Towards Collaborative Batik Waste Management Model in Kampong Batik Semarang

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Abstract. Kampong Batik is one of thematic urban kampongs located in Semarang inner-city with batik production and sales as the main activities. One of the important issues related to this kampong is batik waste management; there is not installation wastewater treatment plan. It caused by several reasons such as land availability, fund, government and community commitment. Therefore, this paper intended to analyses the batik waste management model through collaborative planning strategy. It used qualitative research method through interview and observation techniques. Likewise, secondary data has also used as the data collection method. The research objectives was break downed into several activities; first, identification of existing waste management. Second, analyze waste management gap that compare between the existing situations with the expected performance. Then, it can be structured the collaborative waste management model as the third objective. This study output is a collaborative model in batik waste management that emphasized on the managerial aspect rather than the physical aspect.

Keywords: collaborative, kampong batik, waste management

1. Introduction

Indonesia is a developing country that has challenges in developing the economy. Empowerment of Micro, Small and Medium Enterprises or Usaha Mikro Kecil Menengah (UMKM) is considered to be one of the effective ways to build a stable [1]. Micro, Small and Medium Enterprises (UMKM) have proven to be more resilient in the face of the economic crisis that had occurred in Indonesia in 1997 [2]. UMKM Batik becomes one of the UMKM that has an important role in developing Indonesia's economy, especially in the city of Semarang. One of the UMKM Batik that is fostered by the Semarang City Government is Semarang Batik 16. The development of Semarang Batik 16 has brought many positive impacts such as the existence of branding which is getting better, the amount of batik production that is increasing, increasing tourist visitors both local and foreign tourists.

The potential of Semarang Batik and its wide network attracts many investors who want to invest. One of the investments and cooperation were undertaken with Batik Semarang 16 is the provision of facilities for Wastewater Treatment Plant (WWTP) by the Center for Industrial Pollution Prevention Technology (BBTPPI). But the problem that is happening right now at Batik Semarang 16 is that activities are focused only on developing batik production. Production activities are carried out every
day with a target number of approximately 50 (fifty) pieces of batik cloth per day. However, the amount of production also tends to be inconsistent, this condition has an impact on the amount of wastewater produced. The minimum amount of liquid waste produced per day is 10 (ten) liters per day. Batik Semarang 16, which already has Waste Water Management (WWTP) Installation with Aerob and Anaerobic WWTP, demands that the amount of waste and disposal time must be consistent because it will have an impact on the ability to decompose bacteria and the quality of wastewater produced. This condition is contrary to the amount and consistency of waste disposal time carried out in Batik Semarang 16 at this time. Besides, the activity of Batik Semarang 16 also focuses on expanding marketing networks, and developing cooperation in the field of tourism so that it hasn't maximized the wastewater management system. While the batik industry is an industry that has the potential to produce waste containing heavy metals and hazardous liquid waste that can cause environmental pollution [3]. Since nowadays sustainability emerge as high priority for the business world and all the key players in the various chains of production [4] thus to create a sustainable UMKM batik, quality improvement should not only be done in the marketing of products, the amount of production, and increasing in human resources production activities. But it must also pay attention to waste management, both from the WWTP, management, and also the location of disposal. Due to poor waste management will have an impact on the emergence of various problems both in terms of economic, environmental and social.

In addition, the unavailability of resources or experts in the field of wastewater management in Batik Semarang 16, creates a mismatch of wastewater management procedures stipulated in article 18 of Semarang City Regulation Number 13 2006 [5]. Based on article 18 section 2 of Semarang City Regulation Number 13 2006, states that each party responsible for a business and/or activity must have expert technical staff waste treatment. This requirement becomes one of the conditions that are not much attention by the Semarang Batik Party, currently for WWTP operations only carried out by Semarang Semarang 16 employees with a background in literary education thus there is no any experts for the relevant issue which is waste management.

Wastewater management which is considered not profitable, and asset ownership status with the service contract system causes a lack of attention by the Batik Semarang 16 to the wastewater management. This condition will have an impact on unsustainable wastewater management. Until now there has been no effort made to review the management of Batik Semarang 16 wastewater. Following up on this condition there needs to be a study of Batik Semarang 16 wastewater management to create sustainable wastewater management. The purpose of this study is to analyze the ideal of Batik Semarang 16 waste management using the concept of collaborative waste management.

