

SURAT KETERANGAN
MELAKUKAN KEGIATAN PENGABDIAN KEPADA MASYARAKAT
INSTITUT TEKNOLOGI NASIONAL
No. 304/C.02.01/LPPM/V/2021

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Nama Kegiatan : Pelatihan Webinar Rencana Pengamanan Air Minum (RPAM)
Tempat : Webinar/Gedung Teknik Lingkungan, Kampus Itenas
Waktu : 01 – 05 Maret 2021
Sumber Dana : Prodi Teknik Lingkungan

Demikian surat keterangan ini dibuat untuk dapat dipergunakan sebagaimana mestinya.

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Ditugaskan untuk melakukan,

Kegiatan : Pelatihan Webinar Rencana Pengamanan Air Minum (RPAM)
Sebagai : Tenaga Ahli
Tempat : Webinar/Gedung Teknik Lingkungan, Kampus Itenas
Waktu : 01 – 05 Maret 2021

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Laporan PKM
PELATIHAN WEBINAR RENCANA PENGAMANAN AIR MINUM (RPAM)



Penyusun
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Dr. Mohamad Rangga Sururi
Mila Dirgawati. PhD
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INSTITUT TEKNOLOGI NASIONAL 2021

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Program Studi/Fakultas : Teknik Lingkungan/Teknik Sipil dan Perencanaan
Bidang Keahlian : Air Minum
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Alamat Rumah : Jl. Puspa Cempaka Timur 1 N0.8258, Sukajaya Lembang

Lokasi Kegiatan

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Desa/Kecamatan : -
Kota/Kabupaten : -
Provinsi : -
Jarak PT ke Mitra : -
Luaran : laporan kegiatan
Waktu Pelaksanaan : 1-5 Maret 2021
Total Biaya :

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(Dr. Soni Darmawan, ST., MT.)



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Latar Belakang

Mendapatkan akses terhadap air minum yang layak merupakan hak dasar manusia yang harus dipenuhi. Kemudahan dalam mendapatkan air minum di sepanjang waktu dengan jumlah yang mencukupi dan kualitas yang aman menjadi hal yang wajib diperhatikan oleh para pemangku kepentingan. Kualitas air aman berarti memenuhi seluruh persyaratan air minum berdasarkan Peraturan Menteri Kesehatan No. 492 tahun 2010. Pemenuhan ini perlu dijaga karena mengonsumsi air minum yang tidak aman dapat menimbulkan penyakit bawaan air yang pada akhirnya dapat mempengaruhi kesejahteraan manusia.

Sebagai bentuk komitmen Pemerintah Indonesia untuk terus menjamin pemenuhan akan kebutuhan air minum yang aman, Pemerintah Indonesia mengembangkan konsep Rencana Pengamanan Air Minum (RPAM) yang merupakan adaptasi dari *Water Safety Plan* (WSP) milik *World Health Organization* (WHO). RPAM merupakan suatu pendekatan untuk mengelola risiko yang dapat menghambat proses produksi air minum aman di setiap tahap pada sistem penyediaan air minum, yaitu pada bagian sumber, bagian sistem pengolahan, bagian sistem distribusi, hingga air tersebut diterima oleh konsumen. Dosen Teknik Lingkungan Itenas diwadahi oleh LP2M Itenas telah mendapatkan kepercayaan WHO dan Kementrian PUPR untuk melaksanakan kegiatan webinar pelatihan RPAM bagi PDAM kategori sehat di seluruh Indonesia yang diselenggarakan selama 5 hari .

Sesuai dengan salah satu tujuan dari PKM yaitu memberikan saran dan solusi berdasarkan kajian akademik terhadap kebutuhan dan tantangan terkait lingkungan maka kami memenuhi undangan sebagai panitia dan narasumber pada penyusunan webinar RPAM Tersebut.

Tujuan Kegiatan

- Memberikan pelatihan terkait RPAM bagi PDAM Kategori Sehat di Indonesia
- Mengupdate informasi dan pengetahuan terkait modul-modul pada RPAM

Pelaksanaan

Pelaksanaan diselenggarakan secara daring di tempat masing-masing, dan kami sebagai panitia dan narasumber berkumpul di Gedung Teknik Lingkungan Itenas. Peserta dari webinar dapat dilihat pada table di bawah ini.

No	Instansi	Jumlah instansi	Jumlah Peserta
1	PDAM/Perumda Air Minum	46	127
2	Ministry of Public Works & Public Housing	2	4
3	Perpamsi	1	2
4	Perumda Tugu Tirta Kota Malang	1	3
5	IUWASH	1	1
6	Field facilitator	1	4

Tim pelaksanaa

Nama	Posisi	Keahlian	Penyampaian Modul
Rachmawati Sugihhartati Dj	Team Leader & Facilitator	Environmental (Env.) Engineering (Water & Wastewater Treatment, WSP)	Introduction & Module 7 (Verification)
Candra Nugraha	Team Member & Facilitator	Env. Engineering (Environmental Management)	Module 5 (Improvement Plan) & 8 (Management Procedures)
Iwan Juwana	Team Member & Facilitator	Env. Engineering (Environmental Management)	Module 4 (Control Measures and Re-assess Risk) & 11 (Revision)
M Ranga Sururi	Team Member & Facilitator	Env. Engineering (Water & Wastewater Treatment)	Module 2 (Describe the Water Supply System) & 6 (Operational Monitoring)
Mila Dirgawati	Team Member & Facilitator	Env. Engineering (Environmental & Health Management)	Module 3 (Identification of Hazards & Hazardous Events and Risk Analysis) & 9 (Supporting Programs)
Didin A. Permadi	Team Member & Facilitator	Env. Engineering (Environmental Management)	Module 1 (Assemble WSP Team) & 10 (Reviews)

LAMPIRAN

Webinar Report

**Web-Training to Water Operators in Understanding and Operationalizing Urban WSP
Implementation Manuals and field Assistance to Scale-up WSP in Selected Urban Water Utility
Operators (PDAMs)**

Prepared by:



Indonesia

March, 2021



YAYASAN PENDIDIKAN DAYANG SUMBI
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Webinar Report

Reporting Period: April 5, 2021 to April 9, 2021

Submittal Date March 26, 2021

Project Name : Web-Training to Water Operators in Understanding and Operationalizing Urban WSP Implementation Manuals and Field Assistance to Scale-Up WSP in Selected Urban Water Utility Operators (PDAMs)

Contractor Name : Lembaga Penelitian dan Pengabdian Masyarakat (LPPM), Institut Teknologi Nasional (Itenas) Bandung

I certify that this document and any attachment were prepared by me or under my direction in accordance with the terms and conditions of the Agreement for Performance of Work. Based on my inquiry of the persons or persons who manage the project or those directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false or misleading information.

Bandung, March 26, 2021
Head of LPPM Itenas Bandung

Iwan Juwana, S.T., M.EM., Ph.D.

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1. Background

Safe water supply is one of the critical factors to stop the spread of COVID-19 disease occurred nowadays. *World Health Organization* (WHO) stated that the provision of safe water can be achieved by implementing a water safety plan (WSP) or *Rencana Pengamanan Air Minum (RPAM)*. WSP is widely adopted worldwide as it is an effective tool to supply water, that is safe to be directly consumed (without boiling it) and not harming the consumers, through risk and management approach analysis from the point of drawing it at the source, via the treatment process to the consumer taps (WHO, 2004).

This web-based (Webinar) training was conducted to disseminate the newly developed national urban WSP implementation manual (RPAM Manual) to the urban water utility operators (Perusahaan Daerah

Air Minum/PDAMs). Considering the varied level of understanding of WSP within PDAMs, the Webinar was constructed so as to elevate the knowledge of PDAMs on a step-by-step approach of WSP principle and practice, facilitate the discussion and exercise/group work, and put them into a systematically operation within the daily running of the water supply system for assisting to the water quality control on a regular basis and in a sustainable way.

2. Agenda

Despite the changing dates of Webinar occurred since 2020, the Webinar was eventually planned to be running on March 1-5, 2021. Initial agenda of the Webinar that was shared to the participants is attached in Appendix 4.

3. Invited Participants

List of PDAMs that were invited to the Webinar were always changing as the changing conditions happened around the preparation time of the Webinar. Once the responsible authority of this project was under the Ministry of Public Health, there were 63 PDAMs invited to the Webinar. These PDAMs were taken from the list of PDAMs that had been socialized previously by the Ministry of Public Works and Public Housing since year 2012. Within these 63 PDAMs, their understanding of WSP is varied. 12 of them were supervised directly on site by the Ministry of Public Works and Public Housing, and by the Ministry of National Development Planning (Bappenas) i.e. (1) PDAM Kota Banjarmasin, (2) PDAM Kota Bandung, (3) PDAM Kota Malang, (4) PDAM Kota Payakumbuh, (5) PDAM Kota Salatiga, (6) PDAM Kabupaten Bandung, (7) PDAM Kota Palembang, (8) PDAM Kota Denpasar, (9) PDAM Kota Surabaya, (10) PDAM Kota Mataram, (11) PDAM Kota Medan, dan (12) PDAM Kota Pontianak; while the rests were trained by the Ministry of Public Works and Public Housing through the workshops either Bimbingan Teknis Provinsi or Bimbingan Teknis Kabupaten/Kota. These 63 PDAMs were trained on 4K (quality, quantity, continuity and affordability) targets of WSP. Appendix 1 shows these 63 PDAMs.

From these 63 PDAMs, only PDAM Kota Malang that was supervised and audited directly by WHO on 1K (quality target) since year 2017. PDAM Kota Banjarmasin was also visited and taught directly by WHO on 1K in year 2017; but not audited. WHO also did a workshop for 12 PDAMs (that were included in these 63 short-listed PDAMs) on 1K in year 2019, but only for Module 1 to Module 6.

As the responsible authority of the WSP diverted to the Ministry of Public Works and Public Housing, the PDAMs that were invited to the Webinar were also changed. The Ministry of Public Works and Public Housing would like to only invite those PDAMs that were not socialized on WSP yet. The new short-listed invited PDAMs were 65 PDAMs. Appendix 2 lists these 65 PDAMs.

However, after checked by LPPM Itenas, some PDAMs in the new list had been trained on WSP either by the Ministry of Public Works and Public Housing or by the WHO; so they were both included in the previous and new short-listed invited PDAMs as depicted in Appendix 3.

4. Methods

Webinar was planned to be running through various methods as below.

- 1) Dissemination of regulation and policy by the Government institutions/regulators i.e. Bappenas, the Ministry of Public Works and Public Housing, and the Ministry of Public Health; using zoom and PPT slides.
- 2) Sharing the insight on WSP by the United of Indonesian Water Utility (Perpamsi) using zoom and PPT slides.
- 3) Socialization of WSP principles and practices (Introduction and Module 1-11) by LPPM Itenas Team utilizing zoom and PPT slides.
- 4) Quiz of Introduction and Module 1-11 by LPPM Itenas Team utilizing zoom and PPT slides
- 5) Pre and Post Test by LPPM Itenas Team utilizing socrative
- 6) Discussion and group work for Module 1-6 using zoom, PPT slides, and whatsapp group
- 7) Question and answer using slido, zoom and PPT slides
- 8) Review of Introduction and Module 1-11 by LPPM Itenas using zoom and PPT slides
- 9) Evaluation of webinar using google form
- 10) Discussion between participants, regulators, WHO, LPPM Itenas, donor and other related parties using whatsapp group.
- 11) Interactive questions and answers on Day 5 using zoom application

5. Resource Persons

Resource persons from the Government institutions/regulators i.e. Bappenas, the Ministry of Public Works and Public Housing, and the Ministry of Public Health; were invited to deliver the policies and regulations of WSP. In addition, Perumda Tugu Tirta Kota Malang was also asked to share their experience and best practices in developing and implementing WSP in their water utility. Moreover, Perpamsi was requested as well to share their insight about WSP. Table 1 depicts the resource persons along with their topics shared in the Webinar.

Table 1 The Resource Persons along with their Topics Shared in the Webinar

Name	Institution	Position/Job Title	Topic
Nur Aisyah Nasution, ST MS	Ministry of National Development Planning (Bappenas)	Intermediate Functional of the Directorate of Housing and Settlements	Policy of WSP
Ir. Yudha Mediawan, M.Dev.Plg	Ministry of Public Works and Housing	Director of Drinking Water	Opening remarks
Dades Prinandes, ST, Msi	Ministry of Public Works and Housing	Head of Sub Directorate of Technical Planning, Directorate of Drinking Water	Drinking water safety plan as a strategy to achieve safe drinking water target

Juliana Lestari, ST	Ministry of Public Works and Housing	Sub Coordinator of Institutional, Directorate of Drinking water	Closing remarks
Ely Setyawati	Ministry of Health	Coordinator of the Sub-Directorate for Water Health and Sanitation, Directorate of Environmental Health	Indicators of Water Quality Monitoring and WSP Audit Plan
Rudie Kusmayadi	Perpamsi	Chairman	Role of PERPAMSI in the implementation of WSP

6. Facilitators

4 (four) facilitators delivered the modules of WSP Manual coordinated by the Team Leader. The Team Leader also acted as the main facilitator. The facilitators are from LPPM Itenas as shown in Table 2.

Table 2 Facilitators from LPPM Itenas

Name	Position in the Team	Expertise	Module Shared
Rachmawati Sugihhartati Dj	Team Leader & Facilitator	Environmental (Env.) Engineering (Water & Wastewater Treatment, WSP)	Introduction & Module 7 (Verification)
Candra Nugraha	Team Member & Facilitator	Env. Engineering (Environmental Management)	Module 5 (Improvement Plan) & 8 (Management Procedures)
Iwan Juwana	Team Member & Facilitator	Env. Engineering (Environmental Management)	Module 4 (Control Measures and Re-assess Risk) & 11 (Revision)
M Ranga Sururi	Team Member & Facilitator	Env. Engineering (Water & Wastewater Treatment)	Module 2 (Describe the Water Supply System) & 6 (Operational Monitoring)
Mila Dirgawati	Team Member & Facilitator	Env. Engineering (Environmental & Health Management)	Module 3 (Identification of Hazards & Hazardous Events and Risk Analysis) & 9 (Supporting Programs)
Didin A. Permadi	Team Member & Facilitator	Env. Engineering (Environmental Management)	Module 1 (Assemble WSP Team) & 10 (Reviews)

To make the webinar more interesting and livelier; as well as giving a real full picture of the development and implementation of WSP on site, in presenting each module of WSP, the facilitators were supported by the resource persons from Perumda Tugu Tirta Kota Malang. These resource persons are listed in Table 3.

Table 3 Resource Persons from Perumda Tugu Tirta Kota Malang

No	Name	Job Title	Position in RPAM Team	Appeared in Module
1.	Dra. Nanis Setiari, M.M.	Job Control Manager	Team Leader	Introduction, and Module 1, 7, 11
2.	Djaka Setyanta, S.T.	Raw and Treated Water Quality Control Assistant Manager	Member of Team 1: Monitoring and Evaluation	Module 4

3.	Gigih Yuli Asmara, S.T.	Instrument Control & Supervisory Control and Accusation Data (SCADA) Asisstant Manager	Member of Team 1: Monitoring and Evaluation	Module 2, 4, 5, 8, 10
4.	Agung Putra Kusuma, S. Kom	Progammer	Member of Team: System Control	Module 3, 6, 9, and Lesson Learnt

7 Implementation

Due to the covid pandemic, the changing staff in the Directorate level in the Ministry of Public Health (December 1, 2020), the change of the responsible authority of this work (WSP) from the Ministry of Health to the Ministry of Public Works and Public Housing (January 7, 2021), and staff rotation in the Ministry of Public Works and Public Housing (February 26, 2021), the Webinar had been postponed many times; and keep changing its dates from July 27-31, 2020 (based on the proposal sent by LPPM Itenas); to Nov 2-6, 2020; end of Nov, 2020; Dec 7-11, 2020; Jan 11-15, 2021; Feb 1-5, 2021; March 1-5, 2021, Feb 21-26, 2021, and back to March 1-5, 2021. The Webinar was finally conducted on 1 – 5 Maret 2021 via Zoom Meeting application.

7.1 Agenda

Changes were made, two (2) times, to the agenda that had already shared to the participants. First change was made as to shorter the times of Webinar on the last day (Day 5). Day 5 was on Friday where Moslem man had to go to the mosque for obliged Friday praying. As there were participants from East Indonesian Time, the initial agenda would pass this praying time; thus the agenda was slightly modified to allow this matter.

Second change was done again as requested by the resource person from the Ministry of Public Health. As she could not make her allocated time on Day 4, her time was then moved to Day 5. This modification altered the agenda, shortened other allocated times, lengthened the agenda by 10 minutes, but still allow the Moslem East Indonesian Time participants to do their praying obligation. Appendix 5 depicts the two modifications agenda.

The actual times of the Webinar were slightly different from that of the Agenda. There were the speaker that was not shown in the allocated time; the resource persons that were talked much longer than the allocated times; and/or the Webinar committee as the time keeper did not aware of the lengthened talking so as they missed to inform the speaker about this matter. Appendix 6 shows the actual times taken for each session along with the notes describing the situation leading to the deviation of the scheduled times.

7.2. Participants

127 people from 44 PDAMs/Perusahaan Umum Daerah (Perumda) Air Minum were registered as participants. In addition, the webinar was attended by the regulators i.e. Bappenas, the Ministry of Public Works and Public Housing, the Ministry of Public Health; other related parties i.e. Perpamsi, Balai Teknik Kesehatan Lingkungan (BTKL), Indonesia Urban Water Sanitation and Hygiene (IUWASH), and field

facilitators, as shown in Table 4. Appendix 7 depicts the detailed Webinar participants showing the institutions and number of people registered.

Table 4 Participants of the Webinar

No	Unit	Total Units	Total Participants
1	PDAM/Perumda Air Minum	46	127
2	Ministry of Public Works & Public Housing	2	4
3	Perpamsi	1	2
4	Perumda Tugu Tirta Kota Malang	1	3
5	IUWASH	1	1
6	Field facilitator	1	4

7.3 Methods

- 1) *Dissemination of regulation and policy by the Government institutions/regulators i.e. Bappenas, the Ministry of Public Works and Public Housing, and the Ministry of Public Health; using zoom and PPT slides*

Disseminations of regulation and policy by the Government institutions/regulators were running well except one of the resource persons from the Ministry of Public Health did not show up, without any news, in the opening session. She did not appear again on Day 4 and requested to allocate her time on Day 5. Despite her lateness on Day 5, she eventually showed up at 09.10 on Day 5. This delayed made next sessions were deferred also. Other resource persons were on the room on the allocated times.

The scheduled and actual times for each resource person can be seen in Appendix 4-6. Zoom application was used for these disseminations; and PPT slides from each resource person were shared via zoom. Appendix 8a describes the PPT slides shared by the resource persons. These slides could also be downloaded from google drive with this link: <https://drive.google.com/drive/folders/1VTR0W-YBKsgwKO3a-113xQ735zIlF1Qf>. The talks from the resource persons were documented in Appendix 8b.

