

The Management Model on Integrated SPAL in Supporting Health Development

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Abstract— *Currently, Indonesia has no adequate sanitation and this leads to water pollution. Consequently, the government had a 45 trillion rupiahs loss due to health facilities, clean water provision, and bad tourism. Poor sanitation is caused by no regulations to enhance compliance from the public and professional institutions for wastewater treatment. This paper elaborates on the SPAL model in a sustainable and evenly-distributed system to meet SDG standards. The research is based on legal research by collecting regulations in relation to wastewater treatment, and analysing cases for resolution. There is significance in regulations for sustainable and evenly-distributed sanitation implemented through institutional regulatory and charge payments.*

Keywords—*Regulations, model of public utility management, environmental protection, institutional, and funding by society.*

I. INTRODUCTION

Waste water is any kind of water which can originate from industrial, agricultural or domestic activities. The discharge including human faeces can be disposed of from household activities in residential areas. Wastewater treatment is a process to clean up all contaminants in water resources and to maintain water resource quality to improve human health. The System of Integrated Settlement Wastewater Treatment (SPALP) is a combination of physical (technical) and non-physical (institutions, finance, administration, society role and law) systems and mechanisms, as well as facilities to process wastewater.

Laws Section 23 2014 mandated the Local Government to manage wastewater treatment as a primary public service. Furthermore, the President's Regulation (Peraturan President) Section 2 2015 in the National Mid Term Development Plan (Rencana Pembangunan Jangka Menengah Nasional) 2015–2019 also established the universal target of sanitation access in 2019.

The targets and goals of RPJMD in 2015 – 2019 in SPAL is to establish 100 percent access to wastewater treatment utilities for urban or rural areas since the access to wastewater treatment utility in 2013 was attained by as much as 60.91percent.

Such targeted access to wastewater treatment is required since good sanitation supply is the government policies related to the health and sustainable development goals and therefore, it meets the goals stated in *Outcome Document SDGs* with 17 goals and 169 targets [1]. One of the *SDGs* targets, specifically the sixth target which is to assure the availability of water supplies and water treatment, as well as sustainable good sanitation for public utility. Issues of inadequate sanitation supplies have been an emergency case in Indonesia, and therefore, the government requires immediate actions to solve the problems and to achieve their overall goal.

Poor sanitation will impact on environmental sustainability, particularly groundwater, surface water, greenhouse gas emissions, mud and economic sustainability and social sustainability [2]. Finances and health loss is also impacted, typically when associated with medical service costs, productivity and young age mortality. Poor sanitation also leads to continuously-widespread parasitic diseases caused by parasitic worms such as *schistosomiasis parasites*, which is the second most contiguous disease following malaria. This endemic disease exists in 74 developing countries and has infected 200 million people worldwide [3]. The lack of adequate sanitation followed by poor environmental quality is closely related to the transmission of infectious diseases such as *diarrhoea, cholera, typhoid fever, paratyphoid fever, dysentery, tape worm infestation, ascariasis, hepatitis A and E, trachoma, schistosomiasis, cryptosporidiosis*, malnutrition, and other associated diseases [4]. Poor hygiene has been the main cause for the estimated yearly incidence of diseases and it is listed as *Diarrhoea: 72 per cent, Worm Infestation: 0.85 per cent, Scabies: 1.1 per cent, Trachoma :0.14 per cent, Hepatitis A: 0.57 per cent, Hepatitis E: 0.02 per cent and Malnutrition: 2,5 per cent* . Fatalities due to poor sanitation are listed as *Diarrhoea: 46 percent, Worm infestation: 0.1 per cent, Scabies: 1.1 per cent, Hepatitis A: 1.4 percent and Hepatitis E: 0.04 per cent* [5]. Poor sanitation also contributes to water contamination.

The Asian Development Bank 2008 stated that water contamination in Indonesia incurred a financial loss of IDR 45 trillion per year. The expenditure pays for treating contaminated water, covering medical service costs, providing clean water, productive time loss for restoration, upgrading

bad image on tourism, and preventing high infant mortality. Therefore, water contamination not only results in an inadequate clean water supply for public, but it also incurs a significant loss for national funds, and it requires significant spending for its recovery and restoration.

The further tremendous loss due to water contamination is to do with the environment, ecosystem and biodiversity loss. Polluted water can terminate all living Micro-organisms in water bodies, as reported by Tempo, including used baby diapers and sanity napkins as dumped in the Karangpilang and Gunungsari downstream, Surabaya has been the main cause of infertility and intersexual gender expression in freshwater fish [6].

II. PURPOSE

The availability of adequate and healthy water sanitation as the required infrastructure to support the Human Health Development has urged the government to formulate policies and strategies for the development of a Residential Wastewater Treatment System. SPAL was established in the Regulation of Public Works Ministry Number: 16/PRT/M/2008 on the National Policies and Strategies for the Development of Residential Wastewater Treatment System (KSNP-SPALP). KSNP-SPALP is the guideline and standard operating procedure for formulating technical regulation, planning, programming, implementation and management in operating and developing the system of residential wastewater treatment for both the central and local government, and for business operators, both private and public sector, in accordance with local conditions.

