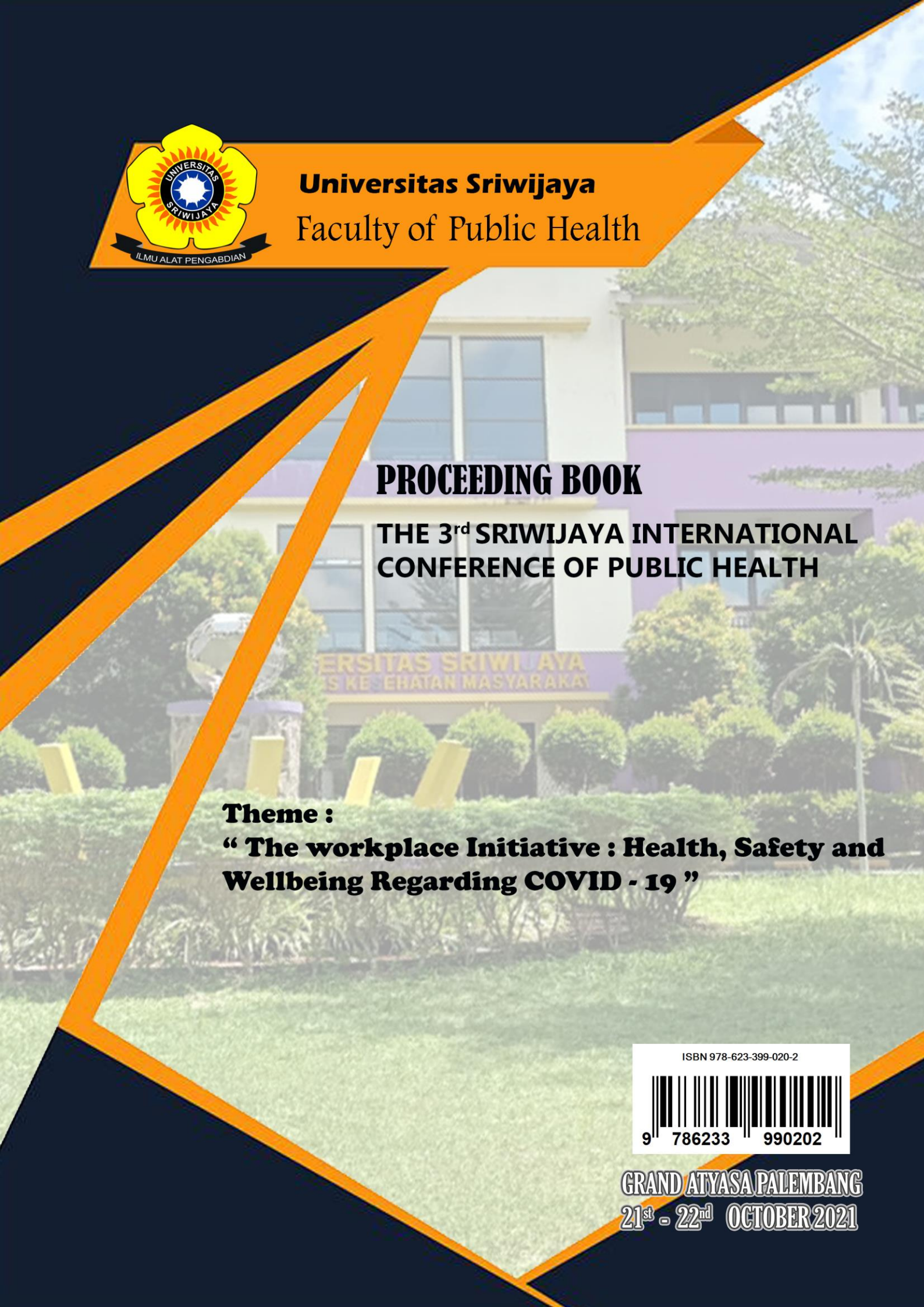

Universitas Sriwijaya

Faculty of Public Health

PROCEEDING BOOK

THE 3rd SRIWIJAYA INTERNATIONAL CONFERENCE OF PUBLIC HEALTH

Theme :

" The workplace Initiative : Health, Safety and Wellbeing Regarding COVID - 19 "

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GRAND ATYASA PALEMBANG

21st - 22nd OCTOBER 2021

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The Work Place Initiative: Health, Safety and Wellbeing Regarding COVID-19