- 2) *Sharing the insight on WSP by WHO and the United of Indonesian Water Utility (Perpamsi) using zoom and PPT slides*

WHO did his opening remarks of Webinar using zoom application on the opening session of Day 1; while the Head of Perpamsi delivered his on PPT slides using zoom application on Day 5, about 28 minutes late than his allocated time due to the lateness of the resource person from the Ministry of Public Health. His PPT slides were also in Appendix 8, and could be retrieved from google drive with this link: <https://drive.google.com/drive/folders/1VTR0W-YBKsgwKO3a-113xQ735zIlF1Qf>.

- 3) *Socialization of WSP principles and practices (Introduction and Module 1-11) by LPPM Itenas Team utilizing zoom and PPT slides*

WSP principles and practices for Introduction and Module 1-11 were shared by LPPM Itenas Team on PPT slides using zoom application. PPT slides for these were depicted in Appendix 9a. The slides could be downloaded as well from google drive with this link: <https://drive.google.com/drive/folders/1VTR0W-YBKsgwKO3a-113xQ735zIlF1Qf>.

These slides were particularly created based on the draft Manual of WSP published by the Ministry of Public Works and Public Housing in January 2021. In addition, the style and other key points were taken from the virtual training of WSP done by WHO in October 2020. Moreover, lesson learnt, best practices, and photos were gathered from the WSP documents made under the Ministry of Public Works and Public Housing supervision of WSP development and implementation since year 2012.

In delivering the Modules as well as the Introduction, LPPM Itenas Team was supported by the resource persons from Perumda Tugu Tirta Kota Malang as shown in Table 3. Their shared of WSP experiences of their water utility are attached in Appendix 9b documented for each session.

4) *Quiz for Introduction and Module 1-11 by LPPM Itenas Team utilizing zoom and PPT slides*

Quiz for Introduction and Module 1-11 were shared through zoom application; and for Modul 7 utilized PPT slides as well. Percentage of participants did the quiz could be seen by the host as well as percentage of participants that answer the quiz correctly. Link for zoom for each Module (and Introduction) was shared through link: <https://drive.google.com/drive/folders/1VTR0W-YBKsgwKO3a-113xQ735zILF1Qf>. Each question was discussed by the related facilitator directly after the participants had finished their quizzes. Appendix 10 lists the quizzes for Introduction and Module 1-11 along with the answers.

5) *Pre and Post-Test by LPPM Itenas Team utilizing Socrative*

Pre and post-test could be accessed by the participants using the link <https://b.socrative.com/login/student/> of Socrative. The questions for pre and post-test were made exactly the same in order to get a picture of how the participants had improved their understanding of WSP after the Webinar. Appendix 11 shows the pre and post-test questions. The results of the pre and post-test are depicted in Figure 1.

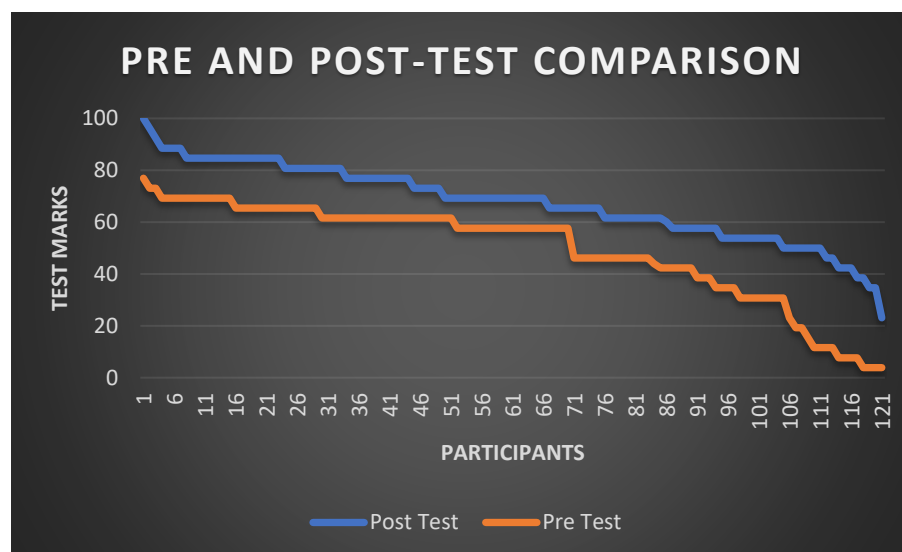


Figure 1 Results of the Pre and Post-Test

Comparing the results of pre and post-test, Figure 1 shows that there is a significant improvement of the participants' marks during the tests. The average mark of the post-test was 66.4%, while the pre-test was 49.8%. This improvement mark should not be taken into granted as is not enough to reflect the good understanding of WSP. Achieving water quality target is extremely important, thus 66.4% average mark

could not be relied on. This mark implies that in average their understanding of WSP was only 66.4%, quite far from 100%. If we would like to deliver safe water to our customers, there is no exception at all, that we should 100% understand WSP. Table 5 shows that 72.73% participant got the score below 80; thus, more works required to enhance the participants knowledge of WSP, such as regular training on WSP, mentorships, intensive consultancy, or other necessary means, by the WSP experts.

Table 5 Score of Pre and Post-Test

Score	Pre-test		Post-test	
	Number of participants	Percentage (%)	Number of participants	Percentage (%)
90-100	0	0.00	3	2.48
80-90	0	0.00	30	24.79
70-80	3	2.48	16	13.22
60-70	48	39.67	37	30.58
50-60	19	15.70	18	14.88
40-50	20	16.53	12	9.92
30-40	15	12.40	4	3.31
20-30	1	0.83	1	0.83
10-20	7	5.79	0	0.00
0-10	8	6.61	0	0.00
Total	121		121	

Participants could obtain their results through google drive with link <https://drive.google.com/drive/folders/1maO0iyg8I9eYKkFSCe2vJWtG6dDnjzWH?usp=sharing> for the pre-test, and https://drive.google.com/drive/folders/1VNnnOzt-tmdCp3IHft7v_j-L8Ns0kSBI?usp=sharing for the post-test. Three (3) participants with the highest scores, shown in Table 6, obtained the letter of appreciation from the Ministry of Public Works and Public Housing. Criteria for having the appreciation letter was not only of the highest score achieved in the post-test, but also of the attendance, activeness during the Webinar, and pre-test results. Other participants got a letter of notice (attached in Appendix 12) for attending this Webinar.

Table 6 Three Participants with the Highest Scores of the Post-Test

No.	Name of the participant	Institution	Post-test Score
1	I Putu Gede Sudarsana	PDAM Kabupaten Badung	100
2	Dwi Shara	Perumdam Kabupaten Tangerang	96.15
3	Mya Musyarowawati	PDAM Kota Depok	92.31

6) Discussion and group work for Module 1-6 using zoom, PPT slides, and whatsapp group

For Module 1-6, participants were asked to do tasks; in group, based on their PDAMs/Perumdams; related to each Module. The results were collected through whatsapp group created for this Webinar, called Webinar RPAM 2021. One PDAM was chosen each day to present their work every next morning. The work was then discussed, commented and corrected by the related facilitator and/or the Team Leader. Appendix 13 shows their group works for Module 1-6.

7) *Question and answer using slido, zoom and PPT slides*

Questions raised by the participants were collected through slido with link provided for each day and answered every next morning by the team Leader using zoom application and PPT slides. Appendix 14 depicts the questions and answers of Introduction, Module 1-11, and any related questions to Webinar.

- Day 1: <http://bit.ly/link-pertanyaan-hari1>
- Day 2: <http://bit.ly/link-pertanyaan-hari2>
- Day 3: <http://bit.ly/link-pertanyaan-hari3>
- Day 4: <http://bit.ly/link-pertanyaan-hari4>
- Day 5: <http://bit.ly/link-pertanyaan-hari5>

8) *Review of Introduction and Module 1-11 by LPPM Itenas using zoom and PPT slides*

Every morning, opening the session on day 2-5, review of the key points of previous day Modules (and Introduction) were done by the Team Leader. Appendix 15 shows the PPT slides in pdf for the review.

9) *Evaluation of webinar using google form*

In order to know the level of satisfaction of participants regarding the Webinar, and to improve the next Webinar, a questionnaire was distributed via google form to all participants via link <http://bit.ly/EvaluasiRPAM>. This form was also created to find out their willingness to be the pilot project of WSP development and implementation. Responses were obtained from 103 respondents (about 70% of the participants). In addition, 81% of respondents stated their willingness to be technically supervised in WSP for their piloted water utility. The participants responses are summarized below.

a) *The purpose of attending the WSP webinar*

Most respondents aim to increase their knowledge, get information, better understand, and add their insight. Based on the results of the evaluation, 98% felt that these objectives could be met. Figure 2 shows the percentage of their objectives achievement.

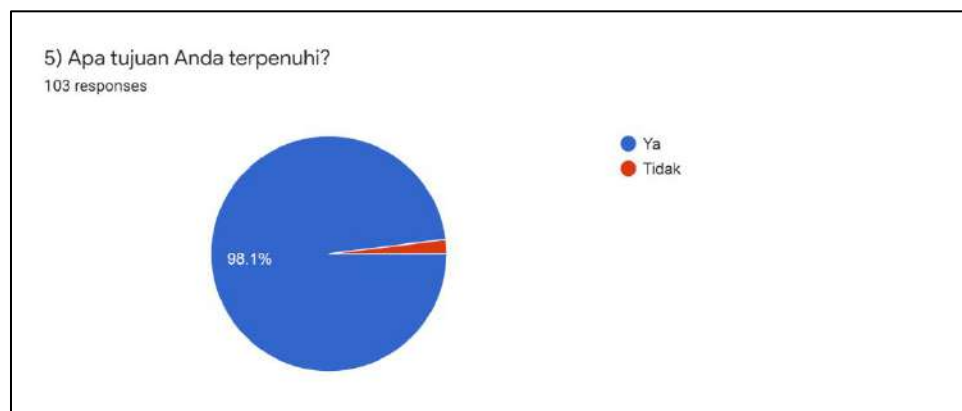


Figure 2 The percentage of the Participants Objectives Achievement

b) *Implementation evaluation*

Participants are asked to give a rating on a scale of 1 (very bad) to 5 (very good). From the results of the evaluation, most participants rated the webinar content as "good" or "very good". However, most of them said the tempo/duration of the webinar as "fair" or "good". On another question in this evaluation, the

participants stated that the tempo/duration of the material delivery was too short; so, they got some difficulties to be able to understand the whole material properly. Nevertheless, the overall course of the webinar was rated "good" or "very good". Figure 3-6 depicts their responses to the content, the tempo, the performance of the Webinar, and of the Webinar committee subsequently.

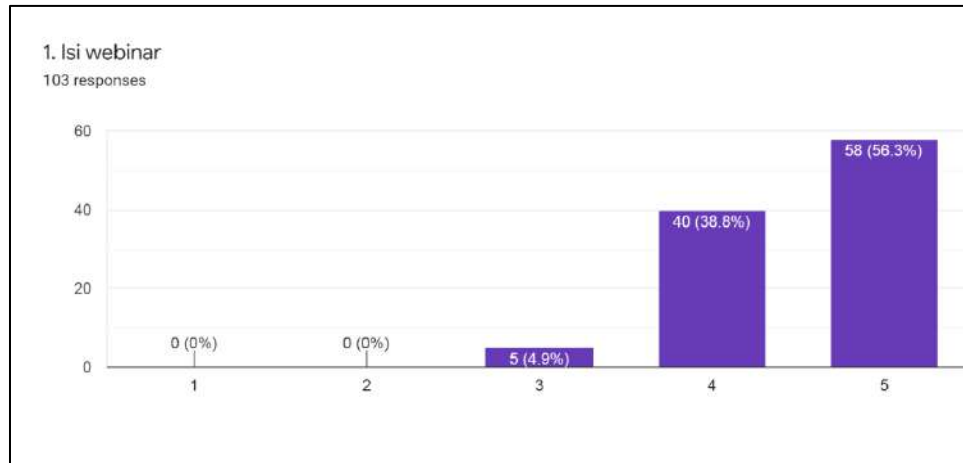


Figure 3 Participants Responses to the Content of the Webinar

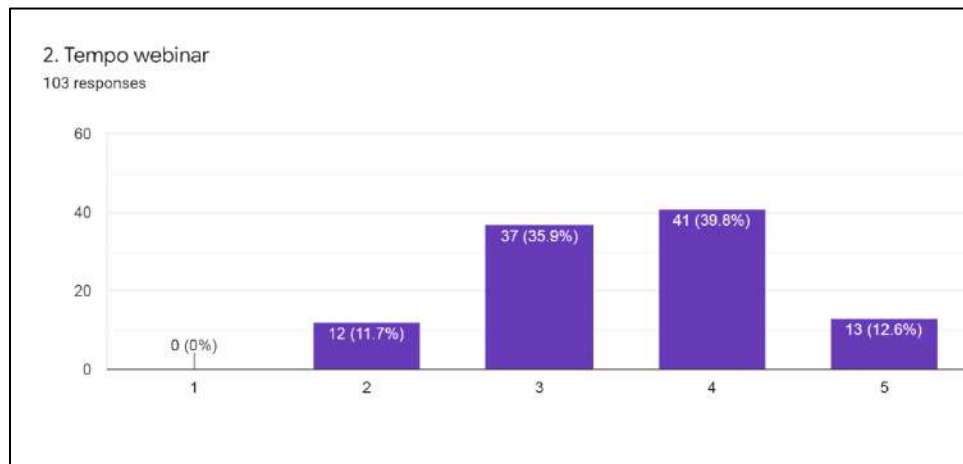


Figure 4 Participants Responses to the Tempo of the Webinar

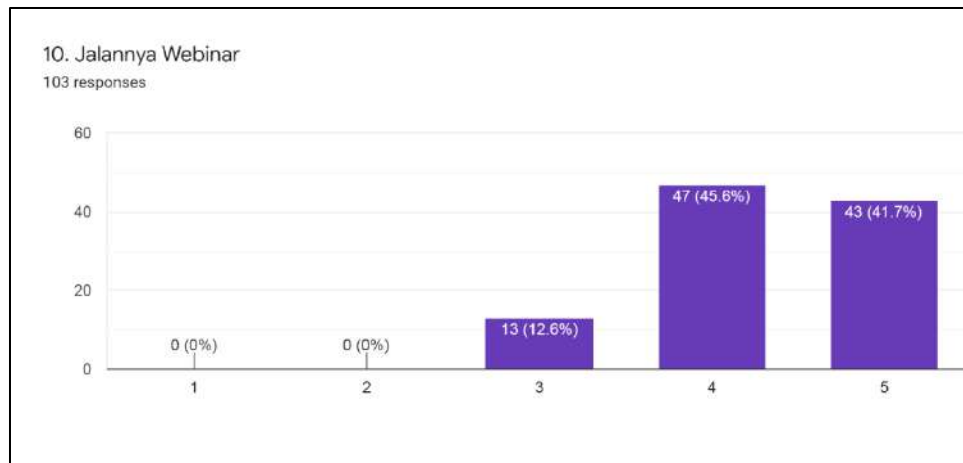


Figure 5 Participants Responses to the Performance of the Webinar

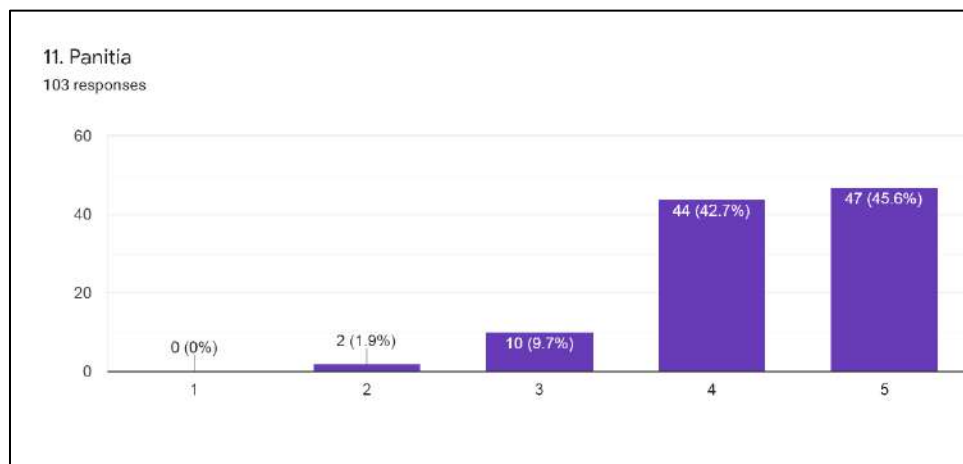


Figure 6 Participants Responses to the Performance of the Webinar committee

c) Explanation of training module

For the training module, participants were also asked to make an assessment on the same scale 1 to 5. Overall, the results of the assessment of the content of the material and the speakers/facilitators were "good" or "very good" results. Figure 7-18 shows the participants responses to the Introduction and Module 1-11 respectively.

