

## ORIGINAL ARTICLE

**Waste handling model based on local wisdom system in Indonesia**

AGNES FITRIA WIDIYANTO, SURATMAN and SIWI PRAMATAMA MARS WIJAYANTI

School of Public Health, Faculty of Health Sciences, Jenderal Soedirman University, Purwokerto, Indonesia

DOI: 10.4081/jphia.2023.2590

**Abstract.** The population of Banyumas Regency, Indonesia is around 1,620,918 people in 2018, waste production in Banyumas Regency is large and increases from year to year. Waste production in this district reaches 1,100 m<sup>3</sup> per day. The purpose of this study is to evaluate the development model of waste management through improving the local wisdom system in Indonesia. The method used in this study is a qualitative research method to understand the phenomena experienced by research subjects holistically. This model consists of data collection, data reduction, data presentation, and withdrawal. Research instruments used are the researchers as the main instrument (human instrument), interview guidelines, check list and record tool. Data validity using the source triangulation technique carried out by crossing the answer check between informants. The result of this study is that community empowerment in waste management is very important. The local wisdom model in the community which is identified in this study is the existence of community empowerment and the contribution of women in household waste management.

**Introduction**

The waste problem is still a concern because it has a negative impact on health (1). Communities must be involved actively in waste management (2,3). The use of media and infrastructure in waste management is important so that it is efficient in its management. There is also rubbish that has a disastrous effect such as medical waste and garbage from sharp objects (4). There are biota that are consumed by humans that accumulates waste, which has an impact on public health (5-7). The problem of waste can cause pollution/pollution of the surrounding environment both water, soil and air contamination. However, there are ways to improve the quality of the environment (8). Social marketing is also important so that

environmental management programs can be known to the wider community (9). In addition, what is not less important in environmental management is participation carried out by the community in society, especially from the community. In addition, women can also be carried out through waste management training activities involving the role of the government and the role of the community. Waste management is important to prevent environmental-based diseases, especially diseases originating from waste. Because garbage causes odor in the environment. Bring vector diseases such as flies, mosquitoes, cockroaches and bring rats. Diseases that can be caused due to garbage include ARI (Acute Respiratory Tract Infection), diarrhea and skin diseases (10-13).

The population of Banyumas Regency is around 1,620,918 people in 2018, waste production in Banyumas Regency is large and increases from year to year. Waste production in the district reaches 1,100 m<sup>3</sup> per day. The first problem in the management of waste in Banyumas from a managerial perspective at the district level is that the potential of the community, especially women, is generally quite large. Second, there is an assumption in the community that solid waste management is the responsibility of the local government. Third, there is still a lack of public awareness in disposing garbage in its place. Fourth, lack of community participation in waste management. Fifth, the location of landfill (Final Processing Site) and land for technical processing is limited, for example for landfill cover. The six lack of fleets or transportation infrastructure resulted in the garbage being transported too late, causing odor and leachate at the polling station and the depot transfer. The seventh processing is not maximal. Eighth there is no local regulation on waste, especially regarding solid waste management at the household level. The ninth refused the residents around the Kaliori landfill to be landfill because the water sources were polluted. Tenth in a certain period of time Banyumas was designated as an emergency city of rubbish. Eleventh there is a pile of garbage everywhere. Twelve residents are looking for new land for waste disposal. Thirteenth, so far, many waste management activities have been carried out by women. The fourteen management models have not yet been found to suit the culture of the local community. The fifteen models of emergency waste management have not adjusted to the local wisdom culture of the local community. The purpose of this study is to determine the development model of waste management through improving the local wisdom system.

---

*Correspondence to:* Agnes Fitria Widiyanto, School of Public Health, Faculty of Health Sciences, Jenderal Soedirman University, Purwokerto, Indonesia  
E-mail: afitriawidiyanto@yahoo.com

*Key words:* waste, management, community, Banyumas

## Materials and methods

The method used in this study is a qualitative research method to understand the phenomena experienced by research subjects holistically. The subject of this study is called the informant. The main informants in this study were women, community leaders and supporting informants, namely the Head of the Environmental Service, company leaders and members of the Banyumas Regency community. Determination of the sample unit (informant) is considered adequate when it has reached redundancy (the data is saturated, plus the research subjects no longer provide new or varied information). Data collection techniques are carried out by in-depth interviews and observations. The researcher will observe the potential of women in waste management activities, weaknesses, strengths, opportunities and challenges of the program of reducing, handling, transporting, processing, recycling, disposal, community awareness, inhibiting factors and drivers to participate in both situational factors, behavior, knowledge, understanding, motivation, values and norms, cultural, economic and social factors in the Banyumas Regency. Open data analysis uses inductive thinking processes using interactive analysis models. This model consists of data collection, data reduction, data presentation, and withdrawal. Research instruments used: Researchers as the main instrument (human instrument), interview guidelines, Check list and record tool. Data validity using the source triangulation technique carried out by crossing the answer check between informants.