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THE 3rd SRIWIJAYA INTERNATIONAL CONFERENCE ON PUBLIC HEALTH

The Work Place Initiative: Health, Safety and Wellbeing Regarding COVID-19

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PREFACE

On behalf of the organizing committee, I am delighted to welcome you to the 3nd Sriwijaya International Conference on public Health (SICPH 2021) during 21th october 2021 at Palembang South Sumatera, Indonesia. The SICPH 2021 is international conference organized by Faculty of Public Health, Sriwijaya University (UNSRI). I would like to extend my warmest welcome to all the participant of The SICPH 2021 under the theme ***"The Impact of Climate Change on Infectious Disease Transmission".***

The SICPH 2021 consists of keynote sessions from well known expert speakers in the field of public health, and academic paper sessions (oral presentations) who are coming from several region. This conference seeks to bring together academics, public health professionals, researchers, scientists, students and health stakeholders from a wide range of disciplines to present their latest research experience and further development in all areas of public health. We hoped that this conference will be usefull platform for researchers to present their finding in the areas on multidisciplinary realted to public health and health system issues.

This conference will provide opportunities to exchange ideas, knowledge, and development of the latest research among the participants. We will publish the paper as output from the SICPH 2021 in proceeding book with ISBN and selected paper will be published in Jurnal ilmu kesehatan masyarakat- SINTA 3 (a nationally-accredited journal). The SICPH 2021 is being attended by about 50 participants. I hope you enjoy the conference.

With regard to considerable conference agenda, we greatly appreciate any support and sponshorship derived from any govermental as well as private institutions for the success of the conference. Great appreciation is also handed to organizing committe of the conference for any voluntarily effort that bring to the succes of the conference.

The conference committee expresses its gratitude towards all the keynote speakers, authors, reviewers, and participanst for the great contribution to enssure the succes of this event. Finnally, I sincerely thank all the members of the organizing committee who have worked hard to prepare this conference.

Palembang, October 2021

Chair,

Anita Camelia, SKM., MKKK.

PREFACE

First of all, let us thank God, the Almighty, who has given His grace and guidance so that the 3rd Sriwijaya International Conference of Public Health (SICPH) with the theme of The Workplace Initiative: Health, Safety and Wellbeing Regarding Covid:19 can be held successfully. I welcome all of you to this seminar which has received great attention not only from university, but also other communities to submit papers to be presented in this seminar. I express my highest gratitude and appreciation the presenters.

The conference is divided in two session, the first session is speeches and the second session is round table discussion. In the first session, the invited keynote speakers were Prof. Dr. Tan Malaka, MOH, DrPH, SpOk, HIU (A Professor from Medical Faculty Universitas Sriwijaya), Prof. Dr. Retneswari Masilamani (University Tunku Abdul Rahman, Malaysia), Prof.Dr.Joselito L. Gapaz MD, M.PH(University of the Philippines) and Prof. Dr Tjandra Yoga Aditama, MHA,DTM&H, DTCE,SpP(C).FIRS (Professor from Griffith University, Australia)

Of course, this conference activity would not have succeeded without the support of all parties involved, as well as the presence of all participants in all regions in Indonesia and internationally. I especially thank to all the organizing committees for their hard work, perseverance, and patience in preparing and organizing this conference so that it can go well, smoothly and successfully.

Finally, through this conference let us extend the network and cooperation among all stakeholders of the public health sector, especially in Indonesia and in the world in general, to build a better public health world in Indonesia

Thank you for participating in this conference.

Dean of Public Health Faculty,

Universitas Sriwijaya

Dr. Misnaniarti, S.K.M, M.K.M

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WATER, SANITATION AND HYGIENE IN FARM AREA AND INDUSTRIAL AREA OF CITARUM WATERSHED

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ABSTRACT

Citarum Watershed Pollution and Degradation problems are very complex, one of them caused by domestic activities. Water, sanitation and hygiene are fundamental pillar of public health. This study aims to assess water, sanitation and hygiene problems of household in Citarum Watershed. The study conducted in 2019 at upper stream Citarum Watershed, Bandung District, especially in farm area and industrial area. It involved 100 household in both areas. There are more than 90% of household have improved drinking water in each area, only 20% of household in farm area and 54% of HH in industrial area have improved sanitation, and only a half of HH in industrial area has hand-washing facility with water and soap. Drinking water source in farm area mostly using water spring, but in industrial area using refill water. It is suggest that need to concerted effort between local government, ministries, and public sector achiving the target in Citarum Watershed Pollution and Degradation Control Action Plan. Also, education and socialization about drinking water treatment, sanitation, and hygiene behaviour are important method to be carried out by all.

