

Co-Production of Knowledge as a Basis of Behavioural Change in Indonesian Sanitation Services: The Case of Sumberdawesari Village, Pasuruan Regency, East Java

Ko-Produksi Pengetahuan sebagai Basis Kesadaran Perilaku dalam Pelayanan Sanitasi di Indonesia: Kasus Desa Sumberdawesari, Kabupaten Pasuruan, Jawa Timur

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ABSTRACT

This study is focused on the change in new behaviour and routines on the issues of safe water and sanitation in Indonesia. The aim of this study is to explain the deconstruction of people's consciousness and societal knowledge on wastewater treatment plant (IPAL) facilities and the resulting behavioural change. By positioning programmes of safe water, sanitation, and the local value of healthy living as the "life projects", this article attempts to re-examine the position of local communities in this project. Life projects are programmes that adhere to the local histories of communities in perceiving 'development'. Life projects are premised on densely and uniquely woven 'threads' of landscapes, memory, expectations, and desire. In this regard, this article tries to disclose the participation of local communities in planning, managing and integrating local values and global visions of proper sanitation development programs in their villages. This study was a micro one conducted at Sumberdawesari village, in Pasuruan, East Java. Sumberdawesari is one of the IWINS-USAID's pilot projects of the communal IPAL programme. This research utilizes the life history approach with the data collection techniques of observation, biography, focus group discussions, and in-depth interviews. The nature of this study focuses on the desire to share information about low-level experiences of local communities regarding the availability and the sustainable management of water and sanitation toward a healthy and self-reliance settlement. This research finds the increased awareness of the population in implementing sanitation development programs at the level of habitus, individual, household, community, and social structure through the dimensions of contextual, managerial and technical knowledge.

Keywords: behaviour change, co-production; knowledge; life project, water and sanitation services



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INTRODUCTION

Access to drinking water and sanitation are pivotal matters that are faced by the global community (Mara, 2003; McFarlane et al., 2014; Mills & Cumming, 2016; Owusu, 2010). Access to water and sanitation sources becomes the basis of the appearance of various problems of community welfare. The resulting effects of difficult access, as reported by various parties, appear to be inverse to the 'false consciousness' possessed by the community itself. Most people in the world, particularly those in cities, have the conviction that there is sufficient availability of water. People who live in developed countries assume that water is available in copious quantities. This is certainly not entirely incorrect since they have never had difficulties all along in obtaining water. Access to safe water is made easier, and therefore it becomes impossible to worry. For people in developed countries, it is easy to obtain safe water, and thus it would never occur to them that there would ever be a problem with this matter. The conditions would be different when considering the viewpoint of developing countries (Bajracharya, 2003; Harris & Helgertz, 2019; McCarthy, 2003).

Poor sanitation and unsafe water quality was found predominantly in Asian, Pacific, and African region countries (WHO, 2004a, 2004b; WHO/UNICEF, 2017, 2019a, 2019b, 2019c, Engel & Susilo, 2014; Farah et al., 2015; Mara, 2003; Wasonga et al., 2014). This means that people in developing countries possess high risk and threats to quality of life in comparison with people living in developed countries. Further, the WHO has claimed that 600 million people in countries in the regions of South Asia, East Asia, and Africa utilize limited sanitation services, in that they share toilets with other people. What is more surprising is that 673 million of the people defecate in open areas (WHO/UNICEF, 2019a).

In considering the data, the majority of affected groups live in settlement areas for the middle to lower class (informal), urban peripheries, and parts of poor villages, where practices of open defecation, poor sanitation services, and usage of water not proper for consumption are considerably quite high (Bourchier, 2010; Farah et al., 2015; Harris & Helgertz, 2019; Kulkarni et al., 2017; McFarlane et al., 2014; Owusu, 2010). The United Nations (UN), through the WHO/UNICEF Joint Monitoring Programme (JMP) for water supply, sanitation, and hygiene, feel that it is necessary to encourage a global cooperative effort to suppress the various problems of development, particularly access to clean water and proper sanitation. The UN had established global development agendas called the Sustainable Development Goals (SDGs) in a declaration during the UN Sustainable Summit on 25 September 2015 (United Nations [UN], 2015). The SDGs also constitute a new form of development agreements that are expected to be able to encourage sustainable positive changes based on human rights and equality (Vandemoortele, 2018). SDGs were enacted with universal, integrative, and inclusive principles to ensure that there would be no person that would be missed, or "No-one Left Behind".

There are various targets that are mapped into the SDGs, one of which is to ensure the availability of clean water and safe sanitation for all people. The word 'safe' here means the availability of basic improved water sources that are free of faecal contamination and in sufficient supply when necessary (United Nations [UN] 2015; see also WHO/UNICEF 2019b). Another target in the field of sanitation service is the availability of facilities that are proper and hygienic. These proper and hygienic facilities will be followed by behavioural changes in society, such as the habit of washing hands before eating. In Indonesia, documents on SDGs, specifically those related to safe water and proper sanitation, were translated as the achievement of access to sanitation and cleanliness that is sufficient and evenly distributed for all people of Indonesia in 2030. Yet another target to be achieved is the elimination of practices of open defecation by paying full attention to the activation of the roles of women and vulnerable groups (Kementerian-PPN/Bappenas, 2017).

