

Deasy Conference

vol.2

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Sewerage and Wastewater Management Department at The Ministry of Land, Infrastructure, Transport and Tourism (MLIT) has a vision of "Deasy" or "Easy handling of Diapers" in order to make it possible for everyone to live comfortably and sustainably. A conference called "Deasy Conference Vol.2" was held on February 4 at 100BANCH in Shibuya-ku, Tokyo, with the aim of shifting from planning into action beyond the boundaries of industry, regarding the future of continence care.

Outline

"Deasy Conference Vol.2", held on February 4, consisted of two parts. During the first part, the Chairperson of Deasy Project Committee, Mariko Sonoda (Professor of Meiji University) opened the conference. Subsequently, Director for International Affairs and Engineering Coordination, Sewerage and Wastewater Management Department, Water and Disaster Management Bureau, Ministry of Land, Infrastructure, Transport and Tourism, Chika Abe spoke about the challenges of the current sewerage system to support flushing of plastic-based diapers, including ongoing initiatives to make this technologically feasible. Creative Director of Loftwork, Shuhei Kato emphasised the importance of Deasy initiative from the designer's perspective under the theme of "Initiating open

innovation with the power of design". There were 56 participants at the conference who were then divided into eight groups, and group discussions (Part 1) were held. The second part of the conference consisted of three guest speakers' keynotes, Science Communicator of the National Museum of Emerging Science and Innovation, Yusuke Date; Chiaki Sakakibara of Unko Bunka Center; and Takashi Taguchi, CEO of Unlog Co., Ltd. The speakers all spoke under the theme of "Innovation in Continence Care". After that, a question-and-answer session was held with the participants. In the group discussion (Part 2), the discussion was further deepened, and ultimately the results of the discussion were shared by all participants through presentations by each group.

Input

Speaker session

"Sewerage as a Service"

Prof. Mariko Sonoda

01

At the beginning of the conference, Prof. Sonoda of Meiji University, in her opening remarks, pointed out changes in the current social context, such as the decline in birthrate and the increase in environmental awareness. "In order to connect everything from life to the sewer in a circular system, we need breakthrough in: (1) innovation in continence care, (2) development of biodegradable diapers and pads, (3) development of diaper disposers, (4) pumping and suction systems for home piping, (5) new design of toilet spaces, (6) direct input of diaper and other organic waste to the sewer, (7) decrease of negative environmental impact, (8) development of technology for local production and local consumption of

energy and resources, and (9) development of economically-sustainable regional management. She also proposed a new concept of "Sewerage as a Service", which views the value of current infrastructure of sewerage in being able to provide a service, and emphasized the need to form a D-easy network for that purpose.



Processing equipment for disposable diapers will be tested next year in social experiments

Ms. Chika Abe

Sewerage International and Technical Coordinator of MLIT, Ms. Chika Abe explained the context of the increase in the use of disposable diapers as being due to a progressively ageing society. "On the one hand, in the world of sewerage, there are various issues such as difficulty in sufficient maintenance due to a decrease in revenue against the backdrop of population decline. We would like to make the most of the existing sewerage facilities for people and society." As part of this effort, the MLIT is studying standards for developing and spreading a "paper-based diaper processing device" that separates excrements from used diapers and sends it to the sewer. "Now, of course, it's no good to use the sewer for disposing commercially available diapers at this time as they are, but the sewer stock could be a help for solving the issue if the device could process used diapers in a way where they become harmless for the sewer system and the environment, which is supposed to be a new role of the sewage system in the progressively ageing society."

There are three types of disposable diaper processing equipment: 1) A-type (solid separation type), 2) B-type (crushing / recovery type), and 3) C-type (crushing / receiving type), depending on whether or not the diaper is crushed and how it's processed into the sewer. For A- and B-type equipment, development is underway in the prototype project of the Housing Bureau of MLIT (in contract with Panasonic for the A type and LIXIL for the B type). For A-type equipment, "We plan to conduct a social experiment in the actual field next year to confirm the impact of the equipment on the sewerage system." Based on this knowledge, we would like to organize institutional and technical standards; compiling them as guidelines by FY2022.



"Game changer" from the viewpoint of circular economy

Mr. Yusuke Date

Mr. Yusuke Date from the National Museum of Emerging Science and Innovation is one of the core members of Deasy Project; and he connects researchers and stakeholders. Through his experience in developing diapers for adults in sanitary manufacturing, Mr Date explained from an expert's standpoint, the fundamentals of paper-based diapers, such as types, materials, configurations, absorption principles, and development trends. The main constraints of disposable diapers are that it is difficult to change the material and design of diapers because it is necessary to consider the entire production process. It is also difficult to recycle because multiple types of plastic are used. Paper-based diapers were developed in the 1960s. In 1983, the introduction of superabsorbent polymers satisfied the fundamental needs of users, and industries are now in the process of developing thinner, softer and more versatile products to meet diversifying needs. Regarding the future direction of disposable diaper development, Mr. Date said, "It is also necessary to change the current thinking of the industry to the paradigm of "circular economy." He hopes that this will be a game changer in the diaper industry.



