KORESPONDENSI PUBLIKASI JURNAL BEREPUTASI

Bagian 1 : Identitas dan Indeksasi Jurnal

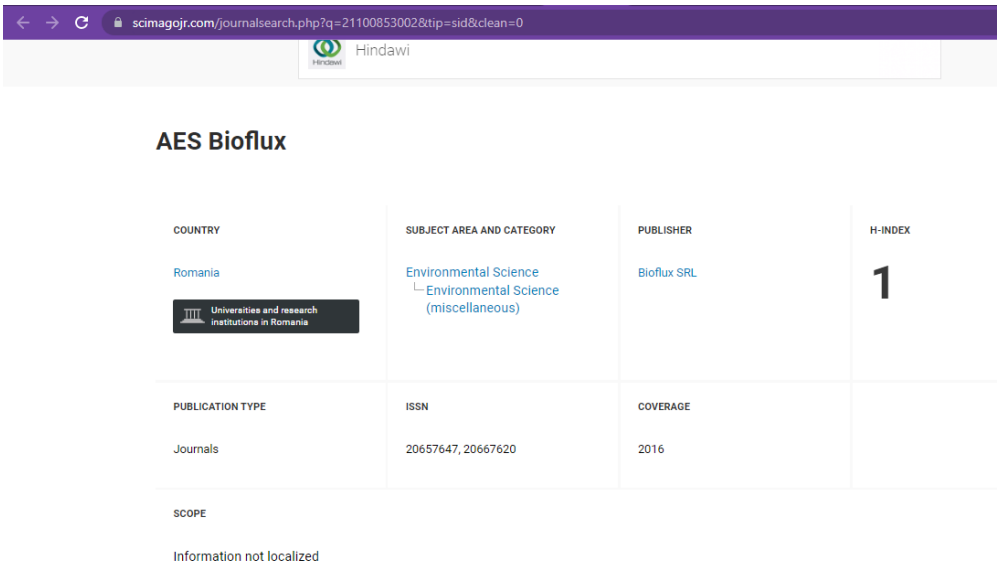
Nama Jurnal : **Advances in Environmental Sciences – International Journal of the Bioflux Society**

URL Jurnal : **http://www.aes.bioflux.com.ro/**

URL Artikel : **http://www.aes.bioflux.com.ro/docs/2021.57-62.pdf**

Scimago :

https://www.scimagojr.com/journalsearch.php?q=21100853002&tip=sid&clean=0



Bagian 2 : Komunikasi Publikasi dengan Editor Journal

Judul Artikel : The role of application of vertical greenery systems on the Jakarta-Cikampek elevated toll road

Penulis Pertama dan Korespondensi :

Efendhi Prih Raharjo (Polytechnic of Indonesian Land Transport, Ministry of Transportation, Bekasi, Indonesia; Email: efendhisttd@gmail.com)

Penulis Anggota :

- **Agus Sembodo** (Polytechnic of Indonesian Land Transport, Ministry of Transportation, Bekasi, Indonesia)
- **Anisa Mahadita Candra Rahayu** (Polytechnic of Indonesian Land Transport, Ministry of Transportation, Bekasi, Indonesia)

Histori Publikasi

- **Surat Penerimaan Abtrak ISSLD Ke-5 Tahun 2020 : 15 Agustus 2020 : Lampiran 1**
- **Hasil Review Paper The 5th ISSLD : 19 Januari 2021 : Lampiran 2**
- **Penyampaian Revisi Naskah : 21 January 2021 : Lampiran 3**
- **Keputusan Pemilihan Paper ISSLD oleh AES Bioflux : 04 Februari 2021 : Lampiran 4**
- **Penyampaian Revisi Naskah Sesuai Format AES Bioflux :08 Februari 2021 : Lampiran 5**
- **Revisi AES Bioflux : 15 Agustus 2021 : Lampiran 6**
- **Revisi AES Bioflux Done : 13 September 2021 : Lampiran 7**
- **Published : http://www.aes.bioflux.com.ro/docs/2021.57-62.pdf**

Lampiran 1

from:	**The 5th ISSLD 2020 OC** <seminar_arl@apps.ipb.ac.id>
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date:	16 Aug 2020, 09:18
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LETTER OF ACCEPTANCE FOR ABSTRACT OF THE 5TH ISSLD 2020
August 15th, 2020

Dear E P Raharjo
Its our pleasure to inform you that your abstract entitled “Application of Vertical Greenery Systems on the Jakarta-Cikampek Elevated Toll Road” has been ACCEPTED for poster presentation in the 5th International Symposium of the Sustainable Landscape. You are therefore invited to submit a full paper of the proposed abstract. Please download the updated full paper template in the "Author Guideline” at The 5th ISSLD website for the full paper writing:

http://arl.faperta.ipb.ac.id/symposium/author-guideline/

Please be reminded that the deadline for the full paper submission is the September 4th 2020. Only the submitted full paper that will proceed for the reviewing process. All papers that pass the review process will be published in the IOP Earth and Environmental Science - Scopus Indexed, Bioflux Advance of Environment Science, or Jurnal Lanskap Indonesia.
Thank you once again for your participation in our conference and we look forward to receiving your full paper.

Sincerely,
Dr. Akhmad Arifin Hadi
Chairman of the Organizing Committee
The 5th ISSLD 2020 Organizing Committee

The 5th International Symposium of Sustainable Landscape Development
THE 5TH ISSLD 2020
Department of Landscape Architecture, Faculty of Agriculture
IPB University
Jalan Meranti Kampus IPB Dramaga 16680 West Java Indonesia

LETTER OF ACCEPTANCE FOR ABSTRACT OF THE 5TH ISSLD 2020

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http://arl.faperta.ipb.ac.id/symposium/author-guideline/

Please be reminded that the deadline for the full paper submission is the September 4th 2020. Only the submitted full paper that will proceed for the reviewing process. All papers that pass the review process will be published in the IOP Earth and Environmental Science - Scopus Indexed, Bioflux Advance of Environment Science, or Jurnal Lanskap Indonesia.

Thank you once again for your participation in our conference and we look forward to receiving your full paper.

Sincerely,

Dr. Akhmad Arifin Hadi
Chairman of the Organizing Committee

Lampiran 2

from:	**The 5th ISSLD 2020 OC** <seminar_arl@apps.ipb.ac.id>
to:	Efendhi Prih Raharjo <efendhisttd@gmail.com>
date:	19 January 2021, 21:38
subject:	Hasil Review Paper The 5th ISSLD
mailed-by:	apps.ipb.ac.id
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Naskah dikumpulkan paling lambat hari Jumat, **22 Januari 2021** Pukul 19.00 WIB.

