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Benefits of local food system survey experience for participants and stakeholders: A case study of Akita, Japan

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Local food systems are complex, and there is no single direct way to address their sustainability transition successfully. Therefore, a system transformation approach called 'co-evolution' is needed. Co-evolution requires continuous cooperation and participation of people from different community sectors and spaces for recursive mutual learning. This paper focuses on the secondary effects of citizen surveys on food systems on the actors involved and how citizen surveys experience can cultivate the conditions for co-evolution. The authors supported a 6-month "transition seminar", a series of learning programs for visioning, fieldwork, analysis of findings, and recommendations for sustainability transitions in local food systems, organized by high school students. This seminar was conducted in 2017 at a high school in Noshiro, Akita Prefecture, Japan, at the request of one of the students. The seminar was held for 8 sessions in total for about 30 high school students who requested it, with the theme of transforming the local food system in the Noshiro area. Participants developed a vision of a desirable local food system under the theme of "the community's ideal food system 30 years from now," conducted fieldwork surveys, planned to realize the vision, and made policy proposals to the mayor of Noshiro. After the seminar, the result of the group interview shows that the fieldwork survey experience, in particular, had a long-term impact on participants' understanding of and ability to reflect on the food system and policies in the Noshiro area. In addition, interviews conducted in 2019 confirmed various secondary effects, including increased interest and networking among participating high school students, teachers, and stakeholders. This result suggests that citizen surveys for sustainable food systems have spillover various positive effects on stakeholders, including providers (researchers). Moreover, citizen surveys experience support collaboration and participation between different community sectors and space for recursive mutual learning and cultivate conditions for co-evolution.

KEYWORDS

local food system, survey experience, co-evolution, sustainability transition, high school students, stakeholders, transformative learning

Introduction

Governments and civil society organizations have promoted local food systems over the past several decades to transform food systems to be more inclusive, resilient, and sustainable (Enthoven and Van den Broeck, 2021). As a result, there is much promise for the re-localization of food systems, a focus on small-scale local food systems consisting of short supply networks, and inter-city and inter-regional exchanges for the sharing and discussion of diverse practices (Chiffolleau et al., 2016; Hebinck et al., 2021; Giordano, 2022). However, local food systems' social, economic, and environmental factors are highly dependent on the type of supply chain being evaluated, and there are significant differences among commodity types and countries, which does not necessarily mean that local food is inherently superior (Edwards-Jones, 2010; Kiss et al., 2019; Stein and Santini, 2021). Moreover, incentives and disincentives to participate in local food systems vary depending on the quantity and nature of production and consumption, the geography of production and consumption areas, the mix of products and distribution channels, and policy and practice constraints (Lamie and Deller, 2020; El Bilali et al., 2021). Therefore, building new supply networks to support local food systems requires, among other things, an understanding of the geographical factors in each region, the influencing relationships among the actors involved, and the characteristics of the roles of businesses and governments (El Bilali et al., 2019; Moberg et al., 2021). For example, depending on the relative development of public infrastructures, such as roads and buildings that provide the physical infrastructure for distribution, how consumer demographics and food choice trends are changing, and whether ordinances that support or hinder the local food system have been enacted in the past, what size of government (national, prefectural, municipal) and what forms of support (public policy, public works, public funding) are needed.

In other words, local food system is complex, and there is no single, direct way to address its sustainability transitions successfully (El Bilali and Probst, 2017). Therefore, a system change approach called "co-evolution" is needed (Delind, 2006; Kilelu et al., 2013; Meynard et al., 2017; Fritsch et al., 2019). This requires ongoing collaboration and participation of people from different community sectors and space for recursive mutual learning (Fritsch et al., 2019).

Cultivating the conditions for co-evolution leading to positive social change is theoretically linked to a bottom-up approach to sustainable social innovation. Positive societal change happens when community members, supporters, and entrepreneurially minded agents combine to aggregate resources and build new capacities (Montgomery et al., 2012; Lumpkin and Bacq, 2019). According to the civic wealth creation perspective, communities (people who share location, identity, and interests) are actors in societal change and not merely

passive beneficiaries (Glynn, 2019). They are collaborating and intimately involved in creating and implementing the solutions. Therefore, communities directly contribute to creating real societal impacts (Branzei et al., 2018). There are several possible ways to foster the conditions for co-evolution and boost sustainable social innovation from the bottom up. One approach that sees this need is citizen-driven research. The power to investigate matters for which data are not yet available is directly linked to the ability of residents and decision-makers to reduce barriers to transition toward the desired social transformation of the local food system and to find clues to change undesirable conditions (Martí, 2016). However, there are not enough case studies on how citizen-driven research can create space for ongoing collaboration, participation of people from different community sectors, and recursive mutual learning.

