

# PROCEEDINGS

OF THE 3<sup>RD</sup> INTERNATIONAL CONFERENCE ON COMMUNITY ENGAGEMENT  
AND EDUCATION FOR SUSTAINABLE DEVELOPMENT



## ICCEESD 2022

organized by:

Directorate for Community Services  
Universitas Gadjah Mada, Indonesia  
7-8 December 2022

**Editors:**

Nanung Agus Fitriyanto  
Zuliyati Rohmah  
Bernadeth F. Ticar  
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Zuliyati Rohmah  
Bernadeth F. Ticar  
Rr. Siti Rokhmah Projosasmito  
Lisna Hidayati  
(Editors)

*Proceedings of the 3<sup>rd</sup> International Conference on  
Community Engagement and Education for  
Sustainable Development  
ICCEESD 2022 (7-8 December 2022)*

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Proceedings of the 3<sup>rd</sup> International Conference on Community Engagement and Education for Sustainable Development  
ICCEESD 2022 (7-8 December 2022)

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**ICCEESD 2022**

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## Foreword

Global development is a broad concept indicating the idea that societies have different development levels on an international scale. This concept serves as the basis of taxonomy for developed, developing, and least developed countries, which further assists practice and research related to international development. Global development has previously been associated with economic development, as reflected in how the Millennium Development Goals (MDGs) focus on poverty alleviation in developing countries with the assistance of developed countries. Following the end of MDGs, the United Nations formulated the Sustainable Development Goals (SDGs) as a succession of the MDGs, which are multifaceted, interlinked objectives in a more inclusive approach towards development than its predecessor, set to be achieved by 2030. Since then, policymakers and practitioners have followed suit and shifted to consider a more sustainable approach. However, it is without doubt that, with all our drivers and barriers, the 2030 Agenda is a long road ahead for us.

The International Conference on Community Engagement and Education for Sustainable Development (ICCEESD) realizes the importance of collective efforts among stakeholders in achieving sustainable development. As a Higher Education Institution (HEI), Universitas Gadjah Mada should encompass the vision of the SDGs and respond to the problems set out by the 2030 Agenda through innovation in teaching and research and active participation of all academic stakeholders. HEIs are expected to provide the knowledge base for this global transition. Achieving sustainability includes HEIs community engagement by actively promoting community participation through systematically realigning institutional objectives, curriculum reforms, use-inspired research, and new partnerships. With that in mind, the 3<sup>rd</sup> ICCEESD this year upholds *“Strengthening Education for Sustainable Development Towards Better Community Engagement”* as the theme.

The 3<sup>rd</sup> ICCEESD 2022 aims to reflect and discuss the good practices of HEIs in enhancing community engagement initiatives for Education Sustainable Development (ESD) towards achieving Sustainable Development Goals (SDGs). This conference is expected to provide a forum for the presenters and participants to exchange their best practices, policies, and other ESD fulfillment towards better community engagement in exploring ideas to answer community needs.

Finally, such sharing would hopefully help the 3<sup>rd</sup> ICCEESD 2022 participants with baseline information for developing plans, programs, and activities critical to advancing the world's Sustainable Development Goals since HEIs are the primary ESD promoters. The organizing committee sincerely thank you for participating in the 3<sup>rd</sup> ICCEESD 2022 and wish you a fruitful and rewarding exchange in this forum.

Best Regards

Dr. dr. Rustamaji, M.Kes.

Director of Community Service

Universitas Gadjah Mada

## About the Conference

Universitas Gadjah Mada (UGM) has always encouraged academics to contribute to society through community service since it is part of the *Tri Dharma* obligation in Higher Education Institutions (HEI). Through the Directorate of Community Service (DoCS), UGM actively and consistently supports community empowerment initiatives that benefit society. One of the approaches is to hold an international scientific conference periodically, the International Conference on Community Engagement and Education for Sustainable Development, or ICCEESD.