## Results and discussion

Based on the research results and data analysis, we identified several themes related to the research topics included in Table I.

The introduction of the environment naturally can be started early. Training and upgrading skills can also be done to improve the knowledge, attitudes and practices of the community. Environmental problems and behavior can affect environmental sanitation in general. Technology applications are considered effective in efforts to improve the environment. In addition, garbage problems occur because of the behavior of people who have the habit of disposing of garbage without doing processing. The existing waste management model in the community is considered effective in reducing waste (14-18).

It is necessary to arrange the space to improve the quality of the region 18. Waste is a common problem (19). In order for waste management activities to be carried out optimally, participation from parties is needed (20). High population rates will have an impact on waste production. Three models of waste management and for the best models are sorting between organic, inorganic, B3 (Hazardous Toxic Materials). Knowledge about the environment does not affect the behavior of domestic waste management (20). For the government itself, the waste bank is a good first step to empower the community in treating waste as something that has useful value and benefits (21,22)

Government policies in waste management have so far paid little attention to environmental aspects and local potential (local wisdom). The policy strategy that needs to be done is involving green community, revitalizing local wisdom, pattern of kerigans,

Table I. The theme of the problem and identification of local wisdom in waste management.

| No. | Code                    | Theme                                                                                                                                                                               | Local Wisdom                                                                                                                              |
|-----|-------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|
| 1   | Financing               | Garbage fees<br>Government Fees                                                                                                                                                     | Self-help<br>Non-self-help                                                                                                                |
| 2   | Operational             | Open dumping<br>Engineering<br>Sanitary landfill<br>Waste Bank<br>Composting<br>Handicraft Making                                                                                   | Natural<br>Learning<br>Training                                                                                                           |
| 3   | Community participation | Household<br>Community<br>Self-Help<br>Groups<br>Corporate Social<br>Responsibility<br>Individual                                                                                   | Proximity<br>Awareness                                                                                                                    |
| 4   | Infrastructure          | Household<br>scale bins<br>Communal scale<br>bins<br>Hangar<br>Komposter<br>Chopper machine<br>Trash cart<br>Biometalgreen<br>Trash cart<br>Tossa Trash<br>Trash transport<br>truck | Needs Giving<br>government<br>Higher<br>Education<br>Cooperation<br>Non-<br>governmental<br>Combination of<br>Government<br>and community |

increasing management, city parks, tree banks, revitalizing management, socializing movements 'garbage collection', revitalizing management, depositing rubbish, garbage insurance by promoting ecoliteration and ecodesain and mental revolution (23). Banyumas Regency Environmental Agency has organized waste management activities with the community through various methods ranging from the provision of facilities and infrastructure, the implementation of the levy system up to socialization of environmental controls and management. To carry out waste management activities, Banyumas district empowers various parties ranging from schools in the Purwokerto region, from the subdistricts and sub-districts supporting the city of Purwokerto, environmental cadres, KSM (Swadaya Masyarakat/(Nongovernmental) and managers of waste banks, private parties and companies. The strategy for handling waste and handling management on a community scale is very important (24). Other results mention communication, attitude, resources, bureaucratic structure and commitment to the commitment will also affect waste management (25).

Information dissemination is carried out by providing information to the community about community-based waste management efforts. But the short duration of implementation

and the lack of involvement of women are obstacles. However, from this activity it is hoped that citizens will grow awareness to manage waste in their environment in a participatory manner, especially for women (26). Increased Knowledge and Attitudes of the Head of the Family on Waste Management shows there are significant differences in knowledge and attitudes between before and after family empowerment interventions (27,28).

Increasing the volume of waste has a direct impact on the capacity of available temporary waste management sites (29). Disposal facilities are being developed, built and operated meeting effective security requirements (30). The role of partnership and spirituality contributes to the protection of toxic waste disposal in an area (31). The application of the model developed to assess leachate production of TPA shows a very good agreement in the implementation of the field (32).

