

## JAPAN SOCIETY OF MATERIAL CYCLES AND WASTE MANAGEMENT

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### Introduction of the Activities of the Planning & Coordination Committee

The Planning & Coordination Committee is in charge of the planning and operation management of the Japan Society of Material Cycles and Waste Management (JSMCWM), also called the “Society”, award projects, public relations, and event planning amongst other activities. Through this work, we aim to address the challenges that the Society is facing.



In particular, we have endeavored to revitalize all activities of the Society. We plan symposiums and seminars on timely themes in the fields of waste treatment and resource recycling, and actively provide information. Also, since the contents of the special themes in the *Material Cycles and Waste Management Research* (the journal of JSMCWM) is attracting attention, we plan seminars on these special themes. Moreover, we have been actively co-hosting seminars with other academic societies and associations and deepening our exchanges to increase the number of our participants and to raise awareness of our Society.

Last year, we planned and held a series of seminars on biomass plastic. In addition, in collaboration with the *Material Cycles and Waste Management Research*, we planned and held various seminars, including the

seminar on recycling of photovoltaic power generation systems. By providing a wide variety of themes on recycling, we expect the participation of not only those involved in the waste recycling field, but also people from other industries, such as the raw material and product manufacturing industries.

Furthermore, in addition to the activities of the Planning & Coordination Committee, we are supporting the lectures, seminars, tours of the Affiliates and Research Groups, and the Meetings for Junior Members. Also, we are working to publicize the Society and provide information on material cycles and waste management. Our policy is to promote the participation of the members of young committee members in our activities through the planning of events by giving them opportunities to be lecturers and thus expanding their field of activity.

For award projects, every year there are nominations for the Society’s awards. After the evaluation is done, the awards ceremony and lectures of prize winners is held at the general meeting of the Society in May.

For public relations activities, we are providing a variety of information through our website and delivering by e-mail our Society news. However, we are looking to further expanding our public relations activities.

For contract projects, the survey projects under contract with the Ministry of the Environment (Japan), we are conducting surveys and studies with the cooperation of academic experts who are members of the Society and familiar with the relevant field of each project.

Not long ago in 2019, we celebrated the 30th anniversary of the Society and planned and held a commemorative ceremony with the Annual Conference of JSMCWM at Tohoku University. At the ceremony, we received congratulatory speeches from the Japanese Ministry of the Environment and the Korean Society of Waste Management. As the main event, we presented certificates of appreciation respectively to each of those who have made a great contribution to the activities of the Society. Furthermore, we invited the chairman of

Japan Business Federation's Subcommittee of Waste and Recycling Division to present a lecture as part of a special lecture in the meeting. We had 350 participants including those who received certificates of appreciation, and ceremony was successfully closed.

Unfortunately, the 31st Annual Conference of JSMCWM at Hokkaido University in 2020 resulted in being held online due to COVID-19 restrictions. However, thanks to the efforts of the members of the Academic Research Committee and the Annual Meeting Executive Committee, and the great cooperation of our supporting companies, presenters, and participants, we managed to finish it safely.

Measures for COVID-19 are still in place. Therefore, instead of reducing our activities to what is possible, we have decided to change our events and face-to-face meetings to online. By adopting new methods for implementing our activities, including online meetings — in particular for the events of the Research Groups and our Affiliates, the Annual Conference of JSMCWM and spring research presentation meetings — we will endeavor to further revitalize all activities of the Society with the aim of increasing the number of participants and new members of the Society. However, face-to-face interaction is very important; thus, we hope that the COVID-19 pandemic will end soon and we will be able to resume our events as usual.

The Planning & Coordination Committee will continue working in collaboration with the Society's committees, the Affiliates, and the Research Groups, solving problems and revitalizing the Society's activities.

(Shigenori CHICHIBU, Planning & Coordination Committee Chair, Kobelco Eco-Solutions Co., Ltd.)