Key words: *water sanitation and hygiene, Citarum river, public health*

ABSTRAK

Masalah kerusakan dan pencemaran di Daerah Aliran Sungai Citarum sangat kompleks, salahsatunya disebabkan oleh aktivitas rumah tangga. Air, sanitasi dan higiene merupakan dasar dalam kesehatan masyarakat. Studi ini bertujuan untuk menilai kondisi air, sanitasi dan higiene di rumah tangga di DAS Citarum. Studi dilaksanakan pada tahun 2019 di Kabupaten Bandung yang merupakan wilayah hulu sungai Citarum, khususnya di kawasan peternakan dan kawasan industri. Jumlah sampel sebanyak 100 rumah tangga. Terdapat lebih dari 90% rumah tangga di kawasan peternakan dan kawasan industri yang memiliki akses air layak, hanya 20% rumah tangga di kawasan peternakan dan 54% rumah tangga di kawasan industri memiliki akses sanitasi layak, dan hanya separuh dari rumah tangga di kawasan industri memiliki fasilitas cuci tangan dengan air dan sabun. Pada umumya, jenis sumber air yang digunakan untuk minum di kawasan peternakan adalah mata air, sedangkan di kawasan industri menggunakan air isi ulang. Studi merekomendasikan perlu usaha bersama baik dari pemerintah setempat, kementerian dan pihak swasta dalam hal mencapai target Rencana Aksi Percepatan Pengendalian Pencemaran dan Kerusakan DAS Citarum. Juga edukasi dan sosialisasi mengenai pengolahan air minum skala rumah tangga, sanitasi dan perilaku higiene merupakan metoda penting untuk dilaksanakan oleh semua pihak.

Kata kunci: air sanitasi dan higiene, sungai Citarum, kesehatan masyarakat

Introduction

Sustainable Development Goal (SDG) 6 aims to "Ensure availability and sustainable management of water and sanitation for all "and includes aspirational global targets for drinking water, sanitation and hygiene. The indicators in Goal 6 were "Proportion of population using safely managed drinking water services" and "Proportion of population using safely managed sanitation services and a handwashing facility with soap and water"[1]. Indonesia was one of the countries that must report the achievements of water, sanitation and hygiene access, in order to 2030 agenda. Water, sanitation and hygiene were fundamental needs for human. Contaminated water and poor sanitation are linked to transmission of diseases such as cholera, diarrhoea, dysentery, hepatitis A, typhoid, and polio. Some 829 000 people are estimated to die each year from diarrhoea as a result of unsafe drinking-water, sanitation, and hand hygiene[2].

Citarum Watershed was a land area that has one unit with a river and its tributaries. Citarum Watershed was the biggest watershed of Citarum River Area, and has around 7000 km^2. It was located through 13 districs/cities in West Java, start from Bandung District until Bekasi District in north Java. There are three of big reservoir inside, those are Saguling, Cirata and Jatiluhur. These are very important as water and electrical supply for people in Java and Bali. The role of Citarum River as water supply, provide water needs for more than 22,9 billion of people in West Java, and also for people in DKI Jakarta[3]. As well as another river watershed, Citarum Watershed has many environmental problems that impact on public health and social life. Literature review showed that the main source of Citarum river pollution come from industrial activities, domestic sector, livestock and agricultural activities. Domestic sector causes solid waste and liquid pollution, which has coliform bacterial. River water quality monitoring by Environmental Agency in West Java Province, has proved that there are high contaminant such as faecal coliform, amoniac and nitrate, from domestic activities[4]. The results of the calculation of the pollutant index in one of the Citarum tributaries (Cikapundung River) showed that the main parameter that decline of river quality was faecal[5].

There are a few of studies that explore water, sanitation and hygiene in household of Citarum Watershed, especially correlation with health impact. A research by BBTKL Jakarta in 2019 at four districts of Citarum Watershed, showed that refill water usage for drinking as much as half of household in each sampling location (Bandung district, Purwakarta district, Karawang district and Bekasi District), and well water usage for domestic activities other than drinking reach to 90% of household. The

ownership of toilet around 80 – 90 % of household, and open defecation behaviour still happen around 8-11 % of household. All of household in four districts have bacterial contamination in their drinking water sources[6].