The involvement of individuals in the behavior of waste management is influenced by their perceived threat caused by environmental contamination (33). After the adoption of a new waste management system, where recycling is the most dominant process, garbage disposal still appears to be the most popular method of waste management (34). There is a weak relationship between knowledge and attitudes and practices in open burning. Intervention programs can encourage higher practice than just focusing on raising awareness. Waste management is becoming increasingly important (35). Waste production is very closely related to environmental and financial assessment (36). Solid waste is a social burden that requires the introduction of reliable public policies, including the principles of recycling and technological facilities (37). The application can be used as an example of sustainable solutions to regional environmental problems (38-44). Environmental conditions and clean health behavior can prevent disease (45). Information and Education Communication (IEC) plays an important role in improving health programs (46). Counseling will be able to improve Knowledge and attitude. Extension of incentives can be done to increase community knowledge and information (47,48). The prevalence of multimorbidity in Indonesia's elderly is quite high, especially those with poor health behavior and low socio-economic conditions. Strategies to improve healthy behavior and improve socio-economic conditions can reduce the prevalence of multimorbidity in the elderly (49). increased country commitment to multi-hazard and multisectoral efforts, deliberate investment in subnational risk communication systems, and investment in capacity building for risk communication activities (50).

## Conclusions

The local wisdom model in the community which is identified in this study is the existence of community empowerment and the contribution of women in household waste management.

## Availability of data and material

Data and materials are available by the authors.

## Informed consent

The manuscript does not contain any individual person's data in any form.

## Conflict of interest

The authors declare no potential conflict of interest.

Accepted: 4, July 2023; submitted: 28, February 2023.

## References

1. Winarni E and Muhammad D: Family planning information, education and communication with conceptive use. *Kesmas Nat Public Health J* 11: 94-102, 2016.
2. Mahwati Y: Determinants of Multimorbidity among the elderly population in Indonesia. *Kesmas Jurnal Kesehatan Masyarakat Nasional* 9: 187-193, 2014.
3. Simanjuntak H, Lestari BW and Anwar AD: The Effect of Structured Counseling towards Knowledge, Attitude, and Participation of Modern Contraceptive among Unmet Need Couples. *Kesmas Jurnal Kesehatan Masyarakat Nasional* 10: 184-190, 2016.
4. Sukiswo SS, Rinidar R and Sugito S: Analisis Risiko Karakteristik, Sosial Ekonomi, Perilaku dan Kondisi Lingkungan Rumah terhadap Kejadian Malaria. *Kesmas Jurnal Kesehatan Masyarakat Nasional* 9, 2014.
5. Febiary I, Widiyanto AF and Yuniarno S: Efektivitas Aerasi, Sedimentasi, dan Filtrasi Untuk Menurunkan Kekeruhan dan Kadar Besi (Fe) Dalam Air. *Jurnal Kesmas Indonesia* 8: 32-39, 2016.
6. Widiyanto AF, Gamelia E and Widiyanto AF: Pengaruh Pelatihan Pembuatan Media Cetak Kesehatan Lingkungan Terhadap Pengetahuan dan Keterampilan Mahasiswa UKM Plakat Jurusan Kesehatan Masyarakat Unsoed. *Kesmas Indonesia Vol 7: 2014* Available at: <<http://jos.unsoed.ac.id/index.php/kesmasindo/article/view/117>>.
7. Widiyanto AF: Aplikasi Teknologi Metamodeling Sebagai Sistem Pengelolaan Sampah Rumah Tangga. Laporan Pengabdian Penerapan IPTEK (Tidak Dipublikasikan). LPPM UNSOED. Purwokerto, 2018a.
8. Widiyanto AF: Evaluasi Pengelolaan Limbah Klinis Tajam di RSUD Kabupaten Cilacap. *Jurnal Kesmas Indonesia* 6, 2014.
9. Widiyanto AF: IbM Forum Kesehatan Desa Wilayah Kerja Puskesmas I dan II Baturraden untuk Mengatasi Permasalahan Perilaku Hidup Bersih dan Sehat. Laporan Penelitian IBM Dikti (Tidak Dipublikasikan). LPPM UNSOED. Purwokerto, 2014c.
10. Widiyanto AF: IBM Sanitasi Total Berbasis Masyarakat (STBM) Puskesmas I dan II Baturraden. Laporan Penelitian IBM Dikti (Tidak Dipublikasikan). LPPM UNSOED. Purwokerto, 2015c.
11. Widiyanto AF: Aplikasi Teknologi Pengelolaan Sampah Mandiri Model Komunal Sebagai Alternatif Pengelolaan Sampah Domestik Melalui Kegiatan Pendidikan Dan Pelatihan Pada Masyarakat. Laporan Pengabdian Berbasis Riset (Tidak Dipublikasikan). LPPM UNSOED. Purwokerto, 2015d.
12. Widiyanto AF: Pengaruh Konseling Terhadap Peningkatan Pengetahuan, Sikap dan Perilaku Masyarakat Tentang Kesehatan Lingkungan. *Jurnal Kesmas Indonesia* 7, 2015.
13. Widiyanto AF: Polusi Air Tanah Akibat Limbah Industri dan Limbah Rumah Tangga. *Jurnal Kemas* 10, 2015.
14. Widiyanto AF: IbM Pembelajaran Perilaku Hidup Bersih dan Sehat (PHBS) Terintegrasi Sejak Dini Pada Anak di PAUD Tunas Harapan Desa Karangmangu dan PAUD Kasih Ibu Desa Kemutug Kidul di Wilayah Kerja Puskesmas II Baturaden Kabupaten Banyumas. Laporan Pengabdian Dikti (Tidak Dipublikasikan). LPPM UNSOED. Purwokerto, 2016b.
15. Widiyanto AF: Pemanfaatan Sampah Plastik Bernilai Ekonomi di Kelurahan Grendeng. Laporan Pengabdian Penerapan IPTEK (Tidak Dipublikasikan). LPPM UNSOED. Purwokerto, 2016c.
16. Widiyanto AF: Aplikasi Model Kampung Sampah Untuk Mendukung Kegiatan Pengelolaan Sampah Rumah Tangga. Laporan Pengabdian Berbasis Riset (Tidak Dipublikasikan). LPPM UNSOED. Purwokerto, 2017a.
17. Widiyanto AF: Community participation in bank of garbage: Explorative case study in Banyumas Regency. *MKP UNAIR* 9, 2017.
18. Widiyanto AF: Efektivitas Pelatihan Tentang Pengolahan Sampah Padat Organik Dalam Meningkatkan Pengetahuan, Sikap Dan Keterampilan Ibu Dalam Mengolah Sampah *Jurnal Kesmas Indonesia* 9, 2017.