The Government of Indonesia has allocated funds that total 2.16 trillion rupiah, in the effort to realise targets of SDGs (KPUPR, 2018). Moreover, since the indicator of SDGs is decided as one of the benchmarks of success in the development of a nation, the construction of water and sanitation facilities has been greatly intensified. Up to October 2018, the percentage of households in Indonesia that possess basic and sufficient sanitation is 69.27%, of which 73.36% are in urban areas and 47.84% are in rural areas (BPS, 2019; Cameron et al., 2019). Basic sanitation is described as having access to facilities for the safe disposal of human waste, as well as disposal that is separated from human contact and for which the waste does not return to the environment. Sanitation facilities are considered sufficient if they are used by no more than five families or 30 people (Sutopo et.al., 2014).

Various ways have been implemented by governments around the world to improve figures of access to safe water and basic sanitation service. Developed countries, through their aid agencies for developing

countries, engage in the participation of safe water and sanitation programmes (Cameron et al., 2013; Moretto et al., 2018). One of the programmes, which becomes the focus of this paper, is a communal wastewater treatment plant (*IPAL Komunal*) facility in Sumberdawesari, Pasuruan Regency, East Java – Indonesia. The programme is conducted through the “Initiative for Water and Sanitation Improvement through Networking Support (IWINS)” (Field Indonesia Foundation, 2016). The IWINS programme is interesting because the primary target is not simply to proper water and sanitation facilities for impoverished households, but also to prioritize the formation of networks of knowledge and support among communities in realising *Sanitasi Total Berbasis Masyarakat* (Community-Based Total Sanitation/STBM). The success of the *IPAL Komunal* will be very much affected by how co-production of knowledge occurs among agents, and then becomes the basis for behavioural change in the management of safe water and sanitation. The processes of co-production and behavioural change WASH becomes a parameter in realising STBM.

A number of research studies have analyzed the co-production of knowledge and its implications for changing people's behavior in the context of sanitation and safe water. According to Peter Beresford (2019), co-production involves a joint effort between two parties, namely consumers and producers who jointly determine the outcome of their collaboration. Well-designed co-production processes can strengthen community capacities and enable community members to build collective processes together with an understanding of effective design (Adams & Boateng, 2018; Turnhout et al., 2020). This concept is aided by solidarity, the associated capacity to organize, as well as developing precedents that show government agencies what is needed and how much it will cost to be able to fight for power, negotiate and collaborate on their needs (Castán Broto & Neves Alves, 2018; Mitlin, 2018). Their discussions focused on the co-production of water services through partnerships between public utilities and water user associations, with support from various civil society organizations. Co-production is defined as a strategy for accessing public services initiated by community-based organizations or grassroots groups, often presented as a practical strategy for delivering services what they need. However, the research above does not show how the level of awareness works as the basis for behavior change. This article argues that the three of knowledge dimensions will promote awareness at various levels such as habitus, individuals, households, community and social structure.

Our understanding of co-production of knowledge in this paper refers to the definition that is proposed by Anuradha Joshi and Mick Moore (2004) as a collection of strategies that are initiated by community-based organisations or grassroots groups that struggle to gain access to public service. Co-production is often represented by a practical approach in providing services in challenging contexts (Castán Broto & Neves Alves, 2018; Joshi & Moore, 2004). In this term, the effort to provide services in the form of a collaboration of popular knowledge becomes the basis for sustainable living. For that, we consider that the co-production of knowledge becomes a strategy as well as a tool to develop the capacity of society, in this case for sanitation services, and broadly for the achievement of SDGs. Thus, co-production is a reaction in explaining knowledge and the learning process, which cannot be separated from the values and implications of the collective production of knowledge as a socio-political process (Adams & Boateng, 2018; Filipe et al., 2017).

Luisa Moretto et al. (2018) explains that co-production is an effort to expand the realism and spectrum of knowledge, in relation to development and institution issues. Co-production of knowledge in the field of sanitation (and drinking water) is highlighted to be relevant to social and environmental perspectives. Therefore, co-production concerns accessibility services, environmental sustainability, and spatial considerations in a collective manner (Moretto and Ranzato 2017). In rural communities, sanitation is considered as a basic need because its existence is related to environmental quality (water and soil). Sanitation management at the same time also contains knowledge production and management administration. Understanding the mechanism of sanitation management becomes a key step in supporting community sustainability

This paper is to explain about the deconstruction of consciousness and societal knowledge of wastewater treatment plant (IPAL) facilities and the behavioural change that accompanies them. We do not only emphasize on the dynamics of the interaction process between individuals and service, but also focus on the different rationalisations between participation and policy agenda, production of knowledge, and differing values. When expanded, the focus concerns rationalisation and the scope of participation of people in relation to experiences of sharing values, knowledge, authority, and resources in the provision of sanitation services, which involves various kinds of organisations.

