The Dynamic of Rubbish Bank Management in Solo City, Indonesia

R.R.I.K.Wardani1, I.W.Istiqlomah1, M.Shalihah1, E.Rusdiyana1, A.Wibowo1
1Department of Agricultural Extension and Communication, Agricultural Faculty, Universitas Sebelas Maret, Ir. Sutami Street 36 A Kentingan, Jebres, Solo, 57126, Indonesia. E-mail: ilma.kswardani@gmail.com

Abstract. This research aimed to find out the dynamic of rubbish bank in Solo City. This research employed qualitative approach with primary and secondary data. Primary data was obtained through focus group discussion (FGD), interview, and participatory observation. Secondary data was obtained using the analyses on article and data coming from Living Environment Office of Solo City. Data validation was carried out using data source triangulation. The result of research showed that rubbish production reached more than 291 ton/day in Solo City, 90% of which enter into the rubbish dump and less than 10% enter into rubbish bank. Out of 75 rubbish bank activated by community group, many of them are less active because the administrator generation does not run well, the participation of public or community as rubbish bank’s customers is low and the legal foundation of rubbish problem has not been implemented well.

1. Introduction
Rubbish is defined as the waste resulting from household activity in solid form, collected further in rubbish dump and ending up with unusable goods. One of cities contributing the largest volume of rubbish in Central Java is Surakarta. A population in Surakarta city disposes 0.5 kg of rubbish/day on average. With total population number of 550,000 people, the average rubbish volume of city produced and disposed in Rubbish Dump is 275 tons/day [1]. The increased volume of rubbish in Surakarta can be a problem when it is not dealt with immediately. In this case, the existence of rubbish bank can be one of community’s strategies to manage rubbish the volume of which increases continuously. It is in line with [2] stating that one of its alternative solutions is to involve the people in reducing waste by applying rubbish bank effectively.

The number of rubbish bank in Surakarta, according to Living Environment Office of Surakarta City’s data in 2019, is 75 distributed in 5 sub district with 51 kelurahans. Out of the 75 rubbish bank, many are inactive, vacuum, and without activity. Rubbish problem and rubbish bank management system in Surakarta City is due to, among others, inadequate public participation and government support. Meanwhile, the implementation of rubbish bank in principle is a social reengineering inviting the people to sort rubbish and to apply 3R (reduce, reuse, and recycle) [3]. Fund limitation, low priority, government’s attention to rubbish problem and limited service scope are the factors of rubbish management not dealt with immediately. [4] stated that in dealing with the problem, local government’s intervention in changing environment-oriented community’s mindset. The use of integrated
rubbish management concept through rubbish bank is an alternative to minimize rubbish and maximizing recycling activity involving community. [5] mentioned that rubbish collection and recycling are domestic activity with women and children participating in collecting and then sorting rubbish. Rubbish bank is intended to motivate people to sort rubbish, to reward the attempt of sorting and benefiting economically from the rubbish.

The need for rubbish management is also supported comprehensively and integrated manner in the presence of law certainty, local government’s clear responsibility and authority, and community’s and stakeholder’s role. Rubbish management responsibility is dealt with not only by government, but community and stakeholder’s participation will also be able to realize proportional rubbish management effectively and efficiently. In this case, it is important to see the dynamic of rubbish bank in Surakarta City to improve the performance of rubbish bank, viewed from activity quality and quantity to achieve the ideal quantity.

2. Materials and Method

This research employed a descriptive qualitative approach, with primary data obtained through focus group discussion (FGD), interview, and participatory observation. Ref. [6] mentioned that forum group discussion (FGD) is a systematic process of collecting very specific data and information on certain problem through group discussion. This research employed FGD activity with some rubbish banks existing in Surakarta City to obtain primary data on rubbish bank management system and administrator and community’s participation within it. FGD activity was conducted with rubbish bank being the subject of research taken from some resources in Surakarta City. Resources include the representatives of 5 rubbish banks, citizen representative, Living Environment Office of Surakarta City, Local Legislative Assembly of Surakarta City, Perum Pegadaian (Pawnshop), environment activists, and representative of Universitas Sebelas Maret Green Campus. Secondary data was collected using literature study on data obtained from Surakarta City’s Living Environment Office. Data validation was carried out using data source triangulation. Technique of processing data used with triangulation was data validating technique utilizing something beyond the data as the control (comparator) for the data [7]. In this research, data source triangulation was used by means of crosschecking the data obtained through some sources. In conducting credibility test, this research employed data from library study trialed with the subject of research and adjusted with the existing theory.