Atas perhatian dan kerjasamanya kami sampaikan terima kasih

Salam,
Panitia The 5th ISSLD

The 5th ISSLD 2020 Organizing Committee

Lampiran 3

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subject:	Penyampaian Revisi Naskah E P Efendhi_Revisi
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atas perhatian dan bantuannya kami sampiakan terima kasih.

salam,
Efendhi Prih Raharjo

Lampiran 4

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Dear Authors,

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thank you for your attention.

regards,
the 5th ISSLD OC
--
The 5th ISSLD 2020 Organizing Committee

Submission letter

Article title:

Name of the authors:

Hereby I would like to submit the manuscript entitled "**article title**" to Advances in Environmental Sciences – International Journal of the Bioflux Society.

This manuscript was not submitted or published to any other journal.

The authors declare that the manuscript is an original paper and contain no plagiarised text. All authors declare that they are not currently affiliated or sponsored by any organization with a direct economic interest in subject of the article. My co-authors have all contributed to this manuscript and approve of this submission.

Corresponding author

Name

Signature

Date

Lampiran 5

from:	**Efendhi Prih Raharjo** <efendhisttd@gmail.com>
to:	The 5th ISSLD 2020 OC <seminar_arl@apps.ipb.ac.id>
date:	8 Feb 2021, 10:46
subject:	Re: Penyampaian Revisi Naskah E P Efendhi_Revisi
mailed-by:	gmail.com

Dear Panitia The 5th ISSLD

Berikut kami sampiakan naskah revisi untuk format AES Bioflux dan Submission Letter sesuai dengan format yang sudah disampaiakan.
atas perhatian dan bantuannya kami sampiakan terima kasih.

salam,
Efendhi Prih Raharjo

Submission letter

Article title: The Role of Application of Vertical Greenery Systems on the Jakarta-Cikampek Elevated Toll Road

Name of the authors: E. P. Raharjo

Hereby I would like to submit the manuscript entitled "**The Role of Application of Vertical Greenery Systems on the Jakarta-Cikampek Elevated Toll Road**" to Advances in Environmental Sciences – International Journal of the Bioflux Society.

This manuscript was not submitted or published to any other journal.

The authors declare that the manuscript is an original paper and contain no plagiarised text. All authors declare that they are not currently affiliated or sponsored by any organization with a direct economic interest in subject of the article. My co-authors have all contributed to this manuscript and approve of this submission.

Corresponding author

E P Raharjo

February 5, 2021

The Role of Application of Vertical Greenery Systems on the Jakarta-Cikampek Elevated Toll Road

E P Raharjo, A Sembodo and A M Rahayu

Polytechnic of Indonesian Land Transport, Ministry of Transportation, Bekasi, Indonesia.
Corresponding author : E.P. Raharjo, efendhisttd@gmail.com

Abstract. The Indonesian government has been focusing on the development of the transportation sector for the past several years. It is done to increase the movement of people and goods, which will improve the economy. One of the transportation projects that has been undertaken is the construction of the Jakarta-Cikampek Elevated Toll Road. The construction of this project has given a change in travel time. However, on the other hand, new problems have arisen, including increases in air pollution, air temperature, and impaired vision. One way to deal with this problem is by greening. The purpose of this study is to provide a concept of handling with an optimal green line to minimize the impact that appears. The method used is a literature review which includes: The selection of planting methods, analysis of CO pollutants, analysis of noise pollution, and analysis of temperature. The result of analysis shows that the most appropriate concept of The vertical greenery system is by using vines. It concept was chosen because it will optimize vacant land in the green belt bellow the overpass as planting medium. The application of The vertical greening system will reduce the CO concentration value by 33.33%, so that the average concentration will become 199.659 ppm. The application of this system can reduce noise pollution by 3 dBA, so that the noise intensity will be reduced to 50-79 dBA with an average of 74,5 dBA. This system will provide a temperature reduction of 1.2° Celsius so that there will be a decrease in The average temperature to 28.2° Celsius.
Keywords: Vertical Greenery System, Pollution, Noise, Temperature, Elevated Toll Road.

Introduction. Transportation has always been a part of life activities, both for moving people and goods. Without transportation, people or goods will not be able to travel. The Indonesian government for several years has focused on developing the transportation sector. This is done to increase the movement of people and goods, which will improve the economy. One of the transportation projects that have been undertaken is the construction of the Jakarta-Cikampek elevated toll road. This toll road is built along 36.84 kilometres and located in the middle of the Jakarta-Cikampek Toll Road. This toll road crosses Bekasi City, Bekasi Regency, and Karawang Regency. The purpose of the construction of this toll road is to separate the Jakarta-Bekasi-Cikarang commuter route (collector/existing line) from long-distance travel routes to Cirebon, Bandung, Semarang and Surabaya (express/elevated lanes).

The construction of the Jakarta-Cikampek Flyover Toll Road project has made changes especially in travel time. But on the other hand, new problems arise. Changes in land use that were use initially as green open space are reduced due to the development. The increase in vehicle traffic around the construction site will also increase air pollution. The construction of the toll road will increase the traffic of passing vehicles which will also have an impact on rising temperatures around the construction. Another impact is noise pollution. Noise pollution increases with increasing traffic. This is also reinforced by the design of the toll road at the top, which causes the sound to spread further.

The Environmental Quality Index Report 2015-2018 (2019) provides information that the historical value of the Environmental Quality Index (EQI) data of DKI Jakarta Province in 2015-2018 has a value of 43.79 (very poor), 36.69 (alert), 35.78 (alert), and 45.21 (very poor). Meanwhile, West Java Province has historical data on the 2015-2018 EQI values as follows 63.49 (good enough), 51.87 (not good), 50.26 (not good), and 56.98 (not good). It is known that the index value of the two provinces can be said to have a low value. The 2018 Environmental Quality Index Report 2018 (2018) states that the EQI value of West Java Province is mostly influenced by the Air Quality Index of 72.80 and the Water Quality Index of 65.77, while the Land Cover Quality Index is only 38.51. Meanwhile, in DKI Jakarta Province the largest EQI was also influenced by the Air Quality Index of 66.57 and the Water Quality Index of 51.93, while the Land Cover Quality Index was only 24.14. The 2018 EQI data illustrates that the quality of the environment in West Java Province is not good and DKI Jakarta is already in a very poor stage. One of the causes of this problem is development in the transportation sector, especially toll roads.

