Journal of Islam and Science

pISSN 2307-5353, eISSN 2580-5355
Vol 6, No. 2, December 2019, pp. 50-54
Published by Institute of Research and Community Services (LP2M)
Universitas Islam Negeri Alauddin Makassar
Available online http://journal.uin-alauddin.ac.id/index.php/jis
https://doi.org/10.24252/jis.v6i2.12091

INITIATION OF DESIGN AND MANUFACTURE OF BATIK WASTE RECEPTACLES FOR THE SARIWARNI BATIK GROUP IN MADIUN REGENCY

Wildanul Isnaini, Nur Ihda Farikhatin Nisa, Dimas Setiawan
Faculty of Industrial Engineering
Universitas PGRI Madiun
Email: wildanulisnaini@unipma.ac.id

Abstract: Sariawarni Batik Group is one of the batik groups in Madiun Regency that is classified as successful in marketing their products. Sariwarni Batik Group is chaired by Mrs. Siti Suwarni and consists of 14 people who are housewives. Sariwarni Batik Group produces several types of batik,i.e. written batik, stamp, and ecoprint. Until now, Sariwarni batik group still uses synthetic dyes in its production. This study aims to create a waste disposal design that will be tailored to the needs of the Sariwarni batik group and adjusted for the cost and time available. As a result, the design of the wastewater collection tank in the Sariwarni Batik Group has been completed and can be used. With this tub, the Batik Sariwarni Group does not need to dispose of batik liquid waste into the yard of the house. In addition, the reservoir can separate and precipitate wax, oil and other particles.

Keyword: *batik waste, design, Sariwarni Batik, Shelter*

Abstrak: Kelompok Batik Sariawarni merupakan salah satu kelompok batik di Kabupaten Madiun yang tergolong sukses dalam memasarkan produknya. Kelompok Batik Sariwarni diketuai oleh Ibu Siti Suwarni dan beranggotakan 14 orang yang merupakan ibu rumah tangga. Kelompok Batik Sariwarni memproduksi beberapa tipe batik yaitu tulis, cap, dan ecoprint. Hingga saat ini, kelompok batik sariwarni masih menggunakan pewarna sintesis dalam produksinya. Berikut adalah beberapa contoh produk dari Batik Sariwarni. Penelitian ini bertujuan untuk membuat desain pembuangan limbah akan disesuaikan dengan kebutuhan kelompok batik sariwarni serta disesuaikan dengan biaya dan waktu yang tersedia. Hasilnya, Desain bak penampungan air limbah cair di Kelompok Batik Sariwarni telah diselesaikan dan dapat digunakan. Dengan adanya bak tersebut Kelompok Batik Sariwarni tidak perlu membuang limbah cair batik ke pekarangan rumah. Selain itu, bak penampungan tersebut dapat memisahkan dan mengendapkan malam, minyak, dan partikel lainnya.

Kata Kunci: *batik Sariwarni, bak penampungan, desain, limbah batik*

Introduction

Batik is a painting produced from canting (Taofik, Rukmi, & Bakar, 2015) and has been established by Unesco as Indonesia's cultural heritage. Almost all regions in Indonesia have their own batik patterns according to the regional uniqueness. No exception in Madiun. Sariawarni Batik Group is one of the batik groups in Madiun Regency that is classified as successful in marketing their products. Sariwarni Batik Group is chaired by Mrs. Siti Suwarni and consists of 14 people who are housewives. Sariwarni Batik Group produces several types of batik,i.e. written batik, stamp and ecoprint. Until now, Sariwarni batik group still uses synthetic dyes in its production. Some examples of products from Batik Sariwarni are shown in Figure 1.

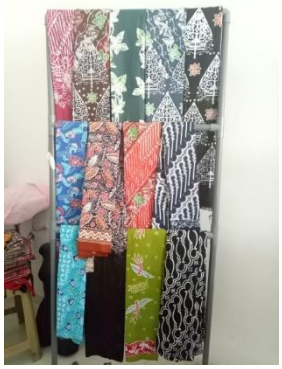

Figure 1. Sariwarni batik products

Based on a review of problems with partners that have been carried out by the community dedication team, one of the problems that the partners think needs to be resolved is manufacture a liquid waste disposal site. In one day, Sariwarni batik group can produce 400 L of liquid waste. Liquid waste produced by the Sariwarni Batik Group is shown in Figure 2.