ICCEESD is a biannual forum for sharing, benchmarking, and discussing HEI's activities in developing Education for Sustainable Development towards community engagement. Education for Sustainability as a teaching strategy for resolving community challenges through formal, informal, or non-formal education is expected to benefit from various community service best practices by academics, researchers, and students. Thus, DoCS designs ICCEESD to encourage academics' interaction in sharing their expertise and experiences of the implemented community engagement initiatives that can inspire and motivate the world to empower the community as one of the Sustainable Development Goals.

The 3rd ICCEESD has "*Strengthening Education for Sustainability Towards Better Community Engagement*" as its theme this year. It is expected that the 3rd ICCEESD will provide a forum for the presenters and participants to exchange best practices, policies, and conceptual implementation of Education for Sustainability towards better community engagement and explore ideas to address community needs. The 3rd ICCEESD also had five symposia on the following topics: (1) Community Empowerment; (2) Innovation in Community Service Programs; (3) Appropriate Technology Design and Implementation; (4) Education for Sustainable Development; and (5) Community-based Development, where academics presented their scholarly articles.

## **About Conference Organizer**

The Directorate of Community Service (DoCS) of Universitas Gadjah Mada (UGM) encompasses one of Tri Dharma Perguruan Tinggi— the three pillars of Higher Education Institutions-community services. This vision is realized through research, implementation, and innovation in advanced education for local communities. DoCS involves all UGM's academic societies, including lecturers, students, staff, and alumni. DoCS UGM comprises two departments: Student Community Service and Community Empowerment. The Department of Student Community Service manages and coordinates the KKN-PPM (*Kuliah Kerja Nyata - Pembelajaran Pemberdayaan Masyarakat*) program, which is a mandatory university-level course for undergraduate students, aiming to foster community outreach and practical application of respective disciplines within students. On the other hand, the Department of Community Empowerment assists in the coordination and quality assurance of community service programs through activities such as the implementation of science and technology within local communities, entrepreneurship assistance, socialization, and training, as well as capacity building for independent, prosperous, and sustainable local communities.

## About the Editors

### a) **Prof. Dr. Nanung Agus Fitriyanto**

Prof. Dr. Ir. Nanung Agus Fitriyanto is a professor of environmental biology and livestock industry waste handling at Universitas Gadjah Mada (UGM). He received his doctoral degree from the University of Gifu, Japan in 2011, in the field of genomic microbiology. In 2013 he had the opportunity to take part in the SAME (Scheme for Academic Mobility and Exchange) Program in Japan to conduct research in the field of environmental microbiology. Along with his teaching career, he has spent 10 years working at the Directorate of Community Service of UGM. He served as the Head of the Sub Directorate of Community Empowerment from 2017 to 2021 where he was trusted to disseminate the UGM service grants and serve as well as develop MSMEs, before he was appointed to be the head of the Sub Directorate of Student Community Service of UGM, to manage Student Community Service program— a mandatory university-level course for undergraduate students, aiming to foster community outreach and practical application of respective disciplines within students. He is also actively involved in developing partnerships with relevant stakeholders and establishing international relations in the field of community engagement through the Erasmus Plus project, UNESCO-ProSPER.Net, the Regional Center of Expertise (RCE), and the International ESD Forum.

### b) **Dr. Zuliyati Rohmah**

Dr. Zuliyati Rohmah is a lecturer in the Faculty of Biology, Universitas Gadjah Mada. She received her doctoral degree from Gyeongsang National University, South Korea, in 2016, majoring in Seafood Science and Technology. Her field of specialization is Animal Structure and Development in Animal Anatomy. She's been the head of the Quality Assurance Unit in the Faculty of Biology, UGM, since 2017. She has also been involved in promoting community service programs in the international level within the Directorate of Community Service of UGM, through the Erasmus Plus project, UNESCO-ProSPER.Net, the Regional Center of Expertise (RCE), and the International ESD Forum.