Handling problems related to air pollution, noise pollution and temperature increases can be done in many ways, one of which is greening. Greening has many methods, one of which is a vertical greenery system. This research will provide an optimal green line treatment concept in order to minimize of air pollution, noise level, and temperature

Research Methodology

Data collection. Data for this research is secondary data. Data is obtained from various sources such as Indonesian government regulations, book report, journals, as well as theory development and case studies. The data used in this research are temperature data, noise value data, and traffic volume data. Data of traffic volume collected from PT. Jasa Marga (2020) is data on vehicles going in and out of Jakarta via the Jakarta-Cikampek Toll at the Cikampek Utama Toll Gate. Noise data is obtained from environmental impact reports (PT. Sarana Perencana Jaya 2017).

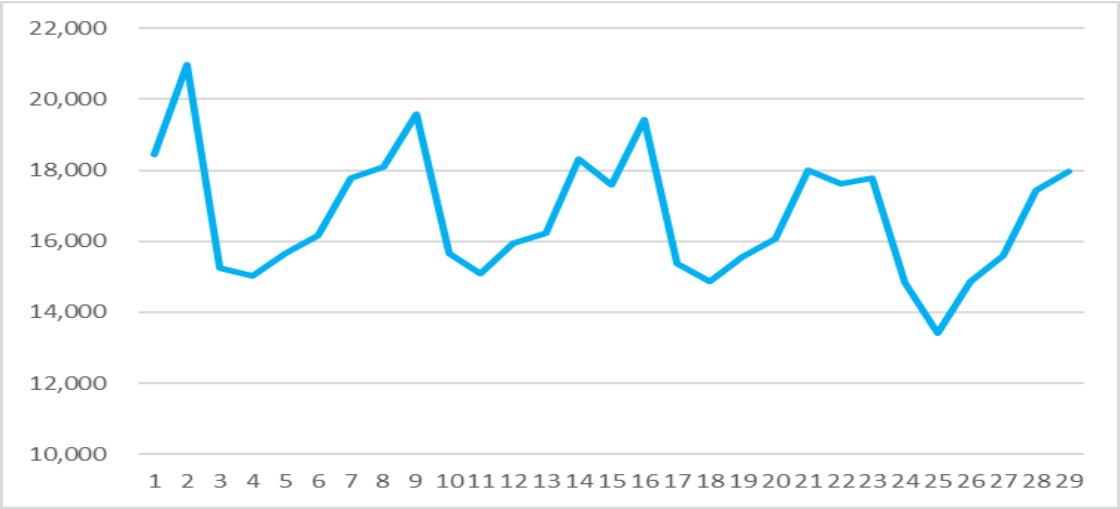

Figure 1. Traffic volume Jakarta-Cikampek Toll Road in February 2020.

Figure 1 shows the traffic volume of Jakarta vehicles through the Jakarta-Cikampek toll road at the Cikampek Utama toll gate. The data was taken in the span of one month in February 2020. The lowest data occurred in the volume of 13416 vehicles, while the highest volume was 20974 vehicles with an average vehicle volume of 16172 vehicles.

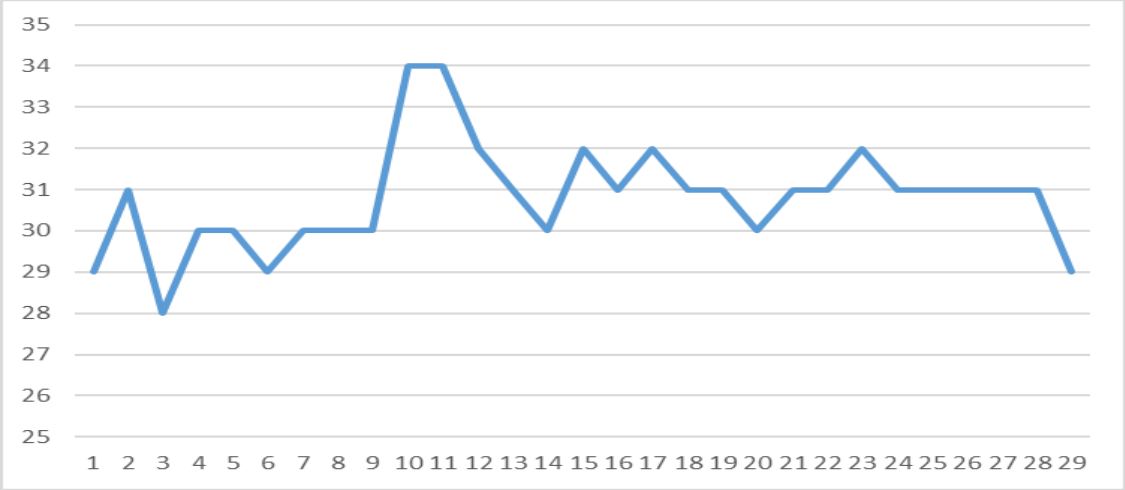

Figure 1 Temperature history data in February 2020

Figure 2 shows the historical data on temperature around the Jakarta-Cikampek toll road area. The data was taken in the span of one month in February 2020. The lowest temperature occurs at 28° C, the highest temperature is at 34° C and the average temperature is 30° C.

Sound noise data is obtained from the Addendum Andal and RKL-RPL report for the construction of the Jakarta-Cikampek II Elevated toll road (PT. Sarana Perencana Jaya 2017). Noise data is obtained with a value between 53-82 dBA with an average value of 77.5 dBA.

Method of analysis. The method of analysis used literature study. Air pollution analysis is performed by calculating the value of pollutants based on the Hobbs Pollutant Regression Model calculation method (Hobbs 1979). This model uses traffic volume data as the basis for its calculations. The pollutant values calculated is the concentration of Carbon Monoxide (CO). Noise level and temperature were calculated using parameter values taken from other studies.

Research Result and Discussion

Vertical greenery system topology. The Vertical Greenery Systems has various topology systems. Wong et al. (2010) Divided them into two patterns, namely the living wall and green façade. The living wall is a planting model on the wall that uses planting media, while the green façade is a planting system that uses vines that are planted in the ground and that also cover the walls. Safikhani et al. (2014) divided them into four, namely tree-against-wall type; wall-climbing type; hanging-down type and module type. Tree-against-wall type is a planting system that uses tree-type plants that are planted opposite the wall. Wall-climbing type is a planting method using vines. It is planted in the ground so that the vines are on the wall. Hanging-down type is a method of planting on a wall using hanging plants. Module type is a planting method using planting media and small plants.

