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HASIL PENILAIAN SEJAWAT SEBIDANG ATAU PEER REVIEW
KARYA ILMIAH : PROSIDING**

Judul Prosiding (Artikel) : Locally stability analysis of the Phytoplankton-Nitrogen- Phosphate-Sediment dynamical system: A study case at Karimunjawa aquaculture system, Central Java

Nama/Jumlah Penulis : Eka Triyana, Widowati, **Sapto P Putro** / 3 orang

Status Pengusul : penulis ke- 2

Identitas Prosiding : a. Nama Prosiding : Journal of Physics: Conference Series
b. Nomor ISSN : 17426588, 17426596
c. Volume, nomor, bulan tahun : Vol. 23, No. 7(2017) 6575–6578(4)
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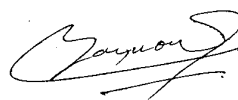
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Reviewer 2



Prof. Dr. St. Budi Waluya, M.Si
NIP. 196809071993031002
Unit kerja : Matematika FMIPA UNNES

Semarang, April 2020
Reviewer 1



Prof. Dr. Basuki Widodo, M.Sc
NIP. 19650506 1989031002
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**LEMBAR
HASIL PENILAIAN SEJAWAT SEBIDANG ATAU PEER REVIEW
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Penulisan artikel baik dan mengikuti standard penulisan artikel di Journal of Physics: Conference Series, yaitu abstract, Introduction, Result and Discussion (IRaD), Conclusion dan Acknowledgement. Belum memuat Methodology. Artikel ini didukung dengan referensi yang sesuai.

2. Ruang lingkup dan kedalaman pembahasan:

Lingkup bahasan dari artikel ini adalah bidang matematika terapan, khususnya pada bidang sistem dinamis. Dalam artikel ini dibahas dengan baik tentang analisis kestabilan asimptotik lokal dari model sistem dinamik dalam kesetimbangan ekosistem air. Relevansi hasil terkait untuk meminimalkan konsentrasi nitrogen dan fosfor, sehingga dapat dimanfaatkan oleh biota laut.

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Artikel memenuhi standard penulisan dan isi untuk prosiding di Journal of Physics: Conference Series. Artikel ini terindeks di Scopus (Q3).

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Reviewer 1



Prof. Dr. Basuki Widodo, M.Sc

NIP. 19650506 1989031002

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**LEMBAR
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Catatan Penilaian artikel oleh Reviewer :

1. Kesesuaian dan kelengkapan unsur isi prosiding:

Kesesuaian dan kelengkapan unsur isi baik. Artikel tersusun dalam kaidah penulisan karta ilmiah. Terdiri atas 5 bagian: Introduction, Mathematical model, Locally stability analysis, Results and discussions, Conclusion. Didukung 16 referensi yang sebagian besar berupa jurnal.

2. Ruang lingkup dan kedalaman pembahasan:

Ruang lingkup dan kedalaman pembahasan cukup baik. Pendahuluan sudah diantarkan dengan cukup baik. Pembahasan mengenai analyzation of the locally asymptotic stable from a dynamical system model in the equilibrium of water ecosystem Termasuk dalam lingkup Matematika Terapan yang sesuai dengan bidang keilmuan pengusul Temuan kebaharuan kurang detail dijejalkan dalam pembahasan.

3. Kecukupan dan kemutakhiran data/informasi dan metodologi :

Kecukupan dan kemutakhiran data/informasi dan metodologi cukup baik. Terdapat 16 referensi yang sebagian besar berupa jurnal (5 diantara referensi lebih dari 10 tahun). Secara substansi ada temuan kebaharuan.

4. **Kelengkapan unsur dan kualitas terbitan:**

Kelengkapan unsur dan kualitas terbitan cukup baik. Artikel diterbitkan dalam Journal of Physics: Conference Series. Penerbit IOP Publishing. Terindeks di SCOPUS: SJR (2018) 0.221 Q3. Hasil Turnitin similarity index=14%. Beberapa editorial kurang cermat.