### c) **Dr. Bernadeth F. Ticar**

**Dr. Bernadeth F. Ticar** is a senior faculty researcher and lecturer at the Iloilo Science and Technology University (ISAT U), Philippines. She received her doctoral degree from Gyeongsang National University, South Korea, in 2013, majoring in Seafood Science and Technology. Being a senior faculty researcher at ISAT U, her principal responsibility is to promote research culture at the institution that involves faculty from various disciplines and to obtain external funding for science-based research projects on a local and global scale. In 2018, she was featured as one of the USAID Women in Science.

### d) **dr. Rr. Siti Rokhmah Projosasimto**

dr. Rr. Siti Rokhmah Projosasimto is a doctor and a lecturer in the Faculty of Medicine, Universitas Gadjah Mada. She received her master's degree from the Faculty of Education at Monash University Clayton Campus, Victoria, Australia, in 2008. She's also a fellow for FAIMER FRIENDSHIP 2020, a fellowship for improving research in medical and health professionals. She's been the coordinator of Community and Family Health Care with Interprofessional Education (CFHC-IPE), a program for undergraduate students in the Faculty of Medicine, UGM since 2016. For the past five years, she's been trusted to plan, coordinate, and evaluate the first-year students' orientation program in the university level. She is also involved in-



Service Training of Teachers to Address Education for Sustainability (ICTeEFs), a joint project coordinated by Frederick University supported by Erasmus+, to develop learning materials and e-toolkit for first-year students' orientation program.

**e) Lisna Hidayati**

Lisna Hidayati is a lecturer in the Faculty of Biology, Universitas Gadjah Mada. Her field of specialization is Biochemistry and Biotechnology of Health. She has been giving topics of general biology, and enzymology. She was one of the speakers in the 6th International ESD Forum held at Shizuoka University, Japan. She talked about the ESD-based cultural campaign for Elementary School students: Implementation in Ngangkrik Elementary School, Yogyakarta. In 2021, Lisna will also be the scientific and environmental literacy program coordinator to build a green society. She is also involved in In-Service Training of Teachers to Address Education for Sustainability (ICTeEFs), a joint project coordinated by Frederick University supported by Erasmus+, to develop learning materials and an e-toolkit for the General Biology course. She is currently pursuing her doctoral degree at Nara Institute of Science and Technology (NAIST), in Japan.

## Message from the Convenors

Dear Ladies and Gentlemen,

On behalf of the organizing committee, it was my great honor to welcome you to the 3<sup>rd</sup> ICCEESD 2022 International Conference on Community Engagement and Education for Sustainable Development. The objective of the 3<sup>rd</sup> ICCEESD 2022 was to provide a platform for scientists, researchers, educators, and multi-stakeholders keen in the field of education for sustainable development to exchange ideas and research findings in the areas of community empowerment, appropriate technology design and implementation, and innovation on community services programs.

We were honored to have brilliant guests as our inspiring speakers in the 3<sup>rd</sup> ICCEESD 2022 shared their perspectives to discuss engaging communities and tapping into collective intelligence to set better priorities and facilitate sustainable development on a local scale.

The fact that 114 abstracts were submitted for this conference from Indonesia, Malaysia, Japan, and Sweden, with the most popular topic being *Appropriate Technology Design and Implementation*, made us happy to observe the great enthusiasm of our participants. The 55 complete papers that were chosen from the submitted abstracts after a thorough peer review procedure are then published as proceeding by AIJR Publisher and are accessible to *Google Scholar*, *CrossRef*, *Scilit*, as well as other scholarly databases. We are pleased that this figure reflects the high enthusiasm among all the participants, and we hope that it will serve as a springboard for future enhancements to our event.

I would also like to thank all the plenary speakers, the parallel speakers, and fellow researchers who have been willing to share their research knowledge and experience with all of us at this conference. Also, I would like to express my deep appreciation and gratitude to every member of the committee who helped make this conference a success. Thank you, and I wish you all the best.

