



# 6<sup>th</sup> GoGreen Summit & Awareness on Climate Change

*"Socio-economic scenarios and Environmental Consequences of Human activities causing Climate Change"*

**Hotel Santika Premiere Malang  
Malang, Indonesia  
01<sup>st</sup> - 02<sup>nd</sup> July, 2020**

Organized by:  
**BioLEAGUES Worldwide**

Co-Hosting Organizations:





## Preface

This book reports the Proceedings of the “**6<sup>th</sup> GoGreen Summit & Awareness on Climate Change**” held at *Hotel Santika Premiere Malang, Malang, Indonesia on 01<sup>st</sup> & 02<sup>nd</sup> July 2020*, organized by *BioLEAGUES Worldwide*.

The publishing department has accepted more than 110 abstracts. After an initial review of the submitted abstracts, 50 papers were presented at the conference and were accepted for publication in the Conference Proceedings. The topics that are covered in the conference include Global Warming, Pollution types & Control techniques, Renewable Energy, Recycling and Reuse, Biodiversity, Green Energy, Environmental Toxicology, Environmental Engineering, Circular Economy, Agriculture, Earth Science. We would like to thank all the participants for their contributions to the conference and the proceedings.

Reviewing papers of the **6<sup>th</sup> GoGreen Summit** was a challenging process that relies on the goodwill of those people involved in the field. We invited more than 15 researchers from related fields to review papers for the presentation and the publication in the conference Proceedings book. We would like to thank all the reviewers for their time and effort in reviewing the documents.

Finally, we would like to thank all the proceeding team members who with much dedication have given their constant support and priceless time to bring out the proceedings in a grand and successful manner. I am sure this **6<sup>th</sup> GoGreen Summit** proceeding will be a credit to a large group of people, and each one of us should be proud of its successful outcome...

**6<sup>th</sup> GoGreen Summit**



## **From BioLEAGUES Director's Desk...**

On behalf of **BioLEAGUES Worldwide**, I am delighted to welcome all the delegates and participants around the globe to the “**6<sup>th</sup> GoGreen Summit & Awareness on Climate Change**” which is going to be held at **Hotel Santika Premiere Malang, Malang, Indonesia on 01<sup>st</sup> & 02<sup>nd</sup> July 2020**. This conference will revolve around the theme “ *Socio-economic scenarios and Environmental Consequences of Human activities causing Climate Change*”.



It will be a great pleasure to join with Doctorates, Research Scholars and Academicians all around the globe. You are invited to be stimulated and enriched by the latest innovations in all the aspects of Environment issues and prevention techniques, while delving into presentations surrounding transformative advances provided by a variety of disciplines.

I congratulate the Chair person, Organizing Secretary, Committee Members, coordinator BioLEAGUES and all the people involved for their efforts in organizing the **6<sup>th</sup> GoGreen Summit**, Bali, Indonesia and successfully conducting the International Conference and wish all the delegates and participants a very pleasant stay at Indonesia.

A handwritten signature in blue ink that reads "A. Siddh Kumar Chhajer".

**A. Siddh Kumar Chhajer**  
Director  
BioLEAGUES Worldwide



## Welcome Message from the Organizing Secretary



Dear Professional Researchers, Presenters, and Participants,

It is a great pleasure to welcome all of you in the "6<sup>th</sup> GoGreen Summit and Awareness on Climate Change." Theme of this GoGreen Summit 2020 is "Socio Economic Scenarios and Environmental Consequences of Human Activities causing Climate Change." I would like to take this opportunity and thank to all the Organizing Committee for their hard work and dedications to held this International Conference in Malang Indonesia successfully. I warmly welcome all participants, presenters, and attendees from all over the world to this conference and look forward to your participation.

With complement of

The Organizing Secretary  
Dr. Ir. Bambang Sugiyono Agus Purwono, MSc  
State Polytechnic of Malang – Indonesia



## Welcome Message from the Keynote Speaker



On behalf of Agribusiness Department, Faculty of Agriculture and Animal Science, University of Muhammadiyah Malang, Indonesia, it gives me a great pleasure to extend greetings and a warm welcome to everyone attending the “6<sup>th</sup> GoGreen Summit and Awareness on Climate Change 2020” on 01<sup>st</sup> - 02<sup>nd</sup> July 2020, Malang Indonesia. I am really happy and delighted that the organization has included me (Dr. Rahayu Relawati) from University of Muhammadiyah Malang, Indonesia, as a cohost to arrange this wonderful event.

On this extraordinary meeting, the organizing committee welcomes participants from all over the world to join in this summit. I sincerely thank you all for your commitments and efforts in attending, preparing and presenting your innovative and valuable research and findings at this conference. I also extend a warm welcome and gratitude to those of you who have joined us at the meeting to support your colleagues and to learn much from the other presenters. An episode of this greatness will distribute a generous opening for scientists, researchers, academicians to learn about socio-economic aspects and environmental consequences related with climate change.

Climate change has an impact on various socioeconomic aspects of agriculture and agribusiness. In the aspect of production, farming of various food crops and horticulture has decreased the quantity and quality of product. Cropping patterns also changes and shifts in schedules due to the uncertainty of weather. In terms of food consumption, farmers' families and rural communities in general face a decrease of food availability, as a result of the decline in farming production and farmers' purchasing ability. Macro food security at the regional level also faces a serious threat due to climate change. Various mitigation and adaptation efforts to climate change need to be done continuously and become a priority in the agricultural development strategy. Nationally, the agribusiness of Indonesia's export crops also faces serious problems related to climate change.

I am sure that this summit will give remarkable effect for the understandings of scientific knowledge in the areas of socio-economics of agriculture and agribusiness and its' applications in numerous aspects. I wish grand success of this event.

Dr. Rahayu Relawati  
Faculty of Agriculture and Animal Science  
Department of Agribusiness  
University of Muhammadiyah Malang,  
Indonesia



## **From BioLEAGUES CEO's Desk...**

It is indeed a privilege to acknowledge and thank all the supporters and organizers of the “**6<sup>th</sup> GoGreen Summit & Awareness on Climate Change**”, who contributed greatly to organize the conference successfully.

I would like to acknowledge and thank the Chief Guest for his/her valuable contribution in the *6<sup>th</sup> GoGreen Summit, Malang, Indonesia*.

My special thanks to all our Special Guests who so graciously accepted our invitation to participate in the conference. I also wish to acknowledge and thank the sponsors of the conference whose financial support was extremely grateful.

I would like to specially thank our Advisory Committee Members from various Organization whose continuous support have helped us plan and execute the conference successfully.

I am highly indebted to the contribution given by all the Scientists, Doctorates, Research Scholars, Academicians and students to the conference.



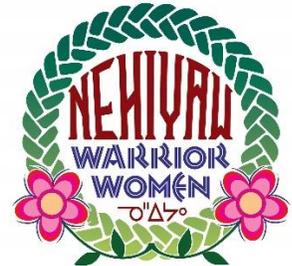
A handwritten signature in black ink, appearing to read 'R. B Satapathy'.

**Mr. R. B Satapathy**  
CEO  
BioLEAGUES Worldwide



# Keynote Speakers





## **The Importance of Protecting and Respecting Our Mother Earth from an Indigenous Perspective**

**Barbara Dumigan-Jackson**

Bluedot Ambassador/ Nehiyaw Warrior Women (Mother Earth Protectors), Canada

**Kiya Bruno**

Bluedot Ambassador/ Nehiyaw Warrior Women (Mother Earth Protectors), Canada

### **Abstract**

As Cree First Nation people we are people of the land, it's our responsibility as Indigenous people to stand up and protect all the elements she has to offer. Since time immemorial we have always had a deep spiritual and sacred relationship and connection to the land. As First Nation people we are tied to a responsibility and stewardship to the land and must always be protective and respectful of our Mother Earth, by fostering a concern for our environment and sustainable habits early, it's important for Kiya and myself to educate others across the globe to be more aware of the environment from an Indigenous perspective. Our traditions, our language, our lives and Earth are scared. We must recognize the importance of honoring and respecting our Mother Earth and protecting our land, water and air worldwide. She creates and sustains life. Protecting our Mother does not only mean the continuation of life but also the continuation of the sacred ancestral wisdom that has been passed down to us through each generation.

At a young age we have been taught the importance and sacredness of the land, air and water and how it's our responsibility as Indigenous people to protect our water, our Mother Earth and all living beings that walk this earth, fly in our sky and swim in the lakes, rivers and Oceans. To only take what is needed and to always give back and replace what we take. To always offer our prayers and give an offering to land. When we hunt, gather and pick medicines, herbs, flowers and roots from the land we do it with good intentions, with love respect and protocol is always given. It's a great honor to Kiya and myself to educate and share our Traditional Indigenous knowledge and relationship to land.

## **Biography**

Kiya Bruno and Barbara Dumigan-Jackson come from a very cultural upbringing In the nehiyaw (Cree) traditional community. Where they incorporate cultural knowledge into their workplaces, homes, hobbies and everyday life. Kiya and Barbara are a mother-daughter dou coaching team who are soul-driven and the founders of Nehiyaw Warrior Women Holistic Health & Empowerment Coaching. Barbara is a nehiyaw Iskewwak (Cree Woman) from Onihcikiskwapin “Saddle Lake Cree Nation” and Ka-miyosicik kinosewak “Goodfish Lake First Nation” in Treaty 6 Territory in Alberta Canada. Barbara is a Blutot Ambassador, Indigenous Rights Advocate, Educator and Mother Earth Protector. Kiya Bruno is a nehiyaw Iskweesak (Cree Girl) who hails from Nipisikohpakh- “Samson Cree Nation” In Maskwacis Alberta Canada. Kiya is an Indigenous Rights Advocate, Mother Earth Protector, Traditional Indigenous Vocalist and Traditional Indigenous Jingle dress dancer, actress and public speaker.



## **The Adaptation toward Climate Change for the Farmer Household's Food Security at Around Reservoirs in Bojonegoro, Indonesia**

### **Rahayu Relawati**

Department of Agribusiness, Faculty of Agriculture and Animal Science, University of Muhammadiyah Malang, Malang, Indonesia.

### **M. Zul Mazwan**

Department of Agribusiness, Faculty of Agriculture and Animal Science, University of Muhammadiyah Malang, Malang, Indonesia.

### **Abstract**

Climate change has caused uncertainty of weather and threatens household food security of farmers at around reservoirs. The study purposed to determine: 1) the farmer perception on climate change; 2) the farmer adaptation on climate change; and 3) the factors affecting household food sufficiency at the climate change situation. The study was conducted at Desa Kedung Sumber, Bojonegoro Regency, Indonesia. Primary data were obtained by interviewing the farmer families. Descriptive analysis and the structural equation model were used to analyze the data. The results showed that most farmers cultivated crops on the reservoirs when the water is receding. The main crops cultivated were corn, chili, watermelon, and rice. Most farmer's perceptions about climate change were the uncertainty of weather, so it was hard to predict when the reservoirs water is tidal and receding. In the climate change situation, farm production has decreased by an average of 20.9%. Some rice farmers even failed of harvesting, and they switched to tobacco. Their adaptation efforts on climate change were changing the crops and beginning cultivation earlier to avoid the reservoirs flooded suddenly. Their farm production and income was not enough for their food sufficiency. It needs support from the non-farming income. The SEM results showed that the climate significantly affected the farm production. The next, farm production and non-farm income positively determined the food sufficiency. It was still dominated by carbohydrate, vegetable, and vegetable protein. The recommendation given is the assistance to farmers in adapting the climate change.

Key words: consumption, food security, food sufficiency, reservoirs.

## **Biography**

Dr. Ir. Rahayu Relawati, MM born in Banyumas - Indonesia, January 1st, 1965. Associate Professor in University of Muhammadiyah Malang, East Java – Indonesia. Under Graduate Degree in Department of Socio-Economic of Agriculture, University of Jenderal Soedirman, Purwokerto, Indonesia (1989). Master Degree in Management, University of Muhammadiyah Malang, Indonesia (1997). PhD Degree in Agribusiness Management, Universitas Gadjah Mada, Yogyakarta, Indonesia (2018).

As a speaker in numerous national and international conferences, such as: University Consortium Graduate Forum in Kualalumpur (2015), 4th International Conference the Community Development in ASEAN (AMCA) in Cambodia (2017); Food, Agriculture and Natural Resources (FANRes) in Yogyakarta, Indonesia (2018). National Seminar of Research Results in Yogyakarta, Indonesia (2019), The 5th Go Green Summit, Singapore, 2019.

M. Zul Mazwan, SP. M.Sc. born in Lamongan - Indonesia, July 12th, 1994. Lecturer in University of Muhammadiyah Malang, East Java – Indonesia. Under Graduate Degree in Agribusiness Department - Agriculture Faculty - University of Brawijaya, Malang, Indonesia (2015). Master Degree in Department of Agricultural Economics, Universitas Gadjah Mada, Yogyakarta, Indonesia (2018). International Conference of Asia International Multidisciplinary Conference (AIMC) in Johor Baru, Malaysia (2017); International Conference on Bioenergy and Environmentally Sustainable Agriculture Technology (ICoN-BEAT) in Malang, Indonesia (2019).



## **The Models of Kampung Improvement Program in Supporting Sustainable Development**

**Ibnu Sasongko**

Urban and Regional Planning Department National Institute of Technology – Malang, Indonesia

**Ardyanto Maksimilianus Gai**

Urban and Regional Planning Department National Institute of Technology – Malang, Indonesia

**Annissaa Hamidah Imaduddina**

Urban and Regional Planning Department National Institute of Technology – Malang, Indonesia.

### **Abstract**

The increasing of many sectors development in Indonesia is characterized by the rapidity of urban growth, including the high urbanization. As the consequence, urban development requires supporting in a number of houses as human basic need. In the history of urban development, most of housing supply is provided by the people itself than supported by private sectors or government. Some people with low income, they make small and high density housing which is not supported by many facilities and infrastructure. This condition makes housing become the slum and squatter area. Some efforts to improve the villages (kampung) have been done, but up to now, kampung problems are always fond. The efforts in improving socio-economic conditions have been conducted, some of them become habitable kampung especially better sanitation, productive and also tourism. Malang is one of the big cities in East Java, and it has the same problem, some kampung improvement programs have been done. One of the interesting things in Malang, is that the improvement of the kampung is not only improving slum areas, but also many of them are able to develop local economic, improve their environmental, and it becomes tourist kampung. In this case, the role of the community and local leaders are very important. Some types of Its Kampung e.g, Kampung with better sanitation, saving the water, sanitary, home industry of tempe, colourful kampung, heritage kampung ect. Another interesting one is the kampung development competitions, which is participated by each sub-district. It is more encouraging of every Kampung to improve their quality which each Kampung has deferent theme. As the result it can classify of kampung development models. Using the identifications of potential, problems and efforts of each kampung and the role of community in improving their kampung and also applying comparative analysis can identify the typology of Kampung development.

Furthermore, it will show the relational between kampung character their variety with to the types of kampung development. Then it can be dispersed or expanded in to models of Kampung development in supporting sustainable development.

## Key words

kampung development model, sustainable

## Biography

Dr. Ibnu Sasongko was born in Malang - East Java, on 08th September 1959. Home address: Jl Bendungan Bening 56 Malang. A lecturer in Urban and Regional Planning Department, National Institute of Technology – Malang, since 1988. Lecturer of: Housing, Spatial Planning Based on Culture, site Planning.

Education back ground:

1. Bachelor Degree, Urban And Regional Planning, Bandung Institute of Technology, 1985
2. Master in Architecture – Urban Design, Sepuluh Nopember Institute of Technology, 1998
3. Doctoral Degree, in Architecture, Sepuluh Nopember Institute of Technology, 2006

Organization of Professionis Indonesian Association of Planners, with the level Leading Expert. As a professional planner, ever since 1985, actively participates in formulating Spatial Planning, in Regional and Urban level held by various city in Indonesia. Recently, becomes the team leader of:

- a. Spatial Planning of Surabaya, 2018
- b. Regional Spatial Planning of East Java Regional Province, 2019
- c. Regional Spatial Panning in Sumba Island 2019

Others activities as Resource Person/speakers

- a. The concept of Detail Plan, East Java
- b. The implementation of spatial planning in development, Surabaya Paper has been published: Kearifan Lokal Masyarakat Sasak: Memahami Perubahan Struktur Ruang Permukiman Kasus Desa Puyung – Lombok Tengah, NALARs (Jurnal Arsitektur FTUMJ), Pembentukan Struktur Ruang Permukiman Berbasis Budaya, Jurnal DIMENSI (Petra – Surabaya), Ritual Spatial Pattern of Indigenous people of Dasarai Lamaknen Kingdom (O Kololo Kausiwe Dasarai Lamaknen} in Belu, East Nusa Tenggara, Indonesia, Journal of Culture society and Development, Vol 12, 2017.