METHODS

In investigating the research questions, we employed a life history approach (Hagemaster, 1992; Lewis-Beck et al., 2004; Ojermark, 2007) by interviewing 25 informants using in-depth interview and other data collection methods such as observation, focus group discussion and biography interview. Life history combines the framework of biographical study, the biographic narrative interpretative method (BNIM), interpretative biography, history of living, narrative analysis, and psychoanalysis (Goodley *et al.* 2004; Connolly and Clandinin 1990; Megías, García, and Arcos 2017). In this case, the information from the life story method tells the long story of the life of an informant in complete detail (Hatch and Wisniewski 1995; Denzin 1989; Roberts 2002). Therefore, life history can express the subject's knowledge about an event, experience and feeling conveyed through oral expression. Informants were the members of *Organisasi Masyarakat Air Bersih dan Sanitasi* (OMARIS). In addition, we also conducted interviews with the people of desa Sumberdawesari such as village chiefs, *karang taruna* (youths' organization), *ibu-ibu PKK* (women association), members of *Jejaring Masyarakat Air Bersih dan Sanitasi* (JEMARIS), and IWINS-USAID representatives. The research was conducted at the village of Sumberdawesari in Grati Sub-District, Pasuruan Regency, East Java (see Figure 1). The research was conducted in the period from November 2017 to the end of July 2018. Afterwards, we then performed several short return visits during 2019/2020 with a research grant from the Faculty of Social Science and Political Science of Universitas Brawijaya.

To understand the sociological aspect of the social movement of sanitation services on the village, village members and related key informants (*Village apparatus, Jemaris and Omaris*) were interviewed to assess their experiences of engaging village authorities to secure the running of the program. Multiple focus group discussion was undertaken with individuals and community leaders to test out assumption and explore the findings. Interviews were recorded, transcribed verbatim and used initially to inform guidance on co-production produced by researchers. Our secondary analysis of the data focused on the identification of salient themes related to the relations of villagers and the village authorities (*pemerintah desa*). These findings and data documentation analysis include internal data reports and IWINS evaluation reports. We were reflexive throughout this process in terms of critically examining potential subjectivities in the data.



Figure 1. The location of the water and sanitation programme in Pasuruan and the research location (Source: Kabupaten Pasuruan, 2019)

FINDINGS AND DISCUSSION

The IWINS Programme

The Initiative for Water and Sanitation Improvement through Networking Support – United States Agency for International Aid (IWINS-USAID) has progressed since 2014. In the first two years (2014-2016), the IWINS project ran on funds from USAID through the FIELD Foundation of Indonesia to conduct education and physical development in the region of the City and Regency of Pasuruan. Before becoming involved in aids of physical development of water and sanitation facilities, IWINS developed the approach of field school (*sekolah lapangan*) to invite publics to learn about the programmes (Field-IWINS, 2016; Field Indonesia Foundation, 2016).

Through *Sekolah Lapangan Air Bersih dan Sanitasi* (the Field School for Water and Sanitation or ARSANI), IWINS initially developed the programme for 10 village and communities in the city of Pasuruan. The programme also targeted 2 *Pondok Pesantren* or *Ponpes* (traditional Islamic schools) in Pasuruan. A year later, the programme added two other villages and another traditional Islamic school. IWINS collaborates with the Islamic organisation of Nahdlatul Ulama (NU) Pasuruan to organise sermons on water and sanitation. This strategy is interesting because the characteristic of the people of Pasuruan, being that they have strong relations with religious figures (*kyai*), can aid the dissemination process. Each field school consists of 25 residents from each village. They were chosen to learn about the problems of the surrounding environment where they live. The field school occurred over the course of 10 meetings. It consists of various backgrounds, including household wives, water officials at the village level, neighbourhood officials (*Rukun Tetangga/Rukun Warga* or RT/RW), environmental cadres, and public figures. The activity was led by two people, one male and one female, who came from each village. Prior to the activity, the guides had participated in activities organised by IWINS over the course of the full two months.

The Field School is divided into three stages. The first stage is introducing the basic knowledge of water and sanitation, cycle, and usage. The second stage is conducting observations and analyses on matters related to water and sanitation by performing transects (regional explorations) and taking photos of activities related to the condition of water and sanitation at the household and community levels, discussing results of observations and situational trends over the past 30 years, and relating the results with the five capitals (social, physical, human resource, natural, and financial) of communities. The third stage creating of action plans, observation, and evaluation that the communities can undertake. The participants of the field school identify different needs for each region. Safe water needs were identified for Sukorejo and Kalianyar, while for the *Pondok Pesantren* Ngalah as well as Bugul Lor and Kebonagung, the need that arose was communal sanitation (Field-IWINS, 2016; Novenanto, 2018). The field school was also designed to enable participants to create detailed action plans that would be taken to improve the behaviour of the people.

IWINS expanded new working areas in the second year. The new areas were Pekuncen, Ngemplakrejo, and Tamban (Panggungrejo Sub-District), Kepel (Bugul Kidul), Randusari (Gadingrejo), and the Ponpes Bayt Al-Hikmah in the city region, as well as Kalirejo (Kraton), Pohjentrek (Purworejo), Sumberdawesari (Grati), and Ponpes Al-Hidayah in the regency region. After the field school, identification of safe water needs was agreed for Kepel, Pekuncen, Kalirejo, and Ngemplakrejo, while sanitation needs were identified for Randusari, Tambaan, Sumberdawesari, and Pohjentrek, as well as the Bayt Al-Hikmah and Al-Hidayah. Overall, the workflow of IWINS was the same with the previous year: training of facilitators, field school, field day, and construction (Detailed Engineering Design). However, what was new in this second year was the start of the institutionalisation process at the level of residents (FIELD Foundation 2015). Until June 2015, it was recorded that residents in 10 villages had formed special teams that function to manage and maintain infrastructure that had been built in their respective regions. As well, in several areas, the accountability of the work of the teams were reported to the village in the respective regions.