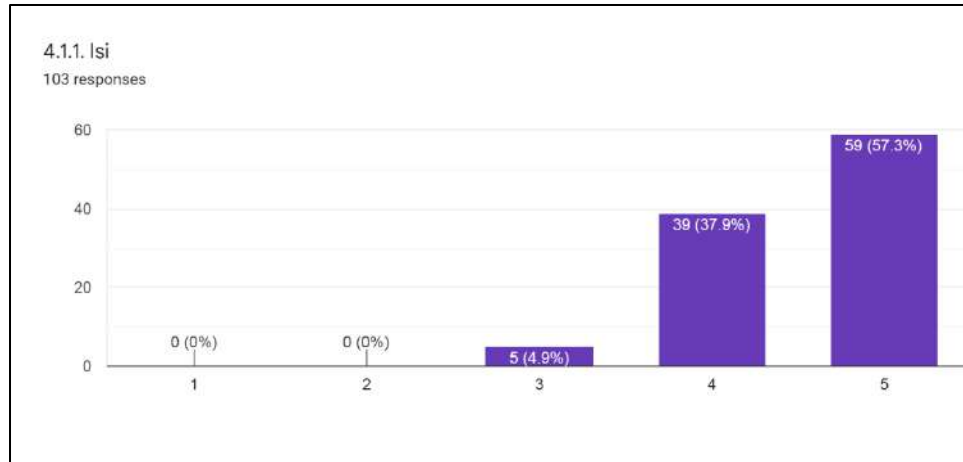


Figure 7 Participants Responses to the Introduction of WSP

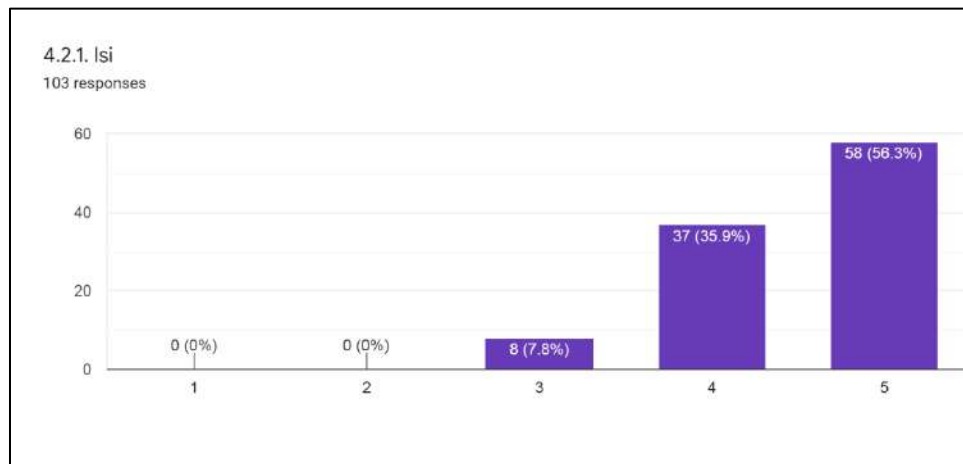


Figure 8 Participants Responses to Module 1: Assemble of WSP Team

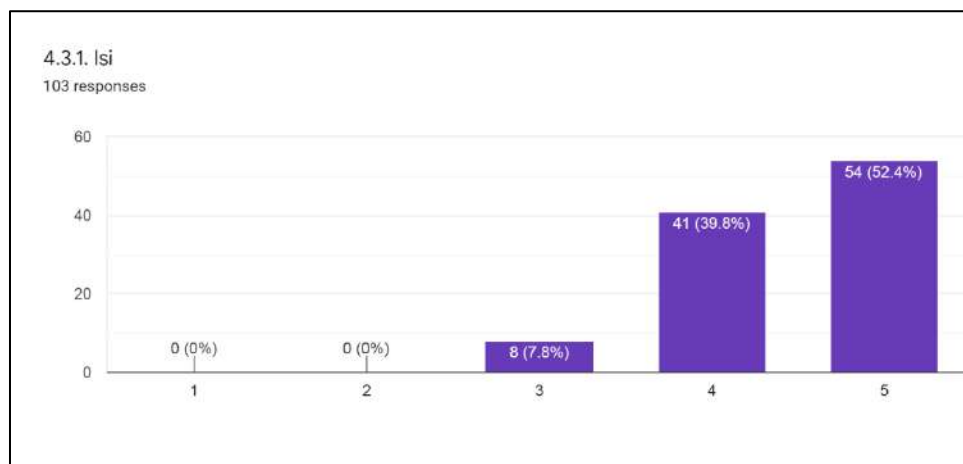


Figure 9 Participants Responses to Module 2: Description of Water Supply System

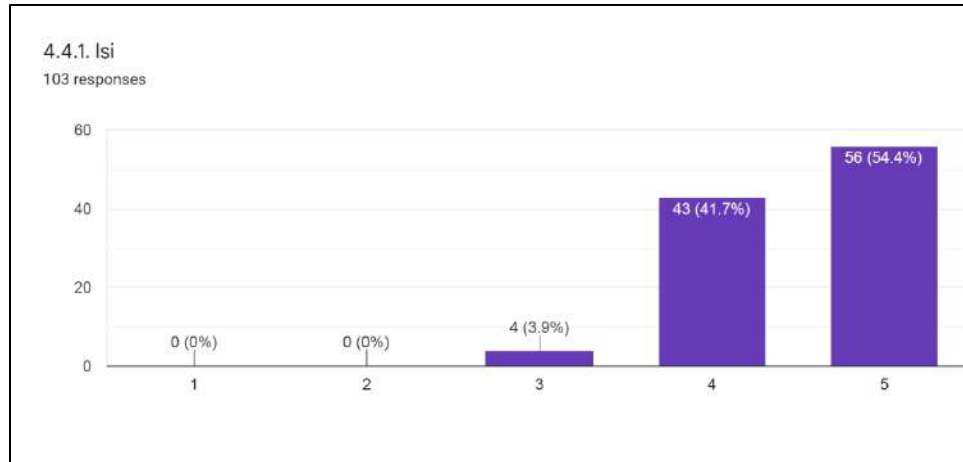


Figure 10 Participants Responses to Module 3 Identification of Hazard & Hazardous Events, and Risk Analysis

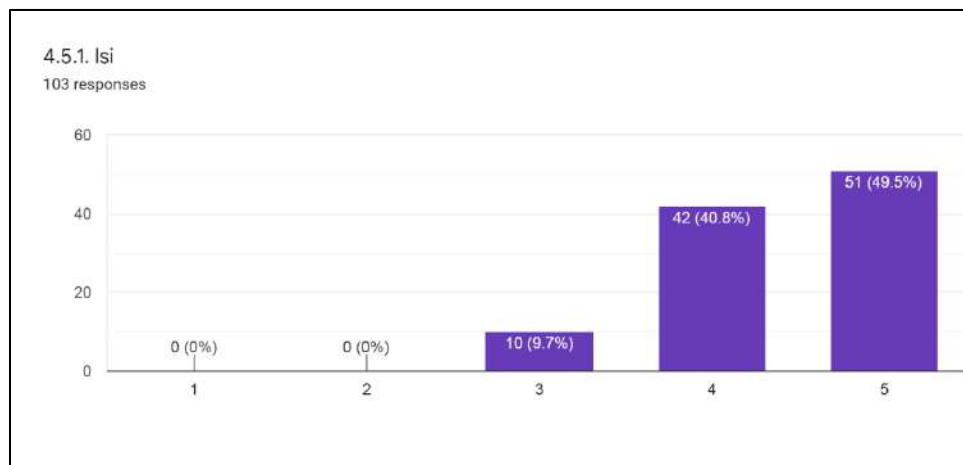


Figure 11 Participants Responses to Module 4: Risk Control Measure and Re-Assess Risk

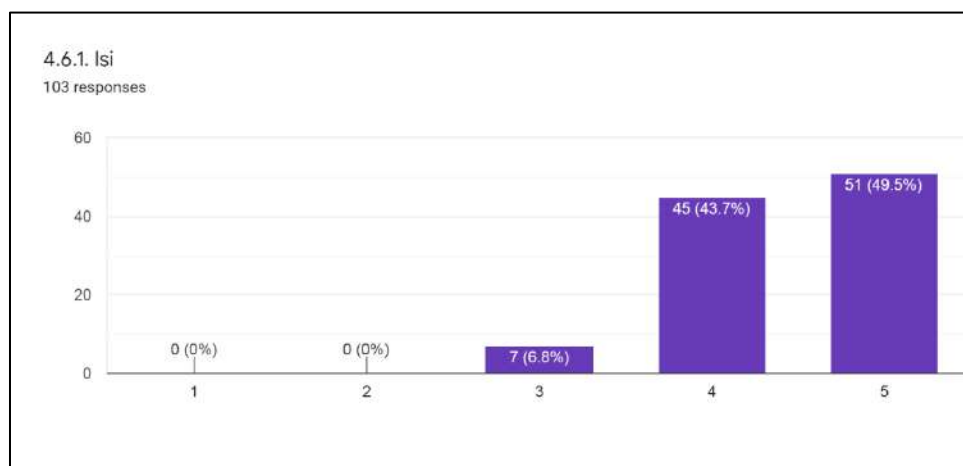


Figure 12 Participants Responses to Module 5: Improvement Plan

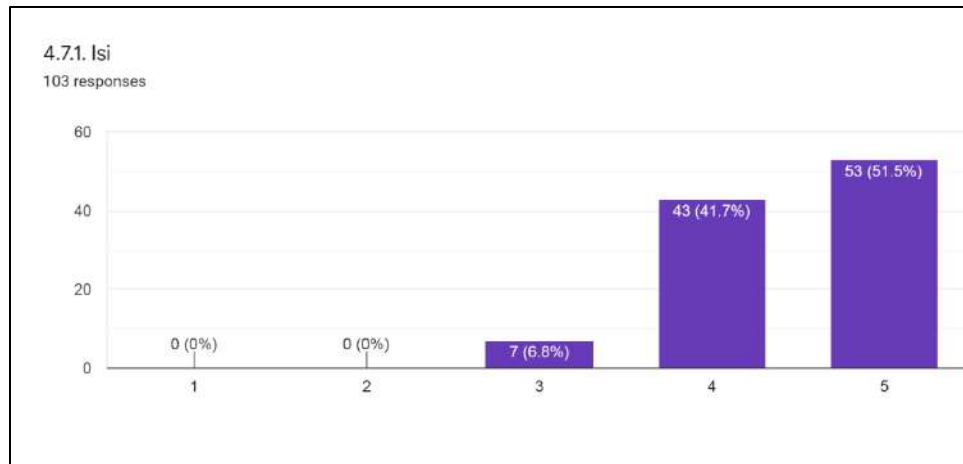


Figure 13 Participants Responses to Module 6: Operational Monitoring

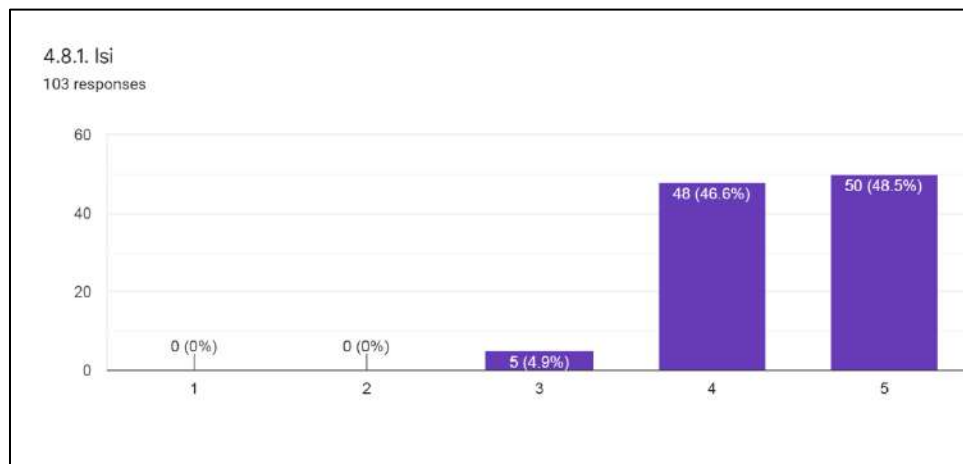


Figure 14 Participants Responses Module 7: Verification

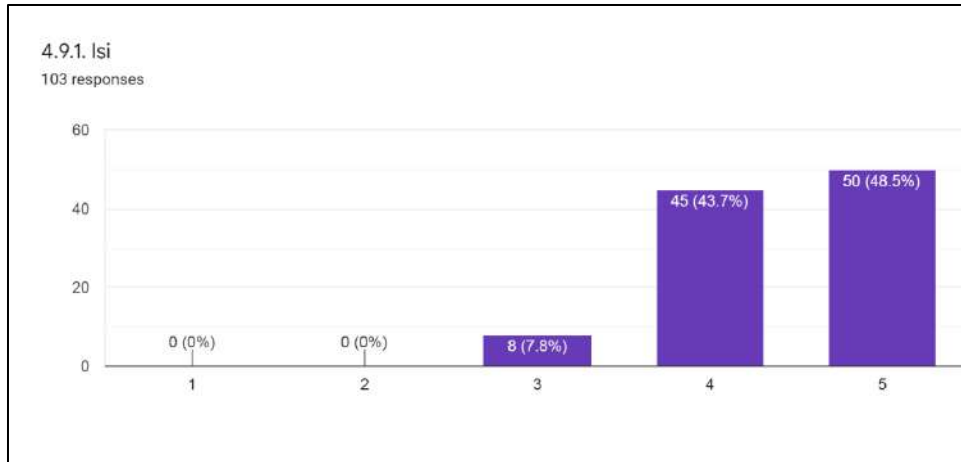


Figure 15 Participants Responses to Module 8: Management Procedures

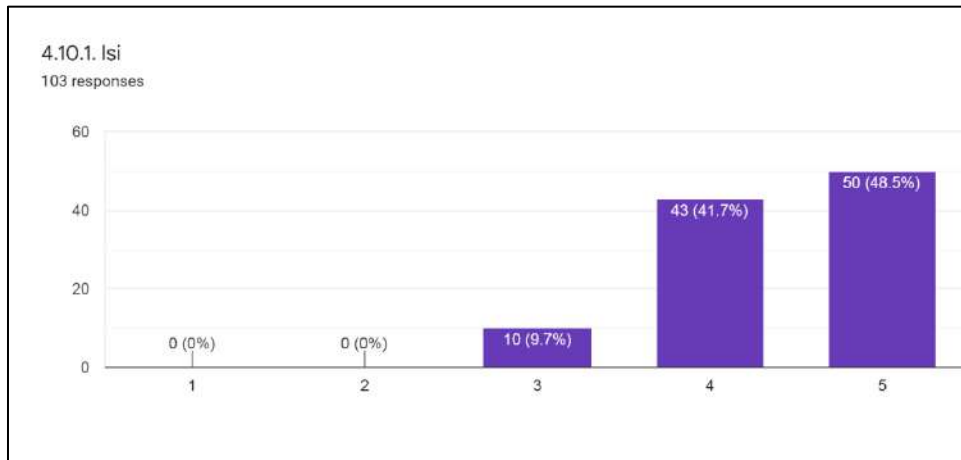


Figure 16 Participants Responses to Module 9: Supporting Programs

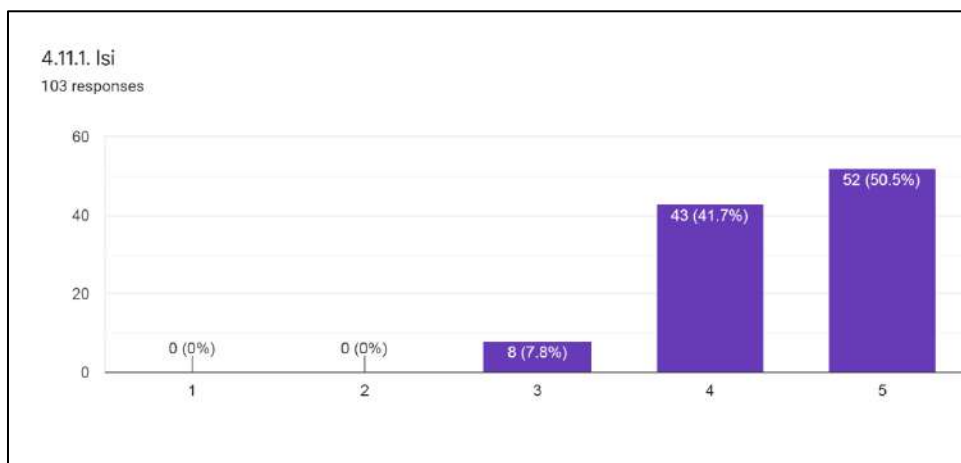


Figure 17 Participants Responses to Module 10: Review

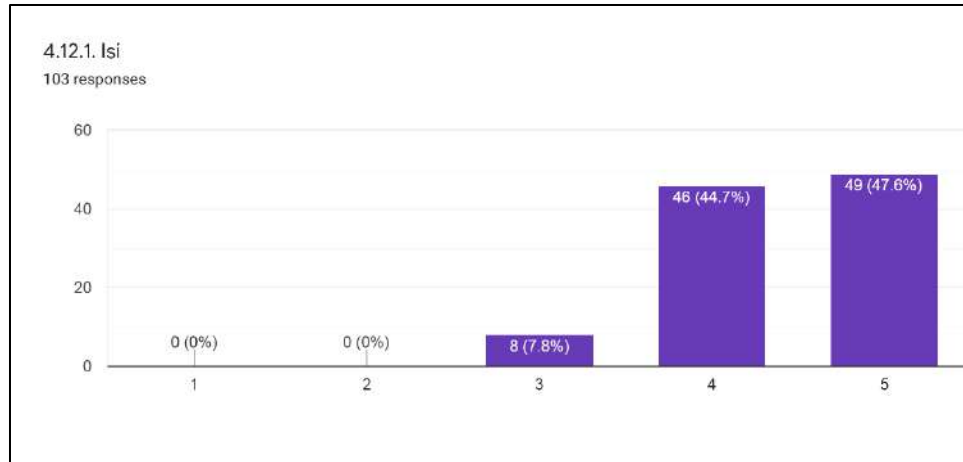


Figure 18 Participants Responses to Module 11: Revision

d) Supporting Methods & Materials

To improve the understanding of the material in each module, several additional activities were carried out such as quizzes, group-works, and pre & post-tests. Materials of the Webinar in pdf were also shared. These supporting methods and materials were also evaluated. The results of the participants' assessments generally show "good" or "very good" results, as shown in Figure 19-23 subsequently.