Various methods of vertical greenery system have advantages and disadvantages. Seeing the field conditions on the Jakarta-Cikampek Elevated Toll Road, the appropriate method to use is either the green façade or Wall-climbing type method. This method was chosen considering that under the toll road there is still free space that can be used as planting media.

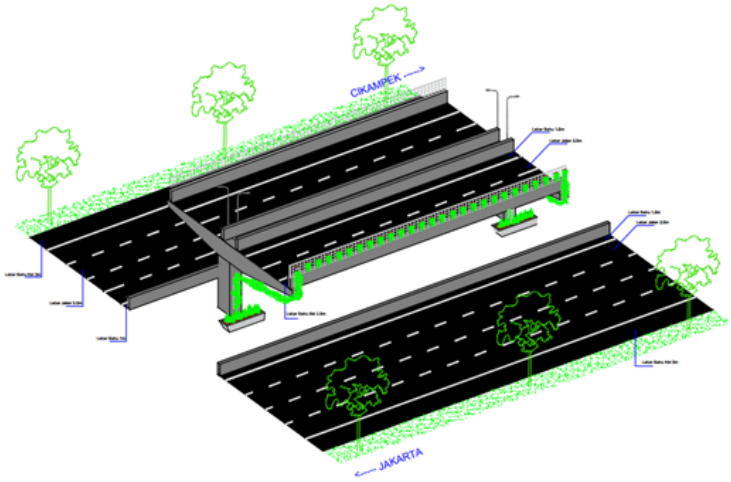

Figure 3 Application of vertical greenery system design

Figure 3 is the application of vertical greenery system design. It is carried out by planting in an empty land area under the Jakarta-Cikampek Elevated Toll Road and directed upwards (elevated road) using wire media. The planting design on the elevated road is formed using wire mesh media that forms the edge wall along the elevated road.

Types of plants. There are many types of plants to use in the vertical greenery system. However, with the type of design chosen, the selection of plant types is only on the type of vines. There are several vines that can be used, including sirih gading (devil's ivy), bitter melon (Momordica charantia), morning glory (Ipomoea tricolor), apios (Apios American medicus), and sword bean (Canavalia gladiata). However, from all of them the most suitable for use in the research location is sirih gading (devil's ivy).

Air pollution. Air pollution analysis was carried out by calculating the carbon monoxide concentration value using the Hobbs regression model (Hobbs 1979). Carbon monoxide concentration (CO) is calculated in parts per million (ppm) which is calculated by the volume of the vehicle during the an hour period in road shoulder of elevated road.

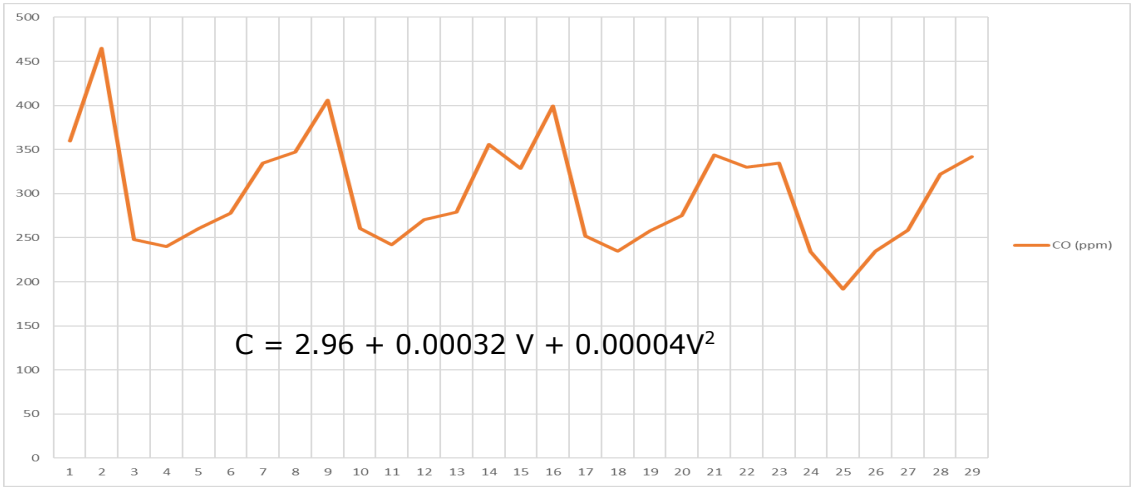

Figure 4 Air pollution based on traffic volume 1 hour period

Figure 4 is the analysis result of calculating the value of pollutants in a 1 hour volume period. The analysis showed that CO concentrations in the region ranged from 192.049 ppm to 464.817 ppm with an average of 299.473 ppm.

B. Adita and N. Ratni (2013) in their research showed that the efficiency level of absorption of carbon monoxide gas on plants at the exposure time of an hour on the fifth day in lidah mertua (Sansevieria) was 40.88%, lili paris (chlorophytum comosum) 36.48%, and sirih gading (devil's ivy) 33.33%. In that case, the application of the vertical greenery system using devil's ivy plant will be able to reduce the carbon dioxide level by 33.33%. So that the lowest concentration will decrease to 128.039 ppm, the highest concentration will sink to 309.894 ppm and the average concentration will become 199.659 ppm.

Noise level. The application of vertical greenery is carried out by planting in an empty land area under the Elevated Road and directed upwards (elevated road) using wire media. The planting design on the elevated road is formed using wire mesh media that forms the edge wall along the elevated road. (see Figure 3)

Green facades mute street noise from 2.5 dB to 3dB and ensure that internal reverberation between facades on each side of the street is reduced (Wong et. all. 2010). Noise intensity originating from vehicle engine activity reached 53-82 dBA with an average of 77.5 dBA. The application of this system can reduce noise pollution by 3 dBA, so that the noise intensity will be reduced to 50-79 dBA with an average of 74.5 dBA.

Temperature. This system will provide a temperature reduction of 1.2° Celsius so that there will be a decrease in temperature to 26.8° Celsius for the lowest temperature, 32.8° Celsius for the highest temperature and an average temperature to 28.2° Celsius.

