off-take points spread across the five regencies and cities. To ensure compliance with the Ministry of Health's Regulation No. 492 of 2010 regarding drinking water quality requirements, the system employs disinfection facilities using the chlorination method. The treated water is then stored in reservoirs before being distributed to consumers through a pipeline network.

The scope of the SPAM Umbulan PPP project includes the following components:

- Raw Water Units: head pond, turbine overflow, spring area.
- Production Units: reservoir, surge tank, chlorination (disinfection) unit, and pump house with a capacity of 4,000 lps.
- Transmission System: procurement and installation of raw water transmission pipes ranging from 1,000–1,800 mm, with a total length of approximately 97.32 km, including two pump houses with a capacity of 4,000 lps along with their equipment, and a meter house.
- Offtake System: construction of 16 off-take units in the five regencies/cities served as off-takers.

SPAM Umbulan project entered the transaction phase and the implementation phase, with a construction period requiring a total of 3 years and 6 months (including any construction time extensions), and a concession period of 25 years and 9 months (Figure 3.82).

Figure 3.82. The SPAM Umbulan Project Timeline



Note : RFP = request for proposal, PPP = public–private partnership, MoF = Ministry of Finance, MoPWH = Ministry of Public Works and Housing, PT SMI = PT Sarana Multi Infrastruktur (Special Mission Vehicle (SMV) under the coordination of the Ministry of Finance), PT PII = PT Penjaminan Infrastruktur Indonesia (Indonesia Infrastructure Guarantee Fund), BPKP = Badan Pengawasan Keuangan dan Pembangunan (Indonesia's National Government Internal Auditor), KPI = Konsultan Pengawas Independen (Independent Supervisory Consultant).

Source: East Java Provincial Government, 2023.

As a regional SPAM Project, the SPAM Umbulan caters to the clean water needs of multiple areas, including Sidoarjo Regency, Gresik Regency, Surabaya City, Pasuruan City, and Pasuruan Regency. The water from the Umbulan spring undergoes treatment at a production facility managed by PT. Meta before being distributed to PT East Java Clean Water. From there, the water is further distributed to the respective PDAMs and the PIER Industrial Area.

3.2.2. Project Objective

Access to clean and safe drinking water is a fundamental human right, essential for individuals' well-being and daily needs. However, not all regions in Indonesia have easy access to such water sources. One promising solution to address this issue is the development of an efficient and affordable SPAM. An exemplary implementation of such a system can be found in the SPAM Umbulan project in East Java, Indonesia.

The implementation of the SPAM Umbulan was driven by the government's obligation to provide drinking water for the community. The Umbulan water source, with its potential discharge of approximately 5,000 lps and suitable water quality for drinking purposes, had remained underutilised until this project. As a National Strategic Project (PSN), SPAM Umbulan was prioritised to address critical water supply issues. Its legal basis includes Presidential Instruction Number 1 of 2016 and Presidential Regulation Number 56 of 2018, which guide the rapid implementation of strategic initiatives necessary for such projects.

Before the implementation of the SPAM Umbulan project, the residents of Umbulan Village and its vicinity faced numerous challenges in accessing safe and high-quality drinking water. Despite the presence of the Umbulan spring, which offered a high-quality water source, difficulties in water extraction made it nearly impossible for the community to access potable water. The Umbulan spring had the potential to address the region's water supply challenges, but substantial investments and collaborative efforts from various stakeholders were required to make this a reality.

The provision of water services through the SPAM Umbulan is prioritised to meet the needs of the community utilising 4,000 lps of spring water. With the implementation of the SPAM Umbulan, it is expected that the community will have access to continuous, quality, and affordable drinking water facilities, available 24 hours a day, to improve public health. The establishment of the production system, transmission pipeline system, and off-take points in the five regencies/cities in East Java is anticipated to enhance the drinking water services for their respective PDAMs.

The Umbulan project stands as an example of how a well-planned and implemented SPAM can transform the lives of communities by providing easy access to clean and safe drinking water. By optimising existing water resources and establishing robust infrastructure, the SPAM Umbulan

has significantly improved public health and the overall quality of life for the served population in East Java. As other regions in Indonesia face similar water supply challenges, the SPAM Umbulan serves as a promising model.

As one of the PSN Project , the SPAM Umbulan receives support from the central, provincial, and local governments. The central government, represented by the Ministry of Public Works and Housing, provides construction support through the state budget. Meanwhile the project's financial viability is supported by the Ministry of Finance through a Viability Gap Fund (VGF) amounting to Rp818 billion. The VGF provides partial construction cost coverage in cash to PPPs that possess economic viability but lack financial viability.

To address the challenges in the development of the SPAM Umbulan as a PSN Project, KPPIP or the Coordinating Ministry for Economic Affairs is actively involved in implementing strategies to address bottlenecks. These measures encompass issues like obtaining construction permits, expediting the VGF process, extending the target for the commercial operation date, and more. The initiative involves intensive coordination among various stakeholders, including ministries, local governments, PT. Sarana Multi Infrastruktur (PT SMI) MI, PT. Penjaminan Infrastruktur Indonesia (PT PII), and private parties. Notably, in 2019, the SPAM Umbulan project achieved a significant milestone with the waiver of land fees granted by the Highway Regulatory Agency under the Ministry of Public Works and Housing.