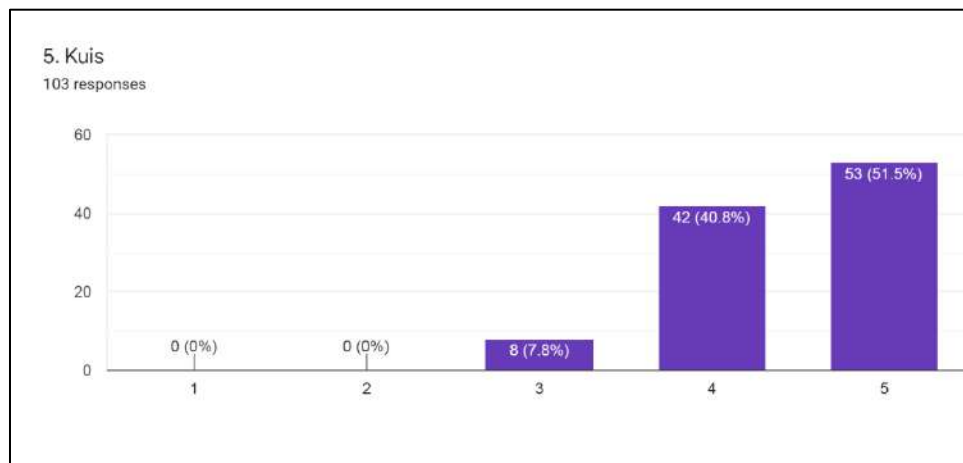


Figure 19 Participants Responses to the Quizzes Sessions

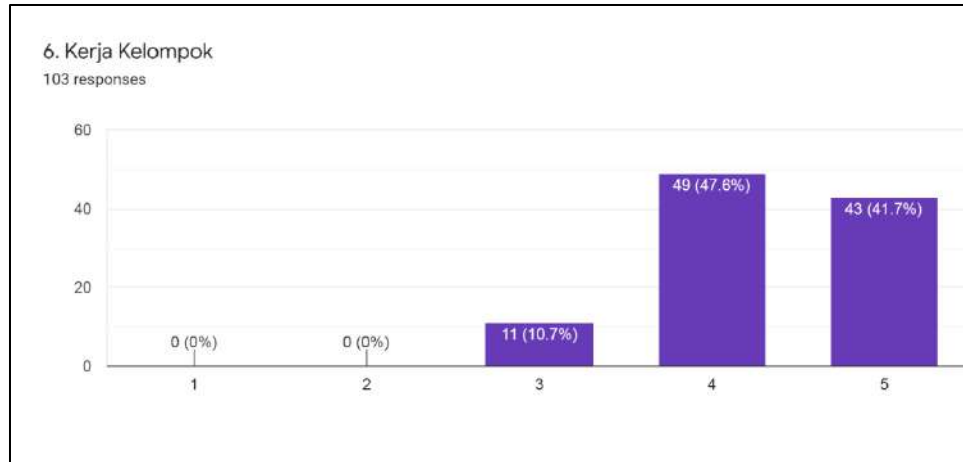


Figure 20 Participants Responses to the Group-works Sessions

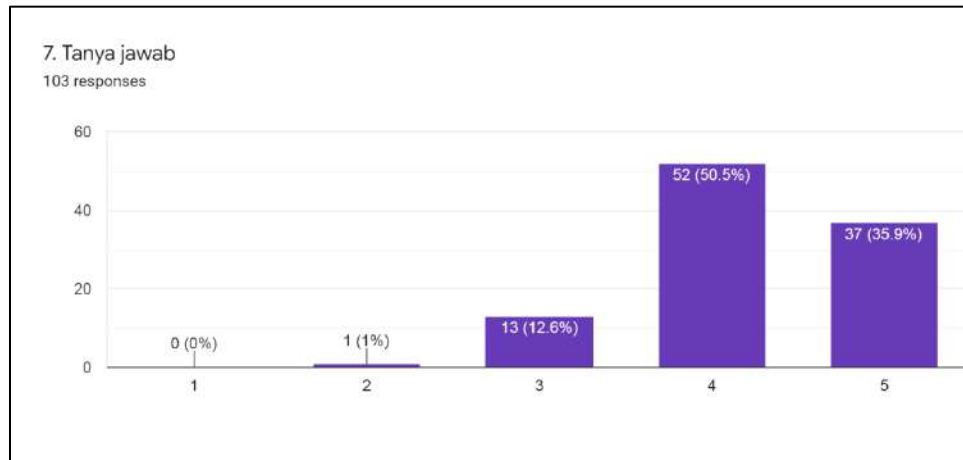


Figure 21 Participants Responses to the Questions & Answers Sessions

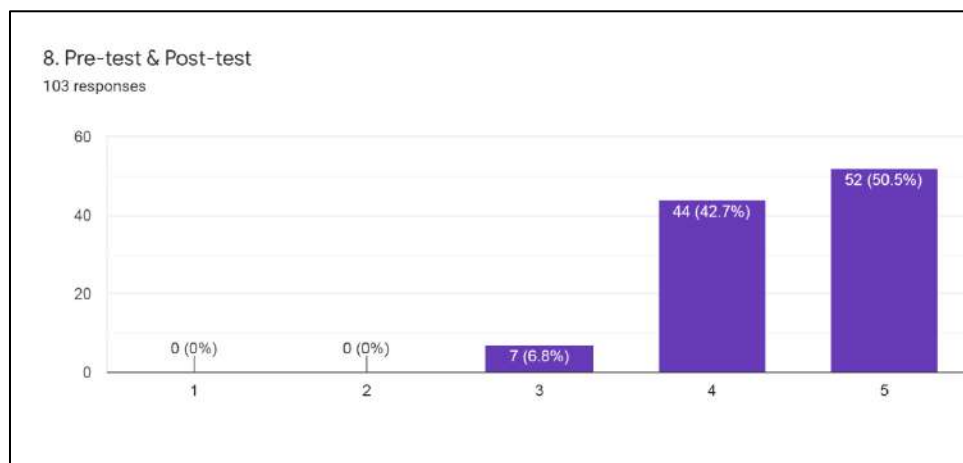


Figure 22 Participants Responses to the Pre & Post-Tests Sessions

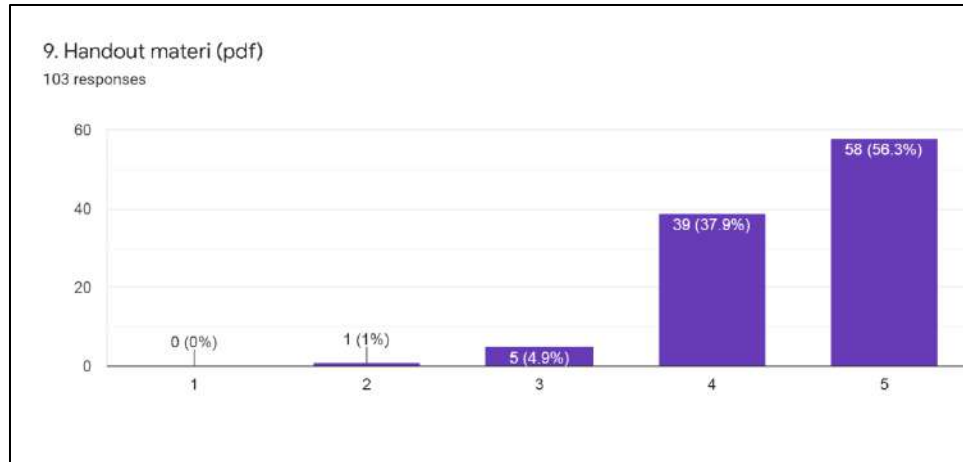


Figure 23 Participants Responses to the Handout in pdf

e) Supporting Presentation

Resource persons from related ministries/agencies and Perumda Tugu Tirta Kota Malang were also evaluated. The results of these assessment are generally "good" or "very good" as shown in Figure 24- respectively.

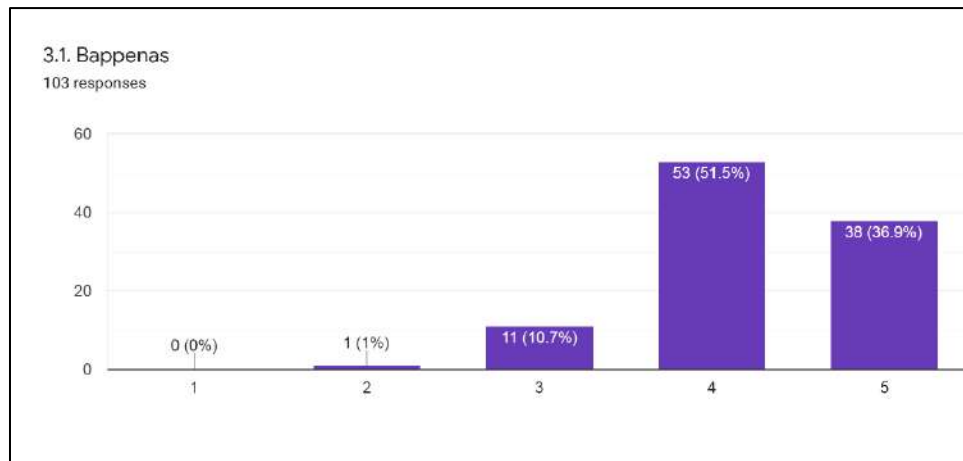


Figure 24 Participants Responses to the Ministry of National Planning and Development Session

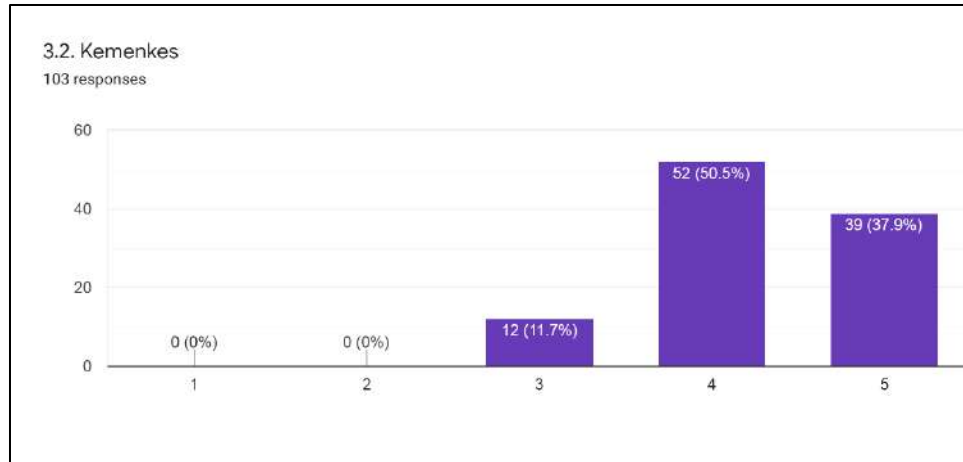


Figure 25 Participants Responses to the Ministry of Public Health Session

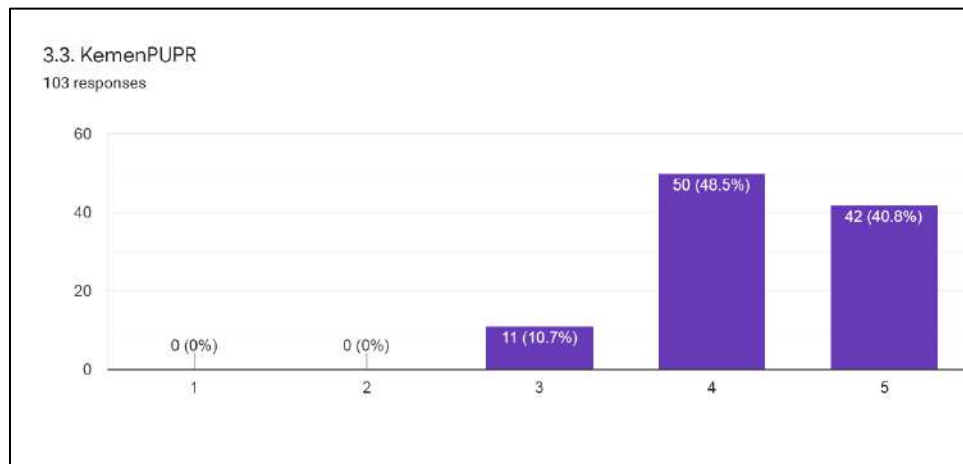


Figure 26 Participants Responses to the Ministry of Public Works and public Housing Session

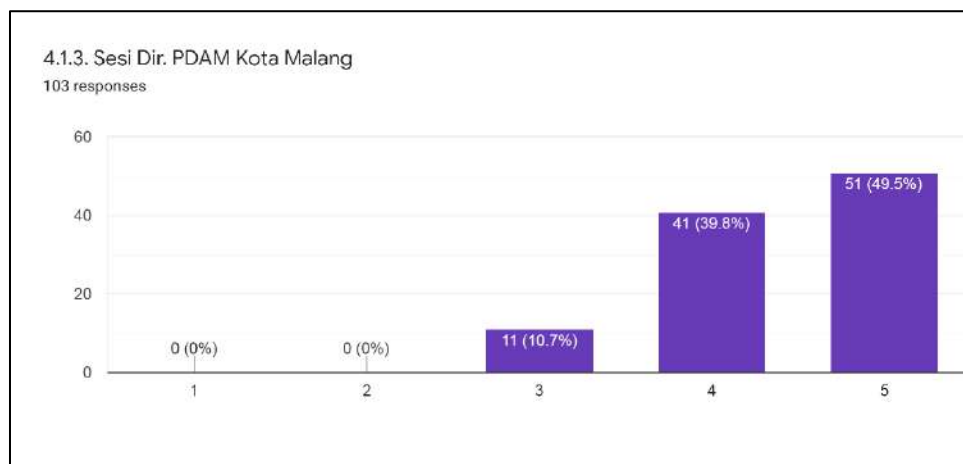


Figure 27 Participants Responses to the Director of Perumda Tugu Tirta Kota Malang Session

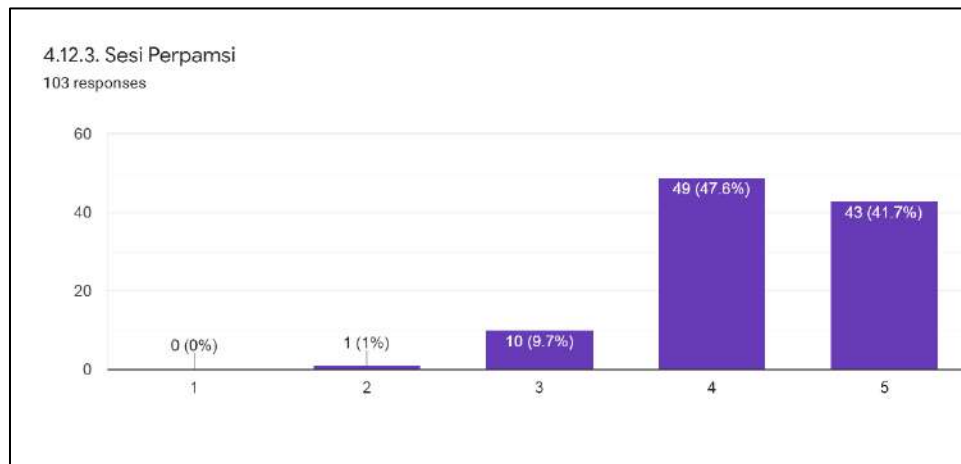


Figure 28 Participants Responses to the United of Indonesian Water Utility Session

f) The plan after the webinar

In general, most participants hoped that they could better understand the stages of preparing the WSP, to further implement the WSP in their respective work areas. In addition, for those who have had WSP, they hoped that they could revised it by reviewing the existing risks and control measures. From the results of the evaluation, it was known that the participants also wanted to convey to their friends/ colleagues about the importance of participating in this activity, because the material was good and important for improving the SPAM performances.

Related to the willingness to become a pilot WSP implementation through providing technical guidance in the field, 81% of respondents said 'Willing' and 7% 'Depends on the management decisions'. This result strengthens the opinion of most respondents who consider the importance of WSP. Figure 29 depicts this willingness.

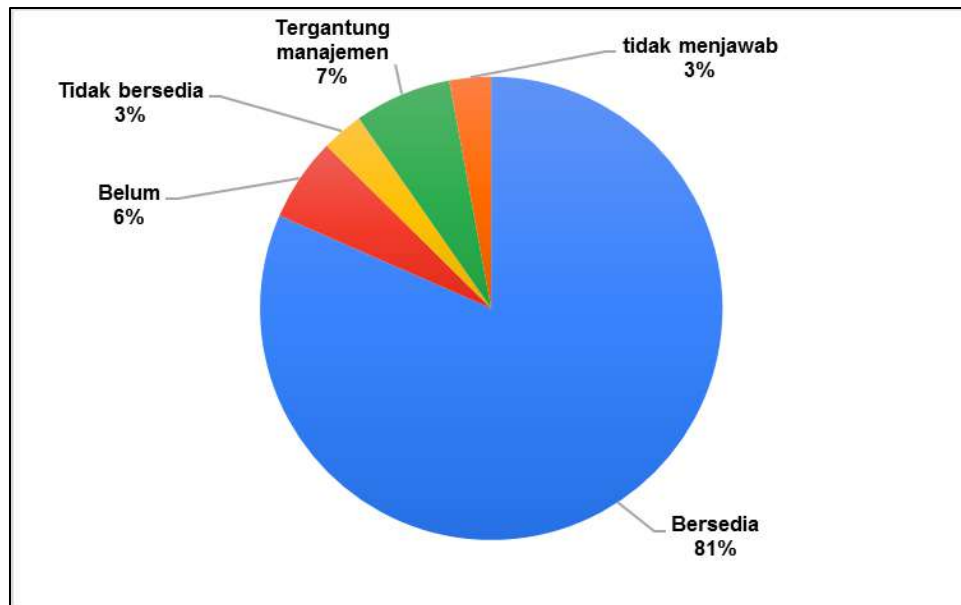


Figure 29 Participants Willingness to Become the Pilot Project of WSP

10) Discussion between participants, regulators, WHO, LPPM Itenas, donor and other related parties using whatsapp group

Whatsapp group was created as a tool to discuss any related problems with WSP, with regulators, WHO, LPPM Itenas, donor and other related parties. This group was called Webinar RPAM 2021 during the running of the Webinar; and was changed into Alumni Webinar RPAM 2021 after the Webinar had finished.

11) Interactive questions and answers on Day 5 using zoom application

Questions and answers (Qs & As) were done actively on Day 5 after the sessions of the resource person from the Ministry of Public Health and Perpamsi. Appendix 16 depicts these Qs & As.

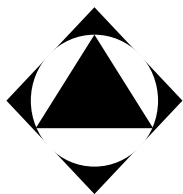
7.4 Documentation

The documentation for the Webinar is attached in Appendix 17 and was also shared through this link: <https://drive.google.com/drive/folders/1kl2mRJNHLMJvQZrpcdOp3Vzebpdze2js>.

References

1. Kementerian Pekerjaan Umum dan Perumahan Rakyat (PUPR), Draft Pedoman Pelaksanaan Rencana Pengamanan Air Minum untuk Sistem Jaringan Perpipaan, 2021
2. Lembaga Penelitian dan Pengabdian Masyarakat (LP2M), Institut Teknologi Nasional Bandung, Pelatihan Webinar bagi Penyelenggara Sistem Penyediaan Air Minum (SPAM) untuk Memahami dan Melaksanakan Manual Rencana Pengamanan Air Minum (RPAM), dan Bantuan Teknis untuk Melaksanakan RPAM di Perusahaan Daerah Air Minum (PDAM) Terpilih, Bandung, Indonesia, Desember, 2020
3. Lembaga Penelitian dan Pengabdian Masyarakat (LP2M), Institut Teknologi Nasional Bandung, Proposal Ref: RFP 069-2020, Web-Training to Water Operators in Understanding and Operationalizing Urban WSP Implementation Manuals and Field Assistance to Scale-Up WSP in Selected Urban Water Utility Operators (PDAMs), , Bandung, Indonesia, June, 2020
4. World Health Organization (WHO), Virtual Training, Water Safety Planning Introduction to Principles and Steps, 29 October 2020

World Health Organization (WHO), Strengthening National Initiatives on Water Safety Plan (WSP) Implementation. Final Report, September 2019.



SURAT KETERANGAN
MELAKUKAN KEGIATAN PENGABDIAN KEPADA MASYARAKAT
INSTITUT TEKNOLOGI NASIONAL
No. 304/C.02.01/LPPM/V/2021

Yang bertanda tangan di bawah ini,

Nama : Iwan Juwana, S.T., M.EM., Ph.D.
Jabatan : Kepala
Unit Kerja : LPPM-Itenas
JL. P.K.H. Mustafa No.23 Bandung

Menerangkan bahwa,

No.	Nama	NPP	Jabatan
1	Rachmawati S. Dj., Ir., M.Env.Stud., Ph.D.	980712	Tenaga Ahli
2	Dr. M. Rangga Sururi, S.T., M.T.	20040909	Tenaga Ahli
3	Mila Dirgawati, S.T., M.T., Ph.D.	20030102	Tenaga Ahli
4	Dr.Eng. Didin Agustian Permadi, S.T., M.Eng.	20180701	Tenaga Ahli
5	Iwan Juwana, S.T., M.EM., Ph.D.	20010601	Tenaga Ahli
6	Dr.Eng. M. Candra Nugraha, S.T., M.Eng.	20190301	Tenaga Ahli

Telah melakukan kegiatan Pengabdian kepada Masyarakat sebagai berikut:

Nama Kegiatan : Pelatihan Webinar Rencana Pengamanan Air Minum (RPAM)
Tempat : Webinar/Gedung Teknik Lingkungan, Kampus Itenas
Waktu : 01 – 05 Maret 2021
Sumber Dana : Prodi Teknik Lingkungan

Demikian surat keterangan ini dibuat untuk dapat dipergunakan sebagaimana mestinya.