Prof. Ir. Nanung Agus Fitriyanto, S.Pt., M.Sc., Ph.D., IPM.  
Chairperson of the 3<sup>rd</sup> ICCEESD 2022

## **Message from Vice-Chancellor of UGM**

Dear Ladies and Gentlemen,

On behalf of the organizing committee, we are delighted to welcome you to the ICCEESD 2022 International Conference on Community Engagement and Education for Sustainable Development. This marks our 3rd biennial conference, and we are proud to be able to host it.

In the past couple of years, we have more than ever cornered with many environmental challenges, such as endless pollution and waste management problems, further depriving us of achieving the 2030 Agenda. As many of you know, these challenges are systemic and not for individuals to unravel. Instead, they require collective efforts from all stakeholders and layers of society.

This event is possible due to our mutual passion for academic breakthroughs in sustainable development and community engagement. Our inspiring guests and enthusiastic participants allow us to achieve our goals in bridging the gap between Higher Education Institutions (HEI) and the community in sustainable development. The local communities need our guidance in facilitating sustainable development at a smaller scale as much as we need them, and that is why we are grateful for the participants' fervor at the ICCEESD 2022.

During these past 5 years, we have hosted participants to confer their research, engage in insightful discourses on sustainable development through a multitude of academic disciplines, participate in community service activities and excursions, and publish their research to gain a further understanding of the challenges in achieving sustainable development and address them using their respective expertise tailored to the needs of local communities. I hope this conference fosters fruitful practices and implementations of community engagement that tackle their needs and accelerate our progress toward the 2030 Agenda.

Finally, I would also like to extend my gratitude towards the committee members without whom this conference would not have been possible. Thank you, and I wish you success in this conference.

Best Regards

Dr. Arie Sujito, S.Sos., M.Si.

Vice-Rector for Student Affairs, Community Services, and Alumni Universitas Gadjah Mada

# Committees

## Academic Advisory Board

- Prof. Tan Sri Dato' Dzulkifli bin Abdul Razak
- Prof. Dr. Mario T. Tabucanon
- Prof. Ir. Irfan Dwidya Prijambada, M.Eng., Ph.D.
- Assoc. Prof. Hui-Nien Lin
- Dr. Eng. Ir. Laretna Trisnantari Adishakti, M.Arch.
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- Yusril Yusuf, S.Si., M.Si., M.Eng., D.Eng.
- Lisna Hidayati, S.Si., M.Biotech.

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- Wahyu Tri Indrawati, S.Pt.
- Isnani, S.I.P.
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- Sari Handayani, S.E.

## Database and IT Support

- Joko Witarto, S.T., M.Eng.

## Finance and Treasury

- Sari Hartanti, S.E.
- Joni Tri Wibowo, A. Md.

## **Peer-Review Process Statement**

All published articles in the Proceedings of the 3rd International Conference on Community Engagement and Education for Sustainable Development have been peer-reviewed through processes administered by the proceedings Editors. Expert referees conducted reviews according to the professional and scientific standards expected of proceedings published by Universitas Gadjah Mada. The ultimate purpose of peer review is to sustain the originality and quality of research work and the filtration of poor-quality articles.

The manuscript submission and peer review processes are broken down into the following steps:

1. The Author writes a research manuscript and submits it.
2. The Editor does the initial screening and forwards it to the Reviewers.
3. Reviewers review the manuscript according to the guidelines based on their expertise and verify the quality of the research.
4. The article is returned to the editor with a recommendation to reject, revise, or accept it.
5. The Editor drafts a decision to be sent to the Author.
6. The article is returned to the Author along with the reviewer's feedback.
7. The Editor receives the updated article and sends it to the Publisher.