2. Collaborative Waste Management Model

Wastewater management is one of the efforts made to create sustainability of an industry in terms of liquid waste expenditure and also its management system [6]. Waste management can be done by integrating social, management and economic aspects to create sustainability [7,8]. A good form of liquid waste management will reduce the risk of environmental pollution, environmental degradation [9]. To see the ideal liquid waste management, it can be seen as follows: social, management, and economy aspects [7,8].

According to Nururrohmah et al. [8], collaborative planning emphasizes the consensus among various stakeholders in making decisions to the implementation of the program. Collaborative planning (collaborative planning) is a decision making process where various stakeholders, who see the problem from various angles, sit together to explore their differences constructively, then search a solution, and to get more than what is obtained if only looking for a solution individually [10]. Collaborative planning is seen as important in developing a shared vision and goals that focus on ecological and social sustainability outcomes [11–13]. There are several important aspects that affect, namely as follows:

- Social aspects, the collaborative waste management social aspect is a variable that reviews the management of wastewater from two components, namely network power and also community power [8]. Network power is the ability to adjust liquid waste management by a group/business entity through cooperation. Network power can be grouped can be grouped into three classes,
as follows [14]: strong, medium and weak. A good community power will start an empowerment management activity and increase the capacity of resources that will affect the capacity, knowledge, behavior, and degree of participation so that they can play an important role in achieving goals. The degree of participation is as follows [15]: Spontaneous participation, Participation induced, Participation depressed by habit, Participation depressed by socio-economic reasons, Participation depressed by regulation.

- The management aspect, in collaborative waste management, the emphasis on management variables leads to three indicators, namely the collaboration model, the application of team regulations and also stakeholder mapping. The principles in management activities, namely as follows: Planning (planning), Organizing (organizing), Actuating (implementation), Controlling (supervision) [16]. In addition, the pattern of cooperation in management aspect is how the relationship between two people or the relationship between two companies to create effectiveness, risk sharing, the existence of the company, cost savings, improvement or maintain service levels that encourage sustainability [17].

- Economic aspects, the collaborative waste management model emphasizes how the financing patterns for wastewater management activities can proceed sustainably without a deficit concept. This financing pattern aims to accumulate how operational costs, procurement costs do not cause losses that lead to the concept of deficit in a company. To encourage funding and assistance in operational activities a company must carry out the principle of cooperation [18].

3. Data and Methods

The research approach used in this study is a qualitative is one of the models invented by James Spradley in 1980 [19]. The qualitative approach used in this study is due to see the Batik Semarang 16 waste management system, as a social phenomenon of the development of the batik industry that still does not pay attention to the sustainability of waste management.

3.1 Data Collection

The method used in the sampling of this study was purposive sampling with the type of snowball. The use of snowball is used to make it easier for researchers to find sources that have not yet been identified and obtain sources that are relevant to the research. For data collection, the authors used 3 types of data collection:

a. Interviews in this study use open and in-depth interviews related to one’s response to, perceptions, opinions, feelings and knowledge. Based on the type of snowball in sampling method, this research found 4 (four) resource person who have an understanding related to the management of Batik Semarang 16 wastewater. They are:
   - Resource person I is Semarang Batik 16 party who played an important role in the management of liquid waste generated from batik production activities.
   - Resource person II is the Central Institute of Industrial Pollution Prevention Technology (BBTPPI) which has an important role in the supply of liquid waste management tools
   - Resource person III is one of the leaders of the batik community in the Metese Village.
   - Resource person IV is the government in the Kelurahan Meteseh. This resource person has a role in the licensing process for the establishment of Batik Semarang 16.

b. Observation, carried out to see, the availability of waste management installations, waste management conditions, environmental conditions and see the impacts that may arise due to the lack of development carried out on the management of liquid waste from industrial waste Batik Semarang 16.

c. In this study, supporting documents such as Law Number 32 of 2009 concerning Environmental Protection and Management, Environmental Ministerial Regulation No. 5 of 2014 and Semarang City Regulation number 13 of 2006. By using these supporting documents, this research only focuses on management aspect, such as in article 18 section 2 that states each party responsible for a business and/or activity must have expert technical staff waste treatment.
3.2 Analysis Techniques

Domain analysis is performed to obtain a general and overall picture of the social situation under study or the object of research. The result of this analysis is a general description of the condition of the research topic that has never been known [20]. In this analysis the form of analysis is not exhaustive and can be classified into the recapitulation activities of an identification activity. In this study, the domain analysis is used to find out how the condition of waste management in Batik Semarang 16 by looking at several aspects namely management, social, economic aspects [7,8].