In this paper examine how a 6-month "Transition Seminar" (see below) combining visioning and field research as active learning (project-based learning) in Akita, Japan, had a derivative effect on the surrounding stakeholders, resulting in the co-evolution of innovations. This case is helpful for school educators, professionals in the community, policymakers, researchers, and practitioners planning workshops for transdisciplinary mutual learning to study how an ongoing local effort can have a derivative effect.

Context

This case study concerns a seminar on sustainability transitions in local food systems conducted at a high school in Noshiro, Akita, Japan. The authors were members of the FEAST project and oversaw the seminar. The FEAST project is short for the research project "Lifeworlds of Sustainable Food Consumption and Production: Agrifood Systems in Transition". It is one of several research projects of the Research Institute for Humanity and Nature, a national research institute, and was run from 2016 to 2020. Using participatory action research methods, the FEAST project aimed to explore the feasibility and potential of sustainable food and agricultural systems in transition bottom-up, focusing on Asia. It implemented various transdisciplinary approaches that contribute to the co-design of food policy (McGreevy, 2017; Oda et al., 2018; Rupprecht et al., 2020; Kantamaturapoj et al., 2022). It should be noted that FEAST is now operating as an NGO.

The seminar was one of several initiatives undertaken by the FEAST project nationally and internationally. However, the seminar was not initiated by a researcher, nor was it an externally mandated or centrally driven initiative; it began at the request of a local high school student. The impetus came from a workshop held by FEAST in Noshiro in December 2016 on sustainability transitions with various stakeholders in the local food system, including farmers, NPOs, supermarkets, banks, and

the government. The workshop was part of FEAST's research study. Its purpose was to obtain a food policy blueprint to help Noyo businesses and public institutions improve the local food system from the bottom up and get local stakeholders to take ownership. The workshop consisted of visioning and backcasting, where each participant envisioned an "Ideal dining table in a 30-year future community" and discussed and proposed initiatives to make it happen. Then, participants were asked to discuss and propose initiatives to achieve this vision.

Two local high school students who attended the workshop emailed one of the authors asking for more information about Sustainability Transitions. The high school student's initial interest was identifying how to contribute to a sustainable society and what the problem is or how to solve it. In response to this question and interest, the authors presented literature available in Japanese. They indicated that the issue of improving the sustainability of society is a complex topic involving many interrelated problems that cannot be solved independently.

These questions and answers evolved into the "Sustainability Transition of Local Food Systems in Noshiro" Transition Seminar (hereafter referred to as the seminar), held in 2017 at Noshiro Shoyo High School in Akita, Japan. The Transition Seminar was not initially planned as a FEAST research project, but FEAST participated in it to support citizen activities related to sustainability transitions. In particular, FEAST contributed to identifying a theoretical framework for incorporating patterns of recursion and mutual learning into the seminar program (Table 1). The authors were involved in various ways in promoting the Transition Seminar. They worked closely with Noshiro Shoyo High School, the Citizen Action Support Center, and staff from local NPOs, farmers, supermarkets, and produce stands to plan and implement multiple initiatives for the Seminar.

As detailed in Table 1, the seminar program consisted of eight sessions led by the lecturers and one independent survey by the participants. The 34 students registered (14 high school freshmen, 13 high school sophomores, and 10 high school juniors). The number of registered participants was 37 (14 first-year high school students, 13 high school sophomores, and 10 high school juniors; 12 boys and 25 girls). The number of participants in each seminar varied from 25 to 30 due to school events and mock examinations. Especially in the latter half of the year, there was a noticeable drop in the participation rate of high school seniors due to entrance examinations. Nevertheless, about 20 people from different grades and classes conducted surveys and discussions each time while successfully sharing information and experiences with those who were absent. In addition, while the participation rate of males decreased, that of females remained relatively unchanged.