International conference: Sustainability of genius loci of the Sasak people: Understanding the changes of Sasak settlement spatial structure, The First Scottish Conference for PROBE, Glasgow Caledonian University/Glasgow, Scotland, UK; Islam, Ritual and Settlement Pattern A Case Study: Puyung Village, Central Lombok, Indonesia, 4th International Symposium of Journal Anthropology Indonesia, FISIP UI/Depok, Indonesia; RITUAL AND PLACEMAKING an understanding of local indigenous Sasak settlement structure, International Convention of Asia Scholars 4, Shanghai, China

Research:

Pemetaan Skala Besar dan Pemodelan 3D Rencana Detail Tata Ruang dan Potensi Kawasan Kota Malang dengan Pesawat UAV; Analisa Perubahan Makna Kultural Kawasan Cagar Budaya Kampung Adat Palawa, Suku Toraja, di Kabupaten Toraja Utara, Analisis Kinerja Pelestarian Kampung Adat Palawa Suku Toraja,

Ardiyanto Maksimilianus Gai, ST, MT, was born in Ende, East Nusa Tenggara, on 16th January 1988. Home address: Citramas Raya BA. 04, Tidar, Malang. A lecturer in Urban and Regional Planning Department, National Institute of Technology (ITN) - Malang, Indonesia. Bachelor of Science in Urban and Regional Planning Department, National Institute of Technology (ITN) - Malang, (2011). Master degree in Environmental Management, Brawijaya University, Malang,

Indonesia (2013).

Professional Training/Courses:

1. 2020, Urban resilience assessment, Centre for Environmental Studies (PSLH) of ITB Bandung
2. 2019, Strategic Environmental Assessment, ITS Training Center
3. 2018, Workshop Arc GIS “Image Analysis for Identification and Prediction The Urban Growth”, Brawijaya University, Malang
4. 2017, Strategic Environmental Assessment, Centre for Environment Studies (PSLH) of Universitas Gadjah Mada, Yogyakarta
5. 2015, Public Private Partnership the alternative Infrastructure financing, Ministry Of Finance Indonesia
6. 2013, Workshop Public Private Partnership In Asia, Asia Public Private Partnership Institute (APPPI)
7. 2012, Training of Water Management, PPLH Brawijaya University, Malang  
Organization of Professionis Indonesian Association of Planners, Indonesian environmental professional association, and Certificate of competence with qualification Environmental Impact Statement consultant.

National and International Journal or proceeding have already published are:

1. The study of Larantuka urban infrastructure service level to accommodate the connectivity of surrounding islands, Conference Series: Earth and Environmental Science 340 (2019) 012006
2. The concept of community poverty reduction in coastal area of Surabaya based on sustainable livelihood approach, I Conference Series: Earth and Environmental Science 137 (2018) 012099
3. Valuasi Ekonomi Hutan Mangrove di Wilayah Pesisir Desa Boroko, Kabupaten Bolaang Mongondow Utara, Provinsi Sulawesi Utara, Jurnal Planoeath Vol. 3 No. 1, Februari 2018, hal. 17-22
4. Volume Calculation of the Rain Runoff and Domestic Waste Water in Sawojajar Village in Malang, Indonesia, Civil and Environmental Research Vol. 9 No 6, 2017
5. The Characteristics and Poverty Level of People in Sukolilo Fisherman Village Surabaya Based on Sustainable Livelihood Approach, Journal of Economics and Sustainable Development, Vol. 8 No. 20, 2017
6. The Influence of Industrial Area Existence towards Community Behavior in Space Utilization at Gresik, Indonesia, Research on Humanities and Social Sciences, Vol 7, No 12 (2017)

Also as a speaker/presenter in international conferences and national seminars

1. Pemetaan Partisipatif dalam Upaya Mitigasi Bencana di Wilayah Pesisir Kota Surabaya, Seminar Nasional PLANO EARTH #2, Tema “Perencanaan & Pemanfaatan Ruang Berbasis Pengurangan Resiko Bencana” Universitas Muhammadiyah Mataram, 28-29 Agustus 2019
2. THE STUDY OF LARANTUKA URBAN INFRASTRUCTURE SERVICE LEVEL TO ACCOMMODATE THE CONNECTIVITY OF SURROUNDING ISLANDS, CITIES  
International Conference Spasial Economic Transport Interaction for Sustainable Development, Department of Urban and Regional Planning, Institut Teknologi Sepuluh Nopember, 24 Oktober 2018
3. Analisis Tingkat Sustainable Livelihood dan Pengaruhnya Terhadap Kerentanan

Masyarakat Desa Surumana, Sulawesi Tengah, Seminar Nasional Perencanaan Wilayah, Kota, dan Desa Terintegrasi yang Berkelanjutan, Berimbang dan Inklusif, IPB International Convention Centre Bogor, Indonesia 29 Agustus 2018

4. Poverty Elimination Concept at the Coastal Area of Surabaya Using Sustainable Livelihood Approach, INTERNATIONAL FISHERIES SYMPOSIUM, Agro Kusuma Resort & Convention Hotel, Batu Jawa Timur, 07 September 2017

5. “Kinerja Pengembangan Obyek Wisata Desa Budaya Pampang Berdasarkan Persepsi Pengunjung”, Seminar Nasional Implementasi New Urban Agenda Melalui Pengembangan Pariwisata yang Berbasis Budaya Lokal & Pemberdayaan Komunitas, Universitas Muhammadiyah Mataram, 14 September 2017

Annisaa Hamidah Imaduddina, ST, MT, was born in Surabaya - East Java, on 06th Desember 1988. Home address: Jl Sunan Muria V blok b1 no 32 Malang. She is a Lecturer in Urban and Regional Planning Department, National Institute of Technology – Malang, since 2015. Lecturer of: Housing, coastal planning, landuse planning dan technology information.

Education back ground:

1. Bachelor Degree, Urban And Regional Planning, Sepuluh Nopember Institute of Technology (ITS) 2011

2. Master in coastal planning and management, UGM 2014

Organization of Professionis Indonesian Association of Planners, with the level madya. As a profesional planner, ever since 2011, actively participates in formulating Spatial Planning, join training and student exchange to japan and brazil.

Some Publication has been published, among of them:

1. Risk Assessment of Inundation in Rawa Pening Area. Seminar Internasional Planokosmi ITB. 2013

2. Kerentanan Masyarakat Dalam Menghadapi Banjir Rob. Buku diterbitkan oleh Gama Press

3. Kajian Potensi Bencana Pesisir Kabupaten Jepara. Buku diterbitkan oleh Gama Press

4. Bahaya Geomorfologi di Pesisir Utara Jawa Tengah, Indonesia. PIT-IGI 2014

5. Strategi Adaptasi Masyarakat Pesisir Kota Surabaya Terhadap Ancaman Kenaikan Muka Air Laut Akibat Pemanasa Global. PIT-IGI 2014

6. Flood Mitigation in Surabaya Coastal Area. Jurnal Internasional Science Direct, 2014

7. Buku Bunga Rampai Gunung Api Merapi : Kebencanaan dan Pengurangan Risikonya, UGM 2017

8. Penataan ruang kawasan rawan bencana pantai selatan Pulau Jawa 2017

9. Panduan Pengembangan Resilient City 2017

10. Kota Tangerang menuju kota tanguh bencana dan berketahanan perubahan iklim 2017

11. Kota depok menuju kota tanguh bencana dan berketahanan perubahan iklim 2017

12. Kota bogor menuju kota tanguh bencana dan berketahanan perubahan iklim 2017

13. Kota balikpapan menuju kota tanguh bencana dan berketahanan perubahan iklim 2017

14. Kota malang menuju kota tanguh bencana dan berketahanan perubahan iklim 2017

15. Kota surabaya menuju kota tanguh bencana dan berketahanan perubahan iklim 2017

16. Kota bandung menuju kota tanguh bencana dan berketahanan perubahan iklim 2016

# CONTENTS

SL.NO	TITLES AND AUTHORS	PAGE NO
1.	The Contribution of Farm Animal Production to Climate Change and Their Mitigation Strategies ➤ <i>Yusuf Leonard Henuk</i>	1 - 2
2.	Local Experiences and Coping Mechanisms on Climate Change phenomenon of Smallholder Upland Farmers in Barobbob Watershed, Nueva Vizcaya, Philippines ➤ <i>Krystel Mae J. Peñaflor</i>	3 - 4
3.	Estimation of the Willingness to Pay of the Urban Households in Santa Rosa, Laguna for Forest Rehabilitation in Silang-Santa Rosa Subwatershed ➤ <i>Richelle Marie B. Legaspi</i>	5 - 6
4.	Comparison between Organic and Good Agricultural Practice Methods for Cultivation of Choy Sum Crop in Siem Reap Province, Cambodia ➤ <i>Vanna Teck</i>	7 - 8
5.	Elevated Increases in Human-Perceived Temperature under Climate Warming ➤ <i>Yongqin David Chen</i>	9
6.	The Roles of Drought, Flooding, and Fire on Climate Change in Tropical Peatland Ecosystem ➤ <i>Cahyono Agus</i> ➤ <i>Pamungkas B Putra</i> ➤ <i>Richard P Napitupulu</i> ➤ <i>Dewi Wulandari</i> ➤ <i>Nur AI Hasanah</i> ➤ <i>Dony Rachmanadi</i> ➤ <i>Purwanto B. Santosa</i> ➤ <i>Tri W Yuwati</i> ➤ <i>Janatun Naim</i>	10 - 11
7.	The Role of Sustainable Innovation in Building Resilience ➤ <i>Mathew Kensen</i> ➤ <i>Dan F. Orcherton</i>	12
8.	Structural Stability of a Modular Artificial Reef Made of Portland cement and Dolomite ➤ <i>Siddharth Pillai</i>	13
9.	Preliminary Investigation on Public Utilization of Green Roof in Commercial Building ➤ <i>Wardah Fatimah Mohammad Yusoff</i>	14

# CONTENTS

SL.NO	TITLES AND AUTHORS	PAGE NO
10.	Conversion of a Miyawaki Forest into a Sacred Natural Site ➤ <i>Maya Pillai</i> ➤ <i>Siddharth Pillai</i> ➤ <i>Navroz Billimoria</i> ➤ <i>Sanjana Berry</i>	15 - 16
11.	Arresting Climate Change in the Context of a Declining Economy: Prospects and Constraints ➤ <i>Cathrine Kudakwashe Matemba</i>	17
12.	Environmental-Economic Assessment of Pyrogenic Damage to Forest Ecosystems of the Republic of Indonesia Using Satellite Data ➤ <i>A.I. Kurbatova</i> ➤ <i>P.V. Kozhevnikova</i> ➤ <i>A. Haesmans</i> ➤ <i>A.V. Orlovsky</i>	18 - 19
13.	Biological control of Mosquito Larvae by <i>Gambusia affinis</i> ➤ <i>M. Sakthivel</i> ➤ <i>P. Ramakotti</i>	20 - 21
14.	Bio-Medical Waste Management ➤ <i>Dr.A. Senthil Kumar</i> ➤ <i>S. Gowripriyadharshini</i> ➤ <i>V.Swetha</i>	22 - 23
15.	Minahasa Traditional House as an Environmentally Friendly Residence ➤ <i>VerryLahamendu</i> ➤ <i>Ferdinan S. R. P. Terok</i>	24 - 25
16.	The Indigenous Javanese Perception toward Green Home: The Application of Greenship Rating Index ➤ <i>Maranatha Wijayaningtyas</i> ➤ <i>Fourry Handoko</i>	26 - 27
17.	Mild Hybrid Vehicles and Their Effect on Emission ➤ <i>Harshit Sharma</i> ➤ <i>Abhishek Sharma</i>	28
18.	Green Buildings and Its Emphasis on the Environment ➤ <i>Mohit Chauhan</i> ➤ <i>Karan Arora</i>	29

# CONTENTS

SL.NO	TITLES AND AUTHORS	PAGE NO
19.	Water Quality Performance of Brantas River using STORET Method ➤ <i>Evy Hendriarianti</i> ➤ <i>Kustamar</i> ➤ <i>Sudiro</i>	30 - 31
20.	Plastic Green Concrete ➤ <i>Nimisha Singla</i> ➤ <i>Saman Sohail</i>	32
21.	Optimizing the Local Made of Hydraulic Ram Pump Design for Promoting Green Energy Deployment ➤ <i>Made Suarda</i>	33
22.	The Production Trends of Indonesian Soybean before and during Climate Change ➤ <i>Istis Baroh</i> ➤ <i>Windiana</i> ➤ <i>Dyah Erni Widyastuti</i>	34 - 35
23.	The Economic Impact of Climate Change on Apple Production in Kota Batu, Indonesia ➤ <i>Bambang Yudi Ariadi</i> ➤ <i>Rahmad Pulung Sudibyo</i>	36 - 37
24.	Reflections on Conservation of Nature with Special Emphasis on Film Avatar ➤ <i>Nur Ocvanny Amir</i> ➤ <i>Yohana Agustina</i> ➤ <i>Harpowo</i>	38
25.	The Adaptation of Poor Fishermen Households at the Overfishing Area in East Java, Indonesia ➤ <i>Anas Tain</i> ➤ <i>Ary Bakhtiar</i>	39 - 40
26.	Long Storage Design Optimization for Flood Control and Ecotourism in the Downriver of <i>Kali Kemuning</i> ➤ <i>Kustamar</i> ➤ <i>Maranatha Wijayaningtyas</i>	41 - 42
27.	Typology of Solid Waste Management in Malang Raya, Indonesia ➤ <i>Hardianto</i> ➤ <i>Hery Setyobudiarso</i>	43 - 44

# CONTENTS

SL.NO	TITLES AND AUTHORS	PAGE NO
28.	The Development of WebApp Builder Using Laravel Framework to Support Irrigation Networks Maintenance in East Sumba District of Indonesia <ul style="list-style-type: none"> <li>➤ <i>Silvester Sari Sai</i></li> <li>➤ <i>Martinus Edwin Tjahjadi</i></li> <li>➤ <i>Masrorul Azizah</i></li> </ul>	45 - 46
29.	Study of Thermal Comfort in Architecture Tenganan Pegringsingan Bali, Study Case Bale Tengah and Bale Meten <ul style="list-style-type: none"> <li>➤ <i>Luh Putu Widhiari</i></li> </ul>	47
30.	International Law on Climate Change (Convention and Protocol) and Indonesian Interest as a Developing Country <ul style="list-style-type: none"> <li>➤ <i>Diogenes</i></li> </ul>	48
31.	Factors that Encourage People to Ignore Environmental Health: A Study Qualitative of Climate Management from Common People's Perspective <ul style="list-style-type: none"> <li>➤ <i>Adhy Firdaus</i></li> </ul>	49 - 50
32.	Alternative Drying Methods for Clove to Improve the Quality of Dry Clove <ul style="list-style-type: none"> <li>➤ <i>Beauty Suestining Diyah Dewanti</i></li> </ul>	51
33.	Determination of Water Status Quality and Primary Productivity of Lahor Dam in Malang District, Indonesia <ul style="list-style-type: none"> <li>➤ <i>Hery Setyobudiarso</i></li> <li>➤ <i>Hardianto</i></li> </ul>	52 - 53
34.	Mapping of Changes in Area and Vegetation Density of Land Surface Temperature in Malang <ul style="list-style-type: none"> <li>➤ <i>Agung Witjaksono</i></li> <li>➤ <i>Ardiyanto Maksimilianus Gai</i></li> </ul>	54 - 55
35.	Obstacles of Green Open Space Availability: Building Malang towards a Greener City <ul style="list-style-type: none"> <li>➤ <i>Agustina Nurul Hidayati</i></li> <li>➤ <i>Muhammad Reza</i></li> <li>➤ <i>Widiyanto Hari Subagyo Widodo</i></li> </ul>	56
36.	Physical Comfort Factors as Elements of Residential Space <ul style="list-style-type: none"> <li>➤ <i>Gaguk Sukowiyono</i></li> <li>➤ <i>Debby Budi Susanti</i></li> </ul>	57 - 58