4. Findings and Discussion

4.1 Gap Analysis

In this gap analysis, three variables used to describe how the existing waste management will be compared with the ideal conditions of a collaborative waste management model. The following are the results of the gap analysis conducted.

4.1.1 Social

The lack of knowledge about the management of wastewater is influenced by the unavailability of experts on wastewater management in Batik Semarang 16 so that it impacts on the efficiency and effectiveness in managing wastewater in Batik Semarang 16 (Table 1). The achievement of efficiency and effectiveness in wastewater management is also influenced by weak networking power in current wastewater management. It is shown that profit tends to be felt by only one party (W2-J2-P10), (W1-J1-P10), has the same vision / different vision (W2-J2-P18) (W1-J1-P13), cooperation not sustainable (W2-J2-P15) (W1-J1-P15) (W1-J1-P13). Weak networking power also influences effectiveness, efficiency, innovation, and adaptability in wastewater management activities.

| Social | Existing Wastewater Management | Collaborative Waste Management | Gap |
|--------|--------------------------------|--------------------------------|-----|
|        | Participation | Person | Knowledge | Community Power | Networking Power |
|        | Semarang | Batik 16 behavior is at the stage of caring for the environment and trying to preserve (W3-J3-P2), (W1-J1-P2), (W1-J1-P23), (W2-J2-P23). | Not yet available human resources who understand wastewater management (W2-J2-P15), (W1-J1-P2). | Transforming organizational systems to improve effectiveness, efficiency, innovation, and adaptability. The way that can be done by doing empowerment is the management of wastewater et al., (2016). | Network power can be done if both parties are equally benefited, have the same views and principles, and are interdependent. the stronger network power between actors will affect transparency, accountability and sustainability of management [14] |
|        |        |        | No attempt has been made to provide understanding that waste that is disposed of must-be monitored, (W4-J4-P1). |        |        |

The absence of transparency and accountability among actors in waste water management is influenced by weak community power, weak community power seen from the form of participation. The degree of participation that is formed tends to be Participatory pressure (W2-J2-P10) (W1-J1-P1)
Distressed participation is carried out for fear of losing social status or suffering losses due to not carrying out the assigned role.

4.1.2 Economy

The sustainability of a management system is inseparable from good financing. In the gap analysis specifically, the collaborative waste management model emphasizes that in good management activities all economic activities must be accumulated so as not to cause harm [8]. The results of the gap analysis of economic aspects can be seen in the Table 2.

| Table 2. Economy Aspect Gap |
|-----------------------------|
| **Aspect**                  | **Existing Wastewater Management** | **Collaborative Waste Management** | **Gap** |
|                             | **Income**                           | **Source of Funding** | **Operational Cost** | **Financing Patterns** |                             |
|                             | • Revenues of 500 million per month  | • Operations sourced from Batik Semarang 16 (W1-J1-P8). | • Operating costs incurred every month of Rp. 2,000,000-3,000,000 (W2-J2-P4). | • Accumulate how operational costs, procurement costs do not cause losses [8]. | • There has not been any innovation in technical management and organizational structure |
| **Economy**                 | (W1-J1-P4), (W3-J3-P4).              | • The cost of constructing WWTP is sourced from the government (W2-J2-P17). | | • Carry out the principle of cooperation in operational and procurement activities [8]. | |
|                             | • There were no deficits and difficulties in operational activities (W1-J1-P4). | | • Emphasizing sustainability with innovations in technical management and also management in an organizational structure [8,18] |

The results of the analysis of the economic aspects found a gap, where there has been no innovation in technical management and organizational structure. The purpose of innovation in technical management is that the results of the activities of treating wastewater can be developed not only directly disposed of. This concept is used to achieve sustainability from water management [14,18]. While innovation in organizational structure is how roles that have been divided can be increased to increase effectiveness and efficiency which can also have an economic impact [8,18]. The absence of innovation is since participation in the management of Batik Semarang 16 wastewater management is fairly minimal (W2-J2-P13), (W2-J2-P15).
4.1.3 Management.