3. Results and Discussion

3.1. Rubbish Problem in Surakarta

The volume of rubbish piling in Surakarta City reaches 305.516 ton/day in 2013. In supporting the rubbish-related sustainable service, Surakarta City’s Government provides about 131 rubbish container units and should conduct 3R program over 150.84 ton rubbish/m3/day. By mapping the rubbish-related service, people can find out the rubbish-related condition existing and expected to deal with the rubbish-related problem in Surakarta City [8]. The volume of rubbish increases over years with the increased population number and the Surakarta people’s increased habit of using disposable goods or materials. Considering the Living Environment Office of Surakarta City’s data in 2019, the quantity of rubbish production increases as presented in Table 1.
Table 1. Rubbish Volume per Month in Surakarta City in 2018 (ton)

| No | Month    | Sub-District | Total   | Average per Day |
|----|----------|--------------|---------|-----------------|
| 1  | January  | 5,372,440    | 9,619,050 | 310,292         |
| 2  | February | 5,061,590    | 8,913,030 | 318,323         |
| 3  | March    | 5,546,600    | 9,646,490 | 311,177         |
| 4  | April    | 5,132,220    | 8,762,760 | 292,092         |
| 5  | May      | 5,442,750    | 9,216,570 | 297,309         |
| 6  | June     | 5,025,670    | 8,514,120 | 283,804         |
| 7  | July     | 4,834,820    | 8,397,590 | 270,890         |
| 8  | August   | 4,759,520    | 7,947,260 | 256,363         |
| 9  | September| 4,570,540    | 7,579,100 | 252,637         |
| 10 | October  | 5,168,440    | 8,683,120 | 280,101         |
| 11 | November | 5,608,770    | 9,303,010 | 310,100         |
| 12 | December | 5,731,880    | 9,696,760 | 312,799         |

Total (Kg) | 62,255,240 | 106,278,860 | 291,175
Total (Ton) | 62,255      | 106,279      |
Total (M³) | 249,021     | 425,115      |
Average/Day (Ton) | 171 | 291 |
Average/Day (M³) | 682,25 | 1,164,70 |

Source: Living Environment Office of Surakarta City, 2019

Unfortunately, 90% of total rubbish production in Surakarta city ends up in the rubbish dump, in Putri Cempo rubbish disposal center. The existence of rubbish bank established based on either citizen’s initiative or government’s facilitation has not been able to develop as expected, as indicated with 75 rubbish bank still focusing on inorganic rubbish having economic value to be sold and to be processed into craft product. In this condition, the proportion of rubbish managed by rubbish bank in Surakarta is still very small, meanwhile the one ending up in Putri Cempo increases continuously. Meanwhile, Putri Cempo has been on in overcapacity condition now as the result of some rubbish collecting points closed in some areas due to people’s declination because of odor pollution, ugly scenery, and health disorder its produces. The rubbish ending up in Putri Cempo has actually not passed through sorting process yet because all types of rubbish are mixed in one place. This potency on the one hand results in rubbish collector in Putri Cempo to find rubbish still having economic value.

Although Surakarta City’s government through Living Environment Office has provided rubbish cask facility, inadequate education has been given to the people. Although the rubbish has been sorted by its type in upstream, the rubbish officer instead puts them onto the same rubbish cart or dump truck during transporting them, so that they are mixed again. Eventually, the availability of separated rubbish casks becomes less effective without education given to people and rubbish officer. The Surakarta City Government targeting at least one rubbish bank in on RW has not been fruitful recalling that the rubbish bank established not based on community’s initiative often running not optimally.

Rubbish bank is a dry processing system encouraging the people to participate actively and collectively within it. The concept of rubbish bank has system storing, sorting, and channeling rubbish with economic value to the market in which the people benefit from saving rubbish [9]. Ministry of Living Environment of RI’s Law Number 13 of 2012 states...
clearly that rubbish bank is the place for collecting rubbish, sorting rubbish, and recycler or reusing rubbish with economic value.

3.2. Dynamic of Rubbish Bank Management in Surakarta

The problem of rubbish bank management in Surakarta City can be categorized into 3: rubbish bank administrator, people surrounding rubbish bank, and implementation of regulation supporting rubbish bank movement or program.

3.2.1. Administrator Regeneration

The Minister of Living Environment’s Regulation Number 13 in 2013 about the rubbish management technique and operation in rubbish bank referring to the concept of 3R: Reduce, Reuse, and Recycle. Rubbish Bank Operating technique involves sorting rubbish, submitting rubbish to rubbish bank, weighing and recording, and sharing profit resulting from the sale of rubbish saved. The activity in rubbish bank needs specific time allocation at least once a week and the management is usually given up to female group whether under Female Welfare Program (FWP), under youth organization (Karang Taruna), or in distinctive structure. Unfortunately, the activity of rubbish administrator is largely still voluntary-based due to no business capital available; it is this that makes the surviving administrators are cadres who indeed have passion with social (non profit) activity. Eventually, this organization model does not find many activators, even most administrators of rubbish bank has also occupied activator cadre position in other social institution like Dasawisma, FWP, or Karang Taruna. In turn, it will lead the rubbish bank activity to be conducted in the remained time and not become the main duty of activating cadre. The activeness level of administrators not compensated with community participation also impacts on the lower spirit among the administrators or cadres of rubbish bank, because their spirit is not in line with community participation.