## **COVID-19 and Waste Management in Japan**

The first COVID-19 patient was identified in Japan on January 15, 2020. Since then, several COVID-19 pandemic “waves” have attacked the country. As of May 24, 2021, ten prefectures — Hokkaido, Tokyo, Aichi, Kyoto, Osaka, Hyogo, Okayama, Hiroshima, Fukuoka, and Okinawa — are under a state of emergency, and eight prefectures are under a state of quasi-emergency. COVID-19 has been affecting Japan in all aspects, including the health and medical situation, business and industrial activities, education, tourism, art, sports and entertainment, the working environment, and lifestyle.

Waste management and recycling are no exception. Under the emergency situation, waste management must not be suspended. Collection, transportation, and disposal of waste, including medical, health care, and personal sanitation waste, such as masks, must be carried out without failure to protect public health and to conserve the living environment. In January and May, the Ministry of the Environment and expert organizations on waste management quickly developed policy and technical guidelines against COVID-19 for safer waste handling practices and proper waste management industries.

Accordingly, COVID-19 has become an important issue for the JSMCWM. The Society's 31st Annual Conference organized a special international online symposium on “Sound Waste Management in Response to the Pandemic of COVID-19”, including a joint statement for future international cooperation, on September 18. “Material Cycles and Waste Management Research” (No. 6, Vol. 31), a special issue of the JSMCWM's journal in Japanese, took up the topic of the “Impact on Waste Management in Japan by COVID-19: Forced Change, Evidenced Robustness, and Future Perspectives” in November 2020. Issue 97 of the JSMCWM Newsletter, dated February 2021, introduced the aforementioned guidelines. Two online sessions at 3RINCs, on March 11 and March 15-19, featured COVID-19 and waste management.

Most statistics in Japan are fiscal year-based (April-March), rather than for the calendar year. Waste management figures in 2020, the year of COVID-19, are about to be published, but have not quite been yet. Nevertheless, many municipal waste management departments suggested that there has been a significant increase, about 10% in household waste generation and collection, bulky waste in particular, compared with pre-COVID years. It is understood that citizens may want to get rid of unnecessary matter and tidy up their houses while working remote at home. The longer the hours spent at home, the more chances there are of dining at home, and the more garbage, combustible waste, and PET bottles for drinks there are. This level of household waste increase does not affect municipalities' waste collection practices very much, though. Because retailers have been prohibited from providing plastic shopping bags, other than those of certain biodegradable plastics and biomass plastics, for free since July 1, 2020 in Japan, a reduction of the amount of plastics in household waste was expected during the same period.

An increase of household bulky waste generation makes citizens wait for a longer number of days for bulky waste collection by their municipality. Many municipalities discourage citizens from bringing waste to waste management facilities to avoid the “3Cs” (closed spaces, crowded places, and close-contact settings). The household waste amount seems to have fluctuated up and down along with the pandemic/emergency level, but it is more than that of previous years after all.

In contrast with household waste, waste generation at many businesses and industries, including manufacturers, retailers, restaurants, and the tourism industry, has been reduced. They had to significantly limit their work and encouraged staff to work at home.

After major disasters such as the Hanshin-Awaji, East Japan, and Kumamoto earthquakes and repeated floods, the COVID-19 pandemic again proved the importance of constant waste management operations. With that recognition and the aforementioned guidelines in mind, the waste management sector paid much attention to maintaining their work. For example, many parts of collection vehicles were carefully wiped clean with alcohol, together with the personal hygiene practices of the collection staff members. (Photo: Environment Department, Fujisawa City, Kanagawa Prefecture). So far, only two sizable cities, one in eastern Japan and the other in western Japan, reported COVID-19 clusters in the waste management sector. In each case, the groups of collection staff patients were supported by other groups and waste collection operations were maintained without causing any inconveniences among the citizens of the two cities.



Interestingly, COVID-19 revealed a special relation between citizens and waste management businesses in this country. Since the outbreak started until now, waste management departments throughout Japan have

received many “thank you” messages from citizens, including from elementary school and kindergarten pupils, appreciating their hard work with the potential risk of disease. (Photo: Environment Department, Fujisawa City). Responding back, several waste collection businesses donated their municipalities’ thousands of extra surgical masks saved for their collection staff, during the early stage of the pandemic, when masks were sold out throughout Japan.