Bandung, 28 Mei 2021

Lembaga Penelitian dan Pengabdian
kepada Masyarakat (LPPM) Itenas
Kepala,

Iwan Juwana, S.T., M.EM., Ph.D.
NPP. 20010601



SURAT TUGAS
No. 219/J.16.01/LPPM/III/2021

Yang bertanda tangan dibawah ini,

Nama : Iwan Juwana, S.T., M.EM., Ph.D.
Jabatan : Kepala
Unit Kerja : LPPM-ITENAS
JL. PHH Mustafa No. 23 Bandung

Menerangkan bahwa :

Nama	NPP	Jabatan
Rachmawati S. Dj., Ir., M.Env.Stud., Ph.D	980712	Dosen
Dr. M. Ranga Sururi, S.T., M.T.	20040909	Dosen
Mila Dirgawati, S.T., M.T., Ph.D.	20030102	Dosen
Dr.Eng. Didin Agustian Permadi, M.Eng.	20180701	Dosen
Iwan Juwana, S.T., M.EM., Ph.D.	20010601	Dosen
Dr.Eng. M. Candra Nugraha, M.Eng.	20190301	Dosen

Ditugaskan untuk melakukan,

Kegiatan : Pelatihan Webinar Rencana Pengamanan Air Minum (RPAM)
Sebagai : Tenaga Ahli
Tempat : Webinar/Gedung Teknik Lingkungan, Kampus Itenas
Waktu : 01 – 05 Maret 2021

Demikian surat tugas ini dibuat untuk dipergunakan sebagaimana mestinya.

Bandung, 01 Maret 2021

Lembaga Penelitian dan Pengabdian
kepada Masyarakat (LPPM) Itenas
Kepala,

Iwan Juwana, S.T., M.EM., Ph.D.
NPP. 20010601

Laporan PKM
PELATIHAN WEBINAR RENCANA PENGAMANAN AIR MINUM (RPAM)



Penyusun

Dr. Ir. Rachmawati S Dj

Dr. Mohamad Rangga Sururi

Mila Dirgawati. PhD

Dr Eng. Didin Agustian Permadi

Iwan Juwana. PhD

Dr Eng. Candra Nugraha

INSTITUT TEKNOLOGI NASIONAL 2021

HALAMAN PENGESAHAN

Judul : Nara Sumber Pelatihan RPAM

Ketua Tim Pengusul

Nama : Dr. Ir. Rachmawati S Dj
NIP : 120040909
Jabatan/Golongan : Lektor Kepala/IVA
Program Studi/Fakultas : Teknik Lingkungan/Teknik Sipil dan Perencanaan
Bidang Keahlian : Air Minum
Alamat Kantor : Jln. PHH Mustofa no.23
Alamat Rumah : Jl. Puspa Cempaka Timur 1 N0.8258, Sukajaya Lembang

Lokasi Kegiatan

Wilayah Mitra : Pelatihan dilaksanakan secara daring
Desa/Kecamatan : -
Kota/Kabupaten : -
Provinsi : -
Jarak PT ke Mitra : -
Luaran : laporan kegiatan
Waktu Pelaksanaan : 1-5 Maret 2021
Total Biaya :

Bandung, 9 Maret 2021

Mengetahui,
Dekan Fakultas Teknik Sipil dan Perencanaan

Ketua Tim Pengusul
ub



(Dr. Soni Darmawan, ST., MT.)



(Dr. Ir. Rachmawati S Dj)

Disahkan Oleh
Ketua LP2M,

(Iwan Juwana, S.T., M.EM., Ph.D.)

NIP: 20010601

Latar Belakang

Mendapatkan akses terhadap air minum yang layak merupakan hak dasar manusia yang harus dipenuhi. Kemudahan dalam mendapatkan air minum di sepanjang waktu dengan jumlah yang mencukupi dan kualitas yang aman menjadi hal yang wajib diperhatikan oleh para pemangku kepentingan. Kualitas air aman berarti memenuhi seluruh persyaratan air minum berdasarkan Peraturan Menteri Kesehatan No. 492 tahun 2010. Pemenuhan ini perlu dijaga karena mengonsumsi air minum yang tidak aman dapat menimbulkan penyakit bawaan air yang pada akhirnya dapat mempengaruhi kesejahteraan manusia.

Sebagai bentuk komitmen Pemerintah Indonesia untuk terus menjamin pemenuhan akan kebutuhan air minum yang aman, Pemerintah Indonesia mengembangkan konsep Rencana Pengamanan Air Minum (RPAM) yang merupakan adaptasi dari *Water Safety Plan* (WSP) milik *World Health Organization* (WHO). RPAM merupakan suatu pendekatan untuk mengelola risiko yang dapat menghambat proses produksi air minum aman di setiap tahap pada sistem penyediaan air minum, yaitu pada bagian sumber, bagian sistem pengolahan, bagian sistem distribusi, hingga air tersebut diterima oleh konsumen. Dosen Teknik Lingkungan Itenas diwadahi oleh LP2M Itenas telah mendapatkan kepercayaan WHO dan Kementrian PUPR untuk melaksanakan kegiatan webinar pelatihan RPAM bagi PDAM kategori sehat di seluruh Indonesia yang diselenggarakan selama 5 hari .

Sesuai dengan salah satu tujuan dari PKM yaitu memberikan saran dan solusi berdasarkan kajian akademik terhadap kebutuhan dan tantangan terkait lingkungan maka kami memenuhi undangan sebagai panitia dan narasumber pada penyusunan webinar RPAM Tersebut.

Tujuan Kegiatan

- Memberikan pelatihan terkait RPAM bagi PDAM Kategori Sehat di Indonesia
- Mengupdate informasi dan pengetahuan terkait modul-modul pada RPAM

Pelaksanaan

Pelaksanaan diselenggarakan secara daring di tempat masing-masing, dan kami sebagai panitia dan narasumber berkumpul di Gedung Teknik Lingkungan Itenas. Peserta dari webinar dapat dilihat pada table di bawah ini.

No	Instansi	Jumlah instansi	Jumlah Peserta
1	PDAM/Perumda Air Minum	46	127
2	Ministry of Public Works & Public Housing	2	4
3	Perpamsi	1	2
4	Perumda Tugu Tirta Kota Malang	1	3
5	IUWASH	1	1
6	Field facilitator	1	4

Tim pelaksanaa

Nama	Posisi	Keahlian	Penyampaian Modul
Rachmawati Sugihhartati Dj	Team Leader & Facilitator	Environmental (Env.) Engineering (Water & Wastewater Treatment, WSP)	Introduction & Module 7 (Verification)
Candra Nugraha	Team Member & Facilitator	Env. Engineering (Environmental Management)	Module 5 (Improvement Plan) & 8 (Management Procedures)
Iwan Juwana	Team Member & Facilitator	Env. Engineering (Environmental Management)	Module 4 (Control Measures and Re-assess Risk) & 11 (Revision)
M Ranga Sururi	Team Member & Facilitator	Env. Engineering (Water & Wastewater Treatment)	Module 2 (Describe the Water Supply System) & 6 (Operational Monitoring)
Mila Dirgawati	Team Member & Facilitator	Env. Engineering (Environmental & Health Management)	Module 3 (Identification of Hazards & Hazardous Events and Risk Analysis) & 9 (Supporting Programs)
Didin A. Permadi	Team Member & Facilitator	Env. Engineering (Environmental Management)	Module 1 (Assemble WSP Team) & 10 (Reviews)

LAMPIRAN

Webinar Report

**Web-Training to Water Operators in Understanding and Operationalizing Urban WSP
Implementation Manuals and field Assistance to Scale-up WSP in Selected Urban Water Utility
Operators (PDAMs)**

Prepared by:



Indonesia

March, 2021



YAYASAN PENDIDIKAN DAYANG SUMBI
INSTITUT TEKNOLOGI NASIONAL

Jl. PKH. Hasan Mustapa No. 23 Bandung 40124 Indonesia, Telepon: +62-22-7272215, Fax: +62-22-7202892
Website: <http://www.itenas.ac.id> E-mail: rektorat@itenas.ac.id

Webinar Report

Reporting Period: April 5, 2021 to April 9, 2021

Submittal Date March 26, 2021

Project Name : Web-Training to Water Operators in Understanding and Operationalizing Urban WSP Implementation Manuals and Field Assistance to Scale-Up WSP in Selected Urban Water Utility Operators (PDAMs)

Contractor Name : Lembaga Penelitian dan Pengabdian Masyarakat (LPPM), Institut Teknologi Nasional (Itenas) Bandung

I certify that this document and any attachment were prepared by me or under my direction in accordance with the terms and conditions of the Agreement for Performance of Work. Based on my inquiry of the persons or persons who manage the project or those directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false or misleading information.

Bandung, March 26, 2021
Head of LPPM Itenas Bandung

Iwan Juwana, S.T., M.EM., Ph.D.

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1. Background

Safe water supply is one of the critical factors to stop the spread of COVID-19 disease occurred nowadays. *World Health Organization* (WHO) stated that the provision of safe water can be achieved by implementing a water safety plan (WSP) or *Rencana Pengamanan Air Minum (RPAM)*. WSP is widely adopted worldwide as it is an effective tool to supply water, that is safe to be directly consumed (without boiling it) and not harming the consumers, through risk and management approach analysis from the point of drawing it at the source, via the treatment process to the consumer taps (WHO, 2004).

This web-based (Webinar) training was conducted to disseminate the newly developed national urban WSP implementation manual (RPAM Manual) to the urban water utility operators (Perusahaan Daerah

Air Minum/PDAMs). Considering the varied level of understanding of WSP within PDAMs, the Webinar was constructed so as to elevate the knowledge of PDAMs on a step-by-step approach of WSP principle and practice, facilitate the discussion and exercise/group work, and put them into a systematically operation within the daily running of the water supply system for assisting to the water quality control on a regular basis and in a sustainable way.

2. Agenda

Despite the changing dates of Webinar occurred since 2020, the Webinar was eventually planned to be running on March 1-5, 2021. Initial agenda of the Webinar that was shared to the participants is attached in Appendix 4.

3. Invited Participants

List of PDAMs that were invited to the Webinar were always changing as the changing conditions happened around the preparation time of the Webinar. Once the responsible authority of this project was under the Ministry of Public Health, there were 63 PDAMs invited to the Webinar. These PDAMs were taken from the list of PDAMs that had been socialized previously by the Ministry of Public Works and Public Housing since year 2012. Within these 63 PDAMs, their understanding of WSP is varied. 12 of them were supervised directly on site by the Ministry of Public Works and Public Housing, and by the Ministry of National Development Planning (Bappenas) i.e. (1) PDAM Kota Banjarmasin, (2) PDAM Kota Bandung, (3) PDAM Kota Malang, (4) PDAM Kota Payakumbuh, (5) PDAM Kota Salatiga, (6) PDAM Kabupaten Bandung, (7) PDAM Kota Palembang, (8) PDAM Kota Denpasar, (9) PDAM Kota Surabaya, (10) PDAM Kota Mataram, (11) PDAM Kota Medan, dan (12) PDAM Kota Pontianak; while the rests were trained by the Ministry of Public Works and Public Housing through the workshops either Bimbingan Teknis Provinsi or Bimbingan Teknis Kabupaten/Kota. These 63 PDAMs were trained on 4K (quality, quantity, continuity and affordability) targets of WSP. Appendix 1 shows these 63 PDAMs.

From these 63 PDAMs, only PDAM Kota Malang that was supervised and audited directly by WHO on 1K (quality target) since year 2017. PDAM Kota Banjarmasin was also visited and taught directly by WHO on 1K in year 2017; but not audited. WHO also did a workshop for 12 PDAMs (that were included in these 63 short-listed PDAMs) on 1K in year 2019, but only for Module 1 to Module 6.

As the responsible authority of the WSP diverted to the Ministry of Public Works and Public Housing, the PDAMs that were invited to the Webinar were also changed. The Ministry of Public Works and Public Housing would like to only invite those PDAMs that were not socialized on WSP yet. The new short-listed invited PDAMs were 65 PDAMs. Appendix 2 lists these 65 PDAMs.

However, after checked by LPPM Itenas, some PDAMs in the new list had been trained on WSP either by the Ministry of Public Works and Public Housing or by the WHO; so they were both included in the previous and new short-listed invited PDAMs as depicted in Appendix 3.

4. Methods

Webinar was planned to be running through various methods as below.

- 1) Dissemination of regulation and policy by the Government institutions/regulators i.e. Bappenas, the Ministry of Public Works and Public Housing, and the Ministry of Public Health; using zoom and PPT slides.
- 2) Sharing the insight on WSP by the United of Indonesian Water Utility (Perpamsi) using zoom and PPT slides.
- 3) Socialization of WSP principles and practices (Introduction and Module 1-11) by LPPM Itenas Team utilizing zoom and PPT slides.
- 4) Quiz of Introduction and Module 1-11 by LPPM Itenas Team utilizing zoom and PPT slides
- 5) Pre and Post Test by LPPM Itenas Team utilizing socrative
- 6) Discussion and group work for Module 1-6 using zoom, PPT slides, and whatsapp group
- 7) Question and answer using slido, zoom and PPT slides
- 8) Review of Introduction and Module 1-11 by LPPM Itenas using zoom and PPT slides
- 9) Evaluation of webinar using google form
- 10) Discussion between participants, regulators, WHO, LPPM Itenas, donor and other related parties using whatsapp group.
- 11) Interactive questions and answers on Day 5 using zoom application

5. Resource Persons

Resource persons from the Government institutions/regulators i.e. Bappenas, the Ministry of Public Works and Public Housing, and the Ministry of Public Health; were invited to deliver the policies and regulations of WSP. In addition, Perumda Tugu Tirta Kota Malang was also asked to share their experience and best practices in developing and implementing WSP in their water utility. Moreover, Perpamsi was requested as well to share their insight about WSP. Table 1 depicts the resource persons along with their topics shared in the Webinar.

Table 1 The Resource Persons along with their Topics Shared in the Webinar

Name	Institution	Position/Job Title	Topic
Nur Aisyah Nasution, ST MS	Ministry of National Development Planning (Bappenas)	Intermediate Functional of the Directorate of Housing and Settlements	Policy of WSP
Ir. Yudha Mediawan, M.Dev.Plg	Ministry of Public Works and Housing	Director of Drinking Water	Opening remarks
Dades Prinandes, ST, Msi	Ministry of Public Works and Housing	Head of Sub Directorate of Technical Planning, Directorate of Drinking Water	Drinking water safety plan as a strategy to achieve safe drinking water target

Juliana Lestari, ST	Ministry of Public Works and Housing	Sub Coordinator of Institutional, Directorate of Drinking water	Closing remarks
Ely Setyawati	Ministry of Health	Coordinator of the Sub-Directorate for Water Health and Sanitation, Directorate of Environmental Health	Indicators of Water Quality Monitoring and WSP Audit Plan
Rudie Kusmayadi	Perpamsi	Chairman	Role of PERPAMSI in the implementation of WSP

6. Facilitators

4 (four) facilitators delivered the modules of WSP Manual coordinated by the Team Leader. The Team Leader also acted as the main facilitator. The facilitators are from LPPM Itenas as shown in Table 2.

Table 2 Facilitators from LPPM Itenas

Name	Position in the Team	Expertise	Module Shared
Rachmawati Sugihhartati Dj	Team Leader & Facilitator	Environmental (Env.) Engineering (Water & Wastewater Treatment, WSP)	Introduction & Module 7 (Verification)
Candra Nugraha	Team Member & Facilitator	Env. Engineering (Environmental Management)	Module 5 (Improvement Plan) & 8 (Management Procedures)
Iwan Juwana	Team Member & Facilitator	Env. Engineering (Environmental Management)	Module 4 (Control Measures and Re-assess Risk) & 11 (Revision)
M Ranga Sururi	Team Member & Facilitator	Env. Engineering (Water & Wastewater Treatment)	Module 2 (Describe the Water Supply System) & 6 (Operational Monitoring)
Mila Dirgawati	Team Member & Facilitator	Env. Engineering (Environmental & Health Management)	Module 3 (Identification of Hazards & Hazardous Events and Risk Analysis) & 9 (Supporting Programs)
Didin A. Permadi	Team Member & Facilitator	Env. Engineering (Environmental Management)	Module 1 (Assemble WSP Team) & 10 (Reviews)

To make the webinar more interesting and livelier; as well as giving a real full picture of the development and implementation of WSP on site, in presenting each module of WSP, the facilitators were supported by the resource persons from Perumda Tugu Tirta Kota Malang. These resource persons are listed in Table 3.

Table 3 Resource Persons from Perumda Tugu Tirta Kota Malang

No	Name	Job Title	Position in RPAM Team	Appeared in Module
1.	Dra. Nanis Setiari, M.M.	Job Control Manager	Team Leader	Introduction, and Module 1, 7, 11
2.	Djaka Setyanta, S.T.	Raw and Treated Water Quality Control Assistant Manager	Member of Team 1: Monitoring and Evaluation	Module 4

3.	Gigih Yuli Asmara, S.T.	Instrument Control & Supervisory Control and Accusation Data (SCADA) Asisstant Manager	Member of Team 1: Monitoring and Evaluation	Module 2, 4, 5, 8, 10
4.	Agung Putra Kusuma, S. Kom	Progammer	Member of Team: System Control	Module 3, 6, 9, and Lesson Learnt

7 Implementation

Due to the covid pandemic, the changing staff in the Directorate level in the Ministry of Public Health (December 1, 2020), the change of the responsible authority of this work (WSP) from the Ministry of Health to the Ministry of Public Works and Public Housing (January 7, 2021), and staff rotation in the Ministry of Public Works and Public Housing (February 26, 2021), the Webinar had been postponed many times; and keep changing its dates from July 27-31, 2020 (based on the proposal sent by LPPM Itenas); to Nov 2-6, 2020; end of Nov, 2020; Dec 7-11, 2020; Jan 11-15, 2021; Feb 1-5, 2021; March 1-5, 2021, Feb 21-26, 2021, and back to March 1-5, 2021. The Webinar was finally conducted on 1 – 5 Maret 2021 via Zoom Meeting application.

7.1 Agenda

Changes were made, two (2) times, to the agenda that had already shared to the participants. First change was made as to shorter the times of Webinar on the last day (Day 5). Day 5 was on Friday where Moslem man had to go to the mosque for obliged Friday praying. As there were participants from East Indonesian Time, the initial agenda would pass this praying time; thus the agenda was slightly modified to allow this matter.

Second change was done again as requested by the resource person from the Ministry of Public Health. As she could not make her allocated time on Day 4, her time was then moved to Day 5. This modification altered the agenda, shortened other allocated times, lengthened the agenda by 10 minutes, but still allow the Moslem East Indonesian Time participants to do their praying obligation. Appendix 5 depicts the two modifications agenda.