The need for continence care specialists

Dr. Chiaki Sakakibara

As an expert in continence care, Dr. Chiaki Sakakibara of Unko Bunka Center introduced her work on training human resources specializing in continence care. Dr. Sakakibara is engaged in multiple community care businesses in Komatsu City, Ishikawa Prefecture, such as consulting on excrement management and training professionals (or POO Masters) for continence care. "In many nursing homes, laxatives are often used because it is more efficient for continence care staff to schedule excrements. However this is not always healthy or comfortable for the users," she pointed out. "Continence care is a matter of human dignity. We need to work on "recovery" to regain life of people who are in need of continence care as a matter of regaining dignity. To do so, we need more specialists in continence care." "In the last two

years, we have produced about 400 POO Masters (continence care professionals)," she said. "The number of professionals needed is 4 million nationwide." This is a matter of urgency. She also mentioned the current situation where many Japanese, including children, are suffering from constipation, and said, "I would like to advocate for the word "fecal education" as an important aspect of health promotion."



"Visualization" of intestinal health by "watching"

Mr. Takashi Taguchi

05

Mr. Takashi Taguchi of Unlog Co., Ltd. explained the history of Unlog; an excrements log application developed by the company, the effects of its use, and future business development. Unlog is an application where users record the state of the shape and

color of excrements by looking at their defecation and this is to enable a basic medical examination including bowel activity. The application has about 600,000 users in Japan. According to Mr. Taguchi, there are about 20 million people in Japan who do not have smooth bowel movements, such as those who suffer from constipation. "By checking the stool, we can visualize intestinal health and help prevent sickness. 91.3% of users have confirmed improvements." In the future, he says, "I would like to strengthen services in the medical and nursing fields." It seems that the company is preparing for new products and services including a mechanism for alerting illness-risk from the defecation, dietary advice based on stool tests, automatic image analysis of defecation using sensors, and other business opportunities in the medical and nursing fields.



Q&A

Q. How is the "time" considered in evaluation of defecation?

A. [Dr. Sakakibara] Early in the morning, food enters the hungry stomach, causing "reflection", so it is a good time to defecate. [Mr. Taguchi] We recommend that you eat non-digestible ingredients, such as corn and hijiki, and check how many hours later it appears in your excrements. Knowing your average time makes it easier to find abnormalities.

Q. There is widespread misconception that using laxative in nursing homes is the only effective method to make the service of continence care easier for nursing staff to provide. How can we change this misconception?

A. [Mr. Taguchi] I think the only way to change the perception of the field is to continue to show that the optimal dosage of laxative was actually better. Also, if you follow data for diarrhea and stool leaks properly, you can understand the effects of laxative administration, so it may trigger the reduction of the amount of laxative used.

Q. The perspective of "circular economy" is important, but where should the change take place in regards to disposable

diaper manufacturing to achieve circular economy?

A. [Mr. Date] Rather than pinpoint somewhere, it is necessary to consider which functional requirements are necessary to achieve the fundamental needs and change the overall design of the production system as a whole. However, since the amount of polymer used is large, I think it is important to change it.

Q. Are there any ways that diaper polymers can be recovered at a level that does not damage ecosystems?

A. [Mr. Date] I think it would need an application of a net-like component to physically recover it. However, since the size of the particles differs depending on the polymer, small ones may pass through the mesh. Therefore, it is difficult to recover the entire polymer. It might be possible to recover the polymers by processing it with chemical materials.

Q. Is it possible to develop biodegradable diapers?

A. [Mr. Date] I know of only one case. Through joint research with a university, an overseas artist seems to be engaged in an art project in which they bury used diapers in soil.

Output

Various ideas in group discussion

In the group discussion, we first shared what some challenges could be which we might face as individuals in about 30 years time, including difficulties ranging from eating to defecating. We then discussed what we could do together. We empathised with the issues faced of two personas (a woman who gave up her husband's home care and an elderly man who had trouble going out) and thought about new service ideas to solve the issues and realize them. The results of the discussion were presented by each group and shared by participants. Here are the main ideas:



New technology development and services

Idea1 - Even if excrement and paper-based diapers are separated, today's diapers are difficult to recycle and burn. We would like to propose a biodegradable diaper.

Idea2 - As a method of knowing the timing of diaper replacement other than smell, we want a technology to gauge the state of excrements with a sensor installed in the diaper.

Idea3 - Development of diapers that do not need to be changed every day and diapers that can be easily replaced.

Idea4 - A service that exchanges diapers and even recovers them.

Idea5 - Simple diaper processing products that can be used on the go. Put used disposable diapers in a bag containing a dehydrating agent in advance, flush the dehydrated human waste into the toilet, and dispose of the disposable diapers in a bag that does not leak odors.

Idea6 - An application that shows the location of a multipurpose toilet on a map.

Idea7 - Educational activities that illustrate that urinary incontinence is not embarrassing so that people can make use of their diapers.

About maintenance of facility

Idea1 - How about using a drainage facility that is no longer in use and replacing it with a facility that trains people to control their bladder?

Idea2 - In addition to toilets, kitchens and baths have a large load on the sewer, so a facility called "Night Only Village" that consolidates their functions and opens them only at night.

Idea3 - Provide a footboard on the toilet where you can change your diaper.



Expect wisdom and practical skills



Prof. Sonoda, who delivered the closing remarks, said, "I want to create a circular system by connecting everything from the sewer system to our life. If we share our wisdom, we can achieve a breakthrough. We look forward to your wisdom and practical skills in the future," she said. "I think that this past year (FY2019) has been an incubation and infancy for the Deasy Project. In fiscal year 2020, we want to open it up and conduct social experiments broadly, and in fiscal 2021, we will bring up projects that can be implemented."