In order to avoid a 3Cs situation, people-attracting events have been cancelled in 2020-2021. For instance, litter-picking events with volunteer citizens were widely practiced by municipalities before COVID-19. Such events are now suspended. Yet, roads, parks, and shopping areas are mostly kept clean, just as before COVID-19. It is observed by municipalities that citizens and communities are individually picking up litter without such volunteer events.

In short, waste management and recycling seems mostly well-practiced, and the living environment around us has been kept clean just as in the days before COVID-19 in Japan. Yet, to avoid the 3Cs in order to cope with the COVID-19 pandemic, several practices in waste management and recycling have been suspended. One of them is the inspection of waste management facilities, required every three years. Many municipalities have been checking their facilities routinely for themselves, but have suspended detailed on-site inspections by expert examiners in 2020 and 2021.

COVID-19 vaccination has just started in Japan. Fast and wide vaccination is highly expected to end the pandemic. In the meantime, however, every industry needs to work together on waste management and recycling practices with citizens for a healthy and eco-friendly life.

(Prof. Hiroki HASHIZUME, School of Global Studies, Tama University)

## Report on the 7th 3R International Scientific Conference on Material Cycles and Waste Management (3RINCs) 2021 online

*Opening and Plenary Sessions: March 11, 2021*

*| Special and General Sessions: March 15 – 19, 2021 |*

*Disaster Waste Management Lectures:*

*March 11 and 15 – 19, 2021*

### I. Outline

The Japan Society of Material Cycles and Waste Management (JSMCWM), in collaboration with the Korean Society of Waste Management (KSWM), Society for Solid Waste, Chinese Society for Environmental Sciences (SSW-CSES), and the King Mongkut's University of Technology Thonburi, Thailand – Kasetsart University (NIES-KMUTT-KU) collaboration research laboratory, held the 7th 3R International Scientific Conference on Material Cycles and Waste Management (3RINCs 2021) online on March 11 and March 15-19, 2021. Further information is shown at the following links.

- Homepage: <https://www.3rincs.org/>
- Materials and videos: <https://www.3rincs.org/3rincs2021-online/>

3RINCs 2021 consisted of four special sessions and 19 general sessions, with a total number of 113 presentations in all sessions. The keynote lectures from Prof. Shinichi Sakai of Kyoto University and Prof. Heinz-Georg Baum of Fulda University of Applied Sciences, and a special symposium on disaster waste management to commemorate the tenth anniversary of the Great East Japan Earthquake and Tsunami, were held on Day 1 of the conference, March 11, 2021. The 337 participants registered at the conference were comprised of researchers, government representatives, policy makers, private entities, NGOs, and international organizations from 31 countries/regions. The number of participants at all events was estimated at 2,029 in total.

### II. Opening Ceremony

On Day 1 of the conference, March 11, 2021, the opening declaration was given by Dr. Reiko Sodeno of Shibaura Institute of Technology, followed by special opening remarks from the five representatives listed below, showing deep appreciation to the organizers, supporters, and participants, as well as congratulatory messages highlighting the necessity of international cooperation and collaboration among all stakeholders in tackling current global crises such as the COVID-19

pandemic, climate change, and marine pollution. Approximately 170 participants joined the opening ceremony and plenary lectures online.



- Prof. Toshiaki Yoshioka, President, Japan Society of Material Cycles and Waste Management, Japan
- Prof. Jai-Young Lee, President, Korea Society of Waste Management, Korea
- Dr. Orathai Chavalparit, President, Solid Waste Management Association Thailand (SWAT), Thailand
- Mr. Choudhury Rudra Charan Mohanty, Environment Programme Coordinator, United Nations Centre for Regional Development (UNCRD) – DSDG/UN DESA, Japan
- Ms. Ligia Noronha, Director, Economy Division, United Nations Environment Programme (UNEP)

