

International Symposium for Global Sanitation

The Sanitation Triangle:

Socio-Culture,

Health,

Materials

October 14,
2021

13:00–17:00
(JST)

Online



Organized by

"The Sanitation Value Chain: Designing Sanitation Systems as Eco-Community-Value System"
Project, Research Institute for Humanity and Nature (RIHN)

Supported by

The Center for African Area Studies, Kyoto University

"Innovative Africa: Educational Networking Programs for Human Resource Development in Africa's SDGs"

Preface

Sanitation refers to a system that hygienically separates humans from harmful excreta and promotes its safe treatment and disposal. The significance of addressing sanitation is encapsulated in the United Nations' Sustainable Development Goal 6: "Ensure availability and sustainable management of water and sanitation for all." We have less than 10 years to meet this daunting goal.

To date, sanitation issues have been focused on infrastructure and facility installation, environmental conservation for alleviation of water and soil contamination, and adverse health outcomes linked to unimproved sanitation. However, sanitation goes beyond technology, encompassing values spawned amidst humans and local communities, which can fall into the nexus of three components: Health, Materials, and Socio-Culture. Our observations of this nexus led to the creation of the *Sanitation Triangle* concept.

This symposium brings this novel concept to the world. It is the culmination of our international research addressing global sanitation. We deliver each component of the *Sanitation Triangle* above, which comprises concepts and a case study. Notably, it showcases interdisciplinary and transdisciplinary research works involving a variety of local actors ranging from children and youth to local governments.

Through this academic contribution, we hope you will be able to visualize how the sanitation themes addressed within are processed through the concept of the *Sanitation Triangle*. More so, that you will be encouraged to explore and witness a range of sanitation issues emerging in different parts of the world through the triangle lens.

Now, it is time to grab the *Sanitation Triangle* and embark on an enlightened quest through global sanitation.

Taro YAMAUCHI
Sanitation Project Leader
RIHN/Hokkaido University

Program

Welcome Address

13:00–13:05 Juichi YAMAGIWA (RIHN, Director-General)

Opening Remarks

13:05–13:10 Taro YAMAUCHI (RIHN/Hokkaido University)

Keynote Address

13:10–13:40 The Sanitation as a Value Creating System
Naoyuki FUNAMIZU (Muroran Institute of Technology)

13:40–13:50 Q & A

(13:50–13:55 Break)

The Sanitation Triangle

Introduction

13:55–14:05 The Sanitation Triangle for SDGs and beyond
Taro YAMAUCHI (RIHN/Hokkaido University)

Socio-Culture

14:05–14:20 Socio-Cultural Aspects of Sanitation
Seiji NAKAO (Kyoto University)

14:20–14:35 Dissociation between National Policy and Local Communities in
regard to Water Supply Management
Mayu IKEMI (Sapporo International University)

14:35–14:40 Q & A

Health

14:40–14:55 Sociocultural Determinants of Health in Water, Sanitation and
Hygiene
Taro YAMAUCHI

14:55–15:10 Participatory Action Research for WASH with Children and Youth
in Peri-Urban Communities
Sikopo NYAMBE (Hokkaido University)

13:55–14:05

Q & A

Materials

14:05–14:20

Interactions between Materials and Socio-Culture in Sanitation
Hidenori HARADA (Kyoto University)

15:30–15:45

Social Relationships and Material Flow in the Co-Creation of
Sanitation Systems
Ken USHIJIMA (Hokkaido Research Organization)

15:45–15:50

Q & A

(15:50–15:55 Break)

Comments

15:55–16:05

Paul SHRIVASTAVA (The Pennsylvania State University)

16:05–16:15

Tetsu SATO (Ehime University)

15:45–15:50

Discussion

Closing Remarks

16:55–17:00

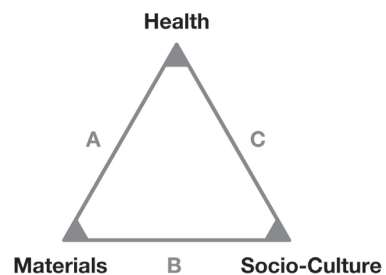
Taro YAMAUCHI

Our project (Sanitation Project, RIHN [FY2017–2021]) has prepared a book as a synthesis of interdisciplinary collaboration;

Yamauchi T, Nakao S, Harada H (2022) The Sanitation Triangle: Socio-Culture, Health and Materials. Springer [in press]

This symposium is to present the core of the book.