3.2.3. Project Cost and Source of Fund

Based on the 2021 First Semester Report of the Committee for Acceleration of Priority Infrastructure Provision (KPPIP), the implementation of the SPAM Umbulan PPP requires a total investment of Rp3.718 trillion. In this PPP sheme, the East Java Provincial Government acting as Government Contracting's Agency (PJPK) and PT. Meta Adhya Tirta Umbulan as the Project Company (SPV). As one of the PSN Project, the SPAM Umbulan receives support from the central, provincial, and local governments. The central government, represented by the Ministry of Public Works and Housing, provides construction support through the State Budget (APBN), and the project's financial viability is supported by the Ministry of Finance through a Viability Gap Fund (VGF) amounting to IDR 818 billion. The VGF, provides partial construction cost coverage in cash to PPP projects that possess economic viability but lack financial viability.

3.2.4. External and Internal Factors

In order to identify the challenges and opportunities, as well as to determine the benefits of the project, a survey was conducted through questionnaires and interviews with various stakeholders, both internal and external. The internal respondents included representatives from the project's

management, namely the East Java Provincial Government and PT. Meta. The external respondents consisted of academics from the University of Brawijaya Malang, business actors, and members of the community residing near the project site. The number of questionnaire respondents was nine, and the number of interviewees was seven, comprising government representatives, PPP partner representatives, academics, those from local communities, and entrepreneurs.

3.2.4.1. External Factors

Based on the initial research, the external factors include the level of local community support for the PSN (E_1); the level of investor interest in development in the PSN area (E_2); availability of PSN land (E_3); timeliness of disbursement of PSN funding from investors (E_4); the level of potential for disputes or legal demands in the PSN implementation process (E_5); the level of reasonableness of the cost of visits/tours to PSN locations (E_6); and the level of ease in obtaining business permits at PSN locations (E_7).

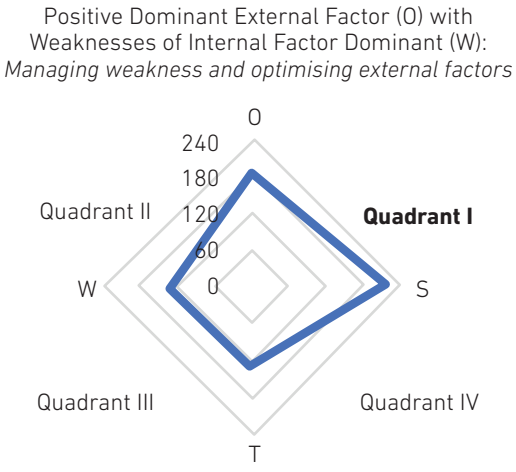
3.2.4.2. Internal Factors

The internal factors as benefits identified include the deregulation/issuance of regulations to support the implementation of the PSN (I_1); the suitability of PSN location for SPAM Umbulan (I_2); compatibility of PSN development with regional spatial planning and land use (I_3); availability of infrastructure that supports PSN, filtration technology, electrical installations, and clean water installations (I_4); the accuracy of the appointment of PT Meta Adhya Tirta Umbulan as the Implementing Business Entity (BUP) of the PSN project (I_5); central and/or regional government support in financing the implementation of the PSN (I_6); level of ease of licensing in the process of preparing PSN implementation (I_7); and the level of technical smoothness of PSN construction development (I_8).

3.2.5. SWOT Results Analysis

A SWOT analysis of the survey shows that the dominant factor was in quadrant I and indicated that external factors, especially opportunities, were more dominant compared to weaknesses (Figure 3.83). Hence, strategies need to be developed to address existing weaknesses and optimise external factors that represent opportunities.

Figure 3.83. SWOT Results

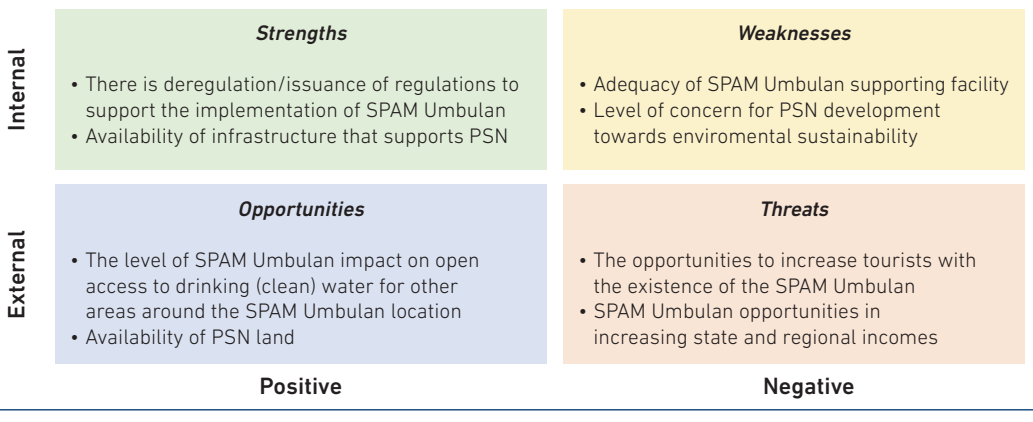


	Categories	Values
S	**Strengths**	**212.784**
W	Weaknesses	125.513
O	**Opportunities**	**179.939**
T	Threats	129.835

Source: Authors, 2023.