### III. Plenary Session

After the opening ceremony, two plenary lecturers were invited to speak. First, Prof. Shinichi Sakai of Kyoto University presented his plenary lecture entitled “‘3R Plus’ Concept for Sustainable Material Cycles and Waste Management”. Prof. Sakai, with enthusiasm, gave an introduction to a vision for sustainable material circulation and more advanced efforts required for waste management. Prof. Sakai focused on the “3R Plus” concept, mainly explaining strategies for the reduced use and recycling of plastic materials and decarbonization. Prof. Heinz-Georg Baum of Fulda University of Applied Sciences then gave a presentation entitled “It’s the Economy – Stupid! On the Relevance of Economics in Creating a Successful Circular Economy”. Prof. Baum provided his



expertise about the economic issues of promoting the circular economy. These lectures are open to the public on YouTube.

- Prof. Sakai:  
<https://www.youtube.com/watch?v=BhGehD12EjU&t=8s>
- Prof. Baum:  
<https://www.youtube.com/watch?v=Ub5OEwJfgK4&t=10s>

#### **IV. Special Sessions**

Four special sessions, through the collaboration of the JSMCWM, KSWM, SWAT, UNEP, the Economic Research Institute for ASEAN and East Asia (ERIA), and other organizations, were held from March 16 to March 19. In response to current strong concerns in the field of material cycles and waste management, the themes set for the special sessions were plastic waste, organic waste, e-waste, and waste management associated with COVID-19. All of the sessions, including presentations, panel discussions, and Q&A with the audiences were successful, with the latest information shared and insightful discussion from a wide perspective. In order to enhance synergy, in addition to a corresponding programme with general sessions on the same topics, collaborative events, including a webinar on Mechanical Biological Treatment (MBT) by IGES held on February 17, 2021, were linked with the special sessions. In response to several requests to release the recorded videos of the special sessions, it was decided that the recorded special sessions would be released for registered participants of 3RINCs on the webpage by the end of April 2021. The following is an outline of each of the four special sessions.

##### **Session 1: Estimating Plastic Waste and Pollution for Data-driven Policy Making in Emerging Economies**

This session was co-organized by the Institute for Global Environmental Strategies (IGES) along with the IGES Centre Collaborating with UNEP on Environmental Technologies (CCET) and ERIA, and moderated by Dr. Yasuhiko Hotta of IGES. The session had five presentations and discussed opportunities and challenges for data-driven policymaking for proper plastic management and mitigation of marine plastics, especially for emerging and developing economies, through recent attempts to estimate plastic waste and pollution either through more traditional methods of systematic information gathering or more advanced methods utilizing GIS, IT technologies, sensing technologies, or modelling methods. Experiences and

lessons learned, especially from Southeast Asian contexts, were shared on this occasion. With the outputs of this special session, ERIA is going to establish a working group on data-driven policymaking for marine plastic pollution management in collaboration with IGES.

##### **Session 2: Recovery and Preparation of Organic Waste as an Alternative Fuel**

This session was organized by the National Institute for Environmental Studies, Japan and King Mongkut's University of Technology Thonburi, Thailand – Kasetsart University ( NIES-KMUTT-KU ) collaboration research laboratory. It was chaired by Dr. Sirintornthep Towprayoon of the Joint Graduate School of Energy and Environment (JGSEE) at KMUTT. The session included four presentations and a panel discussion on the introduction of technology for improvements and the issues related to the use of municipal solid waste (pretreated) in the Thai energy sector, and gaps therein. The session was beneficial for both researchers and private sector companies to gain opportunities for further technological development.

##### **Session 3: E-waste Management and Strategies towards Circular Economy**

This session was organized by the KSWM and chaired by Prof. Han Seung Kim of Konkuk University. Three speakers gave presentations on e-waste management in South Korea, Japan, and other Asian countries, followed by a Q&A session. The session promoted the exchange of academic knowledge in the field of implementing eco-friendly management of e-waste and hazardous waste.