The IWINS programme becomes interesting because their primary target is not to build a safe water and sanitation facilities for impoverished households, but the goal is to strive for the formation of networks of knowledge and inter-community support in realising STBM. This goal may be realised if there is no gap between sanitation knowledge and practices. Not all programmes proceed smoothly; tensions often occur among people, related to the social and cultural aspects. As a life project, by which the participants aspire for a greater life and attempt to realise that through various strategies, this becomes interesting to discuss. We find that everyone who becomes involved possesses different experiences and meanings,

as we found in the village of Sumberdawesari. The following is the portrait of the experiences of people who became involved in the life project, a journey that was told to us as part of the history of the conception of the association of *IPAL Komunal desa Sumberdawesari*.

Initiation of Involvement

When Abdul Kalim (56 years old) was invited by village officers to attend the environmental health socialisation from IWINS-USAID, he never suspected that he would become an important part in the history of his community. Kalim still recalls about the event when the notion of *IPAL Komunal* was introduced. Almost all participants of the meeting were doubtful, suspicious, and anxious if the programme was true to be executed. Pessimism and mutual suspicion regarding this programme were embedded in the minds of villagers. Most villagers suspected that it would be of the same fate as other government programmes that often failed. Projects come and go, and funds disappear without a trace. There was imagined disappointment that the facilities to be built would be unable to function before the end of their lives.

For villager like Kalim, the decision to become involved in issues of sanitation – which means dealing with human faeces – is heavy. Many questions arose in his mind at that time. How would the programme be realised? Could this programme possibly be safe? If a septic tank had to be constructed, where should be the place for? As well, most importantly, how would a person convince the other villagers that this is an important matter for all? He concluded most of the answers to those questions, that it was most likely that the villagers would reject the programme. To answer his curiosity, Kalim took the opportunity to ask his neighbours and acquaintances in other villages about this initiative, and he came away with nothing. Not one of the inhabitants in his and neighbouring villages had accurate information. When IWINS carried out the dissemination, he listened to what was said but did not think about further involvement.

Kalim lives along with his wife and three children. His house is already equipped with bathroom and water closet facilities. He felt that their health has been quite ensured with the presence of basic settlement facilities as required by the government, particularly regarding availability of safe water and sewage channels. In his yard, there is a well dug to a depth of 5 metres, which supplies enough water for cooking, bathing, and washing. The same was also true for his neighbours. Most of them felt already had access to safe water and proper sanitation. However, after several days of the meeting activities in village office, he began to be attentive toward the environmental conditions of his settlement. Kalim realised that the distance between the well and the septic tank was not so far. For a certain residential yard, the distance was thought to be appropriate, but when measured in consideration of the distance from a well or septic tank belonging to another neighbour, their presence was instead very close. This condition left an impression in his mind and drove his desire to take part in the programme for sanitation. IWINS asked Kalim, to reduce his doubts, to visit the other sanitation project by USAID in *dusun* Ketinggen of desa Karanglo in Klatten, Central Java. From his observation on the location of IPAL Komunal, there was no rotten odour as he had feared in the village. In this village, Kalim got information that the waste in this facility could be managed as alternative energy. It may also be processed as fertilizer, depending technological preparedness. The representative of *IPAL Ketinggen* explained that the filtered wastewater could be utilized for irrigation water, watering plants, and usage in catfish ponds. Kalim considered this trip as the second important stimulus that changed his perceptions regarding the IPAL Komunal programme. After he agreed to join the project, Kalim had to participate in the field school activity organised by IWINS. The field school is a field-based education model and approach that is utilized by the Field Foundation of Indonesia and its subordinate programmes.

The emphasis of the field school is on the concept of learning in groups and prioritizing the exchange of experiences within a particular time. The field school improved the knowledge of participants about general health and environmental problems, people responsibilities, and improved the ability of water and sanitation management. Together with Siti Maslukha, his neighbour in Sumberdawesari, Kalim joined 23 other participants that were representative of the city and regency of Pasuruan in Trebes - Mojokerto to participate in the training of trainers for water and sanitation facilitators. The next phase, after partaking in the activity for five days, was they had to convince their neighbours in the village that the IPAL Komunal is important for the welfare of desa Sumberdawesari.