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Reviewer 2



Prof. Dr. St. Budi Waluya, M.Si

NIP. 196809071993031002

Unit kerja : Matematika FMIPA UNNES



Certificate

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This is to certify that

Eka Triyana

has participated in

The 6th International Conference on Research, Implementation and Education of Mathematics and Science 2019

Organized by Faculty of Mathematics and Natural Sciences, Yogyakarta State University
on July, 12th - 13th, 2019

As a

Presenter

With the paper entitled:

Locally Stability Analysis of The Phytoplankton-Nitrogen-Phosphate-Sediment Dynamical System



Dr. Hartono
NIP.19620329 198702 1 002

Yogyakarta, July 13, 2019
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Journal of Physics: Conference Series

Volume 1397, Issue 1, 19 December 2019, Article number 012066

6th International Conference on Research, Implementation, and Education of Mathematics and Science, ICRIEMS 2019; Universitas Negeri YogyakartaYogyakarta; Indonesia; 12 July 2019 through 13 July 2019; Code 156695

Locally stability analysis of the Phytoplankton-Nitrogen-Phosphate-Sediment dynamical system: A study case at Karimunjava aquaculture system, Central Java (Conference Paper) (Open Access)

Triyana, E.^a ✉, Widowati^a, **Putro, S.P.^b** 👤

^aDepartment of Mathematics, Faculty of Science and Mathematics, Diponegoro University, Indonesia

^bDepartment of Biology, Faculty of Science and Mathematics, Diponegoro University, Indonesia

Abstract

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Disturbance of water environment due to organic enrichment by fish activities may result in the reduction of water quality and sediments. The relative importance of N and P limitation and released from organic sediment is still an open question. The aim of this paper is to analyze the locally asymptotic stable from a dynamical system model in the equilibrium of water ecosystem. Mathematical models are resultant of interaction among four main variables. i.e.nitrogen and phosphate concentration, phytoplankton abundance, and sediment in the water ecosystem at Menjangan Besar, Karimunjava islands. The four variables are non-linear system differential equation that will form the dynamical system mathematical model. Local stability was determined by using Taylor series and Jacobian matrix. The system will be locally asymptotically stable if eigenvalues are negative. Numerical simulation was used to analyze the dynamic behavior of the system. From numerical simulation results base, it is concluded that equilibrium points. Because all eigenvalues of the Jacobian matrix ware negative, the dynamic system model was locally asymptotically stable. © Published under licence by IOP Publishing Ltd.

SciVal Topic Prominence ⓘ

Topic: Phytoplankton | Zooplankton | Producing phytoplankton

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Indexed keywords

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Differential equations Dynamical systems Ecosystems Eigenvalues and eigenfunctions

Hydrogeology Java programming language Linear systems Numerical models

Phytoplankton Sediments Water quality

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Forewords From The Head of Committee 2019

Assalamu'alaikum warahmatullahi wabarakatuh
May peace and God's blessings be upon you all

Dear our respected speakers and participants on behalf of the 6th ICRIEMS 2019 Organizing Committee, we would like to extend our warmest welcome to the Yogyakarta.

The 6th International Conference on Research, Implementation, and Education of Mathematics and Science (ICRIEMS) which is organized by Faculty of Mathematics and Science, Universitas Negeri Yogyakarta, Indonesia held today on July, 12–13 2019. The theme of the 6th ICRIEMS is “Integrating Science, Technology, Engineering, & Mathematics (STEM) and Education for Disaster Risk Reduction and Mitigation”. We certainly hope that the theme will covers the field of mathematics, chemistry, physics, biology, mathematics education, chemistry education, physics education, biology education, and science education to enhance society knowledge on natural phenomena and geographical position of countries in the ring of fire pathway that have the potential for natural disasters. The knowledge could help people and government agencies to reduce and prevent the emergence of a larger disaster impact.

The conference is an event where prominent practitioners, researchers, students and educators from all around the world are joining together to share their latest research and exchange their ideas. The conference will be a good place to promote or maintain not only national but also international collaboration and networking among academics, researchers and educators. The conference has accepted 210 papers from six countries, i.e. Turkey, Indonesia, Hongkong, Singapore, Malaysia, and Thailand. There are more or less 140 selected papers will be published by AIP Publisher under Scopus Index and Journal of Physics: Conference Series by IOP Publishing also under Scopus Index. The rest of the papers will be published on DOAJ Journals and Regular ICRIEMS Proceeding.

We owe special thanks to our keynote speakers:

1. Martianus Frederic Ezerman, Ph. D (School of Physical and Mathematical, Sciences, NTU, Singapore),
2. Prof. Dwikorita Karnawati, Ph.D (BMKG, Jakarta),
3. Prof. Dr. Gultekin Cakmakci (Hacettepe University, Turkey),
4. Prof. Wing Mui Winnie So (University of Hong Kong),
5. Dr. Insih Wilujeng (Universitas Negeri Yogyakarta).