19. Widiyanto AF: Pendampingan Kelompok PKK Dalam Usaha Optimalisasi Pengelolaan Sampah Organik Dan Anorganik Domestik Menuju Desa Mandiri Sampah. *Jurnal Kesmas Indonesia*: 7, 2017.
20. Widiyanto AF: Peran Perempuan Sebagai Ibu Dalam Perilaku Hidup Bersih Dan Sehat (Phbs) Pada Anak Usia Dini. *Palastren*: 10, 2017.
21. Widiyanto AF: Peran Serta Masyarakat dalam Pengelolaan Sampah Domestik sebagai Upaya Pencegahan Penyakit Berbasis Lingkungan. *Jurnal Kesmas UAD*: 12, 2018.
22. Muchran J, Wahyuni I, Machfudz S and Susilawati S: Model Perencanaan Ruang Terbuka Hijau Taman Lingkungan Di Kota Banjarbaru, Kalimantan Selatan. *Envirosciencetea*: 11, 2016.
23. Sholeh M and Wahyu S: Model Pengelolaan Sampah Kos-Kosan Di Kelurahan Sekaran Gunungpati Semarang. *Forum Ilmu Sosial*: 38, 2011.
24. Arsanti V: Pengelolaan Sampah Oleh Masyarakat Perkotaan Di Kota Yogyakarta. *Jurnal Sains Dan Teknologi Lingkungan*: 4, 2012.
25. Beni MT, Arjana IGB and Ruslan R: Pengaruh Faktor-Faktor Sosial-Ekonomi Terhadap Perilaku Pengelolaan Sampah Domestik Di Nusa Tenggara Timur. *Jurnal Ilmu Lingkungan*: 12, 2014.
26. Kristina HJ: Model Konseptual Untuk Mengukur Adaptabilitas Bank Sampah di Indonesia. *Jurnal Teknik Industri*: 9, 2014.
27. Suyatno E, Endriatmo S, Sumardjo S and Hartrisari HS: Model Kebijakan Pengelolaan Sampah Berbasis Partisipasi Green Community Mendukung Kota Hijau. *Mimbar*: 31, 2015.
28. Mahyudin RP: Peningkatan Peranan Pemulung Untuk Meningkatkan Pengelolaan Tempat Pemrosesan Akhir Sampah. *Envirosciencetea*: 13, 2017.
29. Hardiansyah H and Rahmad E: Model Implementasi Kebijakan Publik dalam Pengelolaan Sampah dan Kebersihan Kota Palembang. *Mimbar*: 30, 2014.
30. Luthfi A and Elly K: Partisipasi Masyarakat Dalam Sistem Pengelolaan Sampah Di Tpa Sukoharjo Kabupaten Pati. *Jurnal Abdimas* 17: 13-20, 2013.
31. Rilla F, Kusumawardani E and Dewi S: Kualitas Udara Rumah dengan Kejadian Pneumonia Anak Bawah Lima Tahun (di Puskesmas Cimahi Selatan dan Leuwi Gajah Kota Cimahi). *Makara J Health Res* 18: 25-33, 2014.
32. Ruhmawati T, Karmini M and Dwi Tjahjani P: Peningkatan Pengetahuan dan Sikap Kepala Keluarga tentang Pengelolaan Sampah Melalui Pemberdayaan Keluarga di Kelurahan Tamansari Kota Bandung. *Jurnal Kesehatan Lingkungan Indonesia* 16: 1-7, 2017.
33. Ariffin M and Nor Amalina Wan Yacoob W: Assesment of Knowledge, Attitude and Practice of Solid Open Burning in Trengganu Malaysia. *Environment Asia*: 10, 2017.
34. Suandana IN, Mardani NK and Wardi N: Persepsi Masyarakat Terhadap Pengelolaan Sampah Di Kota Singaraja, Kabupaten Buleleng, Provinsi Bali. *Ecotrophic J Environmental Sci* 6: 50-55, 2015.