The government have made a lot of efforts to increasing access to drinking water and basic sanitation, such as Integrated Citarum Water Resources Management Invest Program in 2011-2014. Environmental Health Agency, Ministry of Health, also in 2019 has an intervention program in selected location of Citarum Watershed. The intervention program had given the toilet facility and hand washing facility for poor people in selected village.

This study aims to assess water, sanitation and hygiene facility in household at two districts of Citarum Watershed. This study was part of integrated research about Citarum Watershed.

Method

The research has been done in 2019, at two village in Bandung District. It was Tarumajaya Village (TV) (represent as farm area) and Nanjung Village (NV) (represent as industrial area). Bandung district was an area in upstream of the Citarum river. There are Situ Cisanti in Tarumajaya village which known as the zero point of Citarum river (fig 1). Tarumajaya village is a rural in mountainaous area, whereas Nanjung village is an urban area in lowland of Bandung district. Tarumajaya village located in Kertasari sub-district, which is known as farm area and still be supplier of fresh cow's milk. Nanjung village is located in Margaasih sub-district, which is known as industrial area because there are many of small and medium industries.

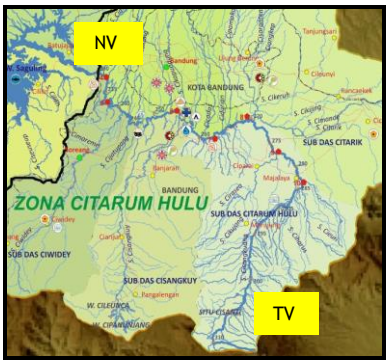

Fig.1 Location map of the study area

The design of the research was cross-sectional, using the combination of quantitative method and qualitative method. The unit analysis of the research was household (HH), with the number of households in both area were 100 HH. The inclution criteria to select sample were household which live near of Citarum river flow (between 0-100 m from the river). The household data was collected using questionnaire. The statistical analysis was descriptive analysis.

Result

There are 100 households was interviewed and observed. Table 1 shows characteristic of household by social and economic factors. The category of income divided as low (under 1 million of month), middle (1-3 million of month) and high (>4 million of month). The category of education divided as low (maximum yunior high school) and high (minimum of senior high school). In both area, most of them have middle income and low education. The type of work in farm area is as farm workers (42%), laborer (24%) and cattle farmers (10%), meanwhile in industrial area there are laborer (38%), private sector (28%) and farm workers (14%).

Table 1. Characteristic of Respondents by Social Economic Factors

Characteristic of Respondents	Farm Area		Industrial Area	
	n	%	n	%
Economic income				
- Low	13	26	10	20
- Middle	33	66	38	76
- High	4	8	2	4
Educational status				
- Low	46	92	46	92
- High	4	8	4	8
Type of work				
- Cow farmer	6	10	0	0
- Farm workers	21	42	7	14
- Labor/driver	13	24	19	38
- Private sector	4	8	14	28
- Government sector	1	2	0	0
- Others	5	10	10	20

Table 2. Percentage of Household by Drinking Water Sources Condition

Variables of Drinking Water	Farm Area		Industrial Area	
	n	%	n	%
Water sources for drinking				
- Surface water	1	2	0	0
- Protected spring water	35	70	0	0
- Unprotected Dug well	1	2	1	2
- Protected Dug Well	1	2	9	18
- Bore hole	5	10	7	14
- Refill water	7	14	33	66
Water Source for others				
- Surface water	24	48	0	0
- Protected Spring water	20	40	0	0
- Unprotected Dug Well	1	2	6	12
- Protected dug well	0	0	28	56
- Bore hole	5	10	16	32
Distance from well to septic tank				
- <10 m	4	42,9	6	76,5
- >=10 m	3	57,1	10	23,5
The ownership of Well				
- Own	3	43	13	76,5
- Communal	4	57	4	0,4
Water treatment in small-scale	45	90	26	52
Method of DW treatment by cooking	45	100	26	100

Table 2 shows the percentage of household by drinking water sources condition. Mostly of household (70%) in farm area using water from spring water for drinking, but there is small percentage of household still using surface water for drinking. In industrial area, refill water usage covered almost 70% of household, and there is no household using surface water for drinking. Surface water and protected spring water much needed for use other than drinking (like for bathing, washing and personal hygiene) especially in farm area, but not in industrial area. All of household in industrial area using well water for bathing, washing or personal hygiene. For household who using well water for drinking, they get the sources from private or communal, but most of the household in industrial area has own their well source. In household small-scale treatment, the method used is cooking (boiling).