As facilitators, they had a difficult challenge for gathering villagers who were willing to participate in the field school. With the help from several heads of neighbourhood officials (RT/RW), they asked the villagers if they were interested to participate in the programme. Only people from RW 5 and RW 7

were interested to partake in the activity. In fact, this programme was offered to several RWs in Sumberdawesari village, but only those two areas received the programme positively. The other RWs rejected with the reason that they were worried that the wastewater would leak and assumed that there was no land area that would be fit for the construction of the facility. Kalim himself was a resident of RT 1/RW 5 and Siti Maslukha was a resident of RT 3/RW 5. From these two groups, 25 people who were willing to participate in the field school were obtained. The activity took place over the course of 20 meetings, with Kalim and Maslukha acting as the facilitator. As a result of the field school, on 25 June 2015 at 11 AM, the *Badan Pengelola Sarana Sanitasi IPAL Komunal (BPIK)* Desa Sumberdawesari, Pasuruan was established. Kalim and Maslukha were elected as the head and secretary of the organisation and the position of a deputy was taken by Supriyono. The BPIK is composed of 16 positions, who are positioned as a trustee, head, secretary, treasurer, and several subordinate assisting sections. These are their tasks: (1) to perform dissemination to beneficiary candidates regarding the planning, execution, and maintenance of IPAL Komunal facilities; (2) to supervise the construction of IPAL Komunal; (3) to provide information openly to beneficiaries regarding sanitation facilities, both incidental and periodic; and (4) to draft regulations related to the continuity of facilities.

Formation of knowledge space

During the visit to Sumberdawesari Village for the first time, Kalim invited us to the hall meeting of desa Sumberdawesari. We joined other villagers who had already taken their seats waiting for our arrival. The building, approximately 3x16 metres, was located beside the public cemetery. At the north corner of the building, which was made to function as a library. Elementary school children took their places in a queue to borrow books. Others chose to read while the women opted to talk with one another. Kalim explained that exactly under the building where we were seated at that time was the central wastewater treatment installation that is utilized by 85 heads of households (approximately 350 people) spread out among three RT. All household waste from resident bathrooms and kitchens, known as "grey water" and "black water", were made to flow through the primary network of pipes to the main network. The process of treatment utilized anaerobic technology in a baffle reactor; with this process, the wastewater remains from the primary containment tank will not release foul odours. The explanation was quite detailed.

The facility was constructed by IWINS-USAID, and the village only needed to provide land for the location of the central wastewater containment. According to the original plan, the location of the primary containment was supposed to be at RT 5, but because technical data showed that the elevation was too low, this became impossible to execute. In the end, the construction location was moved to the place where it now stands. This location was originally the community landfill. The villagers know that there were two main reasons why their village obtained the aid for the construction of the IPAL Komunal. The first was because the population density of their village is considered high and the second was because the close distance between wells and septic tanks, due to lack of land space, was found to be dangerous for the health of the people.

During the activity, Kalim, Sutarjo (46 years old) and Sofiyan (53 years old) invited us to go down and see the disposal pipe network, which was located not far from the location of the meeting. When we went down, Kalim opened the control containment tank and showed the condition of the water. He took a used mineral water bottle to take some of the water from the wastewater. While showing us the water, Kalim told us that as they attempted to convince the villagers, Sofiyan used some of the remaining water from the installation to wash his face. We were quite surprised to hear about his story. We then asked if they were queasy with the aroma of the water. While laughing, Kalim explained, "Yes, it is smelly, because it is the remains of human waste. But we tough it out – what is important is that the people here believe us that the wastewater is safe for the village. This is a sacrifice." (Depth interview, 27 November 2019, Sumberdawesari). We ourselves also felt that the water from the treatment process still had a foul smell even though it had gone through the treatment process. This is reasonable, considering there was a biological process of decomposing solid waste into liquid waste.

When acting as programme evaluators from independent parties, we were surprised that the programme conducted by IWINS-USAID, particularly the field school activity, provided a space for villagers to get to know their environment. Villagers who were used to the practice of open defecation in places such as rivers, yards, and dry fields were asked to examine the conditions around their homes. The activity involved practices of systematic observation by recording the conditions of the environment through photography exhibitions, environmental sermons carried out by *kyai* (clerics), and folk theatre (*teater*

rakyat). The people were asked to show the photographs that they took within their groups. What was funny was the initial response that was shown by the participants, and then when they were asked to point out whose properties are present or close by within the photos, some of them preferred to remain silent. Embarrassment was the reaction that finally occurred after the parties reminded each other about whose properties are present in the photos. Muntaharo, a handyman, observed the water found in his well. He noted that the water in his well was often cloudy and had a fishy smell. When the rain fell, he noticed that the well water turned a chocolate-brown colour, and there was a strong smell as that of a mixture of mud and fishiness. He stressed the smell is like the freshwater catfish. It was during that observation that Muntaharo realised that his well had been contaminated by the septic tank of his neighbour.

Another example can be seen from the experience of Asadi (43 years old). Asadi repeatedly received complaints from his daughter about a frequent stomach-ache. He thought that his daughter only had “*masuk angin*” (quite popular and even considered as an illness. “*Masuk angin*” is often used to describe symptoms of discomfort, aches, and bloating. Many consider that these occur because of too much air entering the body, particularly during the rainy season). However, local medicines and herbal remedies that he gave had no effect on his daughter health. When she went for a check-up at a community health centre (*Puskesmas*), the doctor informed that there was the possibility that his daughter may have been infected by bacteria from the food that she consumed. This occurred for quite a long time until he then realised that what was felt by his daughter was also actually felt by himself and his wife. After repeated discussions with Kalim and Maslukha, who had become guides, we were informed that there was a possibility that his well had been contaminated by faecal matter. He then tried to replace the water consumed by his family with bottled water (*air dalam kemasan*) sold by bottled water companies. He and his family no longer had stomach-aches, although this meant that more money would be expended to purchase safe water.