Conclusion. The result of the research shows that the most appropriate concept of vertical greening system is by using vines. This concept was chosen because it will optimize vacant land in the green belt bellow the overpass as planting medium. The analysis showed that CO concentrations in the region ranged from 192.049 ppm to 464.817 ppm with an average of 299.473 ppm. The application of vertical greening system will reduce the CO concentration value by 33,33%, so that the lowest concentration will decrease to 128.039 ppm, the highest concentration will sink to 309,894 ppm and the average concentration will become 199.659 ppm. Noise intensity originating from vehicle engine activity reached 53-82 dBA with an average of 77.5 dBA. The application of this system can reduce noise pollution by 3 dBA, so that the noise intensity will be reduced to 50-79 dBA with an average of 74.5 dBA. Existing temperature value is the lowest at 28° Celsius, the highest at 34° Celsius with an average of 30° Celsius. This system will provide a temperature reduction of 1.2° Celsius so that there will be a decrease in temperature to 26,8° Celsius for the lowest temperature, 32.8° Celsius for the highest temperature and an average temperature to 28.2° Celsius.

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The Ministry of Environment and Forestry. 2019. Environmental Quality Index Report 2015-2018. Jakarta.

Wong, Nyuk Hien, Alex Yong Kwang Tan, Yu Chen, Kannagi Sekar, Puay Yok Tan, Derek Chan, Kelly Chiang, and Ngian Chung Wong. 2010. "Thermal Evaluation of Vertical Greenery Systems for Building Walls." Building and Environment 45(3):663–72.

Wong, Nyuk Hien, Alex Yong Kwang Tan, Puay Yok Tan, Kelly Chiang, and Ngian Chung Wong. 2010. "Acoustics Evaluation of Vertical Greenery Systems for Building Walls." Building and Environment 45:411–20.

Lampiran 6

from:	**pingkan nuryanti** <pingkannuryanti@apps.ipb.ac.id>
to:	efendhisttd@gmail.com
date:	15 Aug 2021, 10:56
subject:	Artikel BIOFLUX MOHON SEGERA DIREVISI
mailed-by:	apps.ipb.ac.id
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Yth. Pak Efendi

Mohon segera melakukan perbaikin artikel sesuai dgn hasil reviewer Bioflux.

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Best regard,

Panitia ISSLD

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Begin forwarded message:

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Begin forwarded message:

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mohon segera forward ke pak Raharjo
demikian, terimakasih
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Date: Wed, Jul 28, 2021 at 5:57 AM
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To: Akhmad Arifin Hadi INSTITUT PERTANIAN BOGOR <arifin_hadi@apps.ipb.ac.id>

Dear Dr. Akhmad Arifin Hadi,

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Thank you very much!

Cordially yours,
Claudiu Gavriloaie

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On Tuesday, June 22, 2021, 3:54:15 PM GMT+3, Akhmad Arifin Hadi INSTITUT PERTANIAN BOGOR <arifin_hadi@apps.ipb.ac.id> wrote:

Dear Prof Gavriloaie I Claudiu
how are you? I hope everything is okay
we would like to ask about the 2 papers with the titles are:

1. Transport Network Planning for Freight Transport Based on Environment Approach
2. The Role of Application of Vertical Greenery Systems on the Jakarta-Cikampek Elevated Toll Road

are they accepted? thank you very much
SIncerely yours
Hadi

On Sun, Feb 21, 2021 at 10:58 AM Akhmad Arifin Hadi INSTITUT PERTANIAN BOGOR <arifin_hadi@apps.ipb.ac.id> wrote:
Dear Dr Gavriloaie Ionel Claudiu
We submitted the 2 papers that we hope those papers can be published in Bioflux Advance of Environmental SCience

the papers were in doc file.
the titles are:

1. Transport Network Planning for Freight Transport Based on Environment Approach
2. The Role of Application of Vertical Greenery Systems on the Jakarta-Cikampek Elevated Toll Road

we hope those papers can be accepted. we also ready to pay the submission fee to Bioflux AES
thank you very much
Sincerely yours
Hadi

On Thu, Feb 4, 2021 at 9:59 PM gavriloaie ionel claudiu <ionelclaudiu@yahoo.com> wrote:
Dear Dr. Akhmad Arifin Hadi,

I will wait to receive those two papers in doc format.

And what do you say about my proposal for the other 5 papers to be published in Ecoterra journal with no charge?
Thank you!

Cordially yours,
Claudiu Gavriloaie

On Thursday, February 4, 2021, 1:16:12 AM GMT+2, Akhmad Arifin Hadi INSTITUT PERTANIAN BOGOR <arifin_hadi@apps.ipb.ac.id> wrote:

Dear Dr. Gavriloaie Ionel Claudiu
we agree with your suggestion that 2 papers are eligible for Bioflux AES. we will send the papers immediately. the requested the authors to write in Bioflux AES journal format.
thank you very much
Sincerely yours
Hadi

On Thu, Feb 4, 2021 at 4:22 AM gavriloaie ionel claudiu <ionelclaudiu@yahoo.com> wrote:
Dear Dr. Akhmad Arifin Hadi,

I still have no reply to my message below. Looking forward to have it soon.
Thank you!

Yours,
Claudiu Gavriloaie

----- Forwarded Message -----
From: gavriloaie ionel claudiu <ionelclaudiu@yahoo.com>
To: Akhmad Arifin Hadi INSTITUT PERTANIAN BOGOR <arifin_hadi@apps.ipb.ac.id>
Sent: Monday, January 11, 2021, 5:33:23 PM GMT+2
Subject: Re: happy new year

Dear Dr. Akhmad Arifin Hadi,

After analysing the abstracts, we only found two papers which fall under AES journal areas of coverage. It is about Raharjo et al (1) (Vertical greenery of the toll road) and Sari et al (Transport network planning).

So, send me the full papers, but make sure they will be edited according to the journal's format, including the references'quotation in text.
Looking forward to have your reply.
Thank you very much!

Cordially yours,
Claudiu Gavriloaie

P.S. I am the managing editor of another journal (no relationship with Bioflux), edited by an Institute where I also work. The name is Ecoterra and you can search the website here: http://www.ecoterra-online.ro/en/. It is a decent journal and we have done a huge work to develop it during the years. In case you will consider it good enough, the other five papers could be published there, with no charge. Thank you!