##### **Session 4: COVID-19 Waste Management**

This session was facilitated by Mr. Shunichi Honda of the International Environmental Technology Centre (IETC), UNEP. Ms. Monika G MacDevette of the Chemicals & Health Branch in the Economy Division of UNEP delivered the keynote speech, and four speakers gave presentations on waste management measures taken against COVID-19. The panel discussion was moderated by Mr. Mushtaq Ahmed Memon, the Regional Coordinator for Resource Efficiency in the Asia & the Pacific Office of UNEP. The session focused on improving waste management based on the lessons learned from the COVID-19 experience in applying the environmentally-sound management of COVID-19 waste with other waste streams, such as plastic waste. Deep understanding and experiences were shared on this complex and important

issue by the different stakeholders.

## V. General Session

A total of 19 general sessions, including 95 academic presentations and presentations and movies from seven sponsoring companies, were successfully given and broadcast from March 15-19, 2021. The conference set out on a new endeavor, holding special sessions related to organic waste, plastic waste, End of Life Vehicles (ELV) and e-waste, disaster waste, and COVID-19, to share and learn the front-line research and activities in those attractive fields. At the same time, presentations, including cutting-edge research and activities from the

broad areas of material cycles and waste management, were given in the general sessions. Oral presentations and company movies from sponsors were incorporated into the relevant themes of the sessions. The recognized chairs, each of whom had knowledge of the themes, successfully managed each session without any significant trouble. The many comments and questions from the audiences must have satisfied the speakers and contributed to deepening the discussion and understanding among presenters and participants. The theme, names of the chairs, and the number of presentations in each session are as follows.

Session	Theme	Chair	Number of Presentations
A	Organic Waste: Thermal Treatment	Tomonori Ishigaki (National Institute for Environmental Studies)	4 presentations, 5 sponsor movies
B	Waste Management: Situations and Analysis	Kosuke Kawai (National Institute for Environmental Studies)	6 presentations
C	Waste Management: Case Studies and Practices	Kohei Watanabe (Teikyo University)	6 presentations
D	Organic Waste: Hydrothermal Treatment	Shogo Kumagai (Tohoku University)	5 presentations, 3 sponsor movies
E	Plastic Waste: Recycling	Michikazu Kojima (Institute of Developing Economies, Japan External Trade Organization)	4 presentations, 1 sponsored presentation, 5 sponsor movies
F	Plastic Waste: Consumer Behavior	Yasuhiko Hotta (Institute for Global Environmental Strategies)	5 presentations, 2 sponsor movies
G	Hazardous Material in Water and Soil	Shunichi Honda (UNEP)	6 presentations
H	Plastic Waste: New Approach	So Sasaki (Chuo University)	5 presentations
I	Hazardous Material in Ash	Reiko Soden (Shibaura Institute of Technology)	6 presentations
J	Organic Waste: Biological Treatment	Satoshi Mizutani (Osaka City University)	4 presentations, 2 sponsored presentations
K	MFA and SFA for Waste Management	Junya Yano (Kyoto University)	5 presentations, 3 sponsor movies
L	Organic Waste: Treatment Technology and Assessment	Katsuya Kawamoto (Okayama University)	5 presentations
M	Gas and Water Treatment, Resource Recovery	Hideki Yoshida (Muroran Institute of Technology)	6 presentations
N	ELV Management	Yuko Saito (Tohoku University)	4 presentations, 1 sponsored presentation, 2 sponsor movies
O	LCA for Waste Management	Yasuhiro Hirai (Kyoto University)	6 presentations
P	Disaster Waste Management	Misuzu Asari (Kyoto University)	4 presentations, 1 sponsored presentation, 3 sponsor movies
Q	E-waste Management / Industrial Waste Management	Aya Yoshida (National Institute for Environmental Studies)	5 presentations
R	Waste Management Challenges	Ryo Tajima (National Institute for Environmental Studies)	5 presentations, 2 sponsor movies
S	Waste Management with COVID-19 / Medical Waste Management	Hajime Yamakawa (Kyoto Prefectural University)	6 presentations