Last but not least, We address very big appreciation and many thanks to all presenters and participants who have been actively involved in this conference. We also wish to thank to our reviewers for invaluable comments and suggestions. We wish you a productive conference and hope you enjoy your time in Yogyakarta and at 6th ICRIEMS 2019!

Wassalamu'alaikum warahmatullahi wabarakatuh.

Yogyakarta, July 2019

Dr. Restu Widiatmono

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2019

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Effect of pre-annealing and annealing temperature on microstructural and optical properties of multiferroic BiFeO₃ thin films prepared by chemical solution deposition (CSD)

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Locally stability analysis of the Phytoplankton-Nitrogen- Phosphate-Sediment dynamical system: A study case at Karimunjawa aquaculture system, Central Java

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I G N M Jaya, B N Ruchjana, Y Andriyana and R Agata

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The existence of clean elements in a matrix ring over integral domain and its connections with $g(x)$ -cleanness and strongly $g(x)$ -cleanness

IF Ambarsari, S Irawati, I M Sulandra, H Susanto, A C Y Mui and H Marubayashi

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012070

Power law fluid model on wave mitigation, 2D simulation using smoothed particle hydrodynamics

Brief review on materials used as carrier agents for larvicide formulations

S T S Wong, A Kamari, S N M Yusoff, J Jumadi, M M Abdulrasool, S Kumaran and S Ishak

Department of Chemistry, Faculty of Science and Mathematics, Universiti Pendidikan Sultan Idris, 35900 **Tanjong Malim, Perak, Malaysia.**

Email: susanawongsiewtin@hotmail.com

Abstract. Mosquito-borne diseases are great concerns of people in the worldwide, especially dengue. There are 390 million people infected with dengue in a year. According to Dengue Situation Update Report for Western Pacific Region, there is an increment in the number of the infected areas as compared to the same period of previous year. World of Health Organization (WHO) and Ministry of Health (MOH) from every country pay the highest attention towards this issue. Other than inventing new formulation of adulticides, application of larvicide is newly emerging as an effective method to control mosquitoes from spreading virus. In this brief review, several recent studies about ways of the virus transmitted through mosquito biting behaviour, larvicide formulation and types of carrier agents being used to carry larvicide will be discussed. In order to sustain the aquatic ecosystem, materials for carrier agents should be environmental-friendly. This review paper will give insight into the recent development in carrier system for mosquitoes larvicide formulations.

1. Introduction

Weather in Southeast Asia region which located in the Equator is hot and humid throughout the whole year. This makes the countries in this region desired habitats and breeding sites of female mosquitoes and it leads to a proliferation of mosquito-borne diseases in these countries [1]. Dengue and malaria transmitted by *Aedes aegypti* bring high mortality rate around the world. There are approximately 390 million infection cases around the world in a year. Mosquito-borne diseases take away lives more than a war, terrorism, gun violence or other human activities [2]. Table 1 shows the statistics of dengue cases in Southeast Asia countries from 1 January to 20 June 2019.

The proliferation of mosquito-borne diseases after war rises alarm of society towards the reduction of diseases transmittance in the shortest time. Therefore, insecticides and mosquito repellent start to emerge in markets at the late few decades of the 20th century. The spread of the diseases was well controlled after the precaution mentioned were taken. However, rapid urbanisation, dense population growth and modernisation of transportation system prior to economic growth after World War II have driven the diseases to another high new level of uncontrollable infection [3].

Mosquito control is the main way to prevent the transmission of mosquito-borne diseases. After years of application of pyrethrin-based products on adult mosquitoes, there are findings stated that killing larvae is a more effective method to reduce the number of mosquitoes because larvae are living in water and they are not as mobile as adults [4, 5]. The breeding sites are easier to be banished by removal of stagnant water. Mosquito control is carried out mostly by using insecticides on their breeding sites such as poor drainage system, tyre or rubbish in urban areas. However, this leads to environmental pollution and harms other non-targeted organisms [6]. In addition, extensive usage of



Clustering with spatial constraints: The case of diarrhea in Bandung city, Indonesia

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Abstract. Clustering with spatial constraints was introduced in disease surveillance to identify high/low risk areas. These improve the geographical pattern of disease clustering. There are two types of spatial constraints, geographical distance and contiguity based. A Ward-like hierarchical clustering algorithm, including the spatial constraints, was employed on diarrheal data in Bandung city. Diarrhea is an infectious disease that causes death. The geographical distance was the best geographical dissimilarity for the diarrheal disease data. A five-cluster solution was determined to be optimal. Cluster two, which consists of three districts (Cibiru, Cinambo, Mandalajati), was considered as a high-risk cluster. It scored high on standardized incidence ratio which is caused by low on healthy house index and water quality index.