# CONTENTS

SL.NO	TITLES AND AUTHORS	PAGE NO
37.	The Impact of Traffic Congestion on Air Quality in Malang City ➤ <i>Nusa Sebayang</i> ➤ <i>Yudi Limpraptono</i> ➤ <i>Hardianto</i>	59 - 60
38.	Carbon Footprint Reduction in the Post-earthquake Reconstruction of Residential Buildings: A Case of Mahalaxmi Municipality, Nepal ➤ <i>Bishwodev Bhattarai</i> ➤ <i>Janak Raj Joshi</i>	61
39.	Public Initiatives for Conservation of Water Resources in Tamilnadu, India ➤ <i>Dr. G.P. Sudha</i>	62
40.	Management of Fringe Forest Ecological Security: With Special Reference to Malayali Tribes of Javadhi Hills Vellore District ➤ <i>Dr. K. Chithra Devi</i>	63 - 64
41.	Implementation of Coastal Regulations in Tamilnadu: An Empirical Study with Special Reference to Kancheepuram District-India ➤ <i>G. Malini</i>	65
42.	E Waste Management in Chennai Metropolitan Area: A Study ➤ <i>P. Abishek</i>	66 - 67
43.	Environmental Governance and Civil Society Activism: A Study ➤ <i>Dr. P. Maduraiveeran</i>	68 - 69
44.	Green Crackers: an Alternative Technology to Reduce Pollution ➤ <i>R. Sriram Prabhu</i>	70 - 71
45.	Implementation of Green Open Space Using Hydroponics Closed Cycle System ➤ <i>Bambang Sugiyono Agus Purwono</i> ➤ <i>Masroni</i> ➤ <i>Shyamala Susan</i> ➤ <i>Ali Nasith</i> ➤ <i>Ida Bagus Suardika</i>	72 – 73

# CONTENTS

SL.NO	TITLES AND AUTHORS	PAGE NO
46.	Characterization of the Extruded Analog Rice from Arrowroot Starch Added With Seaweed and Spices <ul style="list-style-type: none"><li>➤ <i>Damat</i></li><li>➤ <i>Rahayu Relawati</i></li><li>➤ <i>Sri Wahyuni</i></li><li>➤ <i>Rista Anggriani</i></li><li>➤ <i>Joko Susilo Utomo</i></li></ul>	74 – 75
47.	Study of Logung Water Reservoir and Pollution Loading In Logung River and Gajah River <ul style="list-style-type: none"><li>➤ <i>Maria Rara Palupi</i></li></ul>	76
48.	The Correlation between Production and Availability of Beef Cattle and Climate Change in Daerah Istimewa Yogyakarta, Indonesia <ul style="list-style-type: none"><li>➤ <i>Rahayu Relawati</i></li><li>➤ <i>Dwi Aulia Puspitaningrum</i></li><li>➤ <i>Liana Fatma Leslie Pratiwi</i></li></ul>	77 - 78



# ABSTRACTS







## **The Contribution of Farm Animal Production to Climate Change and Their Mitigation Strategies**

**Yusuf Leonard Henuk**

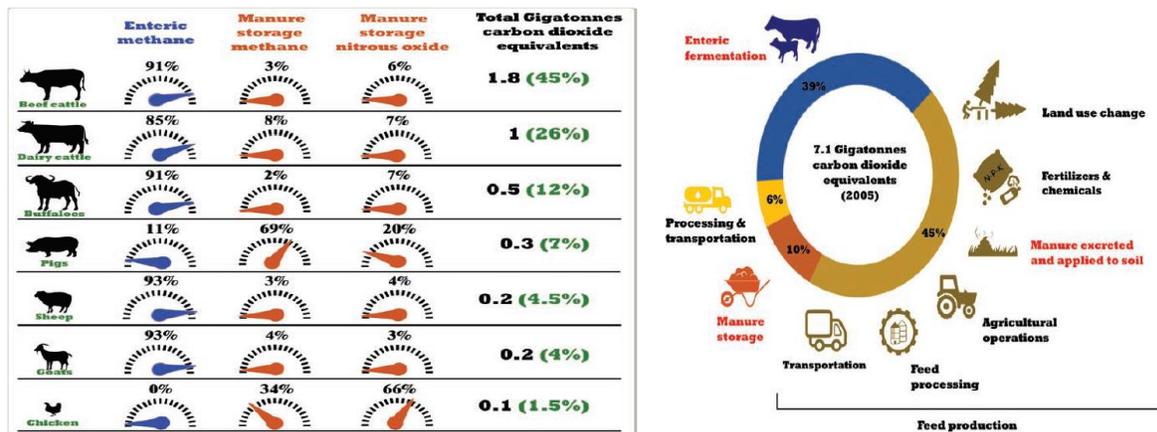
Department of Animal Science, Faculty of Agriculture, University of Sumatera Utara (USU), Medan Indonesia

### **Abstract**

The global food system is a significant contributor to Greenhouse Gas (GHG) emissions, a large part of which stems from animal husbandry. There are three main important GHGs from animal agriculture are Carbon Dioxide (CO<sub>2</sub>), Methane (CH<sub>4</sub>), and nitrous oxide (N<sub>2</sub>O). CH<sub>4</sub> forms about 44% of livestock emissions. The rest is shared between CO<sub>2</sub> (27%) and CO<sub>2</sub> (29%). Beef cattle emit the highest, about 45% of the livestock production emissions followed by dairy cattle (26%), buffaloes (12%), pigs (7%), sheep (4.5%), goats (4%), and chickens (1.5%). CH<sub>4</sub>, mainly produced by enteric fermentation and manure storage, is a gas which has an effect on global warming 28 times higher than CO<sub>2</sub>. N<sub>2</sub>O, arising from manure storage and the use of organic/inorganic fertilizers, is a molecule with a global warming potential 265 times higher than CO<sub>2</sub>. The CO<sub>2</sub> equivalent is a standard unit used to account for the global warming potential. The livestock sector is estimated to account for 15% of global GHG emissions, 88% of which originate from ruminant animal systems (79.5%) compared to non-ruminant animal systems (8.5%) due to high emissions of CH<sub>4</sub> from enteric fermentation and manure management. A large number of mitigation options have been proposed (e.g., diet manipulation, vaccines, chemical additives, animal genetic selection, etc.) with different efficiencies in reducing enteric CH<sub>4</sub> until recently focused on four strategies, i.e. enteric fermentation, manure storage, feed production and animal management. In conclusion, the farm animal sector is the single largest anthropogenic user of land, contributing to many environmental problems, including global warming and climate change and their mitigation option strategies are enteric fermentation, manure storage, feed production and animal management

### **Biography**

Yusuf Leonard Henuk is a Professor in the Department of Animal Science, Faculty of Agriculture at University of Sumatera Utara (USU), Medan, North Sumatera, Indonesia. He received a Bachelor's degree (S1: 'Sarjana') from the Faculty of Animal Science, the University of Nusa Cendana in Indonesia from 1980-1984. He obtained Master in Rural Science (M.Rur.Sc.) from the University of New England from 1991 – 1995 and continued Doctor of Philosophy (Ph.D) from the University of Queensland from 1998 – 2001. He was a twice Visiting Professor to the Department of Poultry Science, Texas A&M University, College Station, USA (September – December 2010 & 2017).



**Figure 1.** Greenhouse gases incidence of enteric fermentation and manure storage by animal type, expressed as Gigatonnes of carbon dioxide equivalents and livestock emissions by source. Direct livestock emissions are shown in red (Grossi et al., 2019: 70-71).

**Table 1.** Mitigation potential of various strategies

Strategies	Category	Potential mitigating effect*	
		Methane	Nitrous Oxide
Enteric fermentation	Forage quality	Low to medium	↑
	Feed processing	Low	Low
	Concentrate inclusion	Low to medium	↑
	Dietary lipids	Medium	↑
	Electrons receptors	High	↑
	Ionophores	Low	↑
	Methanogenic inhibitors	Low	↑
Manure storage	Solid-liquid separation	High	Low
	Anaerobic digestion	High	High
	Decreased storage time	High	High
	Frequent manure removal	High	High
	Phase feeding	:	Low
	Reduced dietary protein	:	Medium
	Nitrification inhibitors	:	Medium to high
Animal management	No grazing on wet soil	Low	Medium
	Increased productivity	High	High
	Genetic selection	High	↑
	Animal health	Low to medium	Low to medium
	Increase reproductive eff.	Low to medium	Low to medium
Reduced animal mortality	Low to medium	Low to medium	
Housing systems	Medium to high	Medium to high	

## Reference

Grossi, G., P. Goglio, A. Vitali, and A.G. Williams. 2019. Livestock and climate change: impact of livestock on climate and mitigation strategies. *Animal Frontiers*, 9(1 –January): 69 – 76.



## **Local Experiences and Coping Mechanisms on Climate Change phenomenon of Smallholder Upland Farmers in Barobbob Watershed, Nueva Vizcaya, Philippines**

**Krystel Mae J. Peñaflor**

University of the Philippines Los Baños, Laguna, Philippines

### **Abstract**

This study analyzes the coping mechanisms adopted by smallholder upland farmers amidst impacts of climate change within the locality of the Barobbob Watershed in Bayombong, Nueva Vizcaya, Philippines. Using qualitative research approach this study employs key-informant interviews and secondary data collection in order to address the following research questions: (a) How do smallholder upland farmers define the climate change evidences within the watershed; and, (b) What are the coping mechanisms of farmers that can be enhanced through strategic interventions in order to enhance their resilience amidst climate change? Thirty smallholder upland farmers are interviewed from three communities within the watershed, namely Barangay Ipil-Cuneg, Magsaysay and Masoc. The results of the study indicate that smallholder upland farmers in Barobbob Watershed are already using various strategies to cope and adapt to the changes and variability of the climate as they experience it locally. These smallholder upland farmers adopt some innovative farming practices to maximize the possibility of harvesting amidst decreasing rainfall conditions by using shorter-cycle and drought-resistant crop varieties such as eggplants (*Solanum melongena*), tomatoes (*Solanum lycopersicum*) and Baguio beans (*Phaseolus compressus*), while abandoning rice cultivation especially during drought season when water shortage is prevalent. It is hoped by these farmers that there would be local government interventions to help enhance their capacity to adapt to the changing climate variabilities in their locality.

## **Keywords**

Adaptation, Climate Change, Upland Farmers

## **Biography**

Krystel Mae Penaflor is a young professional on Disaster-risk reduction and Climate Change adaptation. She obtained her Bachelor's degree in Forestry at the University of the Philippines. Currently, she is an Information Officer at the Climate Change Commission, Office of the President of the Philippines. Growing-up in a farming village, she has witnessed that the poorest populations are the most vulnerable and at-risk to Climate Change impacts. Thus, her strong desire to develop innovative solutions that will enable more youth leaders to implement community-led adaptation initiatives to achieve climate resiliency made her an Ambassadors of the Global Youth Climate Network.



## **Estimation of the Willingness to Pay of the Urban Households in Santa Rosa, Laguna for Forest Rehabilitation in Silang-Santa Rosa Subwatershed**

**Richelle Marie B. Legaspi**

University of the Philippines Los Baños, Laguna, Philippines

### **Abstract**

Flooding is the major problem of Santa Rosa due to the floodwaters coming from the uplands to the downstream areas of Silang-Santa Rosa Subwatershed. Forest rehabilitation is one of the options to mitigate flooding in the downstream area of Santa Rosa. The ability of urban households to directly support forest rehabilitation efforts is a potent source of funding stream for ecological restoration. This study determined the willingness to pay of urban households to support forest restoration in Silang-Santa Rosa Subwatershed. A total of 150 respondents surveyed, with 50 respondents each from the three barangays that were identified with high vulnerability on flooding. Willingness to pay (WTP) was measured using the binary choice elicitation technique of Contingent Valuation Method. Factors affecting the WTP were analyzed through Logit regression model. The survey results have shown that 83.3% of the respondents are aware of the forest ecosystem services. Among these services include provisioning services and regulating services. In terms of priority, the respondents ranked provisioning and regulating services as first and second priority, respectively. They have also shown a positive response towards conservation and maintenance of the forest for flood mitigation purposes. Based on the Logit model, the factors significantly affecting the WTP were age and income of the respondents. The mean willingness to pay was estimated to be Php482 per month per household or Php5,024 per year per household. For the total household population, the social WTP was about Php11,553,903 per month or Php138,646,841 per year and this amounted to Php616,335,415 in present value terms at 10% discount rate. The study also calculated the flood damage incurred by the respondents during the Habagat event in 2012. The average damage cost incurred was approximately Php160,443.50 per household, at 2016 price level, which is significantly higher than the annual mean WTP. This implies that contributing payments for forest rehabilitation efforts to reduce flooding would be a rational option for urban households. Also, the local government can justify in allocating more funds for the forest maintenance since the budget allocated for drainage establishment (Php8,727,273) is less than the social WTP per year.

## **Keywords**

willingness-to-pay, flooding, watershed

## **Biography**

Richelle is a licensed forester and has acquired her Bachelor's degree in Forestry at the University of the Philippines Los Baños. She's been involved as a Research Assistant on a collaborative project between the University of the Philippines and Institute of Global Environmental Strategies. Currently, she's now pursuing MS in Environmental Science at the School of Environmental Science and Management, UPLB. Her desire on serving as an agent towards attaining sustainability by developing solutions based on researches inspired her to pursue this profession and to continue venturing into research applying her gained skills and knowledge.



## **Comparison between Organic and Good Agricultural Practice Methods for Cultivation of Choy Sum Crop in Siem Reap Province, Cambodia**

**Vanna Teck**

Mean Chey University, Banteay Mean Chey Province, Cambodia

### **Abstract**

Choy sum (*Brassica chinensis* var. *Parachinensis*) is a leafy vegetable crop that is very popularly consumed mostly by families in Cambodia due to its plentiful uses. To catch up with this increasing demand, most of the farmers practically use chemicals for pesticides and fertilizers which negatively affect the consumers' health. The study of the effect of the chemicals and pesticides to human health gave such evidences that people who are highly exposed on consuming chemically grown agricultural crops can lead to cancer. Moreover, inorganic farming also poses such risks to the agro-ecosystems such as soil erosion, nutrient degradation that also lead to low yield level eventually in the long run. With this problem, the world is shifting from inorganic (use of chemicals) into organic farming; and this is to achieve the goal towards good agricultural practices (GAP). Such researches on GAP emphasizes the biological techniques on agriculture that increases soil microbial activity, organic compounds, and biodiversity resources which lead to environmental protection, high productivity yield and food security.

With these reasons, comparison between organic and good agricultural practice methods for cultivation of Choy sum crop was analyzed and assessed in the Siem Reap Province (Dr. Tann Huyly's farm). The objective of this study is to determine and assess the growth rate, yields and economic efficiency given by organic and GAP methods on Choy sum crop. The experiment was designed according to complete randomize design (CRD) which had 3 treatments including non-treated control ( $T_0$ ), Organic method ( $T_1$ ) and GAP ( $T_2$ ) and each treatment has 4 replications of 12 plots, and with sizes of 1 m x 6 m. The spaces between each treatment are 1 m long and the spaces between rows are 25 cm x 25 cm, with a total size of the study plot of 143 m<sup>2</sup>. This experiment started from 20<sup>th</sup> of April, 2017 to 27<sup>th</sup> of June, 2017, harvest time. According to the results of analyses, growth rate, number of leaves, and weight of the control treatment ( $T_0$ ), Organic ( $T_1$ ) and GAP ( $T_2$ ) are significantly different at p-value = 0.05. With that, it is really evident that Choy some crops cultivated by GAP method ( $T_2$ ) have better growth rate, yields and economic efficiency than that of other treatments. At the harvest time, aged 25 days, GAP

methods (T<sub>2</sub>) gave the highest yield 15.84 Kg/6m<sup>2</sup> and high profit 0.95 Real at the expense of 1.00 Riel, when compared to the Organic methods yielding 9.45Kg/6 m<sup>2</sup> and profit 0.12 Real, and Non-treated control 3.65 kg/6 m<sup>2</sup> and no profit (- 1.70 Real).