In Figure 3.84 it can be seen the priority factors for each SWOT element. The priority factors are the highest score from the survey results, which indicates that respondents perceive this factor as more dominant than other factors.

Figure 3.84. SWOT Analysis Priority Matrix



Source: Authors, 2023.

3.2.5.1. Main Challenges

One key factor in the success of the SPAM Umbulan is the availability of abundant spring water. Through the production units, water from the Umbulan springs consistently meets the established drinking water quality standards (Table 3.21).

According to the Progress Report of the SPAM Umbulan PPP (2023), the drinking water quality in terms of parameters such as pH, total dissolved solids, residual chlorine, and turbidity at all supply points (Rumah Meter) 'complies with the provisions of the Cooperation Agreement (PKS) and the Minister of Health Regulation No. 492 of 2010' (Table 3.22).

Table 3.22. Quality of bulk drinking water March 2023

No	Location	pH	Turbidity (NTU)	residual chlorine (mg/L)	TDS (mg/L)
1.	Umbulan (Headpond)	7.25	0.11	0.67	118
2.	RM Winongan	7.26	0.27	0.54	119
3.	RM Gempol	7.17	0.28	0.52	116
4.	RM Buduran	6.99	0.35	0.40	122
5.	RM Giri	7.08	0.74	0.35	119

NTU = nephelometric turbidity units, RM = *Rumah Meter* (*Offtake*), TDS = total dissolved solids.

Source: East Java Provincial Government, March 2023.

During its implementation, the SPAM Umbulan Project encountered several challenges as follows:

- **Challenges during construction.** During construction, land acquisition and pipeline installation permit issues resulted in construction time extensions.
- **Challenges in water distribution.** Distribution of clean water from the Umbulan source to household connections was hampered by budget availability and the capacity of the local government in developing the distribution network.
- **Challenges in ensuring the continuity.** Based on the study conducted by the Directorate of Cooperation and Business Management at Sepuluh November Institute of Technology, the Umbulan spring headpond was measured to provide raw water at a rate of 3,000 lpd, which is below the initial capacity of 4,000 lpd. To meet the contracted capacity of 4,000 lpd, the East Java Provincial Government plans to tap into a new water source, Kalirejoso, which requires a treatment process unlike the clean water from the Umbulan spring. Therefore, it is crucial to carefully monitor and manage the Umbulan water source in terms of both its quality and quantity to ensure the continuous operation of the SPAM Umbulan.

The significant capital investment required can be a challenge in its implementation and may restrict its expansion and development. The high dependence of the project financing needs to be considered. Moreover, the absence of downstream infrastructure from the SPAM Umbulan can lead to unabsorbed water, consequently affecting the project's revenue continuity.

The SPAM Umbulan project can be expanded to reach more households, contributing to the health and well-being of the community and promoting social justice. This project can serve as a model for similar projects in Indonesia and other countries, promoting sustainable development and enhancing access to basic services. It presents opportunities for collaboration and partnerships with local stakeholders, including governments, businesses, and non-governmental organisations. Additionally, the SPAM Umbulan project may encounter political and regulatory challenges related to water provision, which can impact the implementation and operation of the project. Additionally, the SPAM Umbulan faces economic challenges concerning the affordability of clean water for low-income households, which may influence consumer demand.

Low community involvement and participation can also influence the operational sustainability of the SPAM Umbulan. Community engagement plays a crucial role in the success of the SPAM Umbulan project. Maintaining the quality of its spring water through community participation will have a direct impact on the sustainability of SPAM Umbulan's operation. Additionally, the community is encouraged to participate in maintaining the infrastructure, promptly report any issues or damages, and consistently pay water bills.

Climate change and environmental degradation can affect the availability of water resources and the quality of drinking water in Umbulan. The availability and quality of water pose challenges for the SPAM Umbulan concerning environmental issues that can impact the reliability and sustainability of water supply. The threat of damage caused by natural disasters or human activities can hinder the operation of the SPAM Umbulan and disrupt the provision of drinking water.