On Friday, January 8, 2021, 8:04:05 AM GMT+2, Akhmad Arifin Hadi INSTITUT PERTANIAN BOGOR <arifin_hadi@apps.ipb.ac.id> wrote:

Dear Dr. Gavriloaie Ionel Claudiu
I am really sorry for my misunderstanding.
I agree with the term of the deal. we already held the 5th International Symposium of Sustainable Landscape Development on 22-24 September 2020. Now the phase is in the review process of submitted papers. we will select 4-5 papers and submitted to Bioflux AES.
however, the submitted papers' topic mostly about transportation. we would like to send you the manuscript in the previous email. we sent it in the attachment in *.rar file. now in this email, we send you the abstract of those papers in the PDF file (attachment). we would like to ask for your help to check if the title and abstract of those papers are suitable with Bioflux AES. according to our review, the papers in the English language and the results are okay, but we are not sure of the suitability with Bioflux AES scope. therefore we need your suggestion. if they are not suitable with Bioflux AES, then we will recommend the authors to submit to another journal or proceedings. but if those papers are suitable with Bioflux AES scope, then we will continue the review process of those papers. would you please check the abstract of each paper in the attachment?
thank you very much and I would like to ask apology for my misunderstanding.
thank you once again
Sincerely yours
Hadi

On Thu, Jan 7, 2021 at 6:41 PM gavriloaie ionel claudiu <ionelclaudiu@yahoo.com> wrote:
Dear Dr. Akhmad Arifin Hadi,

Thank you for the kind words! I wish you all the best for the new year!

Actually I did not receive any manuscript from you. I have sent you the terms of the deal (see the yellow message below), having no reply so far. And now, after one year, you ask me about the manuscripts!!! But, again, you did not send me any manuscript.
So, read carefully the terms below and then, if you will agree, send the papers, to me only.
Looking forward to have your reply.
Thank you!

Yours,
Claudiu Gavriloaie

On Mon, Jan 27, 2020 at 6:55 AM gavriloaie ionel claudiu <ionelclaudiu@yahoo.com> wrote:
Dear Dr. Akhmad Arifin Hadi,

I apologise for answering your message only now. My schedule on the office was hectic the last week.
Yes, we can have a good cooperation. I will provide the conditions:

- we have to receive at least 4-5 papers; they should be already preliminary reviewed by your side (editing style, English quality, suitability for the journal's areas);

- the papers should be sent altogether. Let's say during a week;

- the fee will be either the regular one (250 USD for review process up to 12 weeks) or the special one (300 USD for fast track review, up to 4 weeks), depending on each author's request;

- we will discuss later if we will keep in touch with a single person for all the papers involved or with the corresponding author of each paper.

Feel free to ask for additional information if needed.
Thank you very much!

With best regards,
Claudiu Gavriloaie

On Wednesday, January 6, 2021, 6:57:07 AM GMT+2, Akhmad Arifin Hadi INSTITUT PERTANIAN BOGOR <arifin_hadi@apps.ipb.ac.id> wrote:

Dear AES Bioflux Dr. Gavriloaie Ionel Claudiu
how are you?
happy new year
May this year bring new hopes for us.

By The way, have you checked the draft of the papers from us? thank you very much
sincerely yours

On Mon, Jan 27, 2020 at 6:55 AM gavriloaie ionel claudiu <ionelclaudiu@yahoo.com> wrote:
Dear Dr. Akhmad Arifin Hadi,

I apologise for answering your message only now. My schedule on the office was hectic the last week.
Yes, we can have a good cooperation. I will provide the conditions:

- we have to receive at least 4-5 papers; they should be already preliminary reviewed by your side (editing style, English quality, suitability for the journal's areas);

- the papers should be sent altogether. Let's say during a week;

- the fee will be either the regular one (250 USD for review process up to 12 weeks) or the special one (300 USD for fast track review, up to 4 weeks), depending on each author's request;

- we will discuss later if we will keep in touch with a single person for all the papers involved or with the corresponding author of each paper.

Feel free to ask for additional information if needed.
Thank you very much!

With best regards,
Claudiu Gavriloaie

On Tuesday, January 21, 2020, 6:26:32 AM GMT+2, Akhmad Arifin Hadi INSTITUT PERTANIAN BOGOR <arifin_hadi@apps.ipb.ac.id> wrote:

Dear Dr. Ionel Claudiu Gavriloaie
my name is Akhmad Arifin Hadi. I am a head of Department of Landscape Architecture, IPB University Indonesia
we would like to ask you a question about opportunity to cooperate in publishing our selected paper form symposium. we will hold a symposium this year, The 5th International Symposium for sustainable landscape development (The 5th ISSLD) website http://arl.faperta.ipb.ac.id/symposium/ . this year, we will hold the 5th ISSLD on August 2020
we would like to ask, is it possible if our selected papers (about 5 papers) published in Bioflux AES in regular volume (not special issue)? if so, what are the requirements to cooperate?

thank you very much for your attention
Sincerely yours
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Dr. Akhmad Arifin Hadi
Head of Department / Lecturer
Department of Landscape Architecture - Faculty of Agriculture
IPB University (Bogor Agricultural University) - Indonesia

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Dr. Akhmad Arifin Hadi
Head of Department / Lecturer
Department of Landscape Architecture - Faculty of Agriculture
IPB University (Bogor Agricultural University) - Indonesia

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IPB University (Bogor Agricultural University) - Indonesia

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Dr. Akhmad Arifin Hadi
Head of Department / Lecturer

Department of Landscape Architecture - Faculty of Agriculture
IPB University (Bogor Agricultural University) - Indonesia
2 Attachments • Scanned by Gmail

The role of application of vertical greenery systems on the Jakarta-Cikampek elevated toll road

E. P. Bahacia, A. Sambodo, A. M. Bahawu

Polytechnic of Indonesian Land Transport, Ministry of Transportation, Bekasi, Indonesia.
Corresponding author: E. P. Bahacia, efendhisttd@gmail.com

Abstract. The Indonesian government has been focusing on the development of the transportation sector for the past several years. It is done to increase the movement of people and goods, which will improve the economy. One of the transportation projects that has been undertaken is the construction of the Jakarta-Cikampek Elevated Toll Road. The construction of this project has given a change in travel time. However, on the other hand, new problems have arisen, including increases in air pollution, air temperature, and impaired vision. One way to deal with this problem is by greening. The purpose of this study is to provide a concept of handling with an optimal green line to minimize the impact that appears. The method used is a literature review which includes: the selection of planting methods, analysis of CO pollutants, analysis of noise pollution, and analysis of temperature. The result of analysis shows that the most appropriate concept of the vertical greenery system is by using vines. This concept was chosen because it will optimize vacant land in the green belt bellow the overpass as planting medium. The application of the vertical greening system will reduce the CO concentration value by 33.33%, so that the average concentration will become 199.659 ppm. The application of this system can reduce noise pollution by 3 dBA, so that the noise intensity will be reduced to 55-79 dBA with an average of 74.5 dBA. This system will provide a temperature reduction of 1.2°C so that there will be a decrease in the average temperature to 28.2°C.
Key Words: elevated toll road, noise, pollution, temperature, vertical greenery system.