## VI. Special Symposium and Series of Lectures on Disaster Waste Management

A special symposium, titled “Resilience with Disaster Waste Management - Disaster Waste Management (DWM) for Disaster Risk Reduction (DRR) and Climate Change Adaptation (CCA)”, was held after the plenary session on Day 1 of 3RINCs 2021, on the occasion of the tenth anniversary of the Great East Japan Earthquake and Tsunami, March 11, 2021. The opening remarks were given by the Hon. Noboru Kamitani, Parliamentary Vice-Minister of the Environment, Japan, followed by condolences for the victims of the disaster of March 11, 2011, expressions of gratitude to the participants and organizers, and passionate messages given by representatives from Asia and the Pacific. They also communicated the necessity of building resilience to disasters and sharing global knowledge and experience, including of disaster waste management countermeasures. The representatives were as follows.

- Indonesia: Dr. Novrizal Tahar, Director of Solid Waste Management, Ministry of Environment and Forestry Management, MoEF (KLHK),
- Nepal: Mr. Ganesh Shah, Former Minister of Environment, Science and Technology, and Advisor to the Society of Environmental Engineers (SEEN) of Nepal,
- Thailand: Ms. Preeyaporn Suwanaged, Deputy Director General, Pollution Control Department.

The symposium aimed to review Japan’s experience and efforts to recover from tough challenges and difficulties

in disaster waste management to utilize them as lessons learned throughout the world. After the memorial remarks and messages, a panel discussion was facilitated by Prof. Toshiaki Yoshioka, President of JSMCWM. Following short presentations from five panelists (shown below), a Q&A session and panel discussion were held. All of the participants reconfirmed that disaster waste management in line with disaster risk reduction and climate change adaptation will contribute to community resilience. Furthermore, they confirmed the importance of international communication and cooperation for mutual learning from their experiences.

- Dr. Eng. Maryono, ST, MT, Diponegoro University, Indonesia
- Prof. Maria Antonia N. Tanchuling, University of the Philippines Diliman
- Mr. Satoru Mimura, Chief Advisor, J-PRISM II, JICA
- Mr. Muraleedharan Thummarukudy, Joint Environment Unit, UNEP/UNOCHA
- Mr. Kensuke Mizuhara, Ministry of Environment Japan

After the sessions each day, a new attempt was made in which the Disaster Waste Management (DWM) team of the JSMCWM conducted a series of one-hour lectures on DWM every evening on March 11 and from March 15-19 (see the table below). Participants were able to learn more about DWM from these lectures. The lectures were also conducted interactively between the lecturers and master’s students from Kyoto University.

### < DWM Lecture Programme >

Date	Topic	Lecturer
11 March	Introduction to Disaster Waste Management	Mr. Shintaro Higashi, NTT data
15 March	Estimating the Amount of DWM	Dr. Yuzuru Kushiyama, JSMCWM
16 March	Coordinating Relevant Stakeholders	Dr. Shinya Suzuki, Fukuoka University
17 March	Handling/Managing Hazardous Waste	Dr. Tomonori Ishigaki, NIES
18 March	Management and Utilization of Disaster Waste	Dr. Atsushi Takai, Kyoto University
19 March	Preparing Temporary Storage Site (TSS) before a Disaster	Dr. Ryo Tajima, NIES

All materials and movies were uploaded to the following JSMCWM website. [https://jsmcwm.or.jp/international/?page\\_id=2212](https://jsmcwm.or.jp/international/?page_id=2212)

## VII. Closing Session

At the closing ceremony on March 19, 2021, Dr. Tomonori Ishigaki provided a summary of the results of 3RINCs 2021 on March 11 and March 15-19, 2021. In addition, Prof. Masaki Takaoka announced a call for the Special Issue on 3RINCs 2021, Journal of Material Cycles and Waste Management (JMCWM). Then, Dr. Junya Yano introduced the recipients of the Leading Reviewer Award 2019 of JMCWM, which had been