Table 3 shows percentage of household by sanitation facility condition. In both area, most of household have toilet which is not shared to other house, only few of them have toilets which were

shared, and only 14% in each area have no toilet. In farm area, a half of household use flush for toilet, and in industrial area about 80% use flush for toilet. About sewage facility, only 24% of household in farm area using septic tank (even that we can't prove the technology they have for that facility, or it is only traditional septic tank), and 72% of household use the river as feces disposal area. Different with the industrial area, only 26% using the river and 73% using septic tank.

Table 4 shows percentage of household by WASH indicator, those are improved drinking water, improved sanitation and hand-washing with water and soap. Improved drinking water sources are those which by nature of their design and construction have the potential to deliver safe water. Improved sources include piped water, boreholes or tubewells, protected dug wells, protected springs, rainwater and packaged or delivered water. Improved sanitation facilities are those designed to hygienically separate human excreta from human contact. These include wet sanitation technologies such as flush and pour flush toilets connected to sewers, septic tanks or pit latrines, and dry sanitation technologies such as dry pit latrines with slabs and composting toilets[7]. The percentage of household with access to improved drinking water was 96% in farm area and 98% in industrial area. The percentage of household with access to improved sanitation was 20% in farm area and 54% in an industrial area. The percentage of household with access to hand-washing facility with water and soap was 70% in farm area, higher than in industrial area.

Table 3. Percentage of Household by Sanitation Facility

Variables of Sanitation	Farm Area		Industrial Area	
	n	%	n	%
Ownership of toilet				
- Yes, not shared	40	80	37	74
- Yes, shared	2	4	5	10
- Yes but not used	1	2	1	2
- No	7	14	7	14
Type of toilet				
- Flush	24	48	40	80
- Covered latrine	1	2	0	0
- Uncovered latrine	21	42	10	20
- Plump	1	2	0	0
- In the floor	3	6	0	0
Sewage Facility				
- Septic tank	12	24	37	73
- River	36	72	13	26
- Field/farm	2	4	0	0

The reason has no toilet					
-	don't have money	6	75	5	62,5
-	no space at home	1	12,5	0	0
-	no need to has	0	0	2	25
-	rental house	0	0	1	12,5
-	use public toilet	1	12,5	0	0

Table 4. Percentage of Household by WASH Indicators

WASH Indicators	Farm Area		Industrial Area	
	n	%	n	%
Improved drinking water	48	96	49	98
Improved sanitation	10	20	27	54
Hand-washing facility with water and soap	35	70	21	42

Discussion

The main finding in this study was there are still lack of improved drinking water and improved sanitation access in two area of Citarum Watershed, especially in Tarumajaya Village (as farm area), although just few of household using surface water for drinking and for other purposes. In this study, poor sanitation because of lack of septic tank usage, can cause the river pollution.

Access to drinking water and basic sanitation is a fundamental need and a human right vital for the dignity and health of all people. Contaminated drinking water and poor sanitation is linked to transmission of diseases such as cholera, diarrhoea, dysentery, hepatitis A, typhoid and polio and exacerbates stunting. Poor sanitation reduces human well-being, social and economic development due to impacts such as anxiety, risk of sexual assault, and lost educational opportunities[8].

Tarumajaya village was a rural area that far from the city and have lack of access because of geographic and topography factors. Refill water usage in Tarumajaya village for drinking was high enough, but the quality of refill water maybe not qualified to be improved water. Nanjung village was an urban area that so close to the Bandung City and Cimahi City. There are more than a half of household using refill water for drinking, and no household using surface water and spring water for drinking and other purposes.

This study also highlighted sanitation access, only 20% of household in farm area has access to improved sanitation, lower than industrial area. Although the ownership of sanitation facility that no

shared with other household was high enough in farm area, but only few of household has septic tank for disposal waste area. Most of them use open area such as in the river or in the field.

Conclusion

The finding of this study suggests that lack of access improved sanitation in farm area and industrial area of Citarum Watershed exist, and it can cause Citarum river pollution and public health problems. However, lack of access drinking water still exists in both area because there is no piped water usage for drinking and other purposes. It was suggest that need to concerted effort between local government, ministries, and public sector achiving the target in Citarum Watershed Pollution and Degradation Control Action Plan.

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Conflict of Interest

The authors declare that they have no conflict of interest.

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