The participating students were divided into six groups and given a lecture on the overview and trends of the food system in the Noshiro neighborhood (Session 1). Participants

then drew "the ideal dining table 30 years from now and the dining table one day 30 years from now", noting the gap between the current dining table and the dining table of the future, considering various issues that need to be addressed now to realize the dining table of the future, and reflecting on their preconceived ideas about food (Session 2). They then conducted a food consumption survey (during the summer vacation) to record and reflect on their eating habits, interviews at Shirakami Negi, local supermarkets, and direct sales of agricultural products (Session 4 and 5). Based on the results of the respective surveys, each group exchanged opinions and analyzed the results, focusing on "the state of agriculture," "the state of food supply," and "the state of direct sales places," respectively, with the common theme of "proposing desirable routes to obtain food", (Session 6). Next, the participants created a vision and proposal for a sustainable food system in the Noshiro area. They then prepared a vision and proposal for a sustainable food system near Noshiro (Session 7). Then, they presented in front of all the participants and consolidated their opinions (Session 8).

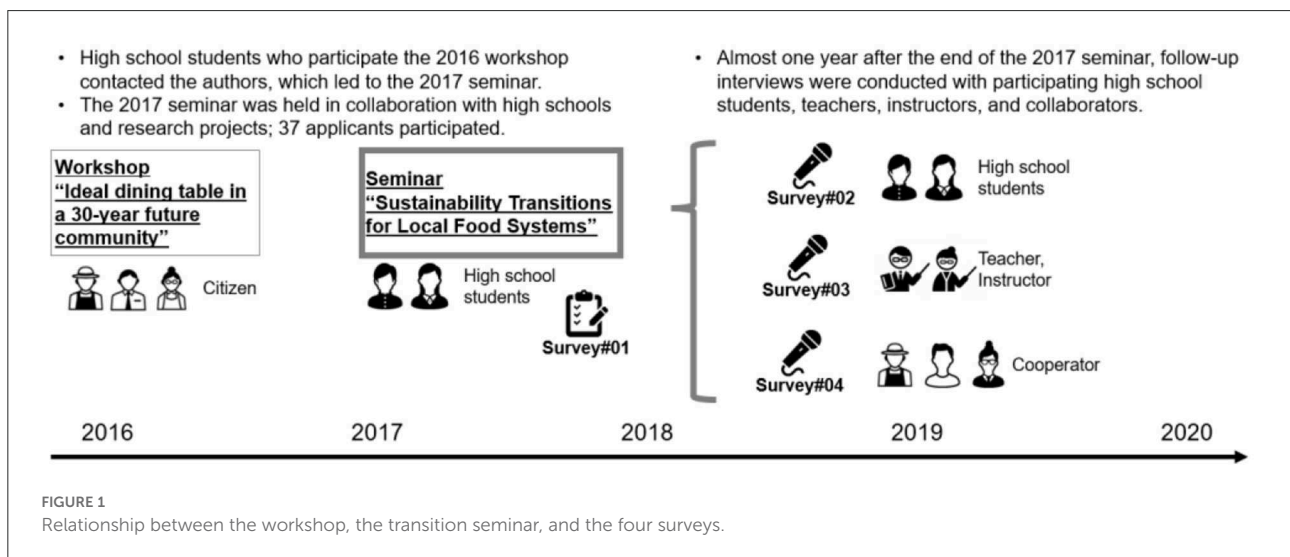
After Session 8 of the seminar, the authors surveyed the participating students based on transformative learning theory (Survey #01). Transformative learning is one theory of learning that focuses on adult education and young adult learning (Mezirow, 1997; Taylor and Cranton, 2012; Hoggan, 2016). Mezirow defines transformative learning as an orientation which holds that the way learners interpret and reinterpret their sense experience is central to making meaning and hence learning (Mezirow, 1991). In other words, transformative learning refers to learning that involves recursive reflection and transformation of previously self-evident views, ideas, and values by learners who acquire knowledge. This kind of learning experience involves a fundamental shift in our perceptions. Learners begin to question everything they previously knew or thought they knew and examine things from new perspectives to make room for new insights and information (Taylor and Cranton, 2012).

Then, in January 2019, almost a year after the seminar, the authors conducted a 2-h focus group interview with 12 high school students who attended the seminar (nine high school sophomores and three juniors) to examine the ongoing effects and changes found by those involved after the seminar (Survey#02). In addition, interviews were conducted with the high school teachers and instructors who led the seminar (Survey#03) and with the leaders of local non-profit organizations who helped with the seminar (Survey#04). The connection between the series of surveys is shown in Figure 1.