scheduled to be celebrated at 6th 3RINCs 2020, but was canceled due to COVID-19 in March 2020. Among the five winners (Dr. Dongwoo Kang of Chungbuk National University, Dr. Yasumasa Tojo of Hokkaido University, Prof. Masafumi Goto of Malaysia-Japan International Institute of Technology, Prof. Yan Peng Li of Chang’an University, and Prof. Qiyong Xu of Peking University Shenzhen Graduate School), Dr. Kang and Dr. Tojo joined the closing ceremony virtually and provided short remarks. Subsequently, Prof. Shinichi Sakai

announced the five winners of the Outstanding Paper Award, selected from approximately 450 papers published in JMCWM during the years of 2017-2019. For the next 3RINCs 2022, Dr. Misuzu Asari introduced the possibility of conducting either an online conference or an onsite conference to be held in Australia, as well as the possibility of a combined version, both online and onsite. In conclusion, Prof. Toshiaki Yoshioka, President of JSMCWM, provided closing remarks with special thanks to all of the participants of 3RINCs 2021 for their great contributions to achieving a successful conference. Prof. Yoshioka also spoke of the knowledge and achievements of past 3RINCs, in addition to which, based on the contributions of 3RINCs 2020 and the expected role of 3RINCs in the future, he provided words of encouragement on the mission of and challenges to 3RINCs on global issues.

### **VIII. Call for the Special Issue on 3RINCs 2021, JMCWM**

The 3RINCs 2021 Steering Committee and the editorial board of the Journal of Material Cycles and Waste Management (JMCWM) confirmed that they will conduct systematic preparation for the publication of the Special Issue on 3RINCs 2021, JMCWM. Under the coordination of editorial board members, dedicated editors and reviewers of the Special Issue on 3RINCs 2021, JMCWM were assigned, and several encouraging measures for participants to contribute to the special issue were discussed. The 3RINCs 2021 Steering Committee then developed a system that enabled participants to indicate their intentions to submit their papers for the Special Issue on 3RINCs 2021, JMCWM during registration and announced the special issue widely to stakeholders before and after 3RINCs 2021. As a result, 59 presenters (52.2%) out of 113 presenters in total expressed an interest in submitting their research papers to the special issue. Also, pre-review comments to encourage submission were provided for 26 papers (23.0%). The deadline for submissions was set for May 31, 2021. The outcome should be further examined based on the actual submissions in terms of the quantity and quality of the papers submitted to the Special Issue on 3RINCs 2021, JMCWM.

### **IX. Public Relations and Outreach**

All public relations and outreach materials created for 3RINCs 2021, such as a flyer, a brochure, and a video, were uploaded to the 3RINCs webpage (<https://www.3rincs.org/>). As new visual materials, a video introducing the history of 3RINCs and video messages from the leaders of the executive committee

were created and uploaded to the webpage. In addition, a series of e-mails were distributed in a timely manner to all stakeholders around the world, such as members of the JSMCWM, partners, supporters, sponsors, past participants of 3RINCs, and international societies, to share any updates on 3RINCs 2021, including the event schedule, call for abstracts, and registrations. The website is also linked with other social media and channels like Facebook and the International Solid Waste Association (ISWA) calendar and newsletter.

### **X. Collaboration and Networking**

On the occasion of 3RINCs 2021, the 3RINCs 2021 Steering Committee agreed to expand networking with other international, national, and regional organizations and groups for the further enhancement of 3RINCs. The following partners expressed interest in further collaboration to expand 3RINCs activities, especially in the Asia-Pacific region. In addition, it is a great honor that a Memorandum of Cooperation (MOC) was exchanged between the Solid Waste Management Association Thailand (SWAT) and the Japan Society of Material Cycles and Waste Management (JSMCWM), with the purpose of establishing an effective partnership to organize 3RINCs.

- Solid Waste Management Association, Thailand (SWAT)
- Government of Cambodia
- Nepal Solid Waste Management Consortium (NSWMC)
- International Solid Waste Association (ISWA)

### **XI. Acknowledgements**

The 3RINCs 2021 Steering Committee would like to thank all stakeholders, including the four organizers, seven supporters, 20 sponsors, and all participants, who have enthusiastically organized, supported, and contributed to 3RINCS 2021. This continuous support enabled 3RINCs to play the role of knowledge platform for sharing the latest findings and experiences, and to enhance networking among people all over the world to overcome any challenges, difficulties, and constraints of global, regional, and local crises.