Fig. The Sanitation Triangle model.
This is a novel theoretical and practical model for global sanitation as proposed in our book.



Sanitation as a Value Creating System

Naoyuki FUNAMIZU
Muroran Institute of Technology, Japan

Keywords: *sanitation, value, chain*

Abstract

We have been conducting research on new sanitization systems since the 1990s. At the beginning, the research was conducted mainly by engineering researchers, and as the experience in the field was accumulated, the research expanded to be interdisciplinary and then trans-disciplinary. In the lecture, the following two points will be discussed while tracing the progress of our sanitation studies:

- Limitations of the current sanitation system in Japan and in developing countries and the need for value-creating sanitation;
- The basic concepts for new sanitization system that creates value:
 - ▶ “Don’t Mix” and “Don’t Collect” waste water in the new sanitation system;
 - ▶ Technology should be changed from “technology for processing human waste” to “technology for increasing the value of human waste”;
 - ▶ Human waste is an important personal property for creating value;
 - ▶ Sanitation facilities are an important asset of users and their community;
 - ▶ Sanitation system should be incorporated into the value system of human community and individuals;
 - Know the value system of each related stake holders that consist of the whole sanitization system and their affinity with each other;
 - Prepare a value chain that creates a flow of money and a business model for that purpose;
 - Prepare technologies that utilizes in the value chain;
 - Co-create the value chain.
 - ▶ Sanitation system should be embedded¹⁾ into the society as a health-techno-socio-cultural system.

¹⁾ Nakao S, Harada H, Yamauchi T (2022) Introduction. In: Yamauchi et al (eds) The Sanitation Triangle: Socio-Culture, Health and Materials. Springer [in press]

Socio-Cultural Aspects of Sanitation

Seiji NAKAO

Graduate School of Asian and African Area Studies, Kyoto University, Japan

***Keywords:** sanitation, sanitation worker, “hard work”, social configuration of technology, Menstrual Hygiene Management*

Abstract

Although sanitation is embedded in the socio-culture, the socio-cultural aspects of sanitation are not fully discussed. In this context, we focus on the socio-cultural aspects of sanitation, especially the socio-cultural linkages with health (C) and material (B), as in the Sanitation Triangle model, from the perspective of humanities and social sciences in this part. To introduce this part, we first briefly review previous studies on sanitation by humanities and social sciences and show the sociocultural aspects of sanitation. Then, after providing an overview of this part, we discuss the theoretical points of each chapter such as “hard work” or “dirty work”, a social configuration of technology, and Menstrual Hygiene Management (MHM) in the local context, and indicate the relevant chapters in this book.

Dissociation between National Policy and Local Communities in regard to Water Supply Management

Mayu IKEMI

Sapporo International University, Japan

***Keywords:** local community, rural Africa, Senegal, water management*

Abstract

Various governments and international organizations have made efforts to expand water supply and sanitation services in rural Africa. This study aimed to evaluate and elucidate the outcomes of national policies on improving water supply management in rural Africa through a case study of Senegal. This case study examined the actual conditions of water supply facilities and residents' water use in villages. I also attempted to identify the remaining challenges for sustainable water management by local communities. In summary, despite improvement in access to safe drinking water resources for rural populations in Senegal, the national policies were not completely successful. My findings highlight that improving water quality is as crucial as expanding water supply facilities in rural Africa. Meanwhile, for the sustainable self-management of water resources in rural Africa, the case study suggested the importance of local people's transparent management, information sharing, and mutual aid. Rural residents in Africa have great potential to improve their current water environment through their own initiatives. This potential should be considered as a key to achieving the goal of sustainable water supply management in local communities.

Sociocultural Determinants of Health in Water, Sanitation, and Hygiene

Taro YAMAUCHI

Faculty of Health Sciences, Hokkaido University, Japan

Research Institute for Humanity and Nature, Japan

***Keywords:** water, sanitation and hygiene, socio-culture, health and well-being, social determinants of health*

Abstract

This part discusses sanitation from the perspectives of health and well-being. In particular, we focus on the sociocultural aspects of water, sanitation and hygiene (WASH) in relation to health. First, we discuss the social determinants of health (SDH) with an in-depth focus on the gender, cultural and economic disparities that impact access to quality sanitation. We also spotlight sanitation workers, who play a significant part in existing sanitation systems yet unquantified and ostracized. Furthermore, as theoretical underpinnings, we review methodologies to behavioral changes including information dissemination, education approach and community-based approach. Subsequently, we introduce the three chapters that constitute this part. Chapter 6 examines relationships between child health (e.g., undernutrition and diarrhea) and its associated factors (e.g., water, sanitation, hand hygiene) in Indonesia. In Chapter 7, we argue the transfer of health risks in sanitation and its social allocation (i.e., genders) in Vietnam. Finally in Chapter 8, we introduce our participatory action research involving local children and youth in tackling WASH issues in sub-Saharan Africa (Zambia). In the end, we reemphasize SDH by mentioning sociocultural aspects of health and attitudinal and behavioral changes on WASH in society through community-based approach.