The lack of communication among stakeholders to develop wastewater management is influenced by the nature of wastewater management which tends to be non-profit and is one of the reasons that Semarang batik is more developing activities that generate economic benefits. The management aspect emphasizes the cooperation and leading of regulations and actors that must be involved based on existing regulations. As for the gap analysis conducted, it can be seen in the Table 3.

| Aspect | Existing Wastewater Management | Collaborative Waste Management | Gap |
|--------|--------------------------------|--------------------------------|-----|
|        | Cooperation Pattern | Regulation | Cooperation Model (Service Contract) | Mapping Stakeholder | Regulation |        |
| WWTP facilities are assets owned by the government / public (W2-J2-P20). | There is no continuing communication between Batik Semarang 16 and BBTPPI as the organizer of WWTP (W2-J2-P13). | Characteristics of service contract cooperation models [17]: - Ownership by the public - Public and private operations and maintenance - Investment by the public - Risks borne by the public - Cooperation duration is 1-2 years | Agencies that have the main task in controlling water pollution (Henri Subagyo, S.H., 2017): Local Government, Public Works & Public Housing Agency, Environmental Agency, Regional Development Planning Agency | Testing the quality and measuring the discharge of liquid waste and reporting to the responsible government agency at least once a month | Lack of cooperation with other agencies / stakeholders that have influence and interest in waste management |
| Batik Semarang 16 has the status of usage rights and is responsible for the operation and maintenance of WWTP (W1-J1-P16). | Initial funding (construction, material, operational) is carried out by BBTPPI (W2-J2-P16, W2-J2-P17). | Collaborative Waste Management requires collaboration between business actors and other stakeholders that lead to the principle of public private partnership to create participatory engagement [18] | | | Lack of communication between stakeholders for the development and sustainability of waste management. |
| Loss / risk will not be borne by the government / public (W2-J2-P17, W2-J2-P13). | The collaboration between Batik Semarang 16 and BBTPPI lasts for + 2 years consisting of the building and mentoring process (2016-2018). | To create an ideal collaboration, the pattern of cooperation must have a long-term duration (Chong, 2015). | | | Lack of commitment from Good Semarang 16 in providing expert resources in waste management to do reporting and meet quality standards in accordance with regulations. |
| Short cooperation time causes the lack of further development of waste management (W2-J2-P15, W2-J2-P13). | | | | | |

Table 3. Management Aspect Gap
Currently, there are several actors involved in the management of Batik Semarang 16 wastewater management, while the stakeholder mapping in the existing management activities can be seen in the Table 4.

| Actor                      | Interest                  | The Ability of Actors in Mobilizing Resources (Technology, Human, Financial) | Tendency of Relationship Direction | Levels of Interest | Level of Influence |
|----------------------------|---------------------------|-----------------------------------------------------------------------------|-----------------------------------|--------------------|--------------------|
| Batik Semarang 16 Business doers | The actor is one who can make decisions regarding available resources | Internal | The most critical interest | Very influential |
| BBTPPI                     | Government body that focuses on developing industrial waste management technology | Internal | Very important | Significant influence |
| Semarang City Government (Village) | Government bureaucracy at the level of output in the context of administration | Cannot Make Decisions Regarding Resources | External | Very small / unimportant | The effect is very small / none |

The lack of cooperation has an impact on ideal management principles if seen from a management principle that consists of Planning, Organization, Actuating, and Controlling Analysis. The planning phase has been carried out by BBTPPI with the main objective to reduce hazardous liquid waste that is discharged into the environment through WWTP installations in Batik Semarang 16. Organization currently the division of roles has been done in the management of Batik Semarang 16 waste. BBTPPI as a party that provides infrastructure and management facilities wastewater and Batik Semarang 16 also get a role as a manager. However in the management of wastewater Batik Semarang 16 has not been able to identify all the actors who must be involved in management activities, this condition causes several gaps to emerge such as on social aspects, there is no transparency, efficiency, and effectiveness, which also has an impact on the unavailability of a clear management organizational structure in waste management. Actuating is an implementation of planning and organizing. Due to the implementation of wastewater management activities in Batik Semarang 16 the involvement of the actors is minimal and the participation of actors who are depressed in their implementation (W2-J2-P13), encourages the implementation of management activities that are efficient and effective and are not formed accountability and transparency in wastewater management • Controlling, is the process of control or supervision to create dynamic, effective and efficient management activities. At the supervision stage, there is currently no form of controlling activities in the Semarang Semarang wastewater management 16.