1. Introduction

Spatial disease mapping study helps us to understand the geographical distribution and clustering of the disease ([1], [2], [3]). It involves a visual representation of the clustering of high/low-risk areas, which is vital to the development of an etiological hypothesis of risk factors affecting the spatial variation of the disease [2]. Thus, it can be used to develop a strategy for reducing, preventing, and controlling the spread of infectious disease [4]. Spatial disease mapping helps the government in policy making and utility of resources [1].

Diarrhea is one of severe infectious disease cause of death in low-and-middle-income countries like Indonesia. It is the second popular cause of death in children under five years of age [5]. According to UNICEF Indonesia report, 10% of all children under five years of age died of diarrhea in 2016 [6]. Diarrhea, as a health problem, may occurs not only in children under five years, but also in older people of all ages. In Indonesia, clean water supply and sanitation are the significant factors affecting the high number of diarrhea cases in several places such as in the city of Bandung [7].

To identify high/low-risk areas, standardized incidence ratio (SIR) and its statistical significance are commonly presented in a map. However, it fails in informing clustering of high/low-risk areas. Clustering SIR with spatial constraints is needed to identify high/low-risk regions. Spatial clustering method has been developed in disease mapping study. Anderson et al. [8] and Adin et al. [9] developed two stage approach to identify spatiotemporal clusters. They combined Bayesian disease mapping and hierarchical agglomerative clusters (HAC). Choe et al. [10] introduced Bayesian latent approach. Jaya et al. [11] applied local Moran'I and spatial scan statistics. In this paper, we apply hierarchical clustering with spatial constraints to identify diarrhea clustering in the city of Bandung, Indonesia.



The existence of clean elements in a matrix ring over integral domain and its connections with $g(x)$ -cleanness and strongly $g(x)$ -cleanness

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Abstract. An element a in a ring R with unity is called clean, if there exist an idempotent element $e \in R$ and a unit element $u \in R$ such that $a = e + u$. This article aims to show all of clean elements in a certain subring $X_3(R)$ of a matrix ring 3×3 over integral domain R and their connections with $g(x)$ -cleanness and strongly $g(x)$ -cleanness for some fixed polynomial $g(x)$. To achieve it, we found out unit and idempotent elements in $X_3(R)$ for constructing clean elements and selected some fixed $g(x)$ in the center of R for investigating their relations with $g(x)$ -cleanness and strongly $g(x)$ -cleanness. In this article, we obtained eight general forms of the clean elements in $X_3(R)$, $g(x)$ -clean elements with $g(x) = x^n - x$, which five forms of them were strongly $g(x)$ -clean but the other three forms were not. The latter result was shown by providing counter examples.

1. Introduction

In this article, for the 3×3 matrix ring over a ring R is denoted by $M_3(R) = (a_{ij}), a_{ij} \in R$. The set of all units and idempotent elements in R are denoted by $U(R)$ and $id(R)$, respectively, that are, $U(R) = \{a \in R \mid ab = 1 = ba, \text{ for some } b \in R\}$ and $id(R) = \{a \in R \mid a^2 = a\}$. Following [1] and [2], an element a in a ring R is said to be clean if can be written as the sum of a unit and an idempotent. Many authors ([3], [4] and [5]) investigated the properties of clean ring.

Let $C(R)$ be the center of a ring R and $g(x)$ be a polynomial in $C(R)[x]$. Then following [6], [7] and [8], an element r in a ring R is called $g(x)$ -clean if can be written as $r = u + s$ with $u \in U(R)$ and $g(s) = 0, s \in R$. It is clear that $(x^2 - x)$ -clean rings are precisely clean rings. Moreover, [9] and [10] proved the relation between clean ring and $(x^n - x)$ -clean ring and gived some examples which showed