Thus, good agricultural practices are very important in the agricultural sector for the increase in yields that farmers can use. Good Agricultural Practices (GAP) is excellent in cabbage crop production and high quality food safety for consumption and economic efficiency. Moreover,, results has shown that GAP was suitable for better biodiversity, food security, food safety, and sustainable agriculture.

## **Keywords**

Organic, GAP, Choy Sum

## **Biography**

Vanna is an agriculturist who successfully acquired his Bachelor's degree in Agronomy at the Mean Chey University, Cambodia. He's been involved and participated on different programs related to Agriculture, Food Security and Climate Change in Israel, Japan and the Philippines. He believes that sustainable natural resource management is important in understanding the issues facing the agro-ecosystem, biodiversity conservation, depletion of food security and the importance of food safety among resource in such local areas. With this, he's currently pursuing MS in Sustainable Ecosystem Management at the University of Battambang (UBB), Cambodia for his desire to attain sustainable development in helping his nation.



## **Elevated Increases in Human-Perceived Temperature under Climate Warming**

**Yongqin David Chen**

School of Humanities and Social Science, The Chinese University of Hong Kong, Shenzhen, china

### **Abstract**

Apparent temperature, an indicator of temperature human perceives, is mainly determined by air temperature, humidity and wind speed. Global warming indicated by increasing air temperature alters climatic and hydrologic circulations, and hence changes humidity and wind speed, which jointly influence apparent temperature. Here we study the global changes in apparent temperature and compare these changes with air temperature to investigate how human feels about continuous global warming. Results show that under climate warming, apparent temperature increases faster than air temperature. This phenomenon is especially remarkable in the tropics and subtropics and under high emission scenario. During 1981-2000, apparent temperature in the tropics is 0-4oC higher than air temperature, and then increases to 3-6oC higher during 2081-2100 under Representative Concentration Pathway 8.5. The apparent temperature in the tropics is projected to reach > 35oC, implying severe health impacts. Continental average of apparent temperature is 1.5oC lower than air temperature in 2000, and turns to 0.25oC higher by the end of 21<sup>st</sup> century. The elevated increment in apparent temperature is a combined effect of stronger heat stress and weaker cooling effect caused by increasing air temperature with negligible changes in relative humidity and wind speed. Effective climate change mitigation efforts, including emission reduction to achieve RCP2.6, can considerably alleviate the faster increase in apparent temperature.

### **Biography**

Dr. Yongqin David Chen is a Professor of the School of Humanities and Social Science and the Master of Muse College at The Chinese University of Hong Kong, Shenzhen. His research and teaching areas include hydrology and water resources management, climatology and climate change, environmental assessment and modeling, and regional development. He has published over 120 papers in these areas in international and Chinese journals (including Nature Climate Change and other top journals), as well as book volumes. He has been active in serving in various capacities for universities, professional societies and government advisory committees at local, national, and international levels.



## **The Roles of Drought, Flooding, and Fire on Climate Change in Tropical Peatland Ecosystem**

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## Abstract

Land-use change, drought season, and forest fire of a million hectares of peatlands tropical region have led to land degradation. This study aimed to determine the effect of drought and forest fire on flooding and the effect of environmental site engineering on the survival rate of revegetation in a tropical peatland ecosystem. Soil characteristics and survival rate of the rehabilitation program on degraded peatland ecosystems were studied at Tahura Orang Kayo Hitam Jambi and Special Forest Park of Tumbang Nusa Central Kalimantan, Indonesia. Forest fire in peatland converted organic materials to available nutrients and increased soil pH at the soil surface. However, the nutrients are easily leached by high rainfall intensity, thus resulted in more degraded land at long-term periods. El-Nino and drought season stimulate peatland could quickly burn during the dry season. Forest fire resulted in high humic acid levels, aromatic area, hydrophobic surface area, decomposition rate and emission of carbon, but lower water holding capability. This condition made the rewetting program in degraded peatland is prone to flooding during the rainy season. Ferns and shrubs occupied the unmanaged degraded lands, and their roots dominated the surface areas. Planting seedlings that are not buried in peat media but planted only in the root zone results in the failure of revegetation programs. Tropical peatlands in Indonesia should be not only enough retorted through 3R (Rewetting, Revegetation, and Revitalization) approach but should also be developed through 9R (reusing, reducing, recycling, refilling, replacing, repairing, replanting, rebuilding, reward) of integrated bio-cycles management. Environmental site engineering should be designed for better soil characteristics and plant growth during the restoration of the peatland ecosystem. Closed cycles of organic matter, carbon, water, nutrient, energy, production, and crops should be maintained for the rehabilitation of peatland and combat global climate change.

## Key words

Carbon Emission, Climate Change, Degraded Peatland, Forest Fire, Tropical Ecosystem.

## Biography

Prof. Dr. Ir. Cahyono Agus DK, M.Sc.

Born in Yogyakarta, March 10, 1965. Professor at Universitas Gadjah Mada Yogyakarta Indonesia. He obtained a Doctorate from Tokyo University of Agriculture & Technology, Tokyo, Japan, in 2003. He was head of UGM University Farm 2008-2015. He currently serves as Chairman of the Central Board of Tamansiswa Society (PP PKBTS) 2016-2021, a member of Majelis Luhur Persatuan Tamansiswa (MLPTS) 2016-2021, and member of Education Board DIY. Active as a reviewer in the field of research, community development, scientific publications, institutional development in Higher Education, Indonesia. He published many scientific works in international seminars and journals, and have several awards and copyrights from various agencies.

## **The Role of Sustainable Innovation in Building Resilience**

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World Maritime University, Malmö, Sweden.

**Dan F. Orcherton**

Principal: CCADIMO (Corp, Inc.). (Climate Change Adaptation, Mitigation and International Development, Corp. Inc.) Prince George, B.C-Canada

### **Abstract**

**I**nnovation in the face of dangerous climate change in the South Pacific and the Caribbean has been at the forefront of community-based resilience, vulnerability and adaptation initiatives over this past century or more. This Chapter will review the important underpinnings of societal level and stakeholder impacts of sustainable innovating as it relates to climate change in Small Island Developing States (SIDS). Urban populations living in coastal or inland cities are distinguished from regions in the sense that they possess and steadily provide various functions, which refer to those in the socioeconomic realm, in addition to physical functions (Donghyun and Lim 2016). This article will review the literature on the concept of vulnerability, its assessment, and measurement in the context of urban environments the findings should be discussed in connection with urban climate resilience. This Chapter will also emphasize shifts towards learning, innovation and the role knowledge can play in this. Both “pro poor adaptation strategies” as “green growth” strategies can exemplify these trends. An important concept within sustainable development and climate resilience of urban populations is vulnerability<sup>3</sup> to natural hazards and climate change; exacerbated much more prominently and often felt and experienced profoundly across and in all geographic scales in the South Pacific.



## **Structural Stability of a Modular Artificial Reef Made of Portland cement and Dolomite**

### **Siddharth Pillai**

B.D Somani International School, Mumbai, India

### **Abstract**

Artificial reefs are potential solution to the rapidly declining coral reefs due to global warming. Various structures have been used in the past including wood, cement, tyre, vehicles etc. An ideal artificial reef structure should be environment friendly and inert and mimic the natural reef. Dolomite exists naturally in the reef and holds immense potential in constructing artificial reefs. However, Dolomite is brittle to be used alone and no known formulation exist today for reef building. In July 2019, a project was undertaken to build a 3D designed module using Portland cement and dolomite at 90: 10 ratio. Each module measured 12 x 8 x 4 inches and weighed 12kgs. About 400 of these modules were assembled by 10 scuba divers at 20meter depth in the Bay of Bengal near Pondicherry building the first ever modular artificial reef with cement and dolomite in the world. At 6 month follow up, the module is intact with no dehiscence with a healthy base layer of barnacles along with growth of Ascidiens and algae. We conclude that a structure made of 90: 10 ratio of Portland cement and Dolomite is structurally suitable for artificial reef building.

### **Biography**

Siddharth Pillai is a 12<sup>th</sup> grade student at BD Somani International School in Mumbai. He is a Mater Scuba diver (PADI) and also one the youngest level 2 SSI certified free diver. He has presented papers at the International Congress for Conservational Biology in Kuala Lumpur 2019. He has also patented and built India's first 3D printed artificial reef. He desires to be an environmental engineer.



## **Preliminary Investigation on Public Utilization of Green Roof in Commercial Building**

**Wardah Fatimah Mohammad Yusoff**

Department of Architecture and Built Environment, Faculty of Engineering and Built Environment,  
Universiti Kebangsaan Malaysia

### **Abstract**

Many previous studies have proved the ability of green roof in reducing the environmental problems and energy usage of a building. Besides offering environmental benefits, green roof is also known to provide social benefits. Due to the additional cost endured by the building owner in the provision of green roof, it is important to ensure that the usage of it is optimized. Hence, this study intends to derive a preliminary idea on the public utilization of green roof in commercial buildings. The study was executed at two commercial buildings located in Malaysia. Two research methods were conducted namely the observation and questionnaire survey. The findings indicate that the design and types of vegetation influence the usage and activities conducted at the green roof. Though many users do not have deep knowledge regarding the green roof, they still agree on the provision of it, and acknowledge its social benefits. Hence, the output of this preliminary investigation is hoped to embark more research on the effective criteria of green roof, especially for commercial buildings located in hot and humid climate. It is also hoped that this study will encourage more provision of green roof in commercial buildings.

### **Biography**

Wardah Fatimah Mohammad Yusoff is a senior lecturer at Department of Architecture and Built Environment, Faculty of Engineering and Built Environment, Universiti Kebangsaan Malaysia. Her Doctoral (PhD) research field is in the area of natural ventilation application in buildings. Currently, she is active in the research related to the environmental design of buildings such as natural ventilation, thermal comfort, solar induced ventilation and green technologies in buildings. In conducting the research, she also involves in the utilization of computational fluid dynamics (CFD) software.



## **Conversion of a Miyawaki Forest into a Sacred Natural Site**

### **Maya Pillai**

B.D Somani International School, Mumbai, India

### **Siddharth Pillai**

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### **Navroz Billimoria**

B.D Somani International School, Mumbai, India

### **Sanjana Berry**

B.D Somani International School, Mumbai, India

## **Abstract**

**S**acred Natural Sites, more commonly known as Sacred Groves, are patches of forestland which are protected collectively by the lands' community and has a significant religious connotation to them. These patches of land cannot be destroyed and cannot be exploited for what it bears. The tradition of sacred groves is practiced all over the world, mainly focusing in the African and South East Asian regions.

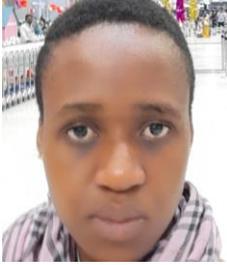
Sacred Natural Sites, are protected through religious belief systems for hundreds of years, hence retaining more of their natural condition as compared to areas being used for human development and agricultural purposes. since Sacred Groves are so abundant in biodiversity, activities like the cutting of trees, animal grazing, or produce exploitation are strictly prohibited at sacred natural sites.

In February 2018, a plot of land in Neral, Maharashtra, India was used to carry out the Miyawaki method of afforestation, and in 2019, once the trees were 20 feet high, a symbolic idol was installed and the plot of land was converted into a Sacred Grove. This land, now considered auspicious, is worshipped by the locals for protection and conservation.

Plots of land like sacred sites play an important role in the conservation of both, protected and unprotected species of plants. Sacred groves are now a forgotten part of our legacy and sincere effort needs to be made to revive this ancient tradition of conserving new and old forests.

## **Biography**

Maya Pillai is a student at B.D Somani International School in Mumbai, India who has been involved in multiple environmental conservation projects like reef building, the development of modal artificial reefs in Pondicherry, India and the creation of sacred groves and Miyawaki forests in Neral, India. Maya is also the youngest certified SSI Level 2 Freediver and PADI Master Scuba Diver in India. She plans on pursuing a career in Environmental Sciences in the future.



## **Arresting Climate Change in the Context of a Declining Economy: Prospects and Constraints**

**Cathrine Kudakwashe Matemba**

Pondicherry University, India

### **Abstract**

Economic performance has a huge bearing on climate change mitigation and adaptation. A declining economy is a stumbling block towards effective climate change mitigation. This is because, it promotes the use of conventional fuel sources, results in the absence of effective technology and expertise to meet the requirements of climate change as well as makes it harder for a country to mitigate or adapt towards climate change. Zimbabwe presents a case in point in which climate change mitigation and adaptation have been hindered by poor economic performance. The country which have thus been afflicted and affected by trends of poverty has witnessed a rise in poor agricultural practises, use of fossil fuels and inadequate technology and improper climate forecasting. Actually, despite the existence of a well elaborated climate policy in Zimbabwe, the inadequate financial resources have made it difficult to adhere to some of the provisions such as effectively adopting clean energy and promoting green development. Huge budget deficits compounded by the absence of a vigorous public sector therefore have a bearing on prioritisation of climate change issues. Therefore what are the prospects and major constraints to addressing climate change in this regard? The paper therefore argues that economic sector reforms should be necessitated in order to provide a viable and feasible mechanism to mitigating against climate change.

### **Biography**

Cathrine Kudakwashe Matemba is currently a PhD student at Pondicherry University India, in the Department of Politics and International Studies. Her research interests include Climate Change, and well as International Relations .She holds an MSc in International Affairs from Midlands State University Zimbabwe. She also holds a First Class BA in Development Studies from Midlands State University, awarded Midlands State University Book Prize.



## **Environmental-Economic Assessment of Pyrogenic Damage to Forest Ecosystems of the Republic of Indonesia Using Satellite Data**

### **A.I. Kurbatova**

Peoples' Friendship University of Russia (RUDN University), Moscow, Russian Federation.

### **P.V. Kozhevnikova**

Peoples' Friendship University of Russia (RUDN University), Moscow, Russian Federation.

### **A. Haesmans**

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### **A.V. Orlovsky**

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### **Abstract**

Sequestration of carbon as a basic regulatory mechanism to mitigate the effects of climate change is a pressing challenge to date. Indonesia's forests cover an area of about 910,100 square kilometres, different types of forest ecosystems absorb carbon differently, carbon accumulation in soils varies too. However, Indonesia 's tropical ecosystems are strong sinks of carbon dioxide from the atmosphere. Recently, both natural and anthropogenic fires have released carbon from Indonesia 's soils and forest ecosystems to the outside, thus making Indonesia 's forests a secondary source of CO<sub>2</sub> entry into the atmosphere, thereby increasing the concentration of this greenhouse gas. In the work the extent of damage to Indonesia 's forest ecosystems was assessed, using multi-year series of satellite observations. The combustion intensity was investigated and combustion area was calculated. The relations between economic predictors (GDP, public debt, unemployment rate and trade balance of the Republic of Indonesia) on the frequency and number of forest ecosystem fires, in particular palm tree plantations, were considered.

### **Key words**

Forest Fires, Carbon dioxide, Republik of Indonesia, Damage of the forest ecosystems, Palm tree

## **Biography**

Kurbatova A. currently works at the Department of Environmental Monitoring and Forecasting, Peoples' Friendship University of Russia. Anna does research in Climatology, Analytical Chemistry and Atmospheric Chemistry. Their current project is 'Spatially distributed modeling of carbon dioxide in the biosphere'.

Kozhevnikova P.V. a third-year bachelor student of Ecological Department of the RUDN University in Moscow, Russia. Research interests: Climate Change, Atmospheric Chemistry, Biomonitoring, Air Pollution. One of the authors of scientific article (Assesment of carbon dynamics in Ecuadorian forests trough the Mathematical Spatial Model of Global Carbon Cycle and NDVI, S.A. Llerena, A.M. Tarko, A.I. Kurbatova. P.V. Kozhevnikova, 6th International Conference on Enviromental Pollution and Prevention ICEPP 2018), (SCOPUS WEB of Science).

Haesmans A. a third-year bachelor student of The Faculty of Economics and Business of the KU Leuven, Belgium. Research interests: Applied Economics, Circular Economy, Environmental Economics.