The Ministry on Public Works and Public Housing has provided a directory for SPALP operators to implement wastewater treatment in a region where communal sanitation is applied. This is followed by the implementation of community-based sanitation (Communal sanitation). Communal sanitation, as a matter of fact, is unlikely to interact with the municipal level of residential wastewater treatment system. In order to support the results of residential SPAL implementation, it has to be backed up by legal instruments in the form of regulations in governing institution, authorisations, SPAL funding through fee collections, and other charges, society compliance with channel wastewater discharges to the SPAL pipe system, and law enforcement attempts. Therefore, according to the laws functioning as compliance-boosting instruments, SPAL in residential areas is the realisation of government duty and responsibility in fulfilling the public right to attain a adequate and healthy environment, as well as the public utility to treat domestic wastewater requiring law enactment to encourage sanitation provision as the target achievement as stated in *SGDs*.

Based on the aforementioned background, rising issues in the research study can be formulated as follows:

1. What is the form of governing institution and governmental agency authority used to implement the system of residential wastewater treatment in regional areas?
2. What is the public funding and expenses likely to be charged for implementing the system of residential wastewater treatment in regional areas?

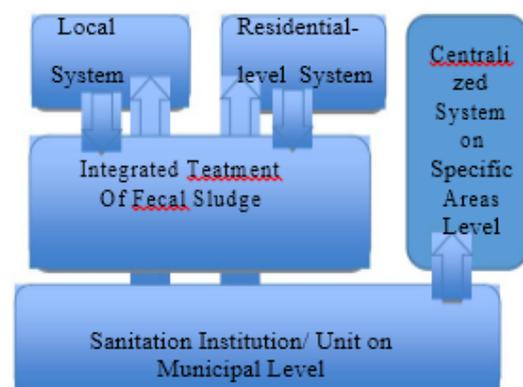
The targets and goals of RPJMD in 2015 – 2019 on SPAL are to establish 100 per cent access to wastewater treatment utilities for urban and rural areas, since the access to wastewater treatment utilities in 2013 was attained as being only 60.91 per cent of the population.

III. METHODS

The Institutional Agency on the Integrated System of Residential Wastewater Treatment

The government, in its attempt to acquire the target of providing access to SPAL utilities which meets 100 per cent of the target of RPJMD 2015-2019, has applied several policy strategies. For instance: improving public awareness, increasing the local government’s commitment, increasing governmental agency and human resource competence, cross-sector corporation and partnership, developing handling levels, as well as improving wastewater planning quality.

In accordance with the policy, the work plan must include 2 programs: physical and non-physical. The physical program covers the local SPAL and centralised SPAL. The local SPAL provides individual and communal septic tanks, means of transportation, Faecal Sludge Treatment and Installation (IPLT). On the other hand, the centralised SPAL includes SPAL at the communal, regional, and municipal level. Furthermore, the local SPAL is individual and/or communal through local treatment and disposal. In centralised SPAL, wastewater is collected through collection groups, and is treated and disposed of with centralised SPAL [7].



Centralised SPAL is a wastewater treatment requiring a physical and non-physical program. The physical program provides a collection network and wastewater treatment infrastructure, and the non-physical program supports access to the wastewater treatment. For instance: campaigns, promotion, and education, local government advocacy (executives & legislatives), governing institution technical assistance, and capacity improvement in Human Resources.

The institutional agency as the operator of Centralised SPAL is one of the supporting facilities that must be established prior to the completion and operation of SPAL as administered in 2014 Laws No. 23 on the Local Government, 2016 Government Regulation No. 18 on the Organization of Local Instrument and the 2017 Regulation of Domestic Affairs Ministry No. 12 in the Guidelines of the Regulatory Office of Branch Establishment and Classification and Unit of Local Technical Operator. Therefore, the Regional/Municipal Regulatory Office or Institution can establish a Unit of the Local Technical Operator (UPTD) to implement operational techniques and/or specified supporting technical activities. Henceforth, the institutional agent for enacting the centralised SPAL can be in form of the Regulatory Office, UPTD Regulatory Office, State-owned Enterprise (BUMN)/Regional-owned Enterprise, and/or Private-owned Enterprise (BLUD).

IV. RESULTS AND DISCUSSION

The establishment of SPAL UPTD as administered in the regulatory laws is promulgated in the Local Regulations in the regulatory organisation as specified in the Regulation by the Local Government Head by meeting the criteria and indicators in establishing UPTD. They should include:

- Implementing the specified technical operating activities such as SPAL;
- The type/ form of things or services provided for the public;
- The direct and real contributions/benefits to society and/or in relation to the governing agent (benefit recipient);
- Resources of personnel, funding, facility and its support ;

The Standard Operating Procedure (SOP) for the performance of technical operating duties and/or specific technical support duties;

- The good inter-governmental relations;
- The technical positions' availability in accordance with

UPTD duties and functions as reflected in the indicators above, the UPTD establishment must be supported by the workload analysis and personnel expenditure analysis ratio.