The previous examples illustrate that the activities of learning in the field school are “school” activities that are founded by efforts of self-discovery from the results of observations of environmental situations or conditions through careful and routine observations. From the findings of participants, there was a process of discussion and analysis, both by oneself and by the help of the guides, by which the villagers learn to recognize the causes of health problems that appear in the environment, the conditions of their family members, conditions of wells and toilets, the necessary actions that need to be performed, and the strategies that may be taken to overcome difficulties. Through this understanding, which was mostly gained from the training, they understood that the responsibility for their health is a shared one. No matter how rich they are, if their well or source of clean water has problems, then the wealth becomes meaningless. They became conscious that there must be a strong commitment and desire to change. A question then emerges: how did they bring realisation to the other villagers?

They chose to bring consciousness to the villagers through a folk theatre, where the villagers became the actors and the audience at the same time. The scenario was based on their own environment. Learning through this performance is a form of representation of their everyday lives. By watching the shows, they are being demonstrated about the situations and conditions that they face, particularly regarding unhealthy behaviours. This method of introduction turns out to be more easily accepted instead of introducing them to difficult concepts. The residents themselves had already possessed the initial knowledge about sanitation and clean water. They realise that water must be boiled before being used for drinking. They also realise that defecation must be done in a closed manner, and that meant that they had to do it in a toilet. The point when they received knowledge about sanitation represents an expansion of the sanitation model that they had received.

Insofar as the investigations that we conducted on the community of IPAL Komunal in the village, there are three dimensions of knowledge that are present within the management of the communal wastewater treatment facilities by the managers, and these are the contextual, managerial, and psychosocial, and technical dimensions. Each of these dimensions work at different levels, as habits, individuals, households/interpersonal, community, and societal structure.

Table 1. Knowledge dimensions in the communal wastewater treatment in Pasuruan

Levels of Awareness	Dimensions of Knowledge		
	Contextual	Managerial and psychosocial	Technical
Habitus	The repetitive habit of open defecation is no longer present, and people wash their hands with soap before eating and comply with the rules for maintenance of the installations	There is an expectation that Communal IPAL members strive to achieve by combining managerial and psychological abilities by	There are no longer beneficiaries who defecate into the river or even bare land in the backyards of houses
Individuals	Access to the program does not differentiate between men and women	The changes that can be seen are increased individual knowledge, self-success, and development of disgust toward improper sanitation.	The presence of a routine that becomes a new habit for the users as the beneficiaries of technology use constitutes the positive effect that is expected by residents and IWINS
Households	The Communal IPAL sanitation program turned out to be followed by changes in roles, responsibilities, division of labor, and structure within a household	There is the distribution of information about sanitation that encourages changes in ways of healthy living, passed down from parents to children	the usage of sanitation technology has been implemented by the beneficiaries and their families
Community	there is an effort by the community to identify a human and natural resources that they have as assets for supporting the project	There are social values and a collective consciousness that are mutually created, shared, and utilized	There is an obstacle in that not all people are willing to become involved as board representatives of the installation
Social structure	The contextual dimension operates and it easier to create regulations	There are signs that the spirit of societal leadership of Communal IPAL members have been tested in a good managerial system	There still needs to be a strong structure to support manufacturing, financing, and policymaking more broadly at the level of village communities

Source: the Fieldwork data (2018, 2019)

“Checklist of activities”. The idea regarding co-production to resolve issues of sanitation and healthy living behaviours in Indonesia is nothing new. The government of Indonesia realised that the role of the state is very limited and is not maximal in realising development. One of the causes of failures of development programmes in Indonesia is the political situation and low community participation (Li, 2005). Even so, the government realised that community participation becomes one of the principles to realise good management, but in practice, the role of the state is still too dominant, particularly in planning. The function of the government appeared quite dominant, and the role of communities is not quite optimal for participation in development activities. The model of development participation that involves the active role of communities in Indonesia is known as “swadaya masyarakat”. *Swadaya masyarakat* does not only comprise active contributions as the labour and materials contributed by a person to a development programme, but also the form of perspectives or ideas in planning. In this case, the function and role of the government are more as a financier and a facilitator. However, failures that still occur within this model of project development are caused by the viewpoint of the state, who still

sees that the facilitator and financier as the parties that possess power and control over the sustainability of a programme (Li, 2005; Scott, 1998).

We see that the failure of the *swadaya* (self-sufficient) development scheme often lies on the occurring effort of recentralizing roles by the government. In the case of the villagers, when they were asked about their initial opinion about the plan to construct a Communal IPAL in their village, most of them felt pessimistic with the continuity of the programme. The villagers still had the assumption that the programmes offered to them by the government are merely efforts to consume budgets and tick off a “checklist of activities” that the government must perform. Although many programmes had been offered by the government, for example regarding sanitation, the idea of introducing the *IPAL Komunal* project was something new. How could it be not? They perceived faeces as a dirty matter that is rarely discussed as a public affair, and now it emerged to be discussed collectively. According to the values of Javanese people, matters that have the potential to impose bad judgment, such as the state of family bathrooms and toilets, must have their presence concealed as much as possible. This is the explanation why the bathrooms or toilets of Javanese people are mostly located in the back part of the house or separated from the main house (see Newberry, 2006). However, when they were informed that this was a grant from the United States through USAID, they immediately believed it. The reputation of the United States seems to be a guarantee for them that the programme was thoroughly planned regarding its execution and finances.