3.2.5.2. Main Benefits

SPAM Umbulan provides various important benefits to the community in the service area. 'With the operation of the SPAM Umbulan, it will bring significant benefits to 1.6 million people or 320,000 household connections in m Regencies/Cities in East Java Province, namely Surabaya City, Pasuruan Regency, Pasuruan City, Sidoarjo Regency, and Gresik Regency,' said Minister Basuki (Ministry of Public Works of the Republic of Indonesia, 2021). Some of the main benefits of the PSN SPAM Umbulan include:

- SPAM Umbulan ensures that the community in the service area has easy and affordable access to safe and quality drinking water.
- With improved access to safe drinking water, public health can significantly improve.
- With adequate drinking water supply, the community no longer needs to spend time and effort searching for clean water from unsafe or distant sources. Additionally, there is an expected increase in productivity and social development in the area.
- SPAM Umbulan can also contribute to local economic development. With adequate drinking water supply, the tourism and industrial sectors can thrive.

SPAM Umbulan can provide clean and safe drinking water access to the community, contributing to the health and well-being of the population. The abundant source in Umbulan can be treated to produce quality drinking water. This project can promote social justice by facilitating easier access to clean water for individuals who were previously underserved. Moreover, the project supports environmentally friendly utilisation of natural resources, social equity, and economic viability. The facilities of SPAM Umbulan can be seen in Figure 3.85.

Figure 3.85. SPAM Umbulan Facilities

Sources: Ministry of Public Works and Housing.

The SPAM Umbulan project involves the construction of adequate infrastructure and technology, such as water distribution pipelines, reservoirs, and water treatment facilities to support the provision of easy and affordable drinking water. The central and local governments collaborate actively to support the development and operation of the SPAM Umbulan, including efforts in socialisation and monitoring. It also presents an opportunity to establish partnerships with private entities. Water supply companies or water technology firms can manage the project. Such collaborations can bring benefits such as enhanced technical capabilities, access to financial resources, and improved operational efficiency.

The implementation of the project provides opportunities for the development and application of technological innovations in water treatment, management, and distribution. By adopting cutting-edge technologies, such as sensor-based water monitoring and management systems or environmentally friendly water treatment systems, this project can serve as a platform to

introduce and test new technologies that may be applied more extensively in the future. At the same time, it can enhance local knowledge and expertise in water resource management and water infrastructure. Through training, education, and participation in the project, the local community can develop valuable skills and expertise, including water management, infrastructure maintenance, and equipment operation. This can provide local employment opportunities and capacity building in the water management sector.

Umbulan is in an area with natural beauty and significant tourism potential, opportunities arise for the development of water tourism, water sports, and water recreation. This will open up new possibilities for local economic growth, increased income, and job creation in the tourism sector. Through the SPAM Umbulan project, the government conveys essential messages of the importance in using safe drinking water and practicing good sanitation. With adequate awareness about the significance of drinking water quality, it is hoped that the community can take better care of their health and improve sanitation in their surroundings.

Conclusion

The SPAM Umbulan represents a significant initiative in addressing the increasing demand for drinking water in its served region. As a crucial infrastructure project, the SPAM Umbulan plays a vital role in ensuring the availability of clean and safe drinking water for the community. This project serves as an example of a PSN in the field of providing access to drinking water/clean water that has been operational in several regions covered by the project in East Java.

The SPAM Umbulan is a well-designed infrastructure, including water intake, treatment, storage, and distribution. The water source utilised by the SPAM Umbulan meets the drinking water quality standards satisfactorily. Moreover, the implementation of advanced treatment processes ensures the removal of contaminants and the provision of safe drinking water for consumers. The distribution network is efficiently designed, minimising losses and optimising water delivery to targeted areas. However, challenges and specific areas for improvement need to be identified, such as the need for routine maintenance, continuous water quality monitoring, and increased stakeholder engagement.

The significant investment required for this project can be addressed through collaboration amongst various stakeholders, including the local and central governments partnering with the private sector through the PPP scheme. Coordination of work programs amongst each stakeholder is necessary to ensure that the positive impacts of this project can be immediately felt by the broader community. A comprehensive strategy is needed to optimise the existing opportunities and address the weaknesses of the SPAM Umbulan project through collaborative efforts involving the government (central/provincial/regional) and private partners, as well as engaging the local community.

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3.3. BENOWO WASTE-TO-ENERGY PLANT

3.3.1. Project Profile

Located at the Benowo Final Disposal Site (TPA), this project is the Benowo environmentally friendly waste-to-energy (WTE) Plant (Figure 3.86). This first-of-its-kind WTE plant in Indonesia was inaugurated on 6 May 2021, by the President of Indonesia and is managed by PT. Sumber Organik under a build-operate-transfer (BOT) scheme for 20 years in cooperation with the Surabaya City Government, starting from 2012 until 2032. The Benowo WTE Plant operates 24 hours a day and provides employment for around 250 people.

Figure 3.86. The location of WTE Plant at the Benowo Final Disposal Site on the Surabaya City Map

WTE = waste-to-energy.

Source: Surabaya City Environment Agency, personal communication, 10 May 2023.