4.2 Collaborative Waste Management of Batik Semarang 16

Based on the results of the gap analysis, the lack of communication and participation of other stakeholders causes waste management in Batik Semarang 16 to be less effective, efficient, accountable, and transparent. So it is needed to increase cooperation by involving several stakeholders who were not
yet involved at all. Increased cooperation will have an impact on the three aspects used to analyze the condition of existing waste management on collaborative waste management. The stakeholders who need to be involved from the results of the gap analysis of the three aspects are contained in the stakeholder mapping of Semarang Semarang 16 waste management can be seen in the Table 5.

| Actor | Interest | The Ability of Actors in Mobilizing Resources (Technology, Human, Financial) | Tendency of Relationship Direction | Levels of Interest | Level of Influence |
|-------|----------|-------------------------------------------------------------------------|-----------------------------------|-------------------|-------------------|
| Batik semarang 16 | Business doers | The actor is one who can make decisions regarding available resources | Internal | The most critical interest | Very influential |
| BBTPPI | Government body that focuses on developing industrial waste management technology | The actor is one who can make decisions regarding available resources | Internal | Very important | Significant influence |
| Semarang City Government (Village) | Government bureaucracy at the level of output in the context of administration | Cannot Make Decisions Regarding Resources | External | Very small / unimportant | The effect is very small / none |
| Industry Agency | Government Agency whose role is to develop procedures for industrial production. Government Agency in research and development of quality, standards, institutional capacity and technology of the batik industry | Cannot Make Decisions Regarding Resources | Internal | Very important | Significant influence |
| Balai Besar Batik | Government Agency whose role is to control the impact of development on environmental sustainability | Cannot Make Decisions Regarding Resources | Internal | Very important | Moderate influence |
| Environmental Agency | Government agencies that play a role in budgeting, implementation, operational supervision, and monitoring and evaluation of development implementation | Cannot Make Decisions Regarding Resources | External | Moderate interest | Moderate influence |
| Development and Financial Planning Agency | Government Agency which has the role of developing environmental facilities and infrastructure | The actor is one who can make decisions regarding available resources | Internal | Very important | Significant influence |
| Public Work Agency | Cannot Make Decisions Regarding Resources | External | Moderate interest | Moderate influence |
The results of stakeholder mapping will be used in the preparation of collaborative waste management models by emphasizing the consensus among various stakeholders in decision making, implementation, and monitoring the results of the program [8]. In developing collaborative waste management models of Batik Semarang 16, the principles of management activities consisting of Planning, Organization, Actuating, and Controlling (POAC) become a component that is used to separate the roles of each actor that also fixes the application of the principles of management activities when this is still not ideal. The collaborative waste management model in Batik Semarang 16 can be seen in Figure 1.

![Collaborative waste management Batik Semarang 16](image)

**Figure 1.** Collaborative waste management Batik Semarang 16

5. **Conclusion**

At the present social aspects do not yet have competence, efficiency, transparency, and accountability in wastewater management activities at Batik Semarang 16, Participation that only requires three actors needs to be increased and increase participation. In the social aspect, waste management is related to two indicators namely network power and community strength, the existing network strength in wastewater management is currently under weak conditions, while community strength is not yet ideal due to the influence of research involving depressed actors.

Economic aspects, there is no innovation in technical management and organizational structure. Folded innovation in terms of technical and organizational structure to encourage management in terms of economic sustainability and bring the economic benefits of waste management activities Batik Semarang 16.

Management aspects, currently there is still a collaboration with other agencies/stakeholders that have less influence and interest in waste treatment, as well as lack of communication and commitment among stakeholders in developing waste management. Batik Semarang 16 also still has limitations on the availability of resources that are experts in waste management. Seen from the four principles of management activities namely Planning, Organization, Actuating, and Controlling (POAC) there are still several conditions that are not specific to the conditions of waste management in Semarang Batik in the Organization, Actuating and Controlling sections.
6. Recommendation
To implement collaborative waste management in Semarang 16 waste management, to create sustainable wastewater management, the following recommendations can be given:

- Identify relevant actors who have a common interest in the context of liquid waste management.
- Increase collaboration by paying attention to the principle of community power that leads to spontaneous participation and also strong networking power.
- Implement provisions following applicable regulations especially in the provision of human resources.
- Make a clear organizational structure in the waste management activities of Batik Semarang 16.
- Pay attention to the principles of management especially in the Organization, Actuating and Controlling sections.
- Increase attention to developing Batik Semarang wastewater management 16.