## **Biological control of Mosquito Larvae by *Gambusia affinis***

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**P. Ramakotti**

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### **Abstract**

Mosquito fishes are of economic importance. They feed on mosquito larvae and pupae. It has a positive role to play in the integrated control measures in which the fish functions as suitable alternative to pesticide. The present study is on the food and feeding habits of *Gambusia*. The optimum level of physico chemical parameters were maintained in all the culture tanks during the study period. The analysis of stomach contents of mosquito fish *G. affinis* revealed that the food of the fish consists of aquatic phytoplankton (12%), zooplankton (26%), detritus (22%) and larvae (34%) and others materials (6%). The highest percentage (34%) of larvae was observed in female culture tank. The analysis of stomach contents of mosquito fish *G. affinis* revealed that the food of the fish consists of aquatic phytoplankton (10%), zooplankton (25%), detritus (19%) and larvae (31%) and others materials (15%). The highest percentage (31%) of larvae was observed in male culture tank. The results of the present study are in accordance with the reports from experiments using mosquito fish for mosquito control all over India. This species potentially could be utilized as a biological control tool for mosquito control in particular ecosystems.

### **Key words**

Mosquito Larvae, Mosquito fish, *Gambusia affinis*

## **Biography**

35 years of teaching and research experience in the field of zoology with special focus on fishery science. Published 28 research papers in reputed journals. Seminar and symposia attended for paper presentation in various international conferences are 17. The seminar and workshops conducted 15. Books published 3. Ph.D., produced 4. The research projects undertaken from CSIR (1993), ICAR (1993-96), DOD-OSTC (2000-03), DST (2009-12 & 2015-17).



## **Bio-Medical Waste Management**

### **Dr.A. Senthil Kumar**

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### **S. Gowripriyadharshini**

Student, Sanskrithi School of Engineering, Electronics and Communication Engineering department, Puttaparthi, AP, India

### **V.Swetha**

Student, Sanskrithi School of Engineering, Electronics and Communication Engineering department, Puttaparthi, AP, India

### **Abstract**

**B**io medical wastes originate from human, animal health care, medical facilities, medical research, and biological laboratory waste and other facilities. The subsystem contains the following considerations about tools used for surgery and other medical kits, segregation of medical waste in different ways for the safety and security of environment such as reusable, non usable and hazardous waste will be collected from different dustbin there by basic and foremost things are segregated by means of effective methods and suggests the precautions that has to be taken while cleaning the floor (dry/wet), creating awareness to the patients in terms of their understandable language i.e., form of video and also avoiding radiations through medical equipment. This paper proposes how far the damage can be avoided caused by bio-medical waste, for compensating these issues few suggestions are being presented in reference to the study analysis such as graphene material which is the most powerful anti-microbial agent that can be coated on the medical tools such as scissors, knives so that they can be reused. Based on the results this paper provides an optimized solution in medical issues. The proposed idea assures to be an innovative approach towards environmental sustainability and supports a hygienic and healthy environment by avoiding bacterial spreading through Bio-Medical waste.

## **Biography**

Dr.A.Senthil Kumar, obtained is Bachelor's Degree (1996) in Electrical and Electronics Engineering in first class from University of Madras, Chennai, Tamil Nadu. He obtained is Master's degree (2000) in Power Electronics and Drives in first class from Bharathidasan University, Trichy, Tamilnadu, and also he obtained is Master's degree (2006) in Human-Resource Management in first class from TNOU, Chennai. He completed his Doctoral degree (2010) in the area of Electrical Engineering from Indian Institute of Technology Roorkee, Roorkee, Uttarakhad, India. He is also completed is Post-doctoral research fellow in Centre for Energy and Electrical Power, Electrical Engineering Department, Faculty of Engineering and the Built Environment, Tshwane University of Technology, Pretoria, South Africa for a period of one year from 2012-13.He completed Senior Post doctoral research in Centre ENET,EnergyUnits forUtilisation of Non-Traditional EnergySources,VSB-Technical University of Ostrava,Ostrava,CZECH REPUBLIC for a period of one year from 2014-2015. He obtained many awards and certificates during M.E and Ph.D studies. He has 20 years of teaching and research experience. He has published 60 papers in international journals and presented 60 papers in international and national conferences. He has attended many international seminars and workshops. He is a life member of many professional bodies like ISTE, IEE, CSI, IAENG, IACSIT,etc.; He visited, foreign countries such as Hong Kong ,Chengudu, Mauritius, Italy, Slovakia, Vienna, Spain ,Czech republic which was financially supported by DST,CSIR ,NRF and European Union Project. He has delivered state of the art lectures in many educational institutions and professional societies. He is currently doing an on-going project funded by AICTE worth of 42 lakhs. Recently he got best innovation award in texas instrument, MHRD,IIC india in the year 2019.recently, he got best principal award 2019 in the year of 2019-2020 sponsored by InSc Award, Bangalore His research interests include Multiphase Machines, Power Electronics, Renewable-Energy Generation Source, Microcontroller & VLSI application in Power Electronics & Electric Drives, Active Filters Stability and System Analysis. He have been worked various engineering college in tamil nadu such velammal engineering college, skp engineering college, Arunai Engineering college . Currently he completed 8 Ph.D students..Now he is working as Principal at sanskrithi engineering college ,Puttaparthi



## **Minahasa Traditional House as an Environmentally Friendly Residence**

**VerryLahamendu, ST.,**

Sam Ratulangi University, Indonesia

**Ferdinan S. R. P. Terok, S.T.,**

Manado State University, Indonesia

### **Abstract**

Stilt house are typical of traditional houses in Indonesia. One of the tribes in North Sulawesi Province is the Minahasa tribe, which has a traditional house consisting of stilt houses. Even though this stilt house is hundreds of years old, it is still occupied because it is safe and comfortable. Over time, the Minahasa stilt house that exists today has experienced many changes from its original form. Minahasa stilt house is one form of local wisdom and evidence of the long history of human cultural adaptation to the environment. This study aims to identify the local wisdom of the Minahasa people in building safe and comfortable homes, even proven to be able to anticipate the occurrence of floods or earthquakes. This research uses purposive sampling method. Data collection is done through field observations, interviews and literature studies. The findings in this study indicate that stilt houses are a form of shelter that is environmentally friendly and sustainable. The use of cross ventilation and natural lighting make the the room feel more comfortable and healthier. Besides preserving the stilt house as a cultural heritage, the use of stilt houses is also a form of care for the preservation of the natural environment.

### **Keywords**

Minahasa Traditional House, Environmentally Friendly

### **Biography**

Verry Lahamendu, born in Lembean June 21, 1971. Received a Bachelor of Engineering (ST), Architecture Department from Sam Ratulangi University, Manado in 1998. Then a Master of Engineering (MT) Department of Regional and City Planning, from the Institute of Technology Bandung in 2013. Since 2018 continued his studies in the Doctoral Program at Udayana University in

the field of Tourism Planning and Development. The author is listed as a permanent lecturer in the Faculty of Engineering at Sam Ratulangi University Manado and active as a writer and one of the writings published in "Planning Malaysia Journal" indexed Scopus, titled "Revitalization of Chinatown Area As Sustainable Urban Heritage in The City of Manado"

(Ferdinan S.R.P Terok, born in Loloh November 11, 1971. Received a Bachelor of Engineering (ST), Architecture Department from Sam Ratulangi University, Manado in 1998. Then a Master of Architecture (M.Ars), from the Sam Ratulangi University, Manado in 2015. The author is a lecturer at Manado State University.



## **The Indigenous Javanese Perception toward Green Home: The Application of Greenship Rating Index**

**Maranatha Wijayaningtyas**

National Institute of Technology (ITN) Malang, Indonesia

**Fourry Handoko**

National Institute of Technology (ITN) Malang, Indonesia

### **Abstract**

As the history of Javanese culture tells, the people take environmental, social and economic life into account when building a home; these three aspects are the main pillars in sustainable development. Consequently, in Javanese society, home and the success of sustainable development are inseparable. Concerning this phenomenon, it is essential to learn the perception of indigenous Javanese towards the application of green home as one of the sustainable development aspects; it is measured using the Greenship Rating Index for green home issued by the Green Building Council Indonesia. This research employed a quantitative approach with a survey as its method, which was conducted using purposive random sampling. The respondents were indigenous Javanese who bought a house with the concept of a green home in Malang and Surabaya; 200 data were obtained from the survey. After conducting a descriptive analysis, it was found that among six criteria of Greenship, land use, efficiency, and energy conservation, as well as environmental management of buildings are the highest three in the respondents' perception. In conclusion, the Javanese indigenous's perception of a green home is still limited to location, energy savings, and social needs. Thus, all stakeholders are required to socialize the fulfillment criteria of a green home according to Greenship; it is essential for the success of sustainable development in Indonesia.

Biography: Maranatha Wijayaningtyas is a Senior Lecturer on the Civil Engineering Postgraduate Program at the National Institute of Technology Malang, East Java. The concern of her research topics is on construction and project management, also property management toward sustainability. Furthermore, she is interested in connecting those topics with Indonesia's culture and explores the phenomenon within.

Fourry Handoko is a Senior Lecturer on the Industrial Engineering Department at the National Institute of Technology (ITN) Malang, East Java, Indonesia. His research topics including Industrial Engineering, Green Industrial System, Knowledge and Technology Transfer (KTT), especially in Developing Economies. His research also discovers the impact of the Green Technology KTT program on business organization competitive advantage and profitability.



## Mild Hybrid Vehicles and Their Effect on Emission

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**Abhishek Sharma**

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### Abstract

Hybrid electric vehicle is a vehicle with at least two sources of energy, one of each is electrical and reversible. For a good understanding of the types of hybrid electric vehicles you may refer Internet. Apparently it's easy to define a Mild Hybrid Electric Vehicle (MHEV), but most of the sources give an incomplete definition. When looking into the types of hybrid electric vehicles, we need to consider the following key aspects:

- The electrical power available (e. g. 15 kW)
- The voltage of the high voltage battery (e.g. 48 V)
- The fuel consumption / CO<sub>2</sub> reduction potential (e.g. 15 %)
- The functions performed by the electric machine (e.g. torque boost)

A Mild Hybrid Electric Vehicle (MHEV) is defined by a combination of the key aspects defined above. However,

According to Continental, a MHEV is defined by:

- An available electrical power between 10 – 20 kW
- A high voltage battery of 48 V
- A fuel consumption / CO<sub>2</sub> saving potential between 13 – 22 % (compared with a conventional vehicle)
- In the MHEV automotive market, there are currently two major categories for the operating value of the high voltage network: 48 V and up to 160 V. The focus is shifting towards the 48V solution, which will become the standard solution for MHEV. A mild hybrid electric vehicle is also defined function of the operating modes that can be performed. In the table below you can see a synthesis of the different levels of vehicle hybridization, function of their energy properties and control functions (operating modes).



## **Green Buildings and Its Emphasis on the Environment**

### **Mohit Chauhan**

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### **Karan Arora**

Delhi Technological University (Formerly DCE), India

### **Abstract**

A 'green' building is a building that, in its design, construction or operation, reduces or eliminates negative impacts, and can create positive impacts, on our climate and natural environment. Green buildings preserve precious natural resources and improve our quality of life.

There are a number of features which can make a building 'green'. These include:

- Efficient use of energy, water and other resources
- Use of renewable energy, such as solar energy
- Pollution and waste reduction measures, and the enabling of re-use and recycling
- Good indoor environmental air quality
- Use of materials that are non-toxic, ethical and sustainable
- Consideration of the environment in design, construction and operation
- Consideration of the quality of life of occupants in design, construction and operation
- A design that enables adaptation to a changing environment

Any building can be a green building, whether it's a home, an office, a school, a hospital, a community centre, or any other type of structure, provided it includes features listed above. However, it is worth noting that not all green buildings are – and need to be – the same. Different countries and regions have a variety of characteristics such as distinctive climatic conditions, unique cultures and traditions, diverse building types and ages, or wideranging environmental, economic and social priorities – all of which shape their approach to green building.

This is why WorldGBC supports its member Green Building Councils and their member companies in individual countries and across regions, to pursue green buildings that are best suited to their own markets.



## **Water Quality Performance of Brantas River using STORET Method**

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**Kustamar**

Civil Engineering Department, National of Technology Institute, Malang, Indonesia

**Sudiro**

Environmental Engineering Department, National of Technology Institute, Malang, Indonesia

### **Abstract**

**B**rantas River is one of the national strategic rivers because its importance as a source of water in most areas of East Java province. To preserve the function of the Brantas river, integrated water quality management from upstream to downstream are needed. Water quality monitoring is one of the water quality management effort. This research analyzes the quality of the Brantas river from the upstream of the Batu town Pendem bridge to the downstream of the Brantas river on the Padangan Mojokerto bridge. Quality analysis using the monthly data for water quality monitoring in 2018 with the method of determining the quality status using the STORET method. River water quality parameters used for calculation are DO, BOD, COD, NO<sub>2</sub> and NH<sub>3</sub>. Analysis of the Brantas river quality status in 2018 with class II river quality standards shows the quality status of the class D Brantas river with bad conditions (heavily polluted). This condition shows that the main pollutant source of the Brantas river is organic waste originating from settlement, agriculture, animal husbandry and industrial activities. More intensive efforts are needed to improve the quality of the Brantas river at least until the quality status is in accordance with class II quality. One of the efforts to treat local and communal domestic wastewater needs to be monitored the suitability of the quality of the resulting effluent. Monitoring the effluent quality of pollutant sources from agriculture, fisheries and industry must also be monitored regularly. In addition to being the responsibility of pollutant

producers and the government as a supervisor, community involvement in efforts to monitor the sources of river pollutants needs to be increased. It was hoped that the results of this quality status analysis would be the basis for better water quality management.

## **Keywords**

water quality, Brantas river, monitoring, status.

## **Biography**

Dr. Evy Hendrianti, ST, MT, is currently a lecturer at the National Institute of Technology in Malang , Indonesia.

Certified in Environmental Engineering Lecturer since 2012 and Environmental Engineering Expert since 2005.

Bachelor's degree in Environmental Engineering, Sepuluh Nopember Institute of Technology in Surabaya, Indonesia (1997), Master's degree in Technology Management, Sepuluh Nopember Institute of Technology in Surabaya, Indonesia (2002) and Doctor's degree in Environmental Engineering, Sepuluh Nopember Institute of Technology in Surabaya, Indonesia (2016).

Dr. Evy showed an interest in water quality modelling, river deoxygenation rate, communal wastewater treatment, phytoremediation and system dynamic model for dissolved oxygen. Frequently attending national conference held by the collaboration between Indonesia Environmental Engineering Expert Association (IATPI) and universities every year since 2010-2016.

Also attending in various International Conference as presenter and paper writer (SWWS 2019, AnCoSET 2018, IPCB 2016). International Journal have already published are Self-Purification Performance Of Brantas River In East Java From Ammonia Deoxygenation Rate (IJCET, 2018), River Water Quality Performance from Carbondioxygenation Rate (IJEM, 2017), Evaluation Of Communal Wastewater Treatment Plant Operating Anaerobic Baffled Reactor And Biofilter (Wastech, 2016), Deoxygenation Rate Of Carbon In Upstream Brantas River In The City Of Malang (JAEBS, 2015).



## **Plastic Green Concrete**

**Nimisha Singla**

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**Saman Sohail**

Delhi Technological University (Formerly DCE) , India

### **Abstract**

**G**reen concrete can be defined as concrete with environment friendly material as partial or complete replacement for cement and/or fine or coarse aggregates. This substitutional material could be waste or residue from manufacturing processes. Ideally, green concrete should help with reducing carbon emissions, energy saving and even waste water management. This can be done in multiple ways. Production of green concrete is the demand of the now upcoming sustainable construction practices.

For this research paper, a detailed investigation was performed to study the complete usage and advantages of green concrete. Post which we attempted to make our own green concrete mix using waste easily found on the university campus like single use plastic (cutlery and straws) and tissues. This mix was then tested for compressibility and compaction in the laboratory, the findings for which are discussed in the paper. The primary targets for this research paper are budding civil and environmental engineers; however, readers of all levels of experiences may find some useful ideas.