Participatory Action Research for WASH with Children and Youth in Peri-Urban Communities

Sikopo NYAMBE¹, Yoshimi KATAOKA², Hidenori HARADA³, Taro YAMAUCHI^{1,4}

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² Faculty of Engineering, Hokkaido University, Japan

³ Graduate School of Asian and African Area Studies, Kyoto University, Japan

⁴ Research Institute for Humanity and Nature, Japan

Keywords: *participatory action research, peri-urban, water, sanitation and hygiene, visualization, fecal contamination, diarrhea risk*

Abstract

In the study of water, sanitation and hygiene (WASH) and its related health impact, it is imperative to understand the people and their respective environments to ensure lasting improvements in their quality of life. To explore this theme, this chapter provides details of a Participatory Action Research (PAR) conducted with members of Dziko Langa, a children and youth club, based in two peri-urban settlements in Lusaka, Zambia. The study was aimed at collaborative examination and intervention alongside club members, focusing on health and sociocultural aspects relating to WASH within their communities. The chapter is divided into three parts: (i) peri-urban WASH assessment and intervention through participatory approaches; (ii) development of a quantitative self-assessment methodology for fecal contamination in their living environment, and (iii) visualization approaches for community and stakeholder engagement. Through collaborative studies such as these, we can further explore the abilities of local communities to independently measure the health levels of their environment, identify WASH priorities, engage with stakeholders and policy makers, and share their findings for the betterment of the broader community.

Interactions between Materials and Socio-Culture in Sanitation

Hidenori HARADA

Graduate School of Asian and African Area Studies, Kyoto University, Japan

Keywords: sanitation, material, socio-culture, the environment, resource, stakeholder

Abstract

The function of sanitation is to control the fate of human waste. A toilet is only the entrance to sanitation, and human waste as materials need to be appropriately handled throughout a sanitation service chain to control the impact of human waste on the environment. While the toilet has a private aspect, post-toilet sanitation has a public aspect. It is unclear how individuals and society should share the impact of post-toilet sanitation. Sanitation enabling the use of human waste may have greater material, socio-cultural, and health impacts in society than sanitation that does not enable the use of human waste. If the impacts caused by sanitation is unreasonable, sanitation will not be sustainable. Designing a sanitation service chain is traditionally an engineering-based business that optimizes these impacts, especially from the material and health aspects. However, in the real world, the system with the maximum benefit and minimum burden as a total for society is not necessarily preferred by all individual stakeholders. Rather than simply adjusting stakeholders' interests, sanitation may actively establish appropriate relationships with each stakeholder, even on an individual level, to be more sustainable. Such a design approach would go beyond the traditional design approaches of sanitation optimization that use conventional engineering approaches.

Social Relationships and Material Flow in the Co-Creation of Sanitation Systems

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¹ Hokkaido Research Organization, Japan

² Indonesian Institute of Science, Indonesia

³ Sapporo International University, Japan

Keywords: *co-creation, material flow, value flow, Indonesia, urban slum*

Abstract

This chapter describes the challenges of co-creating sanitation system design based on material flow and social network with value flow in urban slums in Indonesia. The challenges are described in three phases: first, to understand and describe the current material flow of sanitation and environment; second, to extend our understanding of the wider meaning of material flow and value flow network; and, third, to evolve the solution through a co-creation process with local players. Through the first phase, we could understand the overall problem of sanitation in the research field by applying material flow analysis, the strength was ability to catch all the related processes based on a logical mass balance point of view. However, its weakness was too strict rule and it is difficult to describe each player's motivation, in other word "driving force" of the system. Therefore, in the second phase, we applied social relationship analysis and could draw reasonable picture of sanitation value flow network. Based on that picture, we had started co-creation approach in order to create new sanitation system with local players, and it is still on going. We found that the combination of material flow and social relationship provide reasonable and effective picture of wholistic sanitation system, also that it is important to validate and to update the picture through co-creation process among a team consists of not only various researchers but also local players.

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