3.2.2. Inadequate Community Participation

Paradigm developing within society concerning rubbish management should be reactivated sustainably. The education given concerning rubbish management referring to the concept of 3R (reduce, reuse, and recycle) is considered as important in solving the rubbish problem from its root. Rubbish bank involving community (public) participation is a social capital in community-based rubbish management [10]. The management of rubbish bank in the program should apply the function of management to make its implementation running efficiently and effectively. The function of management should apply the planning involving public (government) and private’s intervention, community participation, and socialization process itself. The organization related to organizational structure, work platform, cooperation with certain party, and clear role division, and implementation thinking of macro approach strategy, and evaluation so that the implementation of program is much more effective. The program is launched as an attempt of empowering community through rubbish bank development to make the people powerful and impacting on family income. There are supporting and inhibiting factors in rubbish bank program. The supporting factor includes good organization, good cooperation with stakeholder, inadequate infrastructure and active role of customer/community. Meanwhile, the inhibiting factors include fluctuating rubbish price, suddenly information, and retarded payment by rubbish collector. Government’s intervention has not been played widely at community level by the Head of Neighborhood Association (RT) and Head of Citizen Association, and Kelurahan Government.
“There has been regulation at city (municipal) level, but public participation is still very low. Local government has not been dare to develop a rule suppressing the people to participate in giving education about rubbish problem within society (FGD, 2019).

Rubbish problem is a part of environmental issue, so that this rubbish-related problem needs communicative approach through environmental communication as well. Environmental communication is an attempt of protecting the nature from environment degradation, a pragmatic attempt to generate consciousness of the importance of environmental issue in community and the world using communication context approach.

It is assumed that rubbish bank program is a social movement becoming a medium by which environmental communication process occurs. Rubbish bank is a combination of social and environmental movements. And today, rubbish issue has been an important problem and has attracted many parties’ attention globally. Activating cadres of rubbish bank in Surakarta City highly needs training for environmental communication to produce productive rubbish bank programs and to attract the people’s attention to be motivated to join the activity in rubbish bank.

3.2.3. Weak Local Regulation
Although Surakarta City has had Local Regulation No.3 of 2010 about rubbish management, its implementation, in fact, has not touched the bottom level of society, whether rubbish bank activator or the public. It makes the urgent rubbish problem in Surakarta City has not been the strategic issue in the lower class of society. Local government at dasa wisma, neighborhood association, citizen association and even kelurahan, referring to local regulation, can develop lower regulation so that the implementation of rubbish management (e.g. through rubbish management) can run more optimally. This initiative has not been seen widely at the government’s local environment unit (SLS) level.

4. Conclusion
Rubbish bank has been a rubbish management media in Surakarta City, but the performance of rubbish bank in Surakarta City encounter dynamic in the aspects of administrator and activator cadre building, (2) fluctuating and decreasing public participation, and (3) poor implementation of rubbish regulation at local environmental unit.

References
[1] Dinas Kebersihan dan Pertanaman Kota Surakarta. 2009.
[2] Purba, H.D., Meidiana, C., dan Adrianto, D.W., 2014. Waste Management Scenario through Community Based Waste Bank: A Case Study of Kepanjen District, Malang Regency, Indonesia. International Journal of Environmental Science and Development, 5(2): 212-216
[3] Direktorat Pengembangan Penyehatan Lingkungan Permukiman Dirjen Cipta Karya Kementerian Pekerjaan Umum. 2011. Materi Bidang Sampah I Diseminasi dan Sosialisasi dan Keteenikan Bidang PLP. Direktorat Pengembangan Penyehatan Lingkungan Permukiman Dirjen Cipta Karya Kementerian Pekerjaan Umum, Jakarta.
[4] Setyowati, K, D Gunawan, F Ansoriyah. 2015. Capacity Building: Governance Perspective On Waste Management Unit In Sragen Bunder Market. Universitas Sebelas Maret Surakarta.
[5] Fahmi, W.S dan Keith, S. 2006. Cairo’s Zabaleen Garbage Recyclers: Multi-Nationals’ Takeover And State Relocation Plans. Habitat International. 30 (4): 809-837.
[6] Irwanto. 20116. Focus Group Discussion (FGD). Yayasan Pustaka Obor Indonesia : Jakarta.

[7] Prabowo, A dan Heriyanto. 2013. Analisis Pemanfaatan Buku Elektronik (E-Book) Oleh Pemustaka di Perpustakaan SMA Negeri 1 Semarang. Jurnal Ilmu Perpustakaan. 2(2) : 1-9.

[8] Lesmana, R.Y. 2016. Layanan Persampahan di Kota Surakarta dengan Pemetaan Berbasis Sistem Informasi Geografis. Jurnal Media Ilmiah Teknik Lingkungan Volume 1 Nomor 1 Februari 2016

[9] Saputro, Y.E., Kismartin, Syafrudi. 2015. Pengelolaan Sampah Berbasis Masyarakat melalui Bank Sampah. Indonesian Journal of Conservation vol.04 no.1 tahun 2015 hlm 83-94

[10] Asteria.D, Heruman, H. 2016. Bank Sampah Sebagai Alternatif Strategi Pengelolaan Sampah Berbasis Masyarakat di Tasikmalaya. Jurnal Manusia dan Lingkungan Vol.23 No.1 Maret 2016 hal 136-141