This research has a weakness in the study of the application of regulations related to wastewater management stipulated in Semarang City Regulation Number 13 of 2006 [5] which contains four policy items. Of the four policy items, it has not yet elaborated on the detailed process related to the waste disposal permit, whether the permit is still valid or has to be extended. In the third item, it is written that each business entity must provide experts, but in this study, the researchers have not provided a detailed explanation of the requirements that must be met by experts and the researchers have not yet explained how sanctions can be imposed on a company that does not have experts. On the fourth item reads that the government is obliged to provide facilities/infrastructure for waste treatment, but in this study, the researchers merely stated that the government had provided the infrastructure but had not yet identified who was involved in detail in the supply activities. Not only in the aspect of regulation in stakeholder mapping activities, but the author also has not described the advantages of each party when cooperating in wastewater management. The application of regulations and profit principles in cooperation can be a recommendation for further research especially in studying the management of liquid waste in similar industries or the same location. By specifying the application of regulations and the benefits of collaboration it is hoped that it will facilitate a more detailed identification of stakeholders.

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8. References
[1] Gunartin 2017 Penguatan UMKM Sebagai Pilar Membangun Ekonomi Bangsa EDUKA J. Pendidikan, Huk. dan Bisnis 1 59–74
[2] Anisyah, Yulianita; Atmanti H D Analisis Perkembangan Industri Batik Semarang 0
[3] Purwaningsih R, Susanto N and Yudha M C 2016 Penilaian Keberlanjutan UKM Batik Kota Semarang dengan Metode Product Service System (PSS) J. Tek. Ind. 18 31–42
[4] Sancha C, Wong C W Y and Gimenez Thomsen C 2016 Buyer-supplier relationships on environmental issues: A contingency perspective J. Clean. Prod. 112 1849–60
[5] Pemerintah Kota Semarang 2006 Peraturan Daerah Kota Semarang Nomor 13 Tentang Tata Cara Pengolahan Limbah
[6] Subki N S R 2011 A Preliminary Study on Batik Effluent in Kelantan State: A Water Quality Perspective Int. Conf. Chem. Biol. Environ. Sci. 274–6
[7] M. Wawan Kurniawan; Purwanto S 2013 Kajian Pengelolaan Air Limbah Sentra Industri Kecil Dan Menengah Batik Dalam Perspektif Good Governance Pengelolaan Sumber. Alam Dan
[8] Nururrohmah Z and Suhirman 2016 Shared-power Governance in Managing Common Pool Resources Case Study: Collaborative Planning to Manage Thematic Parks in Bandung City, Indonesia Procedia - Soc. Behav. Sci. 227 465–76
[9] Rizqon M A M, U D H and Taryana D 2010 Pengaruh Pencemaran Limbah Cair Industri Pengolahan Ikan Terhadap Kualitas Air Tanah di Kecamatan Muncar Kabupaten Banyuwangi
[10] Sufianty E 2014 Kepemimpinan dan Perencanaan Kolaboratif pada Masyarakat Non Kolaboratif J. Perenc. Wil. dan Kota 25 78–96
[11] Moore M-L, Tjornbo O, Enfors E, Knapp C, Hodbod J, Baggio J A, Norström A, Olsson P and Biggs D 2014 Studying the complexity of change: toward an analytical framework for understanding deliberate social-ecological transformations Ecol. Soc. 19 54
[12] Vacik H, Kurttila M, Hujala T, Khadka C, Haara A, Pykäläinen J, Honkakoski P, Wolfslehner B and Tikkanen J 2014 Evaluating collaborative planning methods supporting programme-based planning in natural resource management J. Environ. Manage. 144 304–15
[13] Olsson P, Folke C and Hahn T 2004 Social-ecological transformation for ecosystem management: the development of adaptive co-management of a wetland landscape in southern Sweden Ecol. Soc. 9
[14] Seadon J K 2010 Sustainable waste management systems J. Clean. Prod. 18 1639–51
[15] Totok M and Poerwoko S 2013 Pemberdayaan Masyarakat Dalam Perspektif Kebijakan Publik Bandung Alf.
[16] Carpenter M, Bauer T and Erdogan B 2012 Management principles
[17] Fitriyah F 2016 Model Public Private Partnership Dalam Peningkatan Pelayanan Sumber Daya Air Bersih Di Pdam Kabupaten Kebijak. dan Manaj. Publik 4 1–11
[18] Fuldauer L, Ives M C, Adshead D, Thacker S and Hall J W 2019 Participatory Planning of the Future of Waste Management in Small Island Developing States to Deliver on the Sustainable Development Goals J. Clean. Prod. 223 147–62
[19] Garrido N The Method Of James Spradley In Qualitative Research Cuid. Humaniz. 43
[20] Suryana 2012 Metodologi Penelitian: Metodologi Penelitian Model Prakatis Penelitian Kuantitatif dan Kualitatif Univ. Pendidik. Indones. 1–243