### **Keywords**

concrete, green concrete, sustainability, waste, environmental applications, civil applications



## **Optimizing the Local Made of Hydraulic Ram Pump Design for Promoting Green Energy Deployment**

**Made Suarda**

University of Udayana, Indonesia

### **Abstract**

A hydraulic ram pump is a renewable device without need an external energy source, such as electricity or fossil fuels. It is a cyclic water pump powered by hydropower, therefore, it is also environmental friendly and needed minimal cost of fabrication and maintenance. Recently, when the world was facing energy crisis and utilization of the renewable energy was concerned, the interest toward this device is renewed due its practical installation in remote areas of developing regions including Bali province in Indonesia. The Ministry of Research and Technology of Indonesia even encourages research to produce appropriate technology to increase community productivity. The authors have been designed, constructed and installed fours local made of the hydraulic ram pumps on hilly regions in Bali province of Indonesia for a clean water supply and irrigation. Although the hydraulic ram system is simple, however, all of its parameters affect each other's. Based on the results of researches and practical experiences an optimum guideline design had been proposed for development the local made of the hydraulic ram systems. The proposed design potentially enhanced the overall efficiency of the pump up to 15%. This guideline is expected to promote and help the municipal using the green devices.

### **Biography**

The author, Made Suarda, is a Lecturer in the Mechanical Engineering Department at University of Udayana since 1990 on the pumps and piping system subjects. He was graduated on the Marine Engineering Department of the Sepuluh Nopember Institute of Technology Surabaya in 1989. Then, he completed the Master of Engineering at The University of South Australia in 2004. His researches has been concerned on the development of hydraulic ram pump systems and others appropriate technology. In addition, he has been as a volunteer in giving technical assistances for the Rotary International (Bali region) in helping rural communities in the provision of clean water supply systems.



## **The Production Trends of Indonesian Soybean before and during Climate Change**

### **Istis Baroh**

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### **Windiana**

Department of Agribusiness, Faculty of Agriculture and Animal Science, University of Muhammadiyah Malang, Malang, Indonesia

### **Dyah Erni Widyastuti**

Department of Agribusiness, Faculty of Agriculture and Animal Science, University of Muhammadiyah Malang, Malang, Indonesia & PhD student on Agricultural Science, University of Muhammadiyah Malang

### **Abstract**

Climate change that has been happening since 2005 causes the uncertainty of soybean production in Indonesia. The climate change causes the problem of sharp fluctuation in soybean. The study purposed to: (1) analyze the fluctuation of soybean production before and during climate change; (2) analyze the factors affecting soybean production, including land, soybean price, and climate change. Secondary data used was the time series of soybean production during the year of 1983-2015. It was obtained from the Central Statistics Agency (BPS) of Indonesia. The trend analysis was used to analyze the production fluctuation. Meanwhile, the multiple linear regression was used to analyze the factors influencing the soybean production. The results showed that before climate change the production trend decreased. Surprisingly, a slight increasing trend happened during the climate change. It happened because soybean farmers used more intensive input of production. All factors had positive influence toward the soybean production. The land area and price were significant at 5% level of error. Meanwhile, climate change also influence positively with a higher level of error, 10.3%.

Key words: soybean, trends, climate change.

## **Biography**

Dr. Ir. Istis Baroh, MP. born in Lumajang - Indonesia, January 5<sup>st</sup>, 1960. Associate Professor in University of Muhammadiyah Malang, East Java – Indonesia. Under Graduate Degree in Department of Socio-Economic of Agriculture, University of Jember, Indonesia (1984). Master Degree in Socio-Economic of Agriculture, University of Brawijaya Malang, Indonesia (1996), PhD Degree in Socio-Economic of Agriculture, University of Brawijaya Malang, Indonesia (2014).

As a speaker in numerous national and international conferences, such as: University of Lampung (2016); Food, Agriculture and Natural Resources (FANRes) in Yogyakarta, Indonesia (2018). International Conference on Sustainable Inovation (ICoSI) in Yogyakarta, Indonesia (2019).

Livia Windiana, SP., M.Agr. born in Kebumen - Indonesia, Desember 2<sup>st</sup>, 1987. Assistant Professor in University of Muhammadiyah Malang, East Java – Indonesia. Under Graduate Degree in Department of Agribusiness of Agriculture, University of Brawijaya, Malang, Indonesia (2010). Master Degree in Agribusiness, University of Muhammadiyah Malang, Indonesia (2012).

As a speaker in national and international conferences, such as: Tantangan dan Arah Pembangunan Pertanian dalam Era SDGs” in Malang, Indonesia (2017), International Conference on Bioenergy, Environmentally Sustainable Agriculture Technology (ICon BEAT) at UMM, 2019.



## **The Economic Impact of Climate Change on Apple Production in Kota Batu, Indonesia**

**Bambang Yudi Ariadi**

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**Rahmad Pulung Sudibyoy**

Department of Agribusiness, Faculty of Agriculture and Animal Science, University of Muhammadiyah Malang, Malang, Indonesia.

### **Abstract**

Indonesian local apple production is influenced by cultivation techniques, soil fertility, plant pest and disease control, weed control, and climate conditions (Ruminta & Handoko, 2012). Climate change has an economic impact on the returns and usage of agricultural resources (Manuel & Fragoso, 2018; Shakhawat et al., 2019; Xie et al., 2018). This study aimed to determine the influence of climate change on the local apple production and its economic impact. The study was conducted in Batu City, Indonesia. Primary data were obtained by interview with semi-open questionnaire, and secondary data were obtained from the Statistical Boureau of Kota Batu. Data measurement includes a ratio scale to measure production, input and output prices, and a Likert scale for the qualitative data on climate change and its economic impact. Data analysis was performed with a structural equation model (SEM). Climate change such as temperature and rainfall significantly decreased the apple production. The increase of temperature above optimum for apple production caused the levelling off. Meanwhile, an increase of rainfall disrupted the apple flowering process and caused young apples fall out thereby reducing apple production. In addition, an increase in rainfall caused an increase in air humidity, which causes the development of pests and diseases. Climate change also has an impact on the increase of production inputs, such as fertilizers and pesticides. The increased use of inputs that are not matched with their availability caused an increase of the input prices in the market. This change is inversely to the apple price which has decreased significantly.

Key words: climate change, economic value, Indonesian local apple.

## **Biography:**

Dr. Ir. Bambang Yudi Ariadi, MM, born in Malang - Indonesia, 20 Februari 1966. Associate Professor at Agribusiness Departement, Faculty of Agraiculture and Animal Science, University of Muhammadiyah Malang, Indonesia. Educational background; Bachelor at Socio-Economics of Agriculture, Faculty of Agriculture, University of Muhammadiyah Malang, Indonesia (1989). Master of Management at UMM (1996). Doctor of Agricultural Science (Agribusiness), Faculty of Agriculture, University of Padjadjaran, Bandung, Indonesia (2016). Expertise; Agricultural Economics, focusing on Integrated Farming System and System Dynamics.

The experience of international forum: International Visitors Leadership Program (IVLP) on Demand (Jul 12 - 29, 2017) in USA. Sponsored by U.S. Department of State.

The experience of writing scientific articles: Empirical Model of Institutional Agribusiness Sustainable Wheat to Support Development and Regional Economic Growth. Proceeding ISBN 978-602-18068-907, 2012. Empowerment Agribusiness Entrepreneur Based on Integrated Farming for Food Security and Environmental Sustainability, Proceeding ISBN 978-602-18068-907, 2012. Dynamic Model Engineering of Integration Cassava with Local Food Agroindustry. Proceeding ISBN 978-602-796-263-7, 2013. The Role of Tapioca Industry In Integrated Farming For Sustainable Agriculture in Trenggalek Regency, Proceeding ISBN 978-979-18768-4-1, 2014. Dynamic Model of Farm Management, AGRARIS Journal Vol 1 No 1 January 2015. Using System Dynamics Approach in Modeling the Integrated Farming Scenario to Increase Cassava Production in Indonesia. International Journal of Computer Applications. Vol. 142 – No.9, ISSN:0975 – 8887, 2016. Integrated Farming with Agro-industry for the Sustainable Cassava Production: an Experience from Trenggalek Regency, Indonesia. Proceedings; ISBN: 978-602-74420-2-3, P 238-247. 4th International Conference: the Community Development in ASEAN, 2017. Supply Chain and Profitability of Cassava in District Trenggalek, East Java. Proceedings; ISBN: 978-602-74420-2-3, P 238-247. 5th International Conference on Community Development in ASEAN 18-21 July 2018.



## **The Adaptation to Climate Change: Farmers's Decision to Replace Paddy Fields with Dragon Fruit in Banyuwangi Regency, Indonesia**

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### **Abstract**

Climate change is an important thing that cannot be avoided due to global warming. Climate change has an impact on agricultural sector, so farmers must be able to adapt with this condition. Some farmers in Bangorejo Subdistrict, Banyuwangi Regency, have changed paddy field with dragon fruit as an adaptation to climate change. However, if the paddy fields conversion was uncontrolled, will threaten the food security. The study purposed to analyze what factors play a role in the farmer's decision making to convert paddy fields with dragon fruit in Bangorejo Subdistrict, Banyuwangi Regency. The primary data were obtained from interview with respondents using a structured questionnaire. The sampling method used purposive sampling, by using criteria namely farmer who converted paddy fields into dragon fruit. The data analysis used was binary logistics regression. The results showed that from six factors there are five factors which play a role in the farmers' decision making to convert paddy fields with dragon fruit ( $\text{sig} < 0.05$ ). These five factors were land area, income, total production, pesticides, and pest threats. The land area had the highest influence and positive value (using  $\alpha = 5\%$ ) on farmer's decision to replace paddy fields with dragon fruit.

### **Key words**

Binary logistics, dragon fruits, farmer's decision, land conversion, paddy.



## **The Adaptation of Poor Fishermen Households at the Overfishing Area in East Java, Indonesia**

### **Anas Tain**

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### **Ary Bakhtiar**

Department of Agribusiness, Faculty of Agriculture and Animal Science, University of Muhammadiyah Malang, Indonesia, Indonesia

### **Abstract**

Climate change, marine ecology and socio-economics require fishermen to adapt in fishing. Poor fishermen are both agents and victims of the marine ecosystem damage. Since the year of 2000, the condition of capture fisheries in the North Coast of East Java, starting from Tuban to Situbondo, has experienced overfishing. The scarcity of fish resources threaten the economic sustainability of the fishermen households. The purposes of the study were: (1) to assess poverty and adaptation levels carried out by fishermen households; (2) finding correlation between poverty levels and the variety of adaptations made by fishermen households. The survey method was carried out to find a general description of poverty levels and various adaptations by fishermen households. The sampling technique used in this study was purposive sampling. The data collected was analyzed by using quantitative descriptive and correlation analysis. The results showed that the poverty of fishermen households were multi-dimensional. The form of adaptation carried out by fishermen households is an effort to maintain survival, by increasing income from other sources. Fishermen carried out the adaptation strategies by developing fishing gear, job diversification, and migration, to meet the needs of household life. There were a significant correlation between poverty levels and the adaptations carried out by fishermen households. The poorer the fishing households the less adaptation that could be done.

### **Keywords**

Adaptation, fishermen, poverty, overfishing, survival.

## **Biography**

Dr. Anas Tain was born on February 21, 1966 in Kediri, Indonesia. In 1991 he was appointed as a teaching staff at the Faculty of Agriculture and Animal Science, University of Muhammadiyah Malang (until now). The author completed the doctorate degree in 2010 at Padjadjaran University, Bandung. In accordance with the disciplines studied, the author pays attention to the socio-economic life of the community, mainly related to the utilization of shared resources. The author tries hard to provide a solution formula to poverty that shackles the farming and fishing communities. In the last ten years, the author has been researching the life of small fishermen.



## **Long Storage Design Optimization for Flood Control and Ecotourism in the Downriver of *Kali Kemuning***

**Kustamar**

National Institute of Technology Malang, Indonesia

**Maranatha Wijayaningtyas**

National Institute of Technology Malang, Indonesia

### **Abstract**

In consequence of various factors coming from the upriver to downriver, frequent flooding in Kali Kemuning (“Kali” means river) is relatively arduous to deal with. Flooding in the upriver areas is caused by low capacity watershed. This problem is solved by implementing a Land Conservation Strategy of combined actions of maximizing the amount of rainwater seeping down to the ground, and providing irrigation water. Moreover, the tides at the Kali Kemuning estuary affect flooding in Sampang city as they carry the backwater which rises the river water level during the flood. To deal with this effect, the control system performance needs to be maximized by making: (1) temporary water reservoirs, (2) floodgate, and/ or (3) pump. The flooding in the middle of the river is caused by channel narrowing that leads to reduced river capacity. Channel normalization through riverbed deepening in the downriver is obstructed by tidal elevation. Nevertheless, river channel widening requires land acquisition which is a no easy task to do if the river channel flows through urban areas. Eventually, the river capacity is increased by installing vertical walls of steel file types and deepening the river beds. This strategy can increase the capacity of flood distribution and storage. The temporary storage capacity of river channel normalization can contain 33,000 m<sup>3</sup> of the river water. Conclusively, community participation is increased by utilizing normalized river channels for tourism purposes, such as boating, and inland fisheries. These activities are expected to improve the economy and public awareness.

### **Keywords**

Urban Flood, Irrigation System, Retention Pond, Pump.

## **Biography**

Dr. Ir. Kustamar, MT, born in Blitar – Indonesia, February 1, 1964. Lecturer in National Institute of Technology Malang. Bachelor of Water Resources Engineering degree in National Institute of Technology Malang. Master degree in Civil Engineering in Gajah Mada University-Indonesia.

Doctor of Water Resources Engineering degree in Brawijaya University - Indonesia.

As a speaker in numerous National and International seminars, such as: Annual Conference of Science and Technology (ANCOSET) Malang-Indonesia (2018), and 4th Gogreen Summit in Kuala Lumpur, Malaysia (2018).



## **Typology of Solid Waste Management in Malang Raya, Indonesia**

**Hardianto**

Department of Environmental Engineering, National Institute of Technology Malang, Indonesia

**Hery Setyobudiarso**

Department of Environmental Engineering, National Institute of Technology Malang, Indonesia

### **Abstract**

Typology analysis uses cluster analysis to group variables into smaller groups of variables. The typology survey data of the solid waste recycling facilities was obtained in a qualitative form, therefore the data was codified. This study aims to analyze the typology of solid waste management in Malang Raya, technically and non-technically. Data collection consists of eight operational technical aspects. Types of treated waste include only composted SW, only non composted SW, or a combination of the two. The processing methods include composting only, non composting only, non composting and plastic waste, composting and non composting, and Integrated Solid Waste Treatment Facility (TPST). Management agents include the city/district, self-help, or a combination of the two. The processing capacity includes <1 ton/day, 1-5 tons/day, 6-10 tons/day, >10 tons/day. Capital costs include own costs, grants, a combination of own costs and grants. Operational and maintenance costs include turnover of operating results or operational and maintenance funds. Profits include making or not producing financial benefits. Financial management includes a customer savings system and direct sales or direct sales. Collecting data on non-technical aspects of operations includes the location of solid waste recycling facilities, vision and mission, organizational structure, main tasks and functions, number of personnel, standard operating procedures, regional regulations on solid waste and regional spatial planning, history and institutional, operational and maintenance, and management strategies. The results of the analysis found 18 solid waste recycling facilities. According to the dendrogram analysis at the beginning of the grouping, 8 clusters were formed. In case the similarities are large, the groups will be merged into one new group. The next stage (reslaced distance=5) formed 6 clusters/groups. Cluster 1 includes Mojosari Solid Waste Bank and Pesanggrahan Solid Waste Bank. Cluster 2 is Malang Solid Waste Bank. Cluster 3 includes Muria Composting Unit, Asahan Composting Unit, Polowijen Composting Unit, Sawojajar Composting Unit, Supiturang Composting Unit, Jatimulyo Composting

Unit, Narotama Composting Unit, VEDC Composting Unit, Pandanwangi Composting Unit, Manyar Composting Unit. Cluster 4 includes Tlogomas UDPK, Velodrom UDPK, Gadang UDPK. Cluster 5 includes Pandanrejo TPS 3R. Cluster 6 is Mulyoagung TPST which is found as the best cluster.

## **Keywords**

Malang Raya region, Solid waste recycling facilities, Typology analysis.