Figure 2. Sariwarni Batik liquid waste

Liquid waste is immediately discharged into the yard of the house. Current location of liquid waste disposal is shown in Figure 3.

Figure 3. Location of waste disposal

Liquid waste disposal and processing become problem for many batik entrepreneurs. Batik waste is a liquid waste that is complex and difficult to handle because it contains non-biodegradable compounds that can cause environmental pollution (Indrayani & Si, 2019). There are many preliminary studies that discuss reducing the content of BOD, COD, dyes in batik waste (Pratiwi et al., 2014) using electrocoagulants or using photocatalytic (Wildan, Pramitaningastuti, & Anggraeny, 2018). Wastewater treatment process can be carried out through physical, chemical and biological processes. There are processes of sedimentation, flocculation, coagulation, absorption, in physical and chemical processes and the use of microorganisms in biological processing (Priadie, 2017).

Biological processes can also be carried out by adding gravel, kerakal, bioball, and zeolite stones (Warsito & Purbowati, 2016). In addition to paying attention to the process that will be used in the waste collection, making the installation also needs to consider the costs, the needs of partners, and the time available for efficient design (Sari & Hartini, 2012). Because of the importance of safe disposal of batik waste to the environment and the desires of partners who are in line, these problems will be resolved at this community dedication. Design of waste disposal will be adjusted to the needs of the Sariwarni batik group and adjusted to the available costs and time. Disposal of batik made is expected to reduce levels of existing pollutants.

Materials and Method

Problem identification is done together with partners by considering partner needs and competencies held by community dedication team. In this study the problem is determined to be resolved is to build waste disposal using chemical and physical processes. Both of these processes were chosen because they were based on the team's knowledge and the time and cost involved. With these two processes, it is expected to reduce levels of environmental pollutants present in batik liquid waste. After that, the design is made based on several references and needs. Design making is adjusted to the discharge

of liquid waste produced by Batik Sariwarni Group per day. After the design was agreed by the Team and Partners, the installation construction process was carried out and socialization was carried out to the chairman and members of the batik group about the system and treatment of the waste disposal.

Result and Discussion

Making the installation of liquid waste disposal in the Sariwarni Batik Group begins with a literature study related to the design of the installation. Initial stage of design is to determine what physical and chemical processes will be used in the shelter. There are 4 main tubs in the wastewater disposal tub design that is, the initial shelter, sedimentation 1, sedimentation 2, and Filtration. Physical process is carried out in the initial shelter and sedimentation tank 1. Sedimentation tank 2 is used to carry out chemical processes while the filtration tub is used for biological processes (Widyastuti et al., 2019).

Initial shelter is divided into 3 tanks consisting of 2 overflow tanks to separate wax and a large shelter of liquid resulting from the separation.

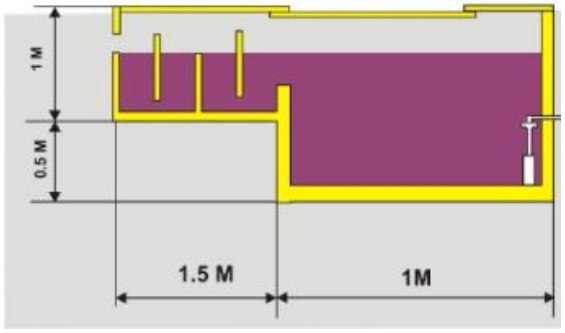

Figure 5. Initial shelter

Size of each tub is determined based on the average water flow per day produced by the Sariwarni batik group which is 400L per day. capacity can go up or down depending on the amount of production per day. After that, there are Sedimentation 1 and Sedimentation 2 tanks. Sedimentation tank 1 is useful for separating fats and oils in the wastewater (Mulasari, 2015). Whereas in the Sedimentation tank 2, it has entered the chemical process, namely flocculation and Coagulation. Flocculation is used to separate small particles that float in water(Rahimah, 2016). Meanwhile, coagulation is used to separate or precipitate larger flocks (Wildan et al., 2018).