The Centralised Treatment of SPAL is not only operated by UPTD, but it is also performed by several local organisations such as:

- Bappeda; in order to implement coordination, planning, and budgeting;
- Public Works Office (Dinas PU)/ Residential Office /(Dinas Permukiman)/Dinas Cipta Karya through technical aspects, and monitoring;
- Environmental Office monitoring on disposal quality;
- Bapermas in order to establish public enactment;
- Health Office (Dinas Kesehatan)/ Public Tertiary Health Service (Puskesmas) to promote health and to monitor water quality;
- UPTD functioning as the operator of the sanitation system;
- AMPL Teamwork/ Sanitation Teamwork as the project operator of sanitation/work unit/ PPK

At the societal level, the users of local SPAL establish groups of facility users. It means that they can create an association as a communication forum to bridge communication and coordination between SKPD and UPTD.

In addition to UPTD, SPAL management can be operated by BUMN/BUMD or a privately-owned enterprise. However, the SPAL operated by UPTD and BUMD requires analysis on SPAL asset, as well as service charges collection SPAL.

Funding on SPAL Services

Funding in the SPAL operation includes funds for constructing, expanding, operating, maintaining, and rehabilitating the physical systems, as well as improving the non-physical system [6]. The funding resources of SPAL are generated from APBN, APBD, BUMN, BUMD, Cooperative, Privately-Owned Enterprise, the Public and other sources of funds as established in the regulatory laws.

The SPAL operation is aimed to treat residential wastewater. Therefore, it meets *The Polluter Principles*. Consequently, the public as well as the waste producer is responsible for paying the treatment charges. The wastewater treatment charges paid by society include:

- Use charges, periodic charges, or rates as promulgated by the institutional agency in the service operation;
- House connection fee.

The SPAL operated by the Office or UPTD charges rate payers (customers) in the form of use charges. The charges collected are established in the Regional Regulation and approved by the Regional House of Representatives. The management and mechanism of use charges collection is one of the charges paid by the public for the service provided by the government and must be subject to Section 28, 2009 Laws on Regional Tax and Regional Use Charge and the regulatory law on regional financial management.

Section 110 in the 2009 Laws on Regional Tax and Regional Use Charge for SPAL established the charges paid for using the wastewater treatment operation. The charges pay for Fluid Discharge Treatment, the Disposal of Domestic Waste/ Hygiene Service, Provision and/or the Pumping of Septic Tanks.

In the case of SPAL being operated by BUMN/BUMD, the charges are established on rateable basis in which the amount paid is regulated by the Head of Regional Government as suggested by the Director and approved by the Board of Supervisors. If the SPAL is operated by the Private-owned Enterprise, then the charge rate is established by the Head of Regional Government. If it is operated by the public or cooperative, the rate basis is established by the cooperative / public members.

The Regional Government, in attempting to fulfil its responsibility, can grant cross-subsidies among the SPAL users for paying the charges of the SPAL operation.

It is imperative to design the use charges rate of SPAL based on calculations and establishment principles which include accessibility, fairness, service quality, expenses recovery, transparency and accountability. Whereas the operational, maintenance, depreciation charges and other charges are also taken into account.

The SPAL financing which can be composed of the infrastructure to the non-physical system rehabilitation cost requires a relatively high cost overall. Consequently, the government can raise the respective funds in many ways such as to:

- Propose for Government Funding until the minimal service standard of attainment is acquired; or
- Hold a partnership with an enterprise.

The partnership between the regional government and the enterprise in building the infrastructure is established in Section 38 in the 2015 Indonesian President's Regulation on the Partnership between the Government and an Enterprise in Providing Infrastructure abbreviated as KPBU. Section 5 President's Regulation (Perpres) KPBU promulgated that the social and economy infrastructure can be sub-contracted. Two of the respective infrastructures are the Centralised SPAL and Local SPAL.

The implementation of KPBU in providing infrastructure aims to:

- Continuously suffice the funding for providing infrastructure by employing private funding;
- Realise the infrastructure provision, be it qualified, effective, efficient, on target and on time;
- Create a good investment atmosphere to encourage enterprise participation in providing infrastructure based on sound business principles;

- Encourage rate payers to pay for the services used or under certain circumstances to consider the rate payer's solvency; and/or
- Ensure return on the investment of the enterprise through periodic terms of payment from the Government to the enterprise.

V. CONCLUSION

1. The operation of the centralised residential wastewater treatment is the government's policy to meet the citizens' rights over the environment in order to prevent water contamination, as well as to attain a better health service. Therefore, the SPAL operation must be performed by technical institutions, for instance: BUMN/BUMD, Authority Office/UPTD, Cooperative and Private Enterprise.
2. As the realisation of *the polluter principles*, each citizen disposing of their wastewater to SPAL has to pay the charges in forms of a periodic fee or rate. The use charges, periodic fees or rates are subject to Laws on Regional Tax and Use Charges, as well as the regulatory laws on the Regional Financial Management.

VI. SUGGESTIONS

The operation of the centralised residential wastewater treatment is not only supported by a physical program, but also must be supported by the non-physical program related to institutional agency, administration, and funding. Therefore prior to SPAL construction, all non-physical documents, specifically the regulatory laws, must be valid for performing activities.

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