## **List of Reviewers**

1. Prof. Dr.rer.nat. Harno Dwi Pranowo, M.Si.
2. Prof. Dr. Ir. Sri Raharjo, M.Sc.
3. Mohammad Affan Fajar Falah, S.T.P., M.Agr., Ph.D.
4. Prof. Dr. Ir. Ambar Kusumandari, M.E.S.
5. Dr. drh. Irkham Widiyono
6. Dr. Ir. Siti Andarwati, S.Pt., M.P., IPM., ASEAN Eng.
7. Dr. Slamet Widiyanto, S.Si., M.Sc.

## Program Schedule

TIME	ACTIVITIES AND TOPIC	DETAILS
<b>Day 1: Wednesday, 7 December 2022</b>		
07:30 – 08:00	Registration	Organizing Committee
08:00 – 08:10	Opening ceremony	MC
08:10 – 08:15	Singing Indonesian National Anthem	Organizing Committee
08:15 – 08:25	Opening remark	<b>Dr. Arie Sujito, S.Sos., M.Si.</b> Vice-Rector for Student Affairs, Community Service and Alumni, Universitas Gadjah Mada
08:25 – 08:30	Photo session	Organizing Committee
08:30 – 10.00	<b>Session 1: Plenary</b>	Moderator: <b>Prof. Ir. Nanung Agus Fitriyanto, S.Pt., M.Sc., Ph.D., IPM.</b> Universitas Gadjah Mada
	<b>Topic 1: Education for Sustainable Development</b>	<b>Prof. Dr. Mario T. Tabucanon United</b> Nations University Institute for the Advanced Study of Sustainability (UNU-IAS)
	<b>Topic 2: Sustainability for All</b>	<b>Prof. Tan Sri Dato' Dzulkifli Abdul Razak</b> International Islamic University Malaysia
	<b>Topic 3: Community Empowerment through Students Community Services</b>	<b>Prof. Ir. Irfan Dwidya Prijambada, M.Eng., Ph.D.</b> Universitas Gadjah Mada
10:00 – 10:15	Coffee break	
10.15 – 12.00	<b>Session 2: Parallel</b> Presentations from the paper presenters at the hotel in six rooms	
12.00 – 13.00	Break	
13.00 – 14.30	<b>Session 3: Plenary</b>	Moderator: <b>Ardhya Nareswari, S.T., M.T., Ph.D.</b> Universitas Gadjah Mada
	Topic 4: <b>Community Empowerment</b>	<b>Assoc. Prof. Hui-Nien Lin</b> National Pingtung University, Taiwan
	Topic 5: <b>Community-based Development</b>	<b>Debasish Nayak</b> Ahmedabad, India
	Topic 6: <b>Collaboration of University, Privates, and Community on Community Development</b>	<b>Dr. Eng. Ir. Laretna Trisnantari Adishakti, M.Arch.</b> Universitas Gadjah Mada
14.30 – 17.00	<b>Session 4: Parallel</b> Presentations from the paper presenters at the hotel in six rooms	Organizing Committee

TIME	ACTIVITIES AND TOPIC	DETAILS
<b>Day 2: Thursday, 8 December 2021</b>		
07.00 – 0800	Registration for the offline participants	
08.00 – 09.00	Trip to Patuk, Gunungkidul District, Yogyakarta	
09.00 – 11.00	Activities at Sari Mulyo Farmer Group and Nglanggeran Tourism Village	
11.00 – 12.00	Trip to Giriloyo Wukirsari, Bantul Yogyakarta	
12.00 – 13.00	Lunch	
13.00 – 15.00	Activities at Batik Tulis Giriloyo, Wukirsari, Bantul Yogyakarta	
15.00 – 15.30	Closing remarks	
15.30 – 16.30	Return to UGM	



## **Acknowledgements**

The Directorate of Community Service of Universitas Gadjah Mada would like to thank all the individuals who dedicated their considerable time and expertise by serving as editors, reviewers, and scientific committee members to the completion of the third Proceedings of International Conference on Community Engagement and Education for Sustainable Development. Their generous contributions are deeply appreciated.



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organized by the Directorate for Community Services  
Universitas Gadjah Mada, Indonesia  
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