Introduction. Transportation has always been a part of life activities, both for moving people and goods. Without transportation, people or goods will not be able to travel. The Indonesian government for several years has focused on developing the transportation sector. This is done to increase the movement of people and goods, which will improve the economy. One of the transportation projects that have been undertaken is the construction of the Jakarta-Cikampek elevated toll road. This toll road is built along 36.84 kilometres and located in the middle of the Jakarta-Cikampek Toll Road. This toll road crosses Bekasi City, Bekasi Regency, and Karawang Regency. The purpose of the construction of this toll road is to separate the Jakarta-Bekasi-Cikarang commuter route (collector/existing line) from long-distance travel routes to Cirebon, Bandung, Semarang and Surabaya (express/elevated lanes).

The construction of the Jakarta-Cikampek Flyover Toll Road project has made changes especially in travel time. But on the other hand, new problems arise. Changes in land use that were use initially as green open space are reduced due to the development. The increase in vehicle traffic around the construction site will also increase air pollution. The construction of the toll road will increase the traffic of passing vehicles which will also have an impact on rising temperatures around the construction. Another impact is noise pollution. Noise pollution increases with increasing traffic. This is also reinforced by the design of the toll road at the top, which causes the sound to spread further.

The Environmental Quality Index Report 2015-2018 (2019) provides information that the historical value of the Environmental Quality Index (EQI) data of DKI Jakarta Province in 2015-2018 has a value of 43.79 (very poor), 36.69 (alert), 35.78 (alert), and 45.21 (very

poor). Meanwhile, West Java Province has historical data on the 2015-2018 EQI values as follows 63.49 (good enough), 51.87 (not good), 50.26 (not good), and 56.98 (not good). It is known that the index value of the two provinces can be said to have a low value. The 2018 Environmental Quality Index Report (2018) states that the EQI value of West Java Province is mostly influenced by the Air Quality Index of 72.80 and the Water Quality Index of 65.77, while the Land Cover Quality Index is only 38.51. Meanwhile, in DKI Jakarta Province the largest EQI was also influenced by the Air Quality Index of 66.57 and the Water Quality Index of 51.93, while the Land Cover Quality Index was only 24.14. The 2018 EQI data illustrates that the quality of the environment in West Java Province is not good and DKI Jakarta is already in a very poor stage. One of the causes of this problem is development in the transportation sector, especially toll roads.

Handling problems related to air pollution, noise pollution and temperature increases can be done in many ways, one of which is greening. Greening has many methods, one of which is a vertical greenery system. This research will provide an optimal green line treatment concept in order to minimize of air pollution, noise level, and temperature.

Material and Method

Data collection. Data for this research is secondary data. Data was obtained from various sources such as Indonesian government regulations, book report, journals, as well as theory development and case studies. The data used in this research were temperature data, noise value data, and traffic volume data. Data of traffic volume collected from PT. Jasa [redacted] (2020) is data on vehicles going in and out of Jakarta via the Jakarta-[redacted] Toll at the [redacted] Utama Toll Gate. Noise data is obtained from environmental impact reports (PT. Sarana [redacted] Jaya 2017).

Figure 1 shows the traffic volume of Jakarta vehicles through the Jakarta-[redacted] toll road at the [redacted] Utama toll gate. The data was taken in the span of one month in February 2020. The lowest data occurred in the volume of 13416 vehicles, while the highest volume was 20974 vehicles with an average vehicle volume of 16172 vehicles.

Figure 1. Traffic volume Jakarta-[redacted] toll road in February 2020.

Figure 2 shows the historical data on temperature around the Jakarta-[redacted] toll road area. The data was taken in the span of one month in February 2020. The lowest temperature occurs at 28°C, the highest temperature is at 34°C and the average temperature is 30°C.

Sound noise data is obtained from the Addendum Andal and RKL-RPL report for the construction of the Jakarta-[redacted] II Elevated toll road (PT. Sarana [redacted] Jaya 2017).

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Noise data is obtained with a value between 53 and 82 dBA with an average value of 77.5 dBA.

Figure 2. Temperature history data in February 2020.

Method of analysis. The method of analysis used literature study. Air pollution analysis was performed by calculating the value of pollutants based on the Hobbs Pollutant Regression Model calculation method (Hobbs 1979). This model uses traffic volume data as the basis for its calculations. The pollutant values calculated is the concentration of Carbon Monoxide (CO). Noise level and temperature were calculated using parameter values taken from other studies.

Result and Discussion

Vertical greenery system topology. The Vertical Greenery Systems has various topology systems. Wong et al (2010) divided them into two patterns, namely the living wall and green façade. The living wall is a planting model on the wall that uses planting media, while the green façade is a planting system that uses vines that are planted in the ground and that also cover the walls. Safikhani et al (2014) divided them into four, namely tree-against-wall type; wall-climbing type; hanging-down type; and module type. Tree-against-wall type is a planting system that uses tree-type plants that are planted opposite the wall. Wall-climbing type is a planting method using vines. It is planted in the ground so that the vines are on the wall. Hanging-down type is a method of planting on a wall using hanging plants. Module type is a planting method using planting media and small plants.

Various methods of vertical greenery system have advantages and disadvantages. Seeing the field conditions on the Jakarta-Cikampek Elevated Toll Road, the appropriate method to use is either the green façade or wall-climbing type method. This method was chosen considering that under the toll road there is still free space that can be used as planting media.

Figure 3 is the application of vertical greenery system design. It is carried out by planting in an empty land area under the Jakarta-Cikampek Elevated Toll Road and directed upwards (elevated road) using wire media. The planting design on the elevated road is formed using wire mesh media that forms the edge wall along the elevated road.

Types of plants. There are many types of plants to use in the vertical greenery system. However, with the type of design chosen, the selection of plant types is only on the type of vines. There are several vines that can be used, including sirih gading (devil's ivy), bitter melon (*Momordica charantia*), morning glory (*Ipomoea tricolor*), apios (*Apios americana* *medicus*), and sword bean (*Canavalia gladiata*). However, from all of them the most suitable for use in the research location is sirih gading (devil's ivy).