The WTE Plant is situated in the West Surabaya area, covering the Romo Kalisari Village in the Benowo sub-district and the Sumber Rejo Village in the Pakal sub-district. Out of the 12 cities that have been designated by Presidential Regulation No. 35 of 2018, Surabaya is the first to successfully operate a WTE Plant. The Benowo WTE Plant project originated from the need to develop waste infrastructure at the Benowo Final Disposal Site, which is the only disposal site in Surabaya. However, the funding from the local budget was insufficient. Consequently, the Surabaya City Government decided to collaborate with a private partner, PT Sumber Organik, in the form of a BOT public-private partnership.

From the above collaboration, power plant facilities have been established, namely a landfill gas power plant with a capacity of 2 MW for methane capture from the waste pile, which obtained its commercial operation date on 30 November 2015. Additionally, a gasification power plant with a capacity of 9 MW was built to process 1,000 tons per day of waste, obtaining its commercial operation date on 10 March 2021 (Figure 3.87) (Surabaya City Environment Agency, personal communication, 10 May 2023).

Figure 3.87. Gasification Power Plant at the Benowo WTE Plant

Source: PT Sumber Organik, personal communication, 11 May 2023.

3.3.2. Project Objectives

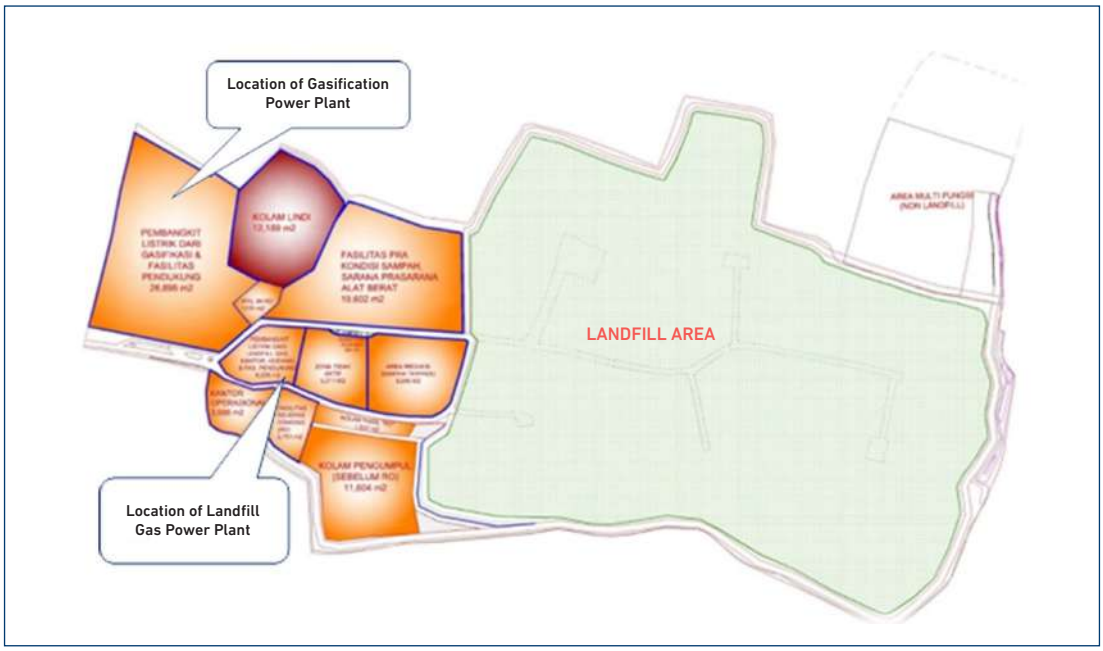
The WTE Plant can reduce the volume of waste, is environmentally friendly, and produces a by-product in the form of electrical energy. The purpose of this project is to fulfil the mandate of the regulations in Presidential Regulation Number 35 of 2018, where waste management aims to improve public health and environmental quality, reduce waste volume, and consider waste as a resource. The term 'resource' here means that waste management is carried out to obtain added value by converting waste into electrical energy. Therefore, waste management is done in an integrated manner, from upstream to downstream, through waste reduction and waste handling.

High population growth and urbanisation, while beneficial for the urban economic sector, together pose many challenges, particularly in meeting the increasing services, including waste infrastructure. Hence, sustainable waste management policies are highly necessary because the previous waste management practices required vast land and had negative social impacts. To implement these policies, the government designated the WTE Plant as one of the National Strategic Projects (PSNs) since technological interventions are crucial to reduce waste volume, especially in areas with limited TPAs (Coordinating Ministry for Economic Affairs, 2021).

According to data from the Surabaya City Environment Agency in 2022, the daily average volume of waste generated by 2.9 million residents of Surabaya is 1,792 tonnes, totalling around 654,341 tonnes per year. However, Surabaya City only has one TPA (Benowo), thus requiring its continuity. As a result, the Benowo WTE Plant can reduce 1,000 tonnes of waste every day by converting it into electrical energy, from the total 1,700–1,800 tonnes of waste that enters TPA Benowo (KPPIP, personal communication, 5 July 2023).