The questions in Surveys #02, #03, and #04 were not strictly identical. Although, we all asked about how active learning (project-based learning) had a derived effect on those around them, including themselves. The interview results were divided into multiple codes and processed inductively. Perceptions narrated by each actor

TABLE 1 Transition Seminar program.

Session	Theme	Detail
1	Introduction	Lecture on overview and trends of the food system in the Noshiro area.
2	Motivational question	Visioning of an “ideal dining table in a 30-year future community” and issues raised by the teacher encourage attention to the gap between the same vision and the current food system.
Summer vacation	Fieldwork (1)	Food consumption survey: recording the contents of their meals and the ingredients used for three days (breakfast, lunch, dinner, and snacks).
3	Analysis	Analysis and group discussion about the food consumption survey results.
4	Fieldwork (2)	Interviews at a large-scale production site (one location) and two supermarkets (two stores) in the Noshiro area by all participants.
5	Fieldwork (3)	Interviews at agricultural products direct sales shops (six shops) in the Noshiro area by each group.
6	Analysis	Analysis and group discussion about the fieldwork survey results.
7	Examine solutions	Create a vision and proposal for a sustainable local food system in the Noshiro area.
8	Summaries of solutions	Presentation of vision and proposal for a sustainable local food system in the Noshiro area.



are a holistic aspect of our investigation (Gioia et al., 2012).

Result

This section summarizes the results of the interviews to examine how the seminar, which included 6 months of fieldwork at the high school, had a derivative effect on the surrounding stakeholders, resulting in the co-evolution of the innovation. Before that, it presents a brief overview of food consumption and eating habits in the Noshiro area, as revealed through a survey conducted by participating high school students in a seminar.

First, the participants identified the availability of the foods they usually eat from a food consumption survey conducted during their summer vacation. “Supermarkets” was the most

common source of food (64.7%), followed by “sharing” (6.1%), “eating out” (5.5%), and “home garden” (4.7%). The rest were “direct sales/produce-direct/coop, etc.” (2.1%), “stores in local shopping street, etc.” (0.6%), and “source/purchase unknown” (8.9%). Participants were surprised at the high percentage of supermarkets. Noshiro is a breadbasket region that produces high rice and vegetables. However, the ingredients and spices used in the bread and meat dishes they usually eat are almost not produced. Next, in sessions 4 and 5, participants interviewed buyers at supermarkets and produce stands. The participants learned that supermarkets value both domestically produced and locally grown foods and ingredients because of their high quality, safety credentials, and the fact that selling fresh ingredients improves the store’s reputation and leads to sales.

Based on these findings, the participants concluded that the challenge is to integrate the major food system, represented by supermarkets, and the local food system, represented by produce stands, in a sustainable and regenerative way. On the other hand, one group of participants summarized the revitalization of local shopping streets and possible measures (e.g., rental of vacant stores by the city and creation of community spaces) as the current food access routes are too dependent on supermarkets. Another group proposed a plan to combine a direct sales shop and lodging facilities with a field that grows small amounts of various types of fruits and vegetables and employs a full-time caretaker to provide long-term accommodation services with agricultural tourism and cooking lessons. The plan proposed to enable long-term accommodation services with agricultural tourism and cooking. Moreover, another group pointed out the need to introduce agricultural internships for high school students. After completing all the seminar programs, participants presented these proposals to the Mayor of Noshiro.

Survey #01 questionnaire to participants immediately after the seminar

The results of the unsigned questionnaire ($n = 22$), which based on transformative learning theory, conducted after the presentation of the results (at the end of the 8th session) shown the motivation of the participants, “I read books or articles on the internet to find new values”, and “I now want to act in a different way than I have in the past”, and the evaluation of others, “I noticed that my friends who participated in the seminar think differently than I have in the past”, indicated that the learning program had a transformation of behavior and thinking through reflection. On the other hand, the number of participants who answered related to the disorienting dilemma (e.g., “I do not know what I should do now”), an indicator of transformative learning, and a sign of questioning one’s value standards, was small.

In response to the question about the trigger that contributed significantly to the change in behavior and thinking, many participants answered fieldwork surveys at supermarkets and agricultural products direct sales shops. In addition, it became clear that many participants referred to the lecturers by the authors of this paper (Taniguchi and Ota) on the outline and trends of the food system in the Noshiro area and how to create a sustainable region.