The actual times of the Webinar were slightly different from that of the Agenda. There were the speaker that was not shown in the allocated time; the resource persons that were talked much longer than the allocated times; and/or the Webinar committee as the time keeper did not aware of the lengthened talking so as they missed to inform the speaker about this matter. Appendix 6 shows the actual times taken for each session along with the notes describing the situation leading to the deviation of the scheduled times.

7.2. Participants

127 people from 44 PDAMs/Perusahaan Umum Daerah (Perumda) Air Minum were registered as participants. In addition, the webinar was attended by the regulators i.e. Bappenas, the Ministry of Public Works and Public Housing, the Ministry of Public Health; other related parties i.e. Perpamsi, Balai Teknik Kesehatan Lingkungan (BTKL), Indonesia Urban Water Sanitation and Hygiene (IUWASH), and field

facilitators, as shown in Table 4. Appendix 7 depicts the detailed Webinar participants showing the institutions and number of people registered.

Table 4 Participants of the Webinar

No	Unit	Total Units	Total Participants
1	PDAM/Perumda Air Minum	46	127
2	Ministry of Public Works & Public Housing	2	4
3	Perpamsi	1	2
4	Perumda Tugu Tirta Kota Malang	1	3
5	IUWASH	1	1
6	Field facilitator	1	4

7.3 Methods

- 1) *Dissemination of regulation and policy by the Government institutions/regulators i.e. Bappenas, the Ministry of Public Works and Public Housing, and the Ministry of Public Health; using zoom and PPT slides*

Disseminations of regulation and policy by the Government institutions/regulators were running well except one of the resource persons from the Ministry of Public Health did not show up, without any news, in the opening session. She did not appear again on Day 4 and requested to allocate her time on Day 5. Despite her lateness on Day 5, she eventually showed up at 09.10 on Day 5. This delayed made next sessions were deferred also. Other resource persons were on the room on the allocated times.

The scheduled and actual times for each resource person can be seen in Appendix 4-6. Zoom application was used for these disseminations; and PPT slides from each resource person were shared via zoom. Appendix 8a describes the PPT slides shared by the resource persons. These slides could also be downloaded from google drive with this link: <https://drive.google.com/drive/folders/1VTR0W-YBKsgwKO3a-113xQ735zIlF1Qf>. The talks from the resource persons were documented in Appendix 8b.

- 2) *Sharing the insight on WSP by WHO and the United of Indonesian Water Utility (Perpamsi) using zoom and PPT slides*

WHO did his opening remarks of Webinar using zoom application on the opening session of Day 1; while the Head of Perpamsi delivered his on PPT slides using zoom application on Day 5, about 28 minutes late than his allocated time due to the lateness of the resource person from the Ministry of Public Health. His PPT slides were also in Appendix 8, and could be retrieved from google drive with this link: <https://drive.google.com/drive/folders/1VTR0W-YBKsgwKO3a-113xQ735zIlF1Qf>.

- 3) *Socialization of WSP principles and practices (Introduction and Module 1-11) by LPPM Itenas Team utilizing zoom and PPT slides*

WSP principles and practices for Introduction and Module 1-11 were shared by LPPM Itenas Team on PPT slides using zoom application. PPT slides for these were depicted in Appendix 9a. The slides could be downloaded as well from google drive with this link: <https://drive.google.com/drive/folders/1VTR0W-YBKsgwKO3a-113xQ735zIlF1Qf>.

These slides were particularly created based on the draft Manual of WSP published by the Ministry of Public Works and Public Housing in January 2021. In addition, the style and other key points were taken from the virtual training of WSP done by WHO in October 2020. Moreover, lesson learnt, best practices, and photos were gathered from the WSP documents made under the Ministry of Public Works and Public Housing supervision of WSP development and implementation since year 2012.

In delivering the Modules as well as the Introduction, LPPM Itenas Team was supported by the resource persons from Perumda Tugu Tirta Kota Malang as shown in Table 3. Their shared of WSP experiences of their water utility are attached in Appendix 9b documented for each session.

4) *Quiz for Introduction and Module 1-11 by LPPM Itenas Team utilizing zoom and PPT slides*

Quiz for Introduction and Module 1-11 were shared through zoom application; and for Modul 7 utilized PPT slides as well. Percentage of participants did the quiz could be seen by the host as well as percentage of participants that answer the quiz correctly. Link for zoom for each Module (and Introduction) was shared through link: <https://drive.google.com/drive/folders/1VTR0W-YBKsgwKO3a-113xQ735zILF1Qf>. Each question was discussed by the related facilitator directly after the participants had finished their quizzes. Appendix 10 lists the quizzes for Introduction and Module 1-11 along with the answers.

5) *Pre and Post-Test by LPPM Itenas Team utilizing Socrative*

Pre and post-test could be accessed by the participants using the link <https://b.socrative.com/login/student/> of Socrative. The questions for pre and post-test were made exactly the same in order to get a picture of how the participants had improved their understanding of WSP after the Webinar. Appendix 11 shows the pre and post-test questions. The results of the pre and post-test are depicted in Figure 1.

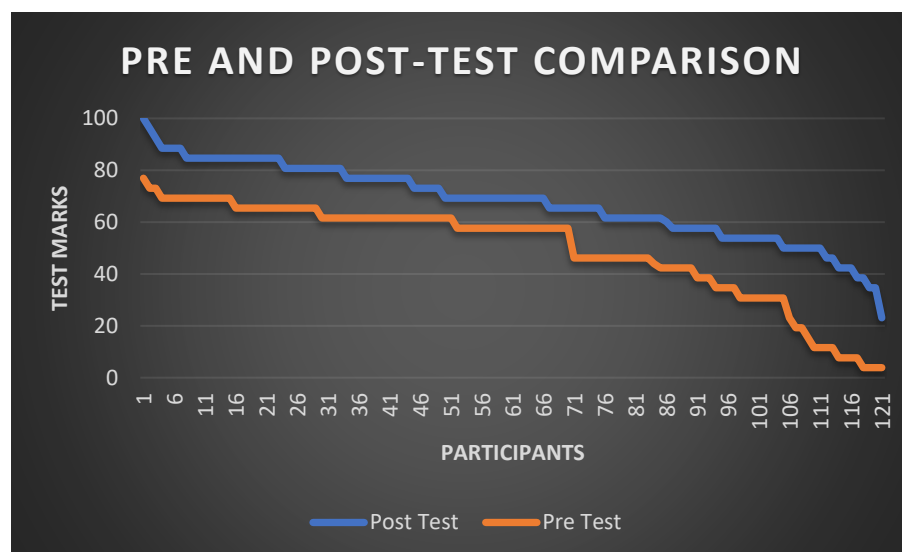


Figure 1 Results of the Pre and Post-Test

Comparing the results of pre and post-test, Figure 1 shows that there is a significant improvement of the participants' marks during the tests. The average mark of the post-test was 66.4%, while the pre-test was 49.8%. This improvement mark should not be taken into granted as is not enough to reflect the good understanding of WSP. Achieving water quality target is extremely important, thus 66.4% average mark

could not be relied on. This mark implies that in average their understanding of WSP was only 66.4%, quite far from 100%. If we would like to deliver safe water to our customers, there is no exception at all, that we should 100% understand WSP. Table 5 shows that 72.73% participant got the score below 80; thus, more works required to enhance the participants knowledge of WSP, such as regular training on WSP, mentorships, intensive consultancy, or other necessary means, by the WSP experts.

Table 5 Score of Pre and Post-Test

Score	Pre-test		Post-test	
	Number of participants	Percentage (%)	Number of participants	Percentage (%)
90-100	0	0.00	3	2.48
80-90	0	0.00	30	24.79
70-80	3	2.48	16	13.22
60-70	48	39.67	37	30.58
50-60	19	15.70	18	14.88
40-50	20	16.53	12	9.92
30-40	15	12.40	4	3.31
20-30	1	0.83	1	0.83
10-20	7	5.79	0	0.00
0-10	8	6.61	0	0.00
Total	121		121	

Participants could obtain their results through google drive with link <https://drive.google.com/drive/folders/1ma00iyg8I9eYKkFSCe2vJWtG6dDnjzWH?usp=sharing> for the pre-test, and https://drive.google.com/drive/folders/1VNnnOzt-tmdCp3IHft7v_j-L8Ns0kSBI?usp=sharing for the post-test. Three (3) participants with the highest scores, shown in Table 6, obtained the letter of appreciation from the Ministry of Public Works and Public Housing. Criteria for having the appreciation letter was not only of the highest score achieved in the post-test, but also of the attendance, activeness during the Webinar, and pre-test results. Other participants got a letter of notice (attached in Appendix 12) for attending this Webinar.

Table 6 Three Participants with the Highest Scores of the Post-Test

No.	Name of the participant	Institution	Post-test Score
1	I Putu Gede Sudarsana	PDAM Kabupaten Badung	100
2	Dwi Shara	Perumdam Kabupaten Tangerang	96.15
3	Mya Musyarowawati	PDAM Kota Depok	92.31

6) Discussion and group work for Module 1-6 using zoom, PPT slides, and whatsapp group

For Module 1-6, participants were asked to do tasks; in group, based on their PDAMs/Perumdams; related to each Module. The results were collected through whatsapp group created for this Webinar, called Webinar RPAM 2021. One PDAM was chosen each day to present their work every next morning. The work was then discussed, commented and corrected by the related facilitator and/or the Team Leader. Appendix 13 shows their group works for Module 1-6.

7) *Question and answer using slido, zoom and PPT slides*

Questions raised by the participants were collected through slido with link provided for each day and answered every next morning by the team Leader using zoom application and PPT slides. Appendix 14 depicts the questions and answers of Introduction, Module 1-11, and any related questions to Webinar.

- Day 1: <http://bit.ly/link-pertanyaan-hari1>
- Day 2: <http://bit.ly/link-pertanyaan-hari2>
- Day 3: <http://bit.ly/link-pertanyaan-hari3>
- Day 4: <http://bit.ly/link-pertanyaan-hari4>
- Day 5: <http://bit.ly/link-pertanyaan-hari5>

8) *Review of Introduction and Module 1-11 by LPPM Itenas using zoom and PPT slides*

Every morning, opening the session on day 2-5, review of the key points of previous day Modules (and Introduction) were done by the Team Leader. Appendix 15 shows the PPT slides in pdf for the review.

9) *Evaluation of webinar using google form*

In order to know the level of satisfaction of participants regarding the Webinar, and to improve the next Webinar, a questionnaire was distributed via google form to all participants via link <http://bit.ly/EvaluasiRPAM>. This form was also created to find out their willingness to be the pilot project of WSP development and implementation. Responses were obtained from 103 respondents (about 70% of the participants). In addition, 81% of respondents stated their willingness to be technically supervised in WSP for their piloted water utility. The participants responses are summarized below.

a) *The purpose of attending the WSP webinar*

Most respondents aim to increase their knowledge, get information, better understand, and add their insight. Based on the results of the evaluation, 98% felt that these objectives could be met. Figure 2 shows the percentage of their objectives achievement.

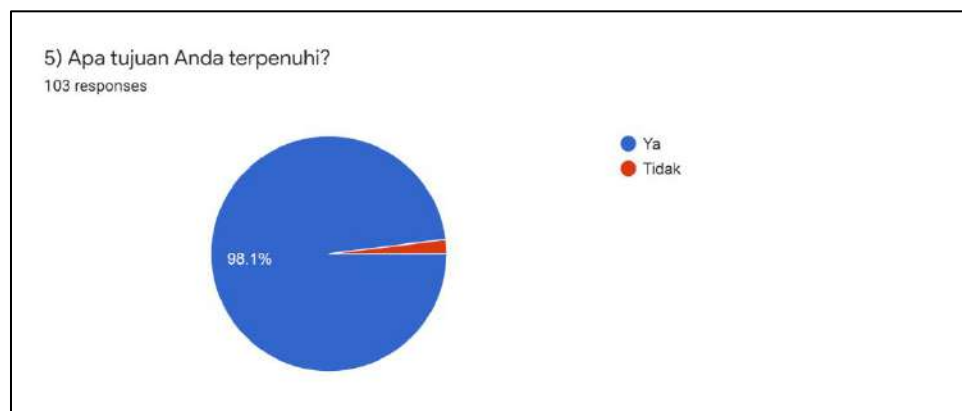


Figure 2 The percentage of the Participants Objectives Achievement

b) *Implementation evaluation*

Participants are asked to give a rating on a scale of 1 (very bad) to 5 (very good). From the results of the evaluation, most participants rated the webinar content as "good" or "very good". However, most of them said the tempo/duration of the webinar as "fair" or "good". On another question in this evaluation, the

participants stated that the tempo/duration of the material delivery was too short; so, they got some difficulties to be able to understand the whole material properly. Nevertheless, the overall course of the webinar was rated "good" or "very good". Figure 3-6 depicts their responses to the content, the tempo, the performance of the Webinar, and of the Webinar committee subsequently.

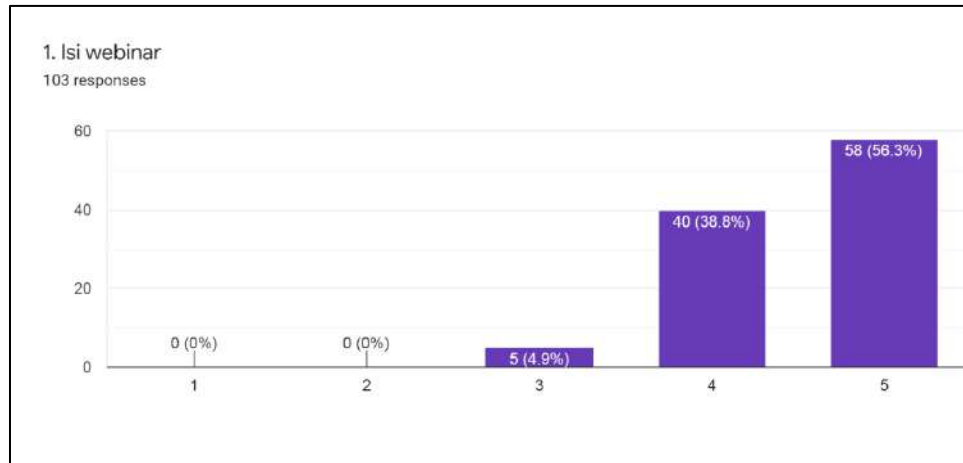


Figure 3 Participants Responses to the Content of the Webinar

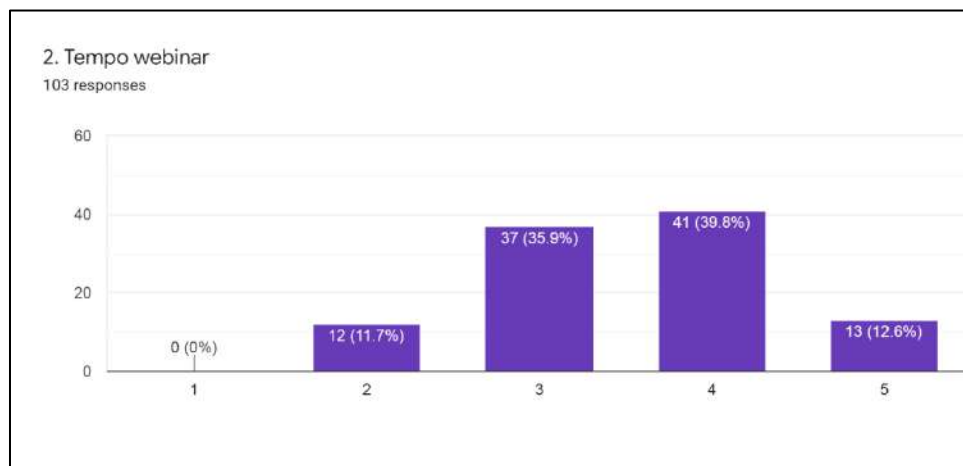


Figure 4 Participants Responses to the Tempo of the Webinar

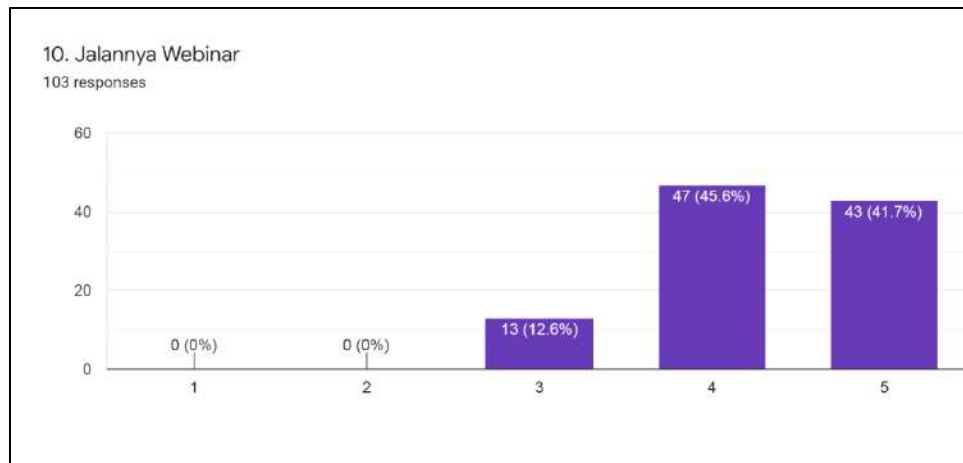


Figure 5 Participants Responses to the Performance of the Webinar

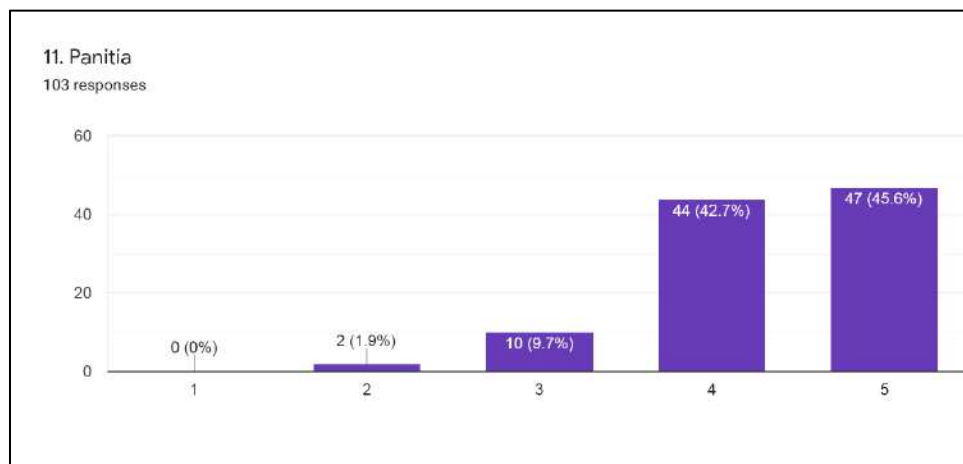


Figure 6 Participants Responses to the Performance of the Webinar committee

c) Explanation of training module

For the training module, participants were also asked to make an assessment on the same scale 1 to 5. Overall, the results of the assessment of the content of the material and the speakers/facilitators were "good" or "very good" results. Figure 7-18 shows the participants responses to the Introduction and Module 1-11 respectively.