The Surabaya City Government pays a tipping fee to the contracting agency that increases annually. In addition, it also provides a waste management service fee (BLPS) assistance in accordance with Article 15 Paragraph (2) of Presidential Regulation Number 35 of 2018. The allocation of this BLPS Support was received by the Surabaya City Government starting in 2021. Concerns from local governments regarding their ability to pay the tipping fee or BLPS to their working partners are common hurdles and affect the continuity of WTE plant development, including the Benowo WTE Plant (Figure 3.88).

Figure 3.88. Location of Landfill Gas Power Plant and Gasification Power Plant at the Benowo WTE Plant



WTE = waste-to-energy.

Source: Surabaya City Environment Agency, personal communication, 10 May 2023.

3.3.3. Project Cost and Source of Fund

Based on the 2022 Semester I Committee for Acceleration of Priority Infrastructure Delivery (KPPIP) Report, the cost of implementing this project is Rp718 billion with a fully funded scheme from the private sector (PT. Sumber Organik). In this project, the Mayor of Surabaya acts as the Government Contracting Agency of the project. Collaboration with PT. Sumber Organik comprises several features including the following (Kurniawan, 2016):

a. There is a party that has exclusive rights, namely the City Government of Surabaya, in terms of the Sanitation and Green Open Space Service (formerly known as the Sanitation and Landscaping Service).
b. There is an exclusive right to the land, namely the land where the TPA Benowo is located.
c. Partners must build waste processing infrastructure, sanitary landfills, gasification, wastewater treatment plants, and a WTE Plant.
d. The budget used to develop the infrastructure mentioned above does not come from the government but from the cooperation partners (investors).

e. The partner (investor) who won the tender for this cooperation is PT. Sumber Organik. The tender auction was attended by four participants, namely Phoenix (Singapore), Medco (Malaysia), PT. Sumber Organik (Indonesia), and Imantata (France), as based on the minutes of the Determination of the Winner of the Auction Number 510/13799/1436.6.512011 dated 22 August 2011 (Sucahyo et al., 2021).
f. As stated in the agreement, PT. Sumber Organik obtained the right and authority to utilise and manage the TPA Benowo from 2012 to 2032.
g. It will return of land assets and built infrastructure to the Surabaya City Government after the end of the 20-year cooperation period.

3.3.4. External and Internal Factors

Besides providing benefits for stakeholders, there are also challenges that need to be managed to ensure the successful implementation of the Benowo WTE Plant. These challenges are external factors from both the central and local governments that cannot be controlled, whilst the benefits are internal factors that can support or hinder the achievement of a goal.

We collected data from stakeholders to measure their perspectives. The participants included representatives from the Surabaya City Government, academics from Institut Teknologi Sepuluh Nopember Surabaya, PT. Sumber Organik, and the local community around the Benowo WTE Plant site. Next, their perceptions of various internal and external factors, namely perceived realities and perceived interests, were collected and analysed. Perceived realities measure stakeholders' perceptions of observed facts, whilst the level of perceived importance assesses factors that respondents consider crucial for the success of the Benowo WTE Plant. Both are given scores on a scale of 1 to 6, where 1 indicates very negative perceptions, and 6 indicates very positive acceptance.

3.3.4.1. External Factors

The external factors include the level of community support (E_1), the level of investor interest in the project (E_2), the potential for the private/community to become investors (E_3), the opportunity for the Benowo WTE Plant to create employment opportunities (E_4), the timeliness of funding disbursement from investors (E_5), the potential for disputes or legal demands during the implementation process (E_6), the supply of waste from the community (E_7), the level of support from relevant community components for the sustainability of the Benowo WTE Plant (E_8), the opportunity for the Benowo WTE Plant to create new business opportunities for the community (E_9), land availability (E_{10}), the potential for the Benowo WTE Plant to improve community welfare (E_{11}), the level of environmental comfort in the surrounding area (E_{12}), the level of environmental aesthetics in the surrounding area (E_{13}), the level of air, water, and soil pollution around the location (E_{14}), and the quality of public health in the vicinity (E_{15}).

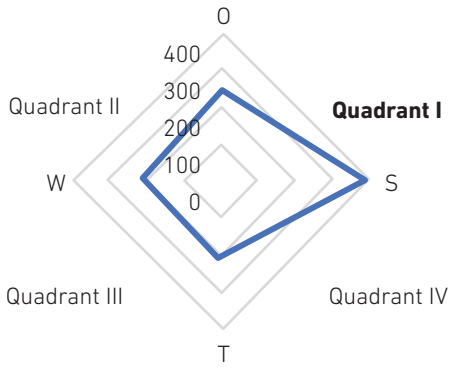
3.3.4.2. Internal Factors

Meanwhile, the Internal factors include location suitability (I_1), compatibility of development with regional spatial planning and land use (I_2), availability of supporting infrastructure (I_3), support from the central and/or local governments in financing (I_4), the level of use of modern technology (I_5), physical quality level (I_6), suitability of designation (I_7), handling of air, water, and soil pollution from the project (I_8), adequacy of supporting facilities (I_9), vehicle traffic management (I_{10}), mechanism for reporting electricity generation results (I_{11}), implementation of activities and utilisation of BLPS assistance from year to year (I_{12}), existence of deregulation/issuance of supporting regulations (I_{13}), accuracy of appointing business entities as project implementers (I_{14}), ease of permitting in the project preparation process (I_{15}), technical smoothness in construction development (I_{16}), timeliness in construction (I_{17}), monitoring and supervision by relevant parties for pollution originating from the project (I_{18}), and ease of access to services (I_{19}).