This indicates that it is important to create opportunities for dialogue between food system players (in this case, retailers) and participants. At the same time, it is essential to provide prior learning to prepare for the dialogue, for participants to participate in the design of the dialogue, and for instructors (in this case, researchers) to support these activities.

Survey #02 group interview with participants 1 year after the end of the seminar

In January 2019, a 2-h focus group interview was conducted in the library of Noshiro Shoyo High School, with 12 high school students participated in the seminar. The purpose of the interviews was to measure the persistence of the seminar’s effects on the learners, the presence of independent learning about the local food system (learning about various practices and initiatives), and the persistence of recursive competence in the relationship between food and society.

First, the authors asked participants about their most memorable learning experiences from the seminar. As a result, many participants mentioned the supermarket interview ($n = 12/15$), similar to Survey #01. The reason for this is that participants were more likely to visit supermarkets because of the content of the survey (e.g., attention to food freshness, setting up a section for local products, suggesting recipes to encourage the total purchase of food products and other aspects of the retail aspect of the food system) was mentioned as a reminder of the food system centered on the retailer. About half of the participants also mentioned the visioning conducted in Session#02 (“The Ideal 30 Years from Now and Food One Day”) ($n = 8/15$). One participant said This visioning experience allowed to overlap their career paths with their interests in community and social sustainability.

Next, the authors asked the participants to draw a simple picture of their “ideal vision and dining table 30 years from now”, 1 year after the seminar, and asked what changes they found compared to their vision 1 year ago ($n = 2/15$), about half of the participants drew a picture of their “table” that included a more detailed social and environmental context ($n = 8/15$). Participants whose visions changed significantly mentioned the influence of studying for college entrance exams after the seminar as the cause of the change. Participants actively found connections between their high school study curriculum and their seminar experience. The participants’ renewed interest in and knowledge of food and society suggested that their interest persisted after the seminar.

Survey #03 interviews with teachers and instructors 1 year after the end of the seminar

After completing the focal group interviews in Survey#02, interviews were conducted with the teacher and instructor who supervised the transition seminars. The teacher directing the seminar scheduling and securing the classroom stated that he was not initially that interested in the idea of a sustainability transition for local food systems. The main

reason for undertaking the program was to meet the needs of students interested in the topic and to provide them with a social engagement experience that would appeal to apply to college in an interview. However, as the seminar went on, she became very interested the theme: “I was probably one of the most transformative learning participants in the Transition Seminar”. Incidentally, at the request of this faculty member, the authors gave lectures to high school students on Sustainability Transitions and the SDGs in 2017 and 2020. The teacher also noted that the most challenging part of the program was scheduling. The schedule was designed to allow as many applicants as possible to participate so that the seminars did not overlap with mock exams for university entrance exams, make-up classes, or other school events. It was emphasized that a plan for collaboration between the institute and high schools should be developed for at least a year to avoid creating unnecessary barriers to innovation.

The instructor, an expert in local food systems and community building, stated that after watching the presentation a year ago, what he found most interesting was not the idea but the interest in the classroom at that moment. Students showed a sense of accomplishment in presenting their results and supported each other within their teams and as a whole. While noting that their interest would change over time, it was suggested that a section be created in the library for access to existing initiatives by non-profit organizations and government agencies that are trying to do something to improve the local food system in Noshiro so that they can be introduced at any time.

Survey #04 interviews with local NPO staffs 1 year after the end of the seminar

After the conclusion of the interview for Survey#03, we interviewed two NPO members who run the Marche, where high school students who participated in the Transition Seminar volunteered. This NPO has collaborated with the FEAST Project since 2016 when it began its activities in Noshiro. The members described the most impressive and positive experience as a derivative effect of the seminar, when the participating high school students volunteered to help at the marché. The reason for this was not merely that the young people were interested in the local food system and the activities to maintain it, but also that they were able to confirm the existence of a community network in the Noshiro area that is flexible and receptive to the interests and demands of the younger generation: “My own peers are trying to hear the voices of the younger generation in Noshiro area. It was good to know that others were prepared to heard younger generation voices too”.