35. Sumarni I and Dewi S: Kondisi Kesehatan Lingkungan Pesantren dan Perilaku Hidup Bersih dan Sehat Siswa dengan Kejadian Hepatitis. *Kesmas*: 9, 2014.
36. Vedernikova MV, Pron IA, Savkin MN and Cebakovskaya NS: Occupational and Public Exposure During Normal Operation of Radioactive Waste Disposal Facilities. *Radiacionnaâ Gigena* 10: 57-65, 2017.
37. Gould R and James R: Once upon a toxic sanctuary: Partnering to restore and reclaim a Dakota sacred site. *Int J Partnership Studies*: 4, 2017.
38. Lombardi F, Giulia C and Piero S: Analysis of the role of the sanitary landfill in waste management strategies based upon a review of lab leaching tests and new tools to evaluate leachate production. *Revista Ambiente Água* 12: 543-555, 2017.
39. Janmaimool P: Application of protection motivation theory to investigate sustainable waste management behaviors. *Sustainability* 9: 1079, 2017.
40. Katarzyna K: Direct landfill disposal versus mechanical biological treatment. *Env Protection and Natural Resources*: 27, 2016.
41. Tsarakakis KP: Minimizing Onsite organic household left over waste: The emission benefits of keeping pet rabbit. *Recycling*: 2, 2017.
42. Vendrametto O, Nivaldo LP, Geraldo C de ON and Osvaldo DP: Cleaner Production: A Growing Movement In Brazilian Companies. *Revista Producao Online*: 9, 2010.
43. Ferronato N, Carolina D, Marco R, Vincenzo T and Giovanni DF: Social Surveys about Solid Waste Management within Higher Education Institutes: A Comparison. *Sustainability*: 9, 2017.
44. Došić A, Dragana TP, Miladin G, Božo D, Đurđa VK, Nataša S and Jelena MB: Green remediation of tailings from the mine using inorganic agents. *Hemijska industrija* 71: 26, 2016.
45. Sumarni I and Dewi S: Kondisi Kesehatan Lingkungan Pesantren dan Perilaku Hidup Bersih dan Sehat Siswa dengan Kejadian Hepatitis. *Kesmas*: 9, 2014.
46. Winarni E and Dawam M: Family Planning Information, Education and Communication with Contraceptive Use. *Kesmas: National Public Health J* 11: 94-102, 2016.
47. Simanjuntak H, Bony Wiem L and Anita Debora A: The Effect of Structured Counseling towards Knowledge, Attitude, and Participation of Modern Contraceptive among Unmet Need Couples. *Kesmas*: 10, 2016.
48. Sukiswo SS, Rinidar R and Sugito S: Analisis Risiko Karakteristik, Sosial Ekonomi, Perilaku dan Kondisi Lingkungan Rumah terhadap Kejadian Malaria. *Kesmas*: 9, 2014.
49. Mahwati Y: Determinants of Multimorbidity among the elderly population in indonesia. *Kesmas*: 9, 2014.
50. Akande OW, Disu Y, Kaduru C, Anueyiagu C, Oguanuo E, Ojumu T, Akomolafe O, Eziechina SO, Ejibe U, Ihekweazu V, *et al*: Risk communication during health emergencies in Nigeria: What are its challenges? *J Public Health Africa*: 14, 2023.