3.3.5. SWOT Results and Analysis

The survey results were analysed using a Strengths-Weakness-Opportunities-Threats (SWOT) approach to depict the challenges and benefits perceived by the respondents. The SWOT analysis results were then presented in a radar chart, as shown in Figure 3.89.

Figure 3.89. The Benowo WTE Plant SWOT Analysis Results



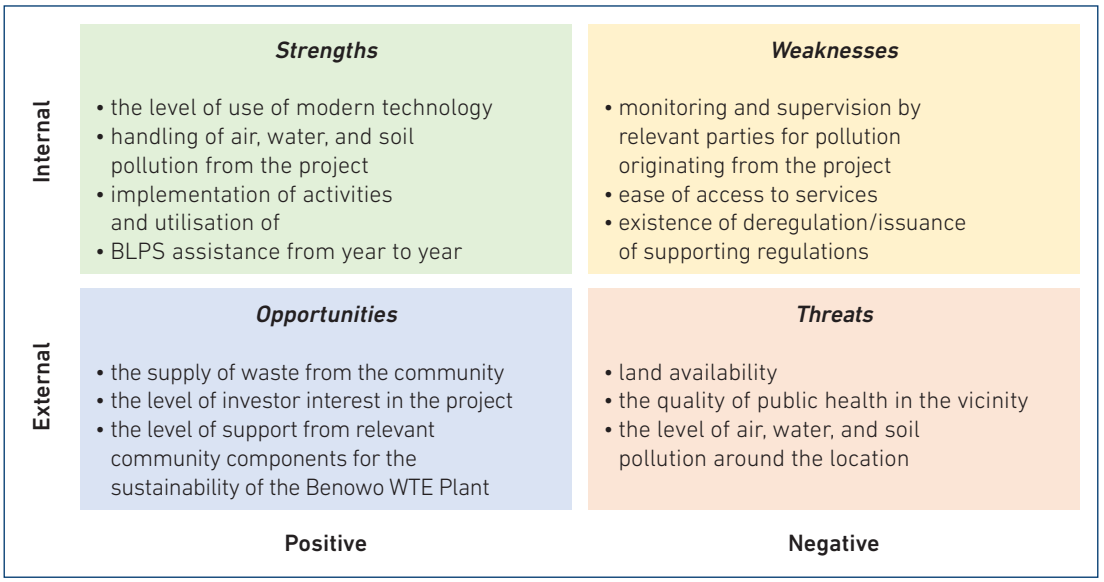
	Categories	Values
S	**Strengths**	**382.62**
W	Weaknesses	204.95
O	**Opportunities**	**253.59**
T	Threats	209.48

WTE = waste-to-energy, SWOT = Strengths-Weakness-Opportunities-Threats.

Source: Authors, 2023.

The summary of the three factors with the highest scores, identified as strengths, weaknesses, opportunities, and threats, is presented in Figure 3.90. The observed factors are ranked based on the highest average scores of perceived realities and importance by the respondents. The higher the score obtained, the better the respondents' perception of that particular factor.

Figure 3.90. SWOT Analysis Priority Matrices



BLPS = waste management service fee, SWOT = Strengths-Weakness-Opportunities-Threats, WTE = waste-to-energy.
Source: Authors, 2023.

3.3.5.1. Main Challenges

Based on the survey responses, the main threats related to the Benowo WTE Plant are land availability, the quality of public health in the surrounding area, and the level of local air, water, and soil pollution. Regarding land availability, Benowo is the only TPA in Surabaya. Originally opened in 2001, this TPA was initially planned to last for only 10 years. However, due to the limited available land for construction, the government made efforts to optimise the existing land, resulting in the idea of establishing WTE Plant in collaboration with the private sector. As a result, at least TPA Benowo can function until the end of the agreement with PT. Sumber Organik in 2032.

Regarding the quality of public health around the TPA, this issue is closely related to the pollution level from TPA Benowo itself. Environmental pollution has always been a major concern of the Surabaya City Government since the initiation of this project, and it is consistently monitored and managed by PT Sumber Organik. To address air or odour pollution from the TPA, regular spraying of sixth-generation microorganisms is carried out, geomembranes are installed on the waste piles, and bamboo trees are planted around the TPA as a buffer zone. These measures are the responsibility of PT. Sumber Organik and are supervised by the Surabaya City Government. Additionally, there is direct social control from the community due to the presence of the Gelora Bung Tomo Stadium, which is located approximately 500 m from TPA Benowo.