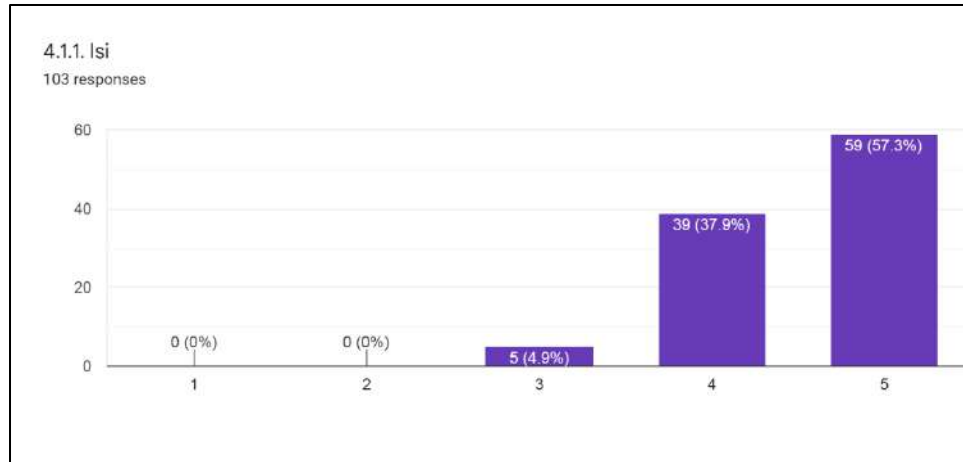


Figure 7 Participants Responses to the Introduction of WSP

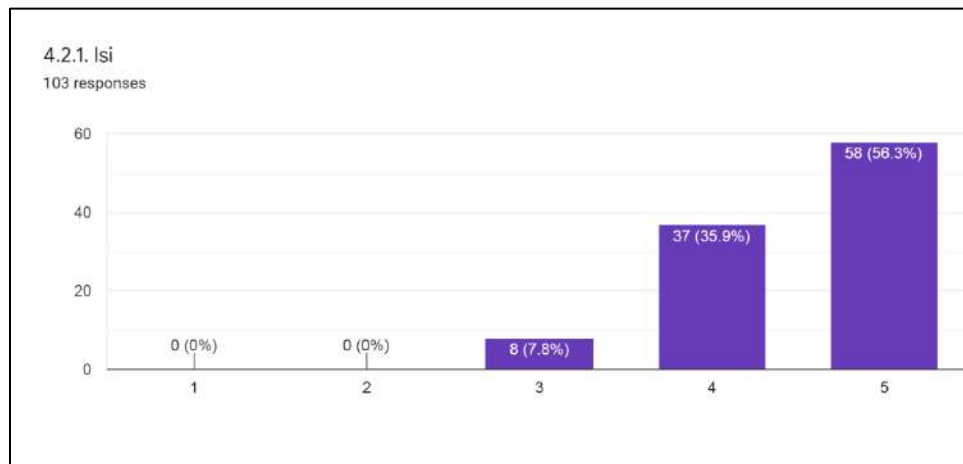


Figure 8 Participants Responses to Module 1: Assemble of WSP Team

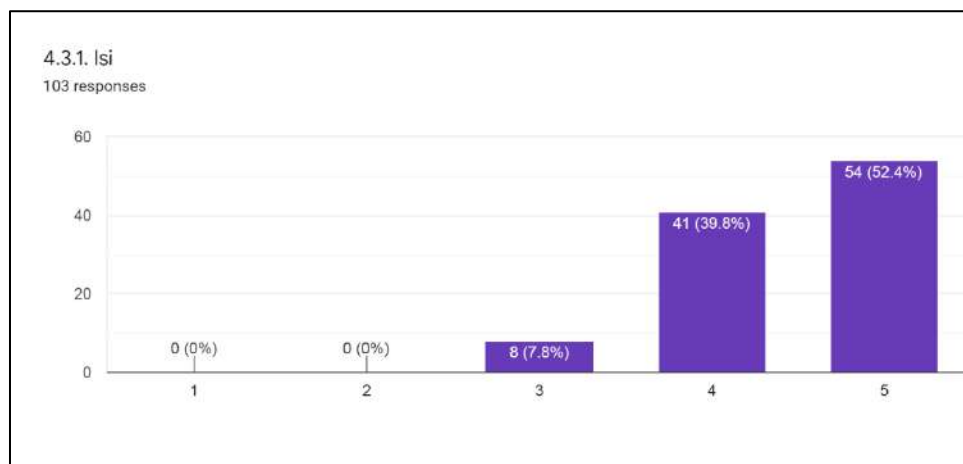


Figure 9 Participants Responses to Module 2: Description of Water Supply System

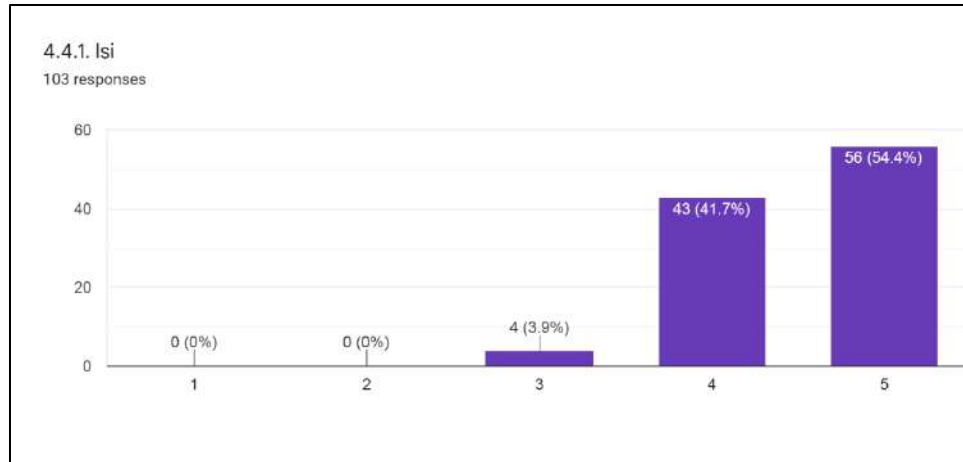


Figure 10 Participants Responses to Module 3 Identification of Hazard & Hazardous Events, and Risk Analysis

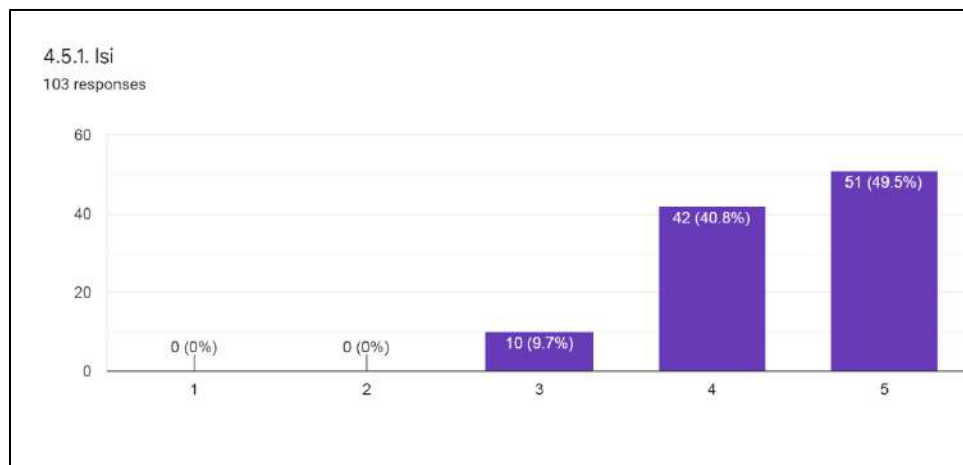


Figure 11 Participants Responses to Module 4: Risk Control Measure and Re-Assess Risk

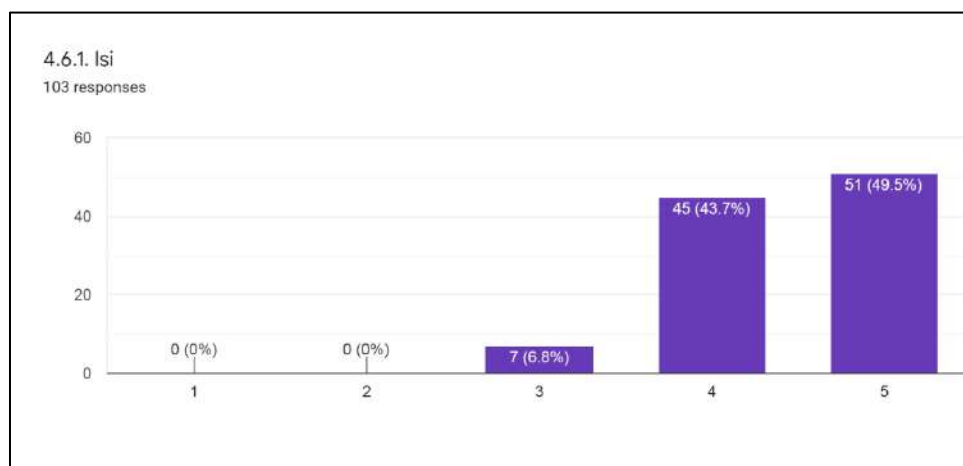


Figure 12 Participants Responses to Module 5: Improvement Plan

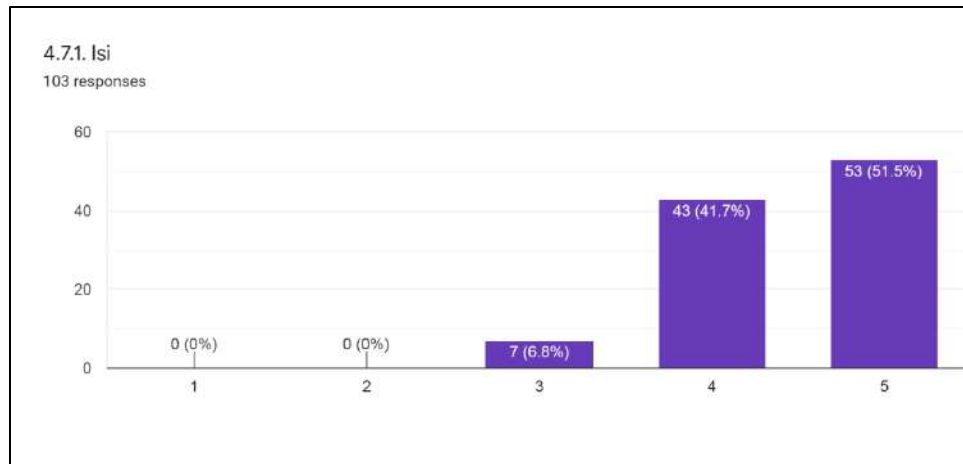


Figure 13 Participants Responses to Module 6: Operational Monitoring

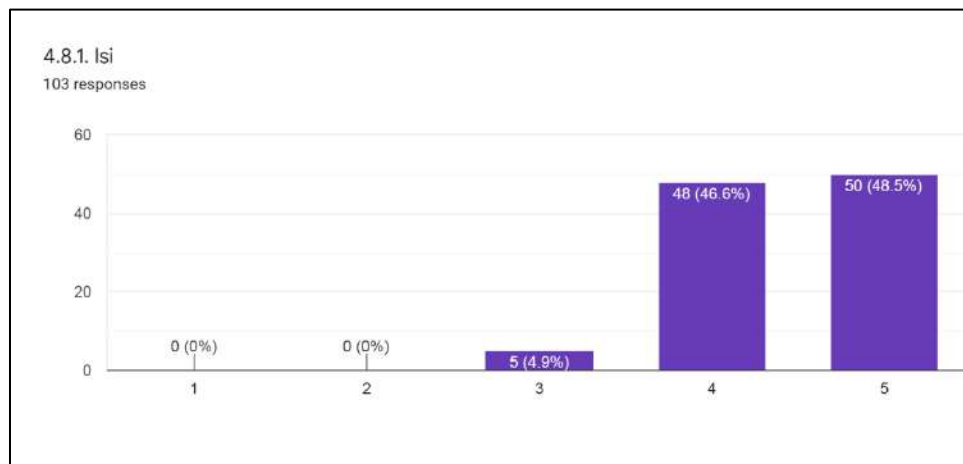


Figure 14 Participants Responses Module 7: Verification

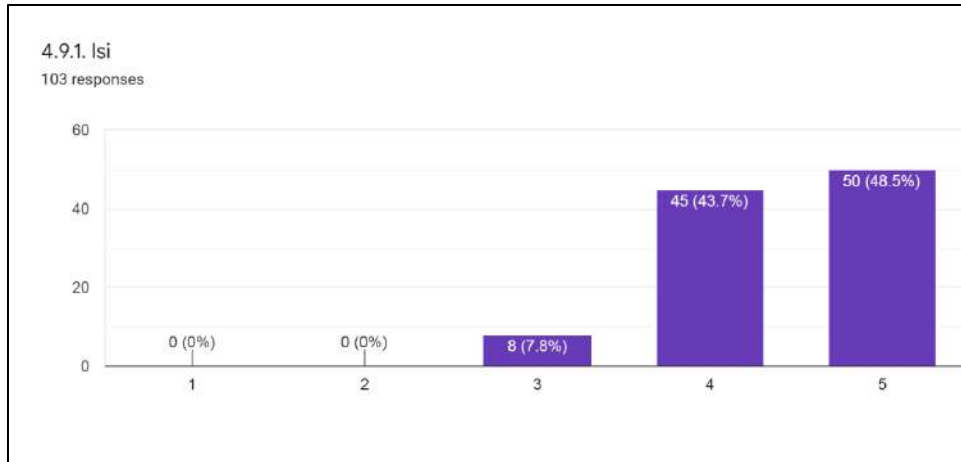


Figure 15 Participants Responses to Module 8: Management Procedures

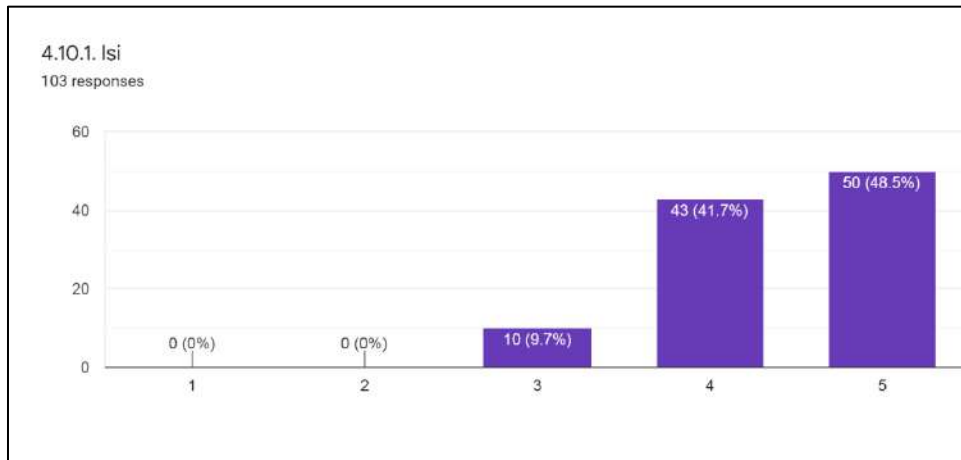


Figure 16 Participants Responses to Module 9: Supporting Programs

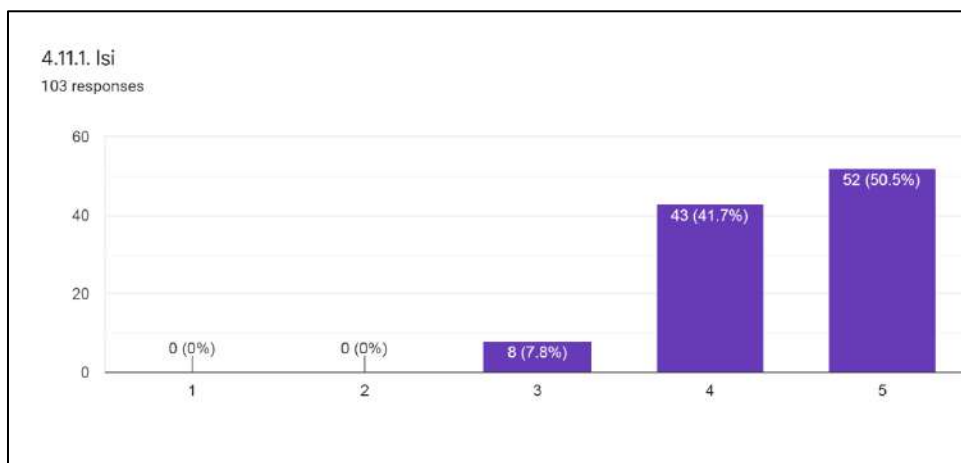


Figure 17 Participants Responses to Module 10: Review

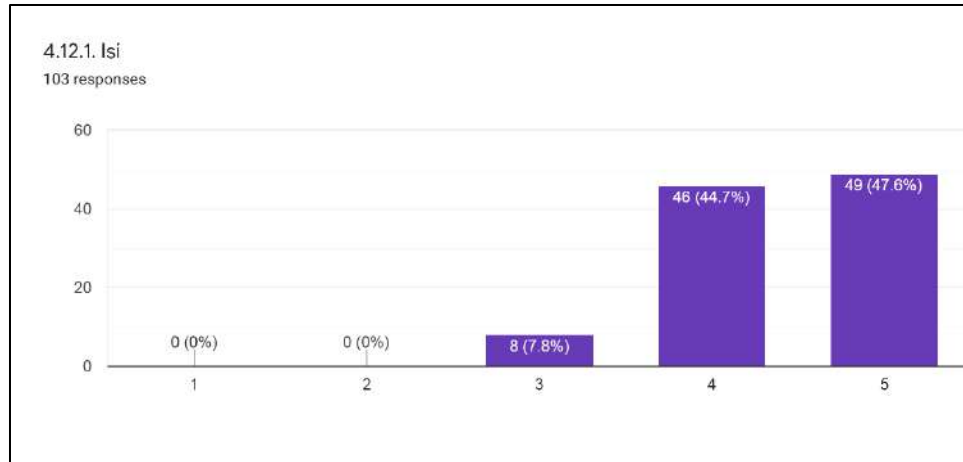


Figure 18 Participants Responses to Module 11: Revision

d) Supporting Methods & Materials

To improve the understanding of the material in each module, several additional activities were carried out such as quizzes, group-works, and pre & post-tests. Materials of the Webinar in pdf were also shared. These supporting methods and materials were also evaluated. The results of the participants' assessments generally show "good" or "very good" results, as shown in Figure 19-23 subsequently.