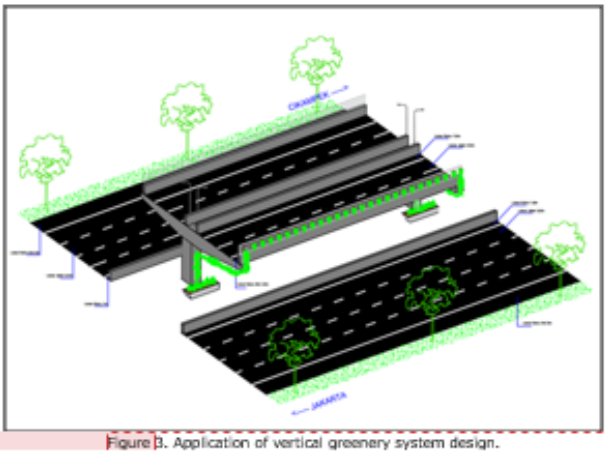

Figure 3. Application of vertical greenery system design.

Air pollution. Air pollution analysis was carried out by calculating the carbon monoxide concentration value using the Hobbs regression model (Hobbs 1979). Carbon monoxide concentration (CO) is calculated in parts per million (ppm) which is calculated by the volume of the vehicle during the an hour period in road shoulder of elevated road.

Figure 4 is the analysis result of calculating the value of pollutants in a 1 hour volume period. The analysis showed that CO concentrations in the region ranged from 192.049 ppm to 464.817 ppm with an average of 299.473 ppm.

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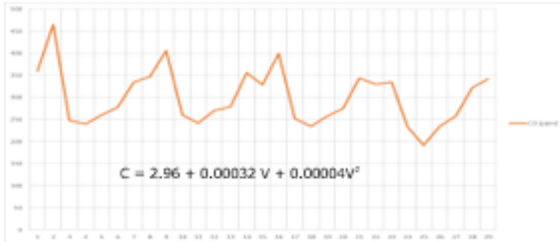

Figure 4. Air pollution based on traffic volume 1 hour period.

Adita & Ratni (2013) in their research showed that the efficiency level of absorption of carbon monoxide gas on plants at the exposure time of an hour on the fifth day in lidah mertua (*Sansevieria* sp.) was 40.88%, lili paris (*Chlorophytum comosum*) 36.48%, and sirih gading (devil's ivy) 33.33%. In that case, the application of the vertical greenery system using devil's ivy plant will be able to reduce the carbon dioxide level by 33.33%. So that the lowest concentration will decrease to 128.039 ppm, the highest concentration will sink to 309.894 ppm and the average concentration will become 199.659 ppm.

Noise level. The application of vertical greenery is carried out by planting in an empty land area under the Elevated Road and directed upwards (elevated road) using wire media. The planting design on the elevated road is formed using wire mesh media that forms the edge wall along the elevated road (see Figure 3).

Green facades mute street noise from 2.5 dB to 3dB and ensure that internal reverberation between facades on each side of the street is reduced (Wong et al 2010). Noise intensity originating from vehicle engine activity reached 53-82 dBA with an average of 77.5 dBA. The application of this system can reduce noise pollution by 3 dBA, so that the noise intensity will be reduced to 50-79 dBA with an average of 74.5 dBA.

Temperature. This system will provide a temperature reduction of 1.2°C so that there will be a decrease in temperature to 26.8°C for the lowest temperature, 32.8°C for the highest temperature and an average temperature to 28.2°C.

Conclusions. The result of the research shows that the most appropriate concept of vertical greening system is by using vines. This concept was chosen because it will optimize vacant land in the green belt bellow the overpass as planting medium. The analysis showed that CO concentrations in the region ranged from 192.049 ppm to 464.817 ppm with an average of 299.473 ppm. The application of vertical greening system will reduce the CO concentration value by 33.33%, so that the lowest concentration will decrease to 128.039 ppm, the highest concentration will sink to 309.894 ppm and the average concentration will become 199.659 ppm. Noise intensity originating from vehicle engine activity reached 53-82 dBA with an average of 77.5 dBA. The application of this system can reduce noise pollution by 3 dBA, so that the noise intensity will be reduced to 50-79 dBA with an average of 74.5 dBA. Existing temperature value is the lowest at 28°C, the highest at 34°C with an average of 30°C. This system will provide a temperature reduction of 1.2°C so that there will be a decrease in temperature to 26.8°C for the lowest temperature, 32.8°C for the highest temperature and an average temperature to 28.2°C.

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Authors:

Add here the complete name of each author, in order. Then, for each one of them, provide the complete name of the institution, the street, number, postal code, city, country and e-mail address.

How to cite this article:
[illegible] E. P., [illegible] A., [illegible] A. M., 2021 The role of application of vertical greenery systems on the Jakarta-[illegible] elevated toll road. AES [illegible] 13(2):xxx-xxx.

Received: 21 February 2021. Accepted: 03 May 2021. Published online: xx 16 May 2021.
Authors:

Add here the complete name of each author, in order. Then, for each one of them, provide the complete name of the institution, the street, number, postal code, city, country and e-mail address.

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Raharjo E. P., Sembodo A., Rahayu A. M., 2021 The role of application of vertical greenery systems on the Jakarta-Cikampek elevated toll road. AES Bioflux 13(2):xxx-xxx.

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rom:	**gavriloaie ionel claudiu** <ionelclaudiu@yahoo.com>
to:	"efendhisttd@gmail.com" <efendhisttd@gmail.com>, "arifin_hadi@apps.ipb.ac.id" <arifin_hadi@apps.ipb.ac.id>
date:	13 Sept 2021, 15:48
subject:	the almost final form of the paper "The role of application of vertical greenery systems on the Jakarta-Cikampek elevated toll road"
mailed-by:	yahoo.com
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security:	Standard encryption (TLS) Learn more
:	Important according to Google magic.

Dear Dr. Raharjo,

The manuscript submitted to AES Bioflux journal is almost done. But there are few minor comments to be addressed. So, work in the attached document and mark red the changes you will do.

The title is already available on the journal's website: http://www.aes.bioflux.com.ro/home/volume-13-2-2021/.
Thank you very much!

Cordially yours,
Claudiu Gavriloaie, PhD
editor-in-chief AES Bioflux journal

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