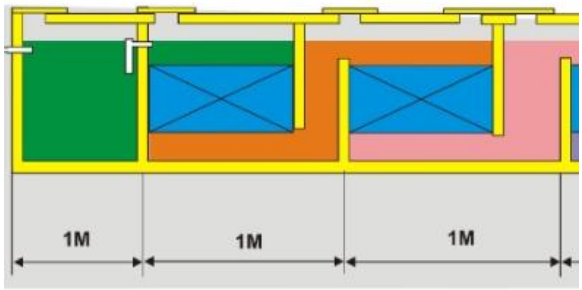

Figure 6. Sedimentation tank 1 and 2

After going through sedimentation 1 and sedimentation 2, liquid waste will enter the filtration tank. The tank is used to carry out biological processes by adding zeolid, palm fiber, gravel, and krakal. The next tank was given water hyacinth to optimize biological processes.

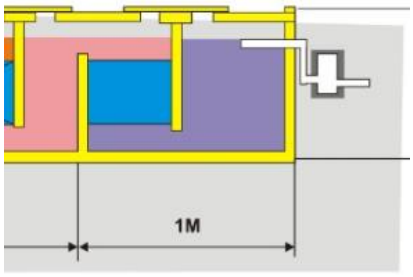

Figure 7. Filtration tank

Design of the liquid waste collection tank for the Sariwarni batik group as a whole is shown in figure 8.

Figure 8. Overall design of waste collection tank

After the design is finished and approved by the partner, the next stage is the construction of the container. The construction is carried out within 1 month from September to October 2019. Shelter tank during the construction process shown in figure 9. Waste storage tanks when used by the Sariwarni batik group are shown in figure 10.

Figure 9. Process for making wastewater shelter tank

Figure 10. Shelter when used

Figure 10 shows that the color and shape changes in the initial shelter to sedimentation tank 1. initial shelter, wax has been successfully separated and in the sedimentation tank 1 oil is seen floating above water. After the tank was finished, community dedication team conducted a socialization about the batik waste collection tank to the Sariwarni Batik Group.

Figure 11. Socialization related to batik waste shelter

Conclusion

Design and making of liquid waste collection tanks in the Sariwarni Batik Group have been completed and can be used.

References

Indrayani, L., & Si, M. 2019. Teknologi pengolahan limbah cair batik dengan IPAL BBKB sebagai salah satu alternatif percontohan bagi industri batik. April, 1–9.

Mulasari, S. A. 2015. Pengaruh metode koagulasi , sedimentasi dan variasi filtrasi terhadap penurunan kadar TSS , COD dan warna pada limbah cair batik. vol 2: 7–12.

Pratiwi, Y., Santoso, G., Waluyo, J. 2014. *Lingkungan, J. T., Elektro, J. T., & Mesin, J. T*. vol 7(1).

Priadie, B. 2017. Potensi IPAL skala individu untuk pengolahan limbah potential of individual scale of waste water treatment plant for. (5).

Rahimah, Z. 2016. Pengolahan limbah deterjen dengan metode koagulasi - flokulasi menggunakan koagulan kapur dan pac. vol 5(2): 13–19.

Sari, M. M., & Hartini, S. 2012. Batik yang efektif dan efisien dengan menggunakan metode *life cycle cost* (studi kasus di kampung batik semarang). 27–32.

Taofik, D. E. N. A. I., Rukmi, H. S., & Bakar, A. B. U. 2015. Strategi pengembangan UKM batik. vol. 03(03): 206–217.

Warsito, B., & Purbowati, E. 2016. Pengelolaan limbah batik cair secara biologis pada ukm.

Widyastuti, D., Kamulyan, B., Mayani, M., Rofi, I., Rachman, N. F., Albihad, D., … Mada, G. 2019. Kajian limbah kerajinan batik kayu di Desa Wisata Krebet Daerah Istimewa Yogyakarta. vol 18(1): 50–56.

Wildan, A., Pramitaningastuti, A. S., & Anggraeny, E. N. 2018. Pengolahan limbah batik dengan metode fotokatalitik di Desa Gemawang Kabupaten Semarang. 135–141.