(3RINCs 2021 Steering Committee, (JSMCWM))

**Journal of Material Cycles and  
Waste Management, Vol. 23, Issue 1  
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[REVIEW, pp. 1-17](#)

“Food loss and food waste recovery as animal feed: a

systematic review”, Caroline Rajeh, Imad P. Saoud, Samer Kharroubi, Salpy Naalbandian, Mohamad G. Abiad\*

[REVIEW, pp. 18-31](#)

“Municipal solid waste management in Ethiopia; the gaps and ways for improvement”, Fiseha Bekele Teshome\*

[REVIEW, pp. 32-43](#)

“Tertiary recycling of plastics waste: an analysis of feedstock, chemical and biological degradation methods”, Alicia Lee, Mei Shan Liew\*

[REVIEW, pp. 44-54](#)

“Management of waste sheep wool as valuable organic substrate in European Union countries”, Blaž Petek, Romana Marinšek Logar\*

[REVIEW, pp. 55-76](#)

“A review of waste paper recycling networks focusing on quantitative methods and sustainability”, Cristiane Maria Defalque\*, Fernando Augusto Silva Marins, Aneirson Francisco da Silva, Elen Yanina Aguirre Rodríguez

[ORIGINAL ARTICLE, pp. 77-83](#)

“The effects on Thailand of China’s import restrictions on waste: measures and challenges related to the international recycling of waste plastic and e-waste”, So Sasaki\*

[ORIGINAL ARTICLE, pp. 84-95](#)

“Deep learning of grasping detection for a robot used in sorting construction and demolition waste”, Yuedong Ku, Jianhong Yang\*, Huaiying Fang, Wen Xiao, Jiangteng Zhuang

[ORIGINAL ARTICLE, pp. 96-106](#)

“Microwave treatment combined with wetting agent for an efficient flotation separation of acrylonitrile butadiene styrene (ABS) from plastic mixtures”, Yan hui Qu, Yan peng Li\*, Xiao tong Zou, Kai wei Xu, Ya ting Xue

[ORIGINAL ARTICLE, pp. 107-120](#)

“Recycled tire granular for playground in hot regions: technical assessment”, Isam Janajreh\*, Mohammed Hussain, Sherien Elagroudy, Konstantinos Moustakas

[ORIGINAL ARTICLE, pp. 121-129](#)

“Regeneration of used sand with sodium silicate binder by wet method and their core manufacturing”, Kyeong Ho Kim, Min A. Bae, Man Sig Lee, Hung-Suck Park\*, Jae Ho Baek\*

[ORIGINAL ARTICLE, pp. 130-138](#)

“Press-extrusion pretreatment of the organic fraction of municipal solid waste for enhanced methane production”, Alessandra Cesaro\*, Valentina Cieri, Vincenzo Belgiorno

[ORIGINAL ARTICLE, pp. 139-148](#)

“A novel humidity regulating material hydrothermally synthesized from concrete waste”, Jiajun Miao, Zhenzi Jing\*, Hongyuan Fan, Haoran Lan, Deping Wang\*

[ORIGINAL ARTICLE, pp. 149-157](#)

“Characterization of different types of electronic waste: heavy metal, precious metal and rare earth element content by comparing different digestion methods”, Merve Tunali\*, Mehmet Meric Tunali, Orhan Yenigun

[ORIGINAL ARTICLE, pp. 158-164](#)

“Elution control of radioactive cesium in MSWI fly ash using water repellent treatment”, Narihito Ogawa\*, Takahito Amano, Yuya Koike

[ORIGINAL ARTICLE, pp. 165-176](#)

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Regular Members	1,888
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Supporting Individuals	1
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Individual Citizens	18
Korea Society of Waste Management	20
Total	2,438

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