The lessons are taken from the knowledge co-production process in Pasuruan. First, we can trace that the process of forming consciousness of healthy living behaviours in Pasuruan is an effort to increase the access of residents toward sanitation. The idea of sanitation is a global concept that is regulated in the SDGs. To realise the knowledge of the villagers, there is a meeting to combine local ideas and national or global ideas. They interact in an activity that is supported by a global force (USAID). The presence of the field schools, for example, is a model that is developed by FIELD International and adopted by Field Indonesia. In the field schools, the residents involved gained an enrichment of knowledge which becomes a constructive learning process (Mitlin and Bartlett 2018). By observing the response of the villagers in the process of maintenance of the installation and how they interact with other villagers who are not beneficiaries, it can be seen how changes in knowledge occur. In this context, the co-production of knowledge involves relationships with the closest people present in the surroundings.

Second, there is an institutionalising of management for the sanitation programme. This means that the sanitation programme has created a new institution in the village community. There were new values and norms that emerged when the physical development of the IPAL was completed. The board of BPIK Sumberdawesari not only ensures the maintenance and continuity of the constructed communal IPAL, but also makes the effort to encourage residents to make a change to healthy living. This institutionalisation process is very contextual and represents the response of villagers in facing their environmental situation. At this point, we finally see that with the knowledge that they gained during the process of learning about sanitation, actors who are involved in the process of providing services appear, in that the initial field managers become service “providers”. According to Tony Bovaird (2007), these service provider actors are in general state agents who act in a professional capacity and are responsible for the services. In this research, the role of the state is minimal. The role of the state as a service provider was not found because of the feeling of disbelief that the residents have toward development programmes that have been previously implemented. This means that the sanitation programme after the development of the Communal IPAL led to the creation of an active society.

Questioning the role of the state and NGO's. Where is the position of IWINS within this active society concept? We see that IWINS plays a double role. IWINS as an actor has double positions of negotiator and knowledge producer. As a civil society organisation (CSO), IWINS and the community of Sumberdawesari collaborate between two primary actors to develop relationships. IWINS plays the role of a mediator for the entry of new technology for the village community on behaviours of healthy sanitation. The technology is not only in the form of physical structures or service provision, but also in the form of strategies, operations, and the integration of both. We strongly see that IWINS also prepared soft skills for the community through the field school. These efforts led to the smooth progression of preparations for integration of communal hardware (septic tank) technology with support from human resources. The results of this research strongly indicate that the co-production of knowledge, which is the result of the actor collaboration phase, strengthens a new modality where power, authority, and supervision of resources lie in the hands of residents. The distribution of these three powers was

politically constructed by active relations among residents. This becomes important, seeing that they fully realise the political potential of the knowledge they received.

Amitai Etzioni (1968, p. viii) defines an active society as “the active quality [in how] societies or sub-societies (ethnic groupings, classes) acquire varying degrees of self-control”. Considering this definition, an active society emerges from argumentation toward high self-confidence, particularly in relation to social control. In our findings on the field, an active society emerges from a serious sense of doubt toward the primary agents of development, being the state. IWINS initially also had the same fate; there was a sense of suspicion toward the NGO because it was considered simply as an organisation that manipulated them, taking external funds, and then leaving without giving back contributions to the community. The activities that the Communal IPAL community materialised reflect a certain modern society management. The attitude of disbelief toward the state is realised as an activity potential and political resources to improve the condition of their community. As an active society, the community of Communal IPAL users master their social universe. They control their social organisation with the powers or capital from within the community itself. The control process within an organisation in a community is determined by personal consciousness, the knowledge of actors, and their commitment to a single goal (Etzioni, 1968).

What has been performed by this Communal IPAL community, by becoming an active actor in a sanitation service programme, has drawn support and opposition. To date, with not all residents of the village becoming a part of the community, this indicates the scale of the difference in viewpoints. The Communal IPAL community realised that not all villagers will have the consciousness to participate within the activity. In general, as previously discussed, the consciousness to become a part of the sanitation community very much depends on their conscience. The villagers can divide their conscience as individuals, groups, and a collective community. In other words, to reveal their basis of conscience based on the above criteria, it is necessary to examine the bonds that are formed among the resources that are involved, within both the formal and informal structure, regarding their knowledge about behaviours of healthy living. We believe that the process of introducing the elements of healthy living behaviours through sanitation practices – such as through realisation of access, supervision, management mechanism, and information sharing – has encouraged a form of modification of behaviours that leads to changes in the conscience of residents.

Before the modification of behaviours occurred, cognitive change had already occurred as the effect of participating in the field school and environmental sermons. With the new knowledge that they possess, the residents possess the ability to determine the disparity between their everyday lives and proper healthy behaviours. A very strong cognitive change was indicated in a flashback of life (reflection) that is expressed in the form of theatre. The theatre, which displays healthy behaviours, becomes the media for residents to criticize sanitation practices that have occurred thus far. Although during the showings, there is laughter from seeing the banter expressed by those on stage, who are notably their own neighbours, here they are also actually attempting to find and agree upon the best solution. The agreements in this cognitive area constitute the aim of the desired behavioural changes. For example, the agreements involve defecating in public toilets and disposing rubbish at the landfill provided by the village.