## **The Development of WebApp Builder Using Laravel Framework to Support Irrigation Networks Maintenance in East Sumba District of Indonesia**

**Silvester Sari Sai**

Geodetic Engineering Department, National of Technology Institute, Malang, Indonesia

**Martinus Edwin Tjahjadi**

Geodetic Engineering Department, National of Technology Institute, Malang, Indonesia

**Masrorul Azizah**

Geodetic Engineering Department, National of Technology Institute, Malang, Indonesia

### **Abstract**

Sustainable irrigation networks maintenance is a continuous effort to ensure them functioning well. To alleviate the process, available information such as defective canals in real time is necessary. Among many established methods for providing fast reporting canals conditions, we investigate the use of Web-GIS based platform to provide reliable information. Open-sourced builders called Web-APP and QGIS2WEB are utilized to just provide standard function related to visualization of the network. This study is aimed to overcome the limitation of those by adding JavaScript source code using Lavarel Framework. The result shows that the adding of JavaScript integrated in Lavarel Framework can improve the function of Web-GIS that is made from Web-App builder. Connectivity of spatial database using Post-GIS can be done to support multi temporal data recording that can be used to know existing condition of the network periodically. The result of this study has been implemented in the development of information system of irrigation building (SISDA) in East Sumba District.

### **Keywords**

Irigation Networks, WebApp Builder, Javasript, Laravel Framework

## **Biography**

Martinus Edwin Tjahjadi obtained his PhD degree in Photogrammetry from the University of Melbourne in 2008. He is currently a Lecturer in Department of Geodesy, Institut Teknologi Nasional (National Institute of Technology (ITN)) Malang, Indonesia. His research of interest includes photogrammetry, computer vision, and 3D modelling and visualization.

Silvester Sari Sai received the bachelor degree in geodesy engineering from Institut Teknologi Nasional (ITN) Malang, Indonesia, in 1996, the master degree in geodesy and geomatics engineering from Institut Teknologi Bandung, Bandung, Indonesia, in 2005. He is currently a Lecturer at the Department of Geodesy, National Institute of Technology (ITN) Malang, Indonesia. His main areas of research interest are point positioning and 3D GIS modelling.

Masrurrotul Ajiza received her Bachelor Degree from University of Kanjuruhan Malang, Indonesia, and Master Degree from University of Islam Malang, Indonesia, both in English for Education Department, obtained in 2005 and 2011 respectively. Currently, Ms. Ajiza is a lecturer in Geodetic Engineering, National Institute of Technology Malang. Her area of research interest includes English for Engineering and Learning Technology.



## **Study of Thermal Comfort in Architecture Tenganan Pegringsingan Bali, Study Case *Bale Tengah* and *Bale Meten***

**Luh Putu Widhiari**

Universitas Teknologi, Indonesia

### **Abstract**

Traditional architecture is inherited from ancestors that has existed since ancient times and became part of public life, made up of culture and adaptation to local environmental conditions. Traditional architecture of Tenganan Pegringsingan - Bali has been formed by its own rules and patterns of community as well as adjustments to the material, environmental conditions and surrounding climate. This research discusses the thermal comfort of Bale Tengah and Bale Meten as spaces for daily activities of people in their home environment.

Researcher has adopted three methods (1) field measurements using Hobo U12 data loggers (for measuring temperature, humidity, light intensity), copper ball 6 inches with a sensor (for measuring MRT), and anemometer (for measuring air velocity); (2) computer simulation using Ecotect 5.5; (3) questionnaires to determine the subjective responses of people to thermal comfort.

The research found that there are different assessments between the PMV-PPD standard and thermal impression of the population. The Ecotect simulation and comfort calculator showed a tendency to warm, close to neutral conditions (with a value above 0.1) and warm (above 1.1). However, the people's subjective opinion showed that they prefer bale tengah and bale meten not to be changed.

### **Keywords**

Traditional Architecture, Thermal Comfort, Simulation.

### **Biography**

Luh Putu Widhiari was born in Ungasan, May 17th, 1987. She has been working as an architect and property development for about twelve years since she finished her study at Udayana University in 2008 majoring in Architecture. And in the end of 2009 she continued her Magister of Digital Architecture at Atma Jaya University. Now she has been working as a lecturer and as a Dean of Engineering Faculty at University of Teknologi Indonesia.



## **International Law on Climate Change (Convention and Protocol) and Indonesian Interest as a Developing Country**

### **Diogenes**

Lembaga Penerbangan dan Antariksa Nasional (Lapan), Indonesia

#### **Abstract**

Article 33 paragraph (3) of the 1945 Constitution that "the earth and water and the natural resources contained therein are controlled by the state and used for the greatest prosperity of the people". The article contains the essence of the mandate for the implementation of Indonesia's national development. In sustainable development and environmentally friendly, humans can play a role in controlling climate change through natural resource management. For this reason, it is necessary to develop patterns of mutual interaction between the atmosphere, earth and water that make up the climate system. Climate change at this time has become a global problem involving various countries and various scientific disciplines. The impact of climate change has begun to be felt in different parts of the world, including an increase in air temperatures and sea levels that threaten life, especially coastal ecosystems. Various aspects of life related to climate change, including aspects of the environment, economy, health, and various other activities. Indonesia has ratified the United Nations Framework Convention on Climate Change (UNFCCC) with Law Number 6 of 1994 concerning Ratification of the United Nations Framework Convention on Climate Change. The Climate Change Convention is a convention framework, requiring the establishment of protocols to establish regulatory measures. This Regulatory measures can only be issued 5 years later at the COP III Meeting in Kyoto, Japan December 10, 1997 with the issuance of the Kyoto Protocol (hereinafter referred to as the Kyoto Protocol) and has ratified the Kyoto Protocol with Law Number 17 of 2004. Both international legal rules The principles of international law in dealing with the problem of climate change. This study was conducted using a descriptive normative analysis method, by ratifying the Climate Change Convention and the Kyoto Protocol, the benefits obtained by Indonesia, among others, show that Indonesia is also responsible for global environmental issues, especially the problem of climate change.

#### **Biography**

Diogenes, SH.M. Publ, Researcher at National National Intitute of Aeronautic and Space (Lapan)



## **Factors that Encourage People to Ignore Environmental Health: A Study Qualitative of Climate Management from Common People's Perspective**

**Adhy Firdaus**

Sekolah Tinggi Ilmu Ekonomi (STIE) Ganesha, Jakarta, Indonesia

### **Abstract**

The flood disaster that hit Indonesia at the beginning of the year 2020 and the earlier haze and forest fires was very shocking and alarming not only Indonesian but also people of neighboring countries. Indonesian did not prepare for these disasters. These disasters are definitely caused by people's ignorance of environmental safety. Indonesian are religious people, they obey religious laws and rules. They come to pray to the Almighty God regularly. It is very clear that harm nature is definitely forbidden by religion. The phenomena are, despite the fact that religions teach to conserve nature, many people still destroy them.

The focus of the study was the perceptions of common people concerning the environment. The research questions are what is the people's perception of nature and the environment? What is the situation that encourages people to ignore the environment? What is the level of environmental knowledge of the common people of Indonesia? What is the best way to wake people up and realize the importance of the preservation of nature and living environment?

This qualitative study which uses Phenomenological and Grounded Theory approach with in-depth interviews collecting data procedures found 5 main perspectives of people concerning their involvement of environment and climate change, 1) Environment is Government responsibility, 2) Economics reason, 3) Lack of knowledge and skills of climate change, 4) No spirit of togetherness to conserve the environment, 5) Climate Changes has no instant and direct impact on oneself.

This study adding the factors of why people ignoring environmental health. Furthermore, the environmentalist can develop a model to awakening the awareness of people to the green environment and make the right action to save nature.

### **Keywords**

flood disaster, forest fire, haze, ignorance, nature, preserve, religious

## Biography

Dr. Adhy Firdaus, MM. Born: Bekasi (West Java, Indonesia), 16th April 1962.

<b>Formal Educations:</b>	
2011	Graduated Program Doctor Ilmu Management, Faculty of Economics & Business, Brawijaya University, Malang, Indonesia.
2008	Graduated Magister Management, STIE Bisnis Indonesia, Jakarta, Indonesia.
2003	Graduated Sarjana Ekonomi, STIE Adhy Niaga, Bekasi, Indonesia.
1990	Graduated Bachelor of Science, College of Business Friends University, Wichita, Ks, USA.
<b>Works:</b>	
2018 – Present	Lecturer, Post Graduate Programs of STIE Ganesha, Jakarta
2015 – Present	President Director of PT. Sadari Adiputra Utama, Bekasi, (a Real Estate).
2000 – Present	Chairman, The Board Commisioner of PT. Adhy Tours & Travel, Bekasi, Indonesia. (A Travel and Tourism Company).
1997 – Present	Chairman, YAF Bekasi Foundation, Bekasi City, Indonesia.
<b>Community Organization:</b>	
2016-2021	Chairman, The Assembly of Expert of the Indonesian Masjid Board of Bekasi City.
2017-2021	President, PERBAKIN (Hunting & Gun Sport) for the City of Bekasi.
2016-Present	President, The Association of the Indonesian Management Scientist of Jakarta asa Region.



## **Alternative Drying Methods for Clove to Improve the Quality of Dry Clove**

**Beauty Suestining Diyah Dewanti**

International Islamic University Malaysia, Malaysia

### **Abstract**

The main product of clove plants is clove buds, which is usually preserved in dry form. The drying process of clove buds is generally done under the sun. However, one of the disadvantages of this drying system is that if the weather is not right, such as during the rainy season and high humidity, it needs a large area of land and if too long to be left in moisture air, it will be covered by mold. A literature search conducted to find out the most recent topics about drying agriculture and spice products that appropriate with clove. Clove drying has widely studied before, but there is still little research on the drying methods that affect the quality of dry clove especially in essential oil content. An artificial drying method suitable for clove that can replace sun drying is oven drying. Several factors that can affect the quality of clove are air temperature, space of the tray in the oven, and the thickness/layer of the clove need to be observed. In this study an oven drying was designed with an indirect heating system, which was adjusted to the needs of clove farmers.

### **Key word**

Clove, Essential Oil, Oven Drying, Space, Temperature, Thickness

### **Biography**

Beauty Suestining Diyah Dewanti, PhD Student in Department of Materials & Manufacture Engineering, International Islamic University Malaysia, Master in Chemical Engineering, Institut Teknologi Sepuluh Nopember, Surabaya Indonesia, Bachelor in Chemical Engineering, Institut Teknologi Sepuluh Nopember, Surabaya Indonesia.



## **Determination of Water Status Quality and Primary Productivity of Lahor Dam in Malang District, Indonesia**

**Hery Setyobudiarso**

Environmental Engineering Department, National Institute of Technology, Malang, Indonesia

**Hardianto**

Environmental Engineering Department, National Institute of Technology, Malang, Indonesia

### **Abstract**

The Lahor Dam is used as a flood control, irrigation channel, water recreation facilities, and aquaculture. This allows the entry of solid waste and other pollutants into dam water which can cause an increase in the content of organic matter inside. Increased organic substances will affect the concentration of physical, chemical and biological parameters in the dam water which results in a decrease in the quality and trophic status. This study aimed to determine the water quality status of the Lahor Dam during dry and rainy seasons. Water samples were taken at the Lahor River inlet, Leso River inlet, Dewi River Inlet, Central section and Outlet dams with different depth variations of 0 m, 5 m and 10 m depth. Data from the analysis of the parameters were tabulated then compared with the standard quality of the dam trophic status according to Ministry of Environment Regulation Number 28 of 2009 and calculated using the National Sanitation Foundation Water Quality Index (IKA-NSF) method. The results showed that the Nitrate parameter values of all sampling points were classified as Eutrophic trophic status with a range of values of 6.31 mg/L - 11.91 mg/L. The phosphate values of all sampling points entered into Mesotrophic Status with a value of 0.584 mg/L - 0.8872 mg/L. Overall quality of the Lahor Dam during the dry and rainy season is included in the Medium classification with the scores of 61.2 and 62.4 respectively while Primary Productivity in the rainy season is 14.283 cells/mL.

### **Keywords**

Dam, IKA-NSF, Eutrophic, Mesotrophic, Quality Status.

## **Biography**

Dr. Ir. Hery Setyobudiarso, M.Sc was born in Malang, June 20th, 1961. He is currently a lecturer at National Institute of Technology Malang, Indonesia. He has bachelor degree in Water Resource Management of Brawijaya University, Malang, Indonesia. Master degree of Environmental Biology in Bandung Institute of Technology, and Doctor Degree of Medical Science (Environmental Pollution) in Airlangga University Surabaya, Indonesia.

Dr.Ir. Hery Setyobudiarso, M.Sc shows an interest in ecology and management of natural resource.



## **Mapping of Changes in Area and Vegetation Density of Land Surface Temperature in Malang**

**Agung Witjaksono**

Urban and Regional Planning Department, National Institute of Technology (ITN) Malang, Indonesia

**Ardiyanto Maksimilianus Gai**

Urban and Regional Planning Department, National Institute of Technology (ITN) Malang, Indonesia

### **Abstract**

One of the climate change impacts is the occurrence of surface temperature changes that affect human daily activities. Changes in surface temperature occur due to many factors such as low vegetation levels, high surface temperature, high population, air pollution, and so on. These changes also happened in Malang. In August 2019, Malang had a minimum temperature of 14.8°C and a maximum temperature of 29.8°C while in October 2019, Malang had a minimum temperature of 16.1°C and maximum temperature of 33.5°C. This condition showed a significant increase in surface temperature. Therefore, a study is needed to be conducted to obtain information on the level of vegetation conditions and their effects on increasing surface temperature. In addition, this study can provide recommendations for controlling spatial use in Malang. By using remote sensing technology, we can detect the level of vegetation density using the Normalized Difference Vegetation Index (NDVI) method in an area. This method can also detect changes in density by processing images in different years. This remote sensing technology is also used to identify Land Surface Temperature. Based on LST analysis results, Malang is dominated by high and medium surface temperature where the area with high surface temperature is 3,760.66 Ha and the area with medium surface temperature is 2,513.37 Ha. For sub-district with the widest area of high surface temperature is Lowokwaru sub-district with 916.08 Ha and Kedungkandang sub-district has the widest area with medium surface temperature, and this is influenced by the condition and characteristics of the vegetation which is divided into 4 density classifications, namely Non-vegetation covering 4,709.81 Ha area, Rarely Dense Vegetation covering 4,183.44 Ha area, Moderately Dense Vegetation covering 2,086.61 Ha area, and Dense Vegetation covering 92.11 Ha area. Malang is dominated by Non-vegetation and Rarely Dense Vegetation area because 59.8% of the area is built-up areas. The largest area of Non-vegetation is in the Blimbing sub-district.

## **Keywords**

NDVI, temperature, global warming, correlation

## **Biography**

Dr. Agung Witjaksono, ST, MT, was born in Mojokerto, Indonesia, 18th December 1964. He is the Head of the Regional and Urban Planning Study Program (2019-2023) – Institut Teknologi Nasional (ITN) Malang, Indonesia.

He obtained his bachelor degree in the Department of Planning Engineering, Faculty of Civil Engineering and Planning, Institut Teknologi Nasional (ITN) Malang, Indonesia (1993). He continued his study in the Master Program in Urban and Regional Planning, UGM, Yogyakarta, Indonesia (2004). Finally, he obtained his doctoral degree in Environmental Science, Universitas Brawijaya, Malang, Indonesia (2019).

He is a lecturer in the subjects: Land Use and Development, Settlement, Rural Planning, Introduction to the Planning Process and Colloquium.

International Journals that have been published:

- 1.Space Restructuring with River Stream Region Approach, 2016, International Journal of Sciences: Basic and Applied Research (IJSBAR), Vol. 26, No 1
- 2.Volume Calculation of the Rain Runoff and Domestic Waste Water in Sawojajar Village in Malang, Indonesia, 2017, Civil and Environmental Research
- 3.ISSN 2224-5790 (Paper) ISSN 2225-0514 (Online), Vol. 9, No.6
- 4.Ritual Spatial Pattern of Indigenous People of Dasarai Lamaknen Kingdom (O Kololo Kausiwe Dasarai Lamaknen) in Belu, East Nusa Tenggara, Indonesia, 2017, Journal of Culture, Society and Development, an International Peer-reviewed Journal Vol.32
- 5.Spatial Analysis Of Land Use In Bumiaji Subdistrict, Batu City, East Java, Indonesia, 2018, International Journal of GEOMATE, July, Vol. 15, Issue 47, pp.139-144
- 6.Development Of The Conservative Village Model In The Upstream Brantas River, 2018, International Journal of GEOMATE, Oct., Vol.15, Issue 50, pp. 182 – 188

Research that has received funding from Ristekdikti: Model Development of Conservation Village in the Upstream Area of the Brantas River Basin (Member, 2012-2013), Effects of Changes in Land Use on Flood in the Upstream Area of the Brantas River Basin (Head Researcher, 2014), Strategies for Controlling Sustainable Agricultural Land Conversion (Head Researcher, 2015-2016), Flood Development Based on Water Resources Conservation (Member, 2019), Regional Mapping Based on Environmental Capability in Realizing Sustainable Cities and Settlements in Batu City (Head Researcher, 2020).