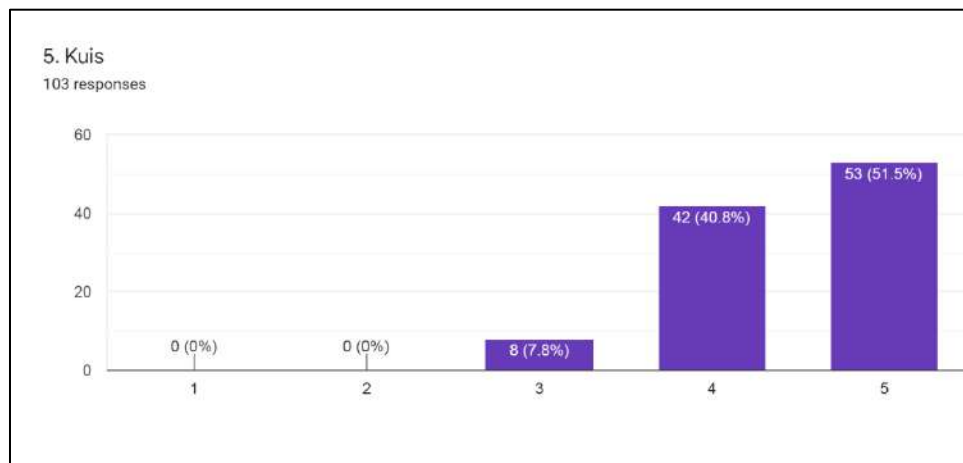


Figure 19 Participants Responses to the Quizzes Sessions

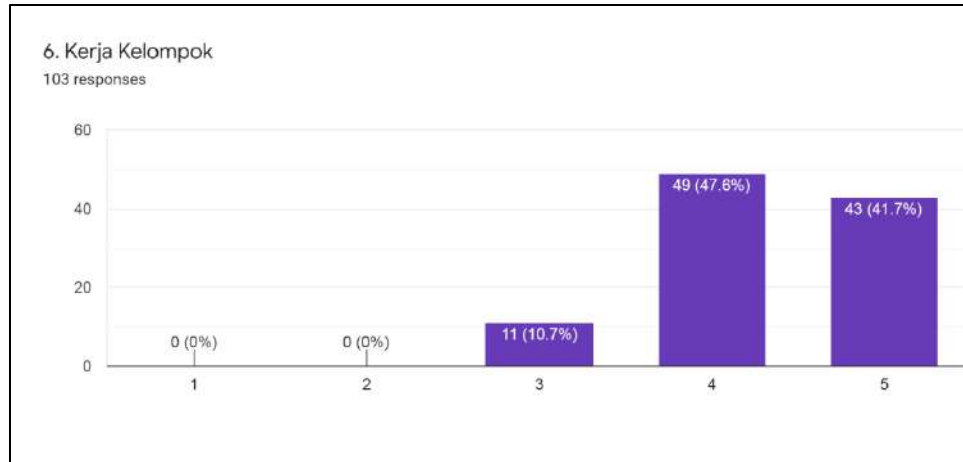


Figure 20 Participants Responses to the Group-works Sessions

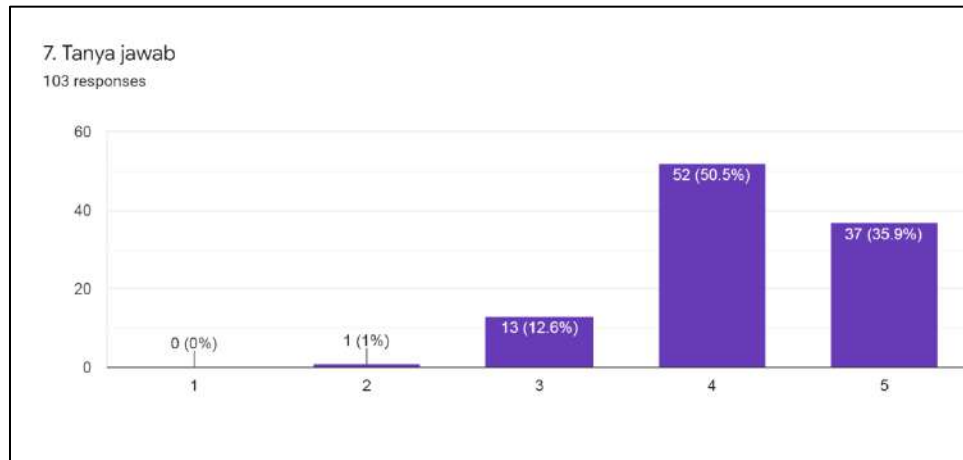


Figure 21 Participants Responses to the Questions & Answers Sessions

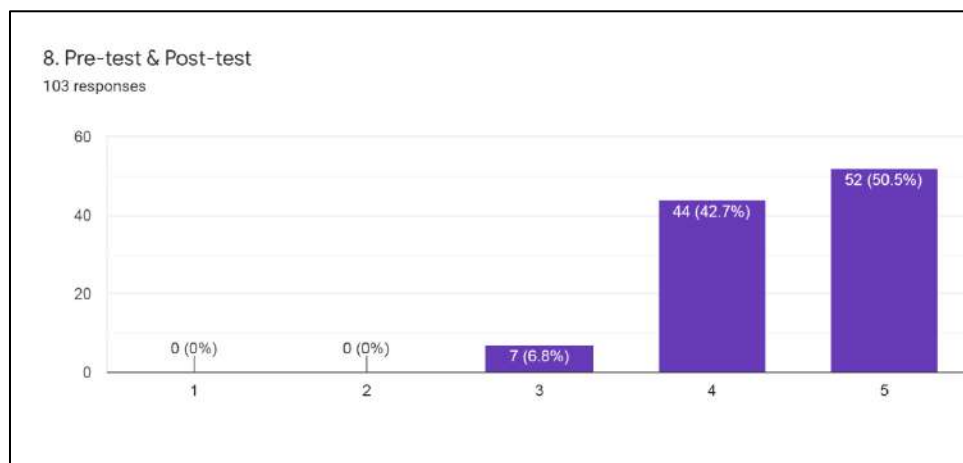


Figure 22 Participants Responses to the Pre & Post-Tests Sessions

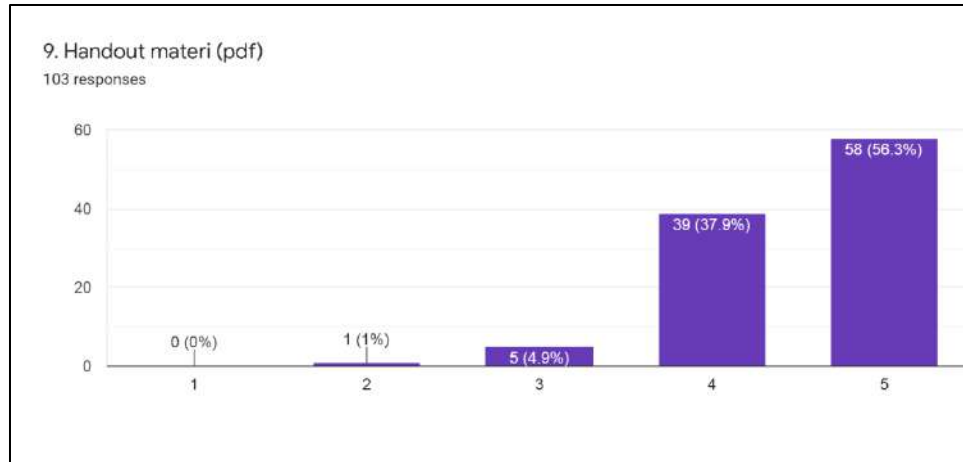


Figure 23 Participants Responses to the Handout in pdf

e) Supporting Presentation

Resource persons from related ministries/agencies and Perumda Tugu Tirta Kota Malang were also evaluated. The results of these assessment are generally "good" or "very good" as shown in Figure 24- respectively.

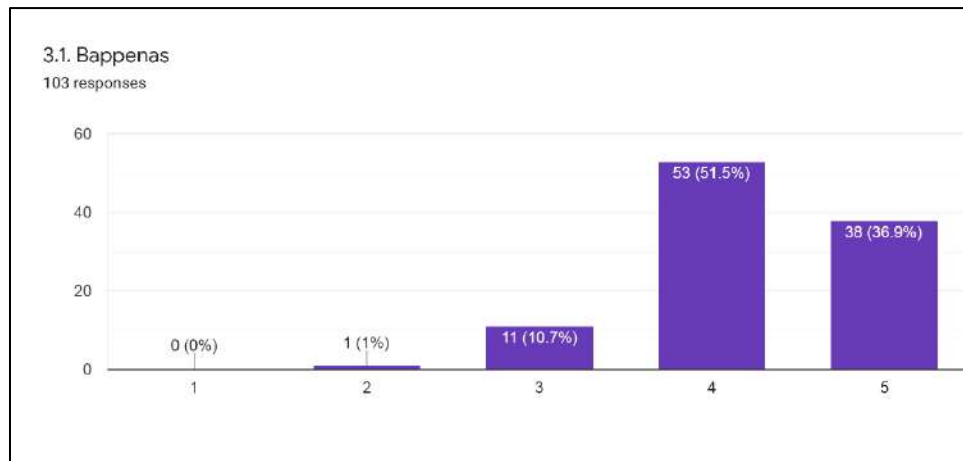


Figure 24 Participants Responses to the Ministry of National Planning and Development Session

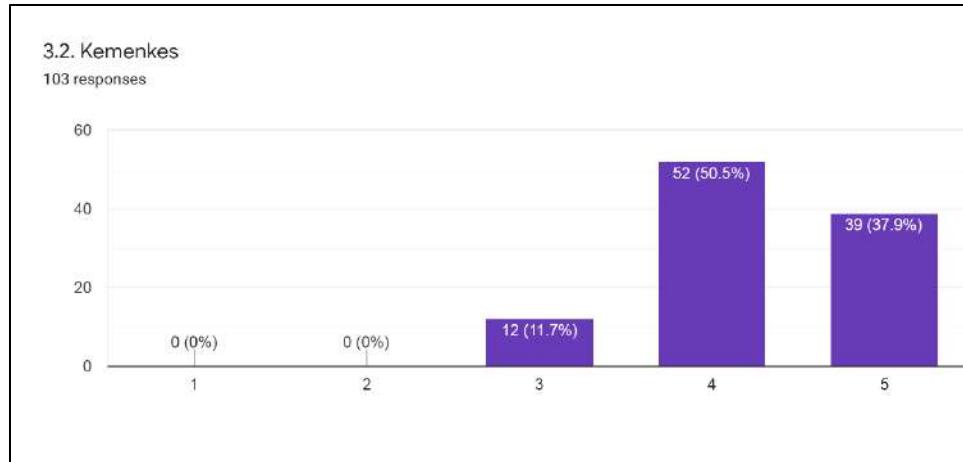


Figure 25 Participants Responses to the Ministry of Public Health Session

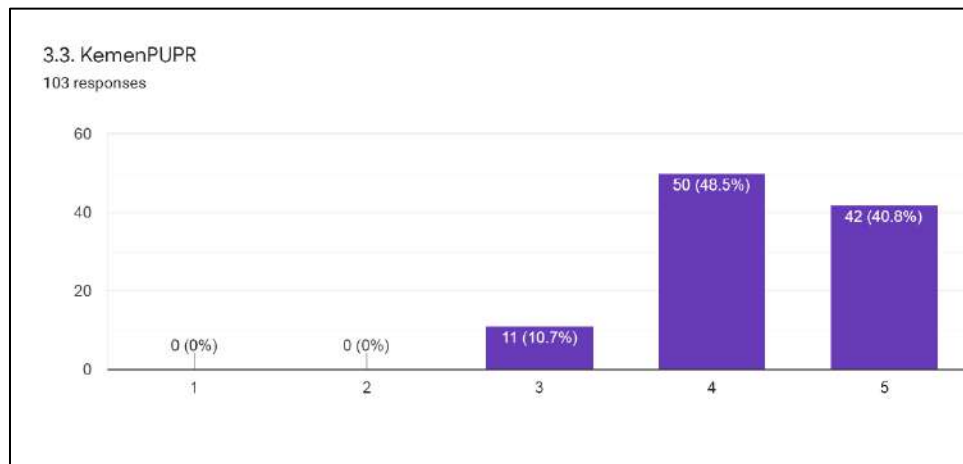


Figure 26 Participants Responses to the Ministry of Public Works and public Housing Session

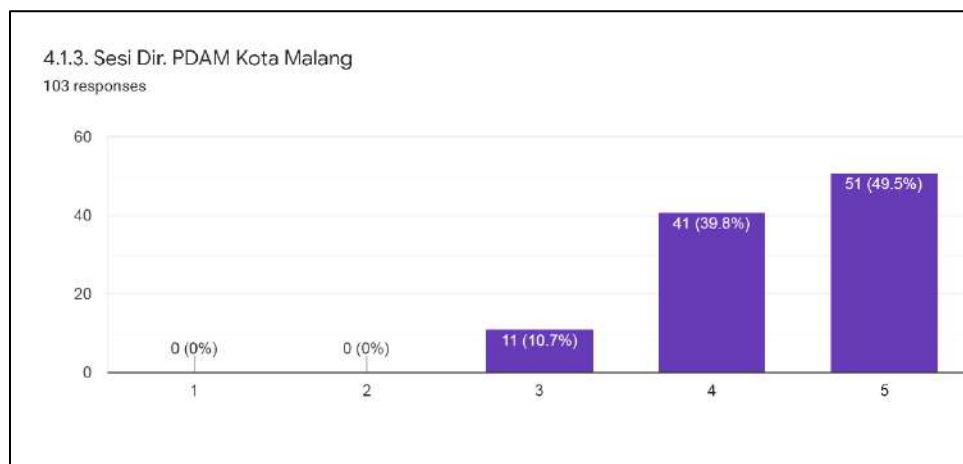


Figure 27 Participants Responses to the Director of Perumda Tugu Tirta Kota Malang Session

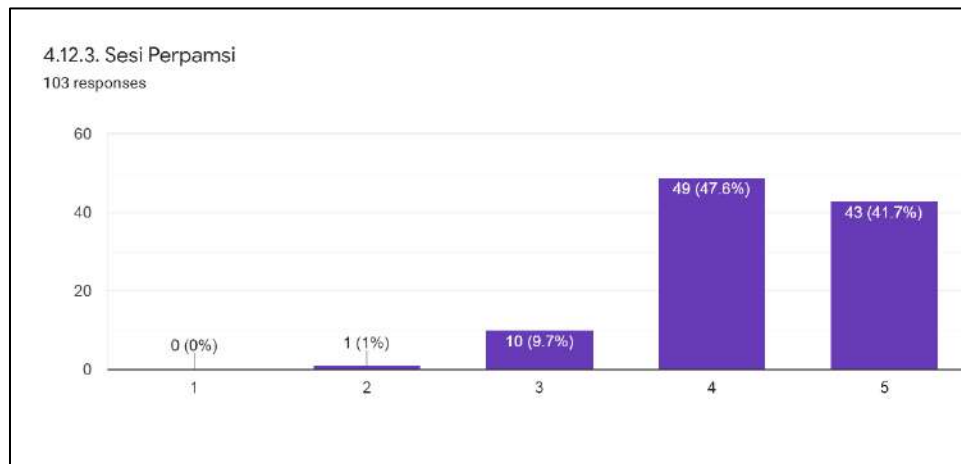


Figure 28 Participants Responses to the United of Indonesian Water Utility Session

f) The plan after the webinar

In general, most participants hoped that they could better understand the stages of preparing the WSP, to further implement the WSP in their respective work areas. In addition, for those who have had WSP, they hoped that they could revised it by reviewing the existing risks and control measures. From the results of the evaluation, it was known that the participants also wanted to convey to their friends/ colleagues about the importance of participating in this activity, because the material was good and important for improving the SPAM performances.

Related to the willingness to become a pilot WSP implementation through providing technical guidance in the field, 81% of respondents said 'Willing' and 7% 'Depends on the management decisions'. This result strengthens the opinion of most respondents who consider the importance of WSP. Figure 29 depicts this willingness.

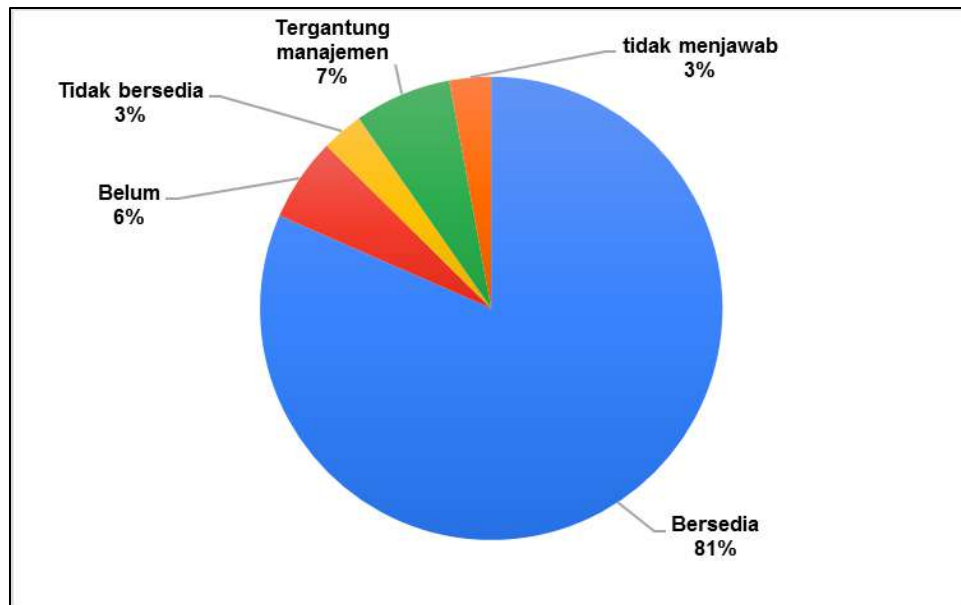


Figure 29 Participants Willingness to Become the Pilot Project of WSP

10) Discussion between participants, regulators, WHO, LPPM Itenas, donor and other related parties using whatsapp group

Whatsapp group was created as a tool to discuss any related problems with WSP, with regulators, WHO, LPPM Itenas, donor and other related parties. This group was called Webinar RPAM 2021 during the running of the Webinar; and was changed into Alumni Webinar RPAM 2021 after the Webinar had finished.

11) Interactive questions and answers on Day 5 using zoom application

Questions and answers (Qs & As) were done actively on Day 5 after the sessions of the resource person from the Ministry of Public Health and Perpamsi. Appendix 16 depicts these Qs & As.

7.4 Documentation

The documentation for the Webinar is attached in Appendix 17 and was also shared through this link: <https://drive.google.com/drive/folders/1kl2mRJNHLMJvQZrpdOp3Vzebpdze2js>.

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2. Lembaga Penelitian dan Pengabdian Masyarakat (LP2M), Institut Teknologi Nasional Bandung, Pelatihan Webinar bagi Penyelenggara Sistem Penyediaan Air Minum (SPAM) untuk Memahami dan Melaksanakan Manual Rencana Pengamanan Air Minum (RPAM), dan Bantuan Teknis untuk Melaksanakan RPAM di Perusahaan Daerah Air Minum (PDAM) Terpilih, Bandung, Indonesia, Desember, 2020
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4. World Health Organization (WHO), Virtual Training, Water Safety Planning Introduction to Principles and Steps, 29 October 2020

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