The Surabaya City Government is highly committed to minimising the environmental impact of waste management at TPA Benowo. Therefore, the government is currently focused on establishing a green belt as a buffer zone covering an area of 40.4 hectares around TPA Benowo. The comparison between the green belt, the position of the Gelora Bung Tomo Stadium, the TPA Benowo area can be seen in Figure 3.91.

Figure 3.91. Position of the Green Belt, the Gelora Bung Tomo Stadium

TPA = final disposal site.

Source: Surabaya City Environment Agency, personal communication, 10 May 2023.

3.3.5.2. Main Benefits

The Benowo WTE Plant was built to reduce the TPA Benowo area waste. The project aims to extend the lifespan of TPA and contribute to the increase of renewable energy generation. According to the Surabaya City Government's report in 2022, the electricity generated was 4.81 MWh from the planned 7.20 MWh, with a stable waste supply of approximately 1,700–1,800 tonnes per day. The disparity between the planned and actual electricity generation is mainly due to variations in the amount of household waste received and the lower calorific value of the waste. In terms of waste management, the operator has been able to operate the WTE Plant in accordance with environmental quality standards. For instance, the Gelora Bung Tomo Stadium, located adjacent to the TPA and the Benowo WTE Plant, was selected as a venue for the International Federation of Association Football U-20 World Cup.

From the perspective of investor interest, the Surabaya City Government provides revenue certainty to the business entities partnering with them. This certainty comes in the form of a tipping fee clause. The tipping fee clause is an innovative approach that emphasises the government's commitment to pay investors a fixed cost for waste processing at a predetermined value. This is a way to boost investment climate in specific infrastructure sectors, including the waste management sector. The Surabaya City Government pays a tipping fee of Rp119,000 per tonne of waste for the first year, and then increases by approximately 7% each year. In addition, the central government also provides BLPS assistance in accordance with Article 15 Paragraph (2) of Presidential Regulation Number 35. The allocation of this BLPS assistance was received by the Surabaya City Government starting in 2021 (Table 3.23).

Table 3.23. BPLS Assistance Allocation for the Benowo WTEP

No	Budget Year	Allocation	Realisation	Percentage Realisation
1.	2021	Rp53,095,000,000	Rp51,039,050,000	96.13%
2.	2022	Rp60,417,301,494	Rp55,658,240,000	99.99%

BLPS = waste management service fee, WTE = waste-to-energy.

Source: 2021 Audited LKBUN and 2022 Surabaya City BPLS Assistance Report (processed).

PT. Sumber Organik mentioned that changing the community's mindset regarding jobs related to waste management poses its own challenge and requires extra effort to change it. However, once the community becomes aware that the jobs at the TPA are not just scavenging but also technology-based work with a good, modern, and clean working environment, it strongly supports the WTE Plant and actively participates in its sustainability.

Conclusion

The Benowo WTE Plant, which was inaugurated on May 6th 2021, is the first WTE Plant in Indonesia. This WTE Plant is implemented with a Build–Operate–Transfer (BOT) scheme for 20 years which is valid from 2012 to 2032 and the selected partner is PT. Sumber Organik. Surabaya is the first city to successfully operate WTE Plant out of 12 cities planned in accordance with Presidential Regulation Number 35 of 2018. The Benowo WTE Plant can reduce the volume of waste significantly, the process is also environmentally friendly, and can also produce electricity as a by-product.

The Benowo WTE Plant costs Rp718 billion, all of which is borne by the private sector, namely PT. Sumber Organik as the BOT partner. The Benowo WTE Plant currently has waste processing infrastructure, sanitary landfill, gasification, treatment plants, and a WTE Plant in accordance with the agreement and this will fully belong to the Surabaya City Government after the cooperation period ends. The Surabaya City Government also received technology, competency and expertise transfer from PT. Sumber Organik that is concerned with processing waste into electrical energy, considering that this field is still not generally owned and mastered by government agencies.

The Benowo WTE Plant proves that the government can manage waste to achieve sustainable urban development. Additionally, the utilization of the landfill has become more effective, and its lifespan has been extended since it is now managed by the private sector. The strengths of the Benowo WTE Plant need to be further reinforced with adequate government regulations and consistent monitoring of pollution originating from the landfill. The high level of support from the community, both investors and the general public in Surabaya, should always be optimised as an opportunity and maximised to overcome challenges that arise in managing the Benowo WTE Plant.[1]

[1] The existence of refuse-derived fuel plants, which are built in several areas, should not be compared with WTE Plants because they serve different purposes. A WTE Plant is suitable for urban areas and large cities with waste production exceeding 1,000 tonnes per day, whereas a refuse-derived fuel plant is more suitable for smaller scales, such as cities with waste production below 500 tonnes per day.

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