Modification of behaviours also occur through the Communal IPAL or sanitation technology. After the physical development, the villagers routinely gathered. Their gatherings are encouraged by the motivation find out and share experiences on how to manage the infrastructure. This fact indicates that the Communal IPAL has an important role as a concrete element that drives the activities of villagers. In this case, they face the contextual, technical, psychosocial, and managerial knowledge dimensions. Here, there are expectations that the experiences of each villager can become lessons for other villagers in maintaining the infrastructures that are already present in their regions. In this condition, there are processes of learning and network creation among organisations that manage Communal IPAL that are present in Pasuruan. From this, the people learn not only to make use of technology but also to develop an organisational system for the sustainability of the technology. There is a process of knowledge development, in this case improving the socio-technical system in the management of the Communal IPAL.

Another form of encouragement that emerged was that the existence of new knowledge strengthened solidarity among beneficiaries. This solidarity also developed across sub-districts and regencies. Thus, it was not rare that their powers as a social organisation and citizens are beginning to be approached by political parties. This situation is quite dangerous for the solidarity of the beneficiaries' group. In other

words, the transformation of knowledge regarding sanitation practices has added value in initiating changes in resident behaviours, yet on the other hand has the potential to become a new political force, as political imagery (Becker et al., 2017; Susser & Tonnelat, 2013). This is proven by the bargaining positions of OMARIS members in the village. Several villagers even became representatives in the village structure. The position of JEMARIS as an organisation with very strong relations in these two regencies reflects the transformation of this solidarity.

The theoretical implication of this research shows that the co-production of knowledge has a broad meaning and it is better to look at it as a dynamic, experimental, and reflective process. Through the contextual, managerial, psychosocial, and technical dimensions, the co-production of knowledge works as a generative process. It means the co-production as the basis of consciousness emerged as an exploratory space that challenges each individual, group of people, and community to show up their capacity to develop themselves. The success of the program in the form of practices of involvement, participation, and volunteerism in society are other forms of knowledge and value production modes. Finally, we hope that this paper will provide a site for debate on different ways of shaping behavioral awareness in sanitation and public health issues.

CONCLUSIONS

The article presents an analysis of the theoretical and empirical questions that the collective consciousness raises for service co-production. Collective consciousness emerges as a lens to reformulate old and new questions about the people attempts to fulfil the sanitation service needs, the dynamics of participation, deliberation process and conceptual basis for understanding village realities. This study resulted in the finding that collective consciousness and behavioural change are constructed based on the contextual, managerial and psychosocial, and technical dimensions. The three dimensions are constructed through lessons that are conducted by NGO that have the foundation of a group approach. The collective consciousness has begun to be present at the stage of policy and regulation at the levels of societal living, community, household, personal or individual, and habitus. At those five levels, not everything has succeeded; in general, the micro (habit) and community levels are very dynamic. This is quite surprising because in fact the level that is the easiest to change is the community level and the most difficult is the habit level.

The findings of this study showed that this programme is still considered not as a part of government activities, and thus a good amount of the obstructions that emerged instead came from bureaucracy apparatus from the village to the department levels. Moving forward, the board representatives must convince that there is a deeper understanding for intervention based on the social setting of the community. This process may be balanced by carrying out promotions and health education at the household level, which becomes the centre of dialogue for knowledge in a community. To attain knowledge and a collective consciousness that have the aims to realise a healthy and independent community as a new ideology, the community must implement a full strategy. This strategy is to reduce the disparity between community knowledge and practices.

The co-production of knowledge in this context must be appreciated as a broad opportunity for residents to develop the natural and human resources that they possess. Although the co-production in this research is the result of cooperation between a CSO and residents, the role of the state is still evident particularly in the early periods, where it gives a greater room for the agents to take up roles. In this research it is seen that although there is contradiction and disbelief from residents toward the state, there is still a certain obedience that is followed by residents, especially in relation to permit applications, which still involve the village government. Co-production in encouraging changes in the knowledge basis of residents occurs in the phases of service provision and programme sustainability. The initial phase involves the effort of making important decisions from the actors that are involved. The sustainability phase of the management process for the Communal IPAL involves the effort to maintain the continuity of the programme in the future. At this point, IWINS has accomplished its efforts in Pasuruan. At the final moments of this research, anxiousness began to emerge among the managers, particularly in relation to maintenance, which requires high costs.

In the context of implementing knowledge co-production in sanitation services, values in efforts to strengthen social cohesion among user communities are a main policy challenge. At the villager level, these great challenges become visible and tangible, which in many senses of the group's efforts become actively involved. It means that sanitation services are not only aimed at strengthening the groups but are aimed at efforts to establish a comprehensive welfare system. The efforts of villagers with *IPAL*

Komunal show positive signs, all activities show that the share of new knowledge and maintaining local values increases their sense of belonging of the facilities. There are different groups among villagers who are still reluctant to participate, but it is clear that new ideas and approaches to tackle these very wicked problems are needed.

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