On the other hand, however, she said she was somewhat dissatisfied with the effectiveness of the research project itself:

“I expected more widespread and significant innovation when I heard about the FEAST project and the Transition Seminar, but that did not happen. However, it must have been very inspiring for the students to see researchers from Kyoto come and work with the people of Noshiro, coordinating ways to work together and enthusiastically engaging in workshops and research. At least, it was a good stimulus for those of us who were around to watch.”

Discussion

Local food systems are complex, and there is no single direct way to address their sustainability transition successfully. Therefore, a system transformation approach called “co-evolution” is needed. Co-evolution requires continuous cooperation and participation of people from different community sectors and spaces for recursive mutual learning. This research examined the effectiveness of citizen surveys on food systems to cultivate conditions for co-evolution. The authors supported a 6-month “transition seminar”, a series of learning programs for visioning, fieldwork, analysis of findings, and recommendations for sustainability transitions in local food systems, organized by high school students. And they interviewed high school students, researchers, teachers, and NPO staff participating in this research program. The high school students conducted multiple surveys of the local food system during this research program (Survey #01). In addition, group interviews were conducted with the participating high school students (Survey #02), and informal interviews were conducted with several stakeholders who supported this research (Surveys #03, #04) about their experiences with this series of surveys.

The case studies of the Transition Seminar illustrate the co-evolving nature of innovation for participants and stakeholders. This paper describes the changes and learning that occurred among seminar participants (high school students), seminar providers (research projects and high schools), and seminar supporters (e.g., local non-profit organizations, agricultural produce stands), and how innovation spills over. Findings indicate that individual and organizational learning and learning spillovers to the periphery occurred primarily during the program conception phase of the seminar and during fieldwork by seminar participants at local supermarkets and produce stands. The major successes of the seminars can be attributed to the transformation of some of the seminar participants from passive learners to contributors to the local food system, the experience gained by the seminar providers in localizing the themes, and the networking opportunities for the seminar supporters.

This paper describes the case studies of the Transition Seminar conducted in the Noshiro area, Akita, Japan. It illustrates the changes and learning that occurred among

seminar participants (high school students), seminar providers (research projects and high schools), and seminar supporters (e.g., local non-profit organizations and agricultural produce stand) and how innovation spills over. Findings indicate that individual and organizational learning and learning spillovers to the periphery occurred primarily during the program conception phase of the seminar and during fieldwork by seminar participants at local supermarkets and produce stands. The major successes of the Transition Seminar can be attributed to the transformation of some of the seminar participants from passive learners to contributors to the local food system (some of the high school students who took part in the seminar helped with the marches organized by the NPO), the experience gained by the seminar providers in localizing the themes (teachers' interest in sustainability transitions had increased from before the seminar was implemented), and the networking opportunities for the seminar supporters (meet potential collaborators in the seminar).

The success of the Transition Seminar is connected with the fact that citizen surveys for environmental research have been conducted in various parts of Japan since the 1970s and have gained a certain level of recognition in Japan. It is important to note that adaptive management to feedback survey results (Maruyama, 2007) and the fact that it was implicitly shared by the stakeholders this time that citizen surveys are not merely a scaled-down version of surveys conducted by experts (Miyachi, 2003). Comparing community case studies with different geographical and social conditions for the impact of these assumptions would be a future research step.

Despite the above limiting factors, this case is helpful for school educators, professionals in the community, policymakers, researchers, and practitioners planning workshops for transdisciplinary mutual learning to study how an ongoing local effort can have a derivative effect. The results of the Transition Seminar practice and stakeholder interviews indicate that education, practice, and research for sustainable food systems have spillover effects on stakeholders, including providers (researchers). This suggests that while education and practice usually design and measure their impact in terms of change within a specific target period, the social impact of education, practice, and research for sustainable food systems needs to be designed as a co-evolutionary process beyond the framework of a single solution to a narrowly defined problem.

Data availability statement

The original contributions presented in the study are included in the article/supplementary material, further inquiries can be directed to the corresponding author.

Ethics statement

Ethical review and approval was not required for the study on human participants in accordance with the local legislation and institutional requirements. Written informed consent from the participants' legal guardian/next of kin was not required to participate in this study in accordance with the national legislation and the institutional requirements.

Author contributions

KO conceptualized the paper and wrote the first draft of the manuscript. All authors contributed to workshops, data collection, data analysis, manuscript revision, and read.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

The handling editor FM is currently organizing a Research Topic with the author SM.

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