Involved in the Professional Association, Indonesian Association of Urban and Regional Planners (IAP) East Java – Indonesia, as Head II (2013-2016), The Head of the Members Protection and Development Division (2016-2019), Advisory Board (2019-2022).



## **Obstacles of Green Open Space Availability: Building Malang towards a Greener City**

**Agustina Nurul Hidayati**

Urban and Regional Planning, National of Technology Institute, Malang, Indonesia

**Muhammad Reza**

Urban and Regional Planning, National of Technology Institute, Malang, Indonesia

**Widiyanto Hari Subagyo Widodo**

Urban and Regional Planning, National of Technology Institute, Malang, Indonesia

### **Abstract**

The rapid development resulted in increasingly sparse green open space, with said space getting continuously replaced by massive buildings. This has led to an increase in regional heat islands, which in turn could contribute to global warming. Efforts to maintain green open space have been anticipated in Law No. 26 of 2007 on Spatial Planning which requires every urban city to provide at least 30% of green open space consisting of 20% of public green open space and 10% of private green open space. In its implementation, there are many obstacles in realizing the availability of urban green space. By using an approach from the local government side to provide 20% of the city's green open space and from the side of the community whom should cooperate in providing 10% of green open space in each plot of their lands. From the aspect of local government, the potential, problems, opportunities and challenges of each of the government organizations involved in the provision of green open space, starting from the functions, duties and authorities, financing and other factors that may be found in the field. Likewise from public side, obstacles in providing private space will also be revealed. This will benefit the steps needed for the realization of green open space in the city of Malang.

### **Keywords**

Green open space, green city



## **Physical Comfort Factors as Elements of Residential Space**

**Gaguk Sukowiyono**

Architecture Department, National Institute of Technology (ITN) Malang, Indonesia

**Debby Budi Susanti**

Architecture Department, National Institute of Technology (ITN) Malang, Indonesia

### **Abstract**

The home is not merely a place of shelter for their family. Maslow theory that provides a standard sequence of fulfillment of human needs according to the level of socio-economic conditions the owner gives the idea that a dwelling demands the need to adjust to the comfort of its occupants. The House also has functions as a place to grow a family and settle for a long period of time. Therefore, a House should be able to provide comfort for its occupants. Often residential owners have to make changes to their home's physical condition for the comfort of their families. When you have chosen the location of the residence, the House dwellers must adapt to the natural environment and the target environment around the place. Such conditions also affect the community occupancy in Indonesia in humid tropical climates. Thermal comfort is very influential in the comfort standard of a dwelling. The activities of the House occupants and customs also have a big influence in the comfort of a dwelling. When there is one of those three elements that do not conform to the standard of comfort for the occupants, then the home owner will make a physical change of its rights. It is tried to be researched to the extent of the comfort factor desired by the community at the research site. In this study, we tried to find everything that became the element of the space forming that would be a physically determinant for the occupants. To find the factors that are the physical comfort of residential in the study is limited to measurable elements and has a dimension (tangible). The result of this research is expected to provide guidance for an architect in designing a comfortable home for the owner. In addition, the results of this research can also be used as a foundation theory for the next researchers who become the topic of subsequent research as the development of natural environmental conditions and the target environment follow the development of society

### **Keywords**

Residential, Natural Environment And Built Environment, Physical Comfort.

## **Biography**

Ir. Gaguk Sukowiyono, MT, is a senior lecturer of Architecture Department in National Institute of Technology (ITN) Malang, East Java since 1991.

The educational backgrounds are the Bachelor Program of Architecture at the National Institute of Technology (ITN) Malang (Graduated in 1991), Master Program of Architecture Department at Institut Teknologi Sepuluh November Surabaya (ITS), Indonesia (Graduated in 2004).

The research focus is environmental architecture related to local wisdom and green design and he has already published many of national journals and proceeding of national seminars.

He is also currently as one of the building experts in the Public Works Department of Malang city for many buildings in Malang City.

Debby Budi Susanti, ST, MT, is a lecturer of architectural department at National Institute of Technology (ITN) Malang, Bachelor degree of Architecture Department at the National Institute of Technology (ITN) Malang, Indonesia (Graduated in 1997), and Master Program of Architecture Department at Institut Teknologi Sepuluh November Surabaya (ITS), Indonesia (Graduated in 2002).



## **The Impact of Traffic Congestion on Air Quality in Malang City**

**Nusa Sebayang**

Department of Civil Engineering, National Institute of Technology Malang, Indonesia

**Yudi Limpraptono**

Department of Electrical Engineering, National Institute of Technology Malang, Indonesia

**Hardianto**

Department of Environmental Engineering, National Institute of Technology Malang, Indonesia

### **Abstract**

**T**raffic congestion in urban areas in Indonesia continues to increase from time to time. The reason is the high rate of increase in the number of vehicles that is not proportional to the increase in the existing road infrastructure capacity. Likewise, Malang City, the level of traffic congestion tends to increase from time to time. The location of congestion usually occurs at network links are located in the same horizontal plane. The occurrence of traffic congestion at the intersection location causes the vehicle to experience delays so that it will affect air quality due to vehicle exhaust gases. In this study measurements of ambient air quality were measured, namely the content of Nitrogen Oxide (NO<sub>x</sub>), Sulfur Dioxide (SO<sub>2</sub>), Carbon Monoxide (CO), Hydro Carbon (HC). While the study of traffic congestion is carried out surveying the length of the queue and the amount of the delay. The analysis was performed using the regression analysis method. This research was conducted in June 2019 at 10 crossing points namely 4 points on the secondary local road, 2 points on the primary collector road and 4 points on the primary arterial road. The results of ambient air quality research are as follows: The maximum Nitrogen Oxide (NO<sub>x</sub>) content is 1,179 µgr/Nm<sup>3</sup>, Sulfur Dioxide (SO<sub>2</sub>) of 1,8601 µgr/Nm<sup>3</sup>, Carbon Monoxide (CO) of 0.00 ppm, Hydro Carbon (HC) of 8 ppm . The results showed that the ambient air quality in all study locations was still good and was below the threshold of air quality standards in accordance with Government of the Republic of Indonesia regulation No. 41 of 1999. While the largest queue length was 135.03 m with a delay of 118.07 seconds/vehicle with level service F. Regression analysis results of the relationship between the average delay with ambient air quality as well as the analysis of the length of the queue with a decrease in ambient air quality did not show a significant relationship with a correlation coefficient of less than 0.5.

## **Keywords**

Ambient air quality, Delay, Queue Length

## **Biography**

Dr. Ir. Nusa Sebayang, MT was born in Karo, North Sumatera, on 18th February 1967. Home address: Danau Ranau I G2B/15, Sawojajar, Malang. He is a Lecturer in Civil Engineering Department, National Institute of Technology – Malang, since 1993. Lecturer of: Transportation Engineering, Traffic Engineering, and Highway Engineering.

Education background:

1. Bachelor Degree, Civil Engineering, North Sumatera University, (USU) – Indonesia, 1991
2. Master Degree in Civil Engineering, Bandung Institute of Technology (ITB) - Indonesia, 1999.
3. Doctor of Civil Engineering degree in Brawijaya University (UB) - Indonesia, 2016.

Organization of Professionis Indonesian Association of Road Engineer, with the level Madya. Recently becomes the team leader of:

1. Preparation of Information Systems/Database Roads in East Sumba Regency, 2017
2. Preparation of the Nganjuk Regency Road Network Master Plan, 2018.
3. Preparation of a Traffic Impact Analysis Document for the Construction of a New Hospital in the City of Probolinggo, 2019

Research focus on:

Development of Signal Time Optimization Models at Adjacent Signals Based on Traffic Volume with Low Emissions

# **Carbon Footprint Reduction in the Post-earthquake Reconstruction of Residential Buildings: A Case of Mahalaxmi Municipality, Nepal**

**Bishwodev Bhattarai**

Lecturer at Kathmandu University, Department of Civil Engineering (Architecture Program), Nepal

**Janak Raj Joshi**

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## **Abstract**

Buildings are responsible for more than 40 percent of global energy used, and as much as one-third of global greenhouse gas emissions. Construction, operation and maintenance of a building requires huge amount of energy, acquired by carbon dioxide emission. This research has focused on the possible ways of energy and carbon footprint reduction using alternative materials on the houses which were reconstructed as a part of post-earthquake reconstruction after Gorkha Earthquake, 2015. The survey location Mahalaxmi Municipality had 824 houses reconstructed after Gorkha Earthquake and among which 76% were Reinforced Cement Concrete masonry, 18% were Brick Masonry Construction and 6% were Stone Masonry Construction. The analysis of materials of each buildings found that cement contributed highest proportion of equivalent carbon emission (45%), followed by bricks (34%) and reinforcement bar (11%). Although aggregate constituent in regard to the building weight in a building is second largest (after Brick) and however, the carbon emission contribution of aggregate is only 1% of the total building emission. Embodied Energy (EE) and equivalent carbon emission eCO<sub>2</sub> of construction phase of the building was analysed on Building System Boundary of cradle-to-handover period, with the guideline of Inventory of Carbon and Energy (ICE) developed by University of Bath. As per the EE and eCO<sub>2</sub> analysis it was found that Brick masonry construction accounts for highest proportion of EE and eCO<sub>2</sub> contribution which is 41.00 Kg eCO<sub>2</sub> / Sq. Ft followed by RCC Masonry construction which requires 34.12 Kg eCO<sub>2</sub> / Sq. Ft emission. Stone masonry construction contributes lowest share of Kg eCO<sub>2</sub> contribution which is 25.19 kg eCO<sub>2</sub>/ Sq. Ft. The table below shows the total emissions of 81 buildings, which shows that average emission is 34.1 kg eCO<sub>2</sub> / Sq. Ft. of building considering all types of buildings. Also, average emission of a building was 49189 Kg eCO<sub>2</sub> considering the materials and technology used in local context.

When a wall materials of a building was replaced by AAC blocks and Hollow Cement Block, total equivalent carbon emission by the building was reduced by 34-42 percent and 34-43% respectively. Similarly, when opening was replaced by aluminium frames, the equivalent carbon emission by the building is increased by 3.5%-4/9%. However, if we compare this data with opening only, total increment in equivalent emission is 129%-243%. When roofing material CGI sheet was replaced by stone slate, the total reduction in equivalent carbon emission is 6.6-11.7% of total building emission. Thus, the finding revealed that, using walling materials alone will reduce the carbon emission by 34-43%. The study also found that, use of aluminium in place of timber will contribute 234% more equivalent carbon emission.

## **Keywords**

Embodied Energy, Carbon Footprint, Energy Footprint, eCO<sub>2</sub>, Alternate Materials



## **Public Initiatives for Conservation of Water Resources in Tamilnadu, India**

**Dr. G.P. Sudha**

Anna Centre for Public Affairs, University of Madras, India

### **Abstract**

In modern times, cities and urban centres are also built upon the same principles, where the source of water or catchment region is located. Water is one of the basic needs which is required by all living beings, lacking which life cannot be sustained. As such, the impact of urban growth and development has made water resource a scarce one.

Article 51 A of the Constitution of India casts duty upon the every citizen of India “to protect and improve the natural environment including forests, lakes, rivers and wild life and to have compassion for living creatures. There is a traditional perception among the public that it is the duty of the government to protect environment and water bodies.

The attention given to water management has lately increased due to the growing problem of water scarcity and rising conflicts between users. Participation of local people in water management is now seen as a crucial prerequisite for the conservation and sustainable use of scarce water resources. Since the late 1990s, participatory and integrated water management is on high agenda.

Water governance promotes an enabling environment with participation from all sectors-private and public. Participatory governance is creating an administrative and institutional framework where people can participate freely and agree to co-ordinate their actions at the international and national level, government and the private sectors and NGOs need to work together to manage and save water resources and coordinate efforts to balance the economic, political and social needs of the society.

It has been recognised that water resources cannot be seen separated from the surrounding ecosystem and the people. Participatory approaches are an important component of institutional frameworks for the governance of water resources and services. Participatory processes are complex and there is no single method by which to interpret approach and implement them.

It is in this context, this research describes and enumerate the public participation (citizen initiatives) in conservation of water resources in Tamilnadu during the couple of decade with illustrations in which NGOs, Citizen Forums and Local Communities have collaborated both in urban and rural areas of Tamilnadu.



## **Management of Fringe Forest Ecological Security: With Special Reference to Malayali Tribes of Javadhi Hills Vellore District**

**Dr. K. Chithra Devi**

Guest Lecturer, Anna Centre for Public Affairs, University of Madras.

### **Abstract**

The Javadhu hill range in Vellore forest division is an important component of the Eastern Ghats and inhabits several tribal hamlets and villages in its fold. The tribals of Javadhu hills are ecologically inseparable. The principal inhabitants of Javadhis are scheduled tribes called Malayalis. The forests of Vellore division can be broadly divided into two broad categories, Eastern plain forests and western hill forests. The people in forest fringe villages are dependent on forests for their food, wood, water and livelihood security. The reduction of marketable non timber forest produce like fruits, flowers, berries, tubers, resins, honey, leaves, creepers and other resources has accentuated the poverty conditions among the forest fringe communities.

The people living in the fringe villages have increasingly perceived the forest department as an agent of fringe village development in order to gain trust and respect in remote forest fringe villages. There is a need to undertake management of fringe forest areas following a holistic approach with a focus on convergence to scale up overall progress and property with a win-win situation for forest as well as adjoining non forest lands. The overall goals of the project is to optimise management of the fringe forest and adjoining non-forest lands for developing fringe forest areas for integrated and holistic management of natural resources.

The Fringe forest Management has specific objectives:

1. Integrate land based activities of agriculture, animal husbandry, forests and rural development for holistic development of fringe forests and adjoining non forest lands.

Development of mechanisms for convergences of resources, activities and programmes to demonstrate win-win situation for upstream forest and downstream agricultural areas for ecological, water, food and livelihood security.

2. Ensure better ecology and conservation of native biodiversity for adaptation to climate change response and carbon sequential.

3. Enable village institutions to develop and promote micro and medium less, women and vulnerable sections of the society through development, promotion, value addition and processing of locally available natural resources.
4. Enhance the capacity of forest departments and other developmental agencies and NGOs through joint collaboration and experience sharing.

The main objective of this research paper is to analyse the recent trends and role of forest dwellers in the joint forest management which converge the ecological equilibrium in the study area. The study has revealed the interdependence of forest department and forest dwelling tribes. Further, tribal communities capacity has been improved by providing various appropriate skill development training to ensure their livelihood, which have been discussed in detail in the research paper. She teaches Advanced Statistical Methods and specialises on data analysis in agricultural framework. Her research interest focuses on green projects, particularly involving waste management from agricultural context.



## **Implementation of Coastal Regulations in Tamilnadu: An Empirical Study with Special Reference to Kancheepuram District-India**

**G. Malini**

3<sup>rd</sup> year M.A. Post Modern Development Administration [5 Year Integrated Course], Anna Centre for Public Affairs, University of Madras, India

### **Abstract**

The main objective of this paper is to analyse the implementation of Integrated Coastal Zone Management (ICZM) system which ensures the ecological development of the local areas. This regulation is mostly adopted to regulate the development activities in the coastal areas in Tamil Nadu. This paper will analyse the their regulations is necessary to ensure effective protection to valuable coastal environment resources without unnecessarily impeding the livelihoods and legitimate rights of fisher folk and heir settlements or infrastructure development. While implementing this regulation the government has to take into account geological nature of the area, unique culture, livelihood pattern, coral native etc. Taking this into consideration this study focus on the impact of ICZM in Kancheepuram district, where Mamallapuram, one of the heritage tourist spot is located and noted for the recent visit of Chinese premises

This study has revealed that the components of ICZM are not comprehensive and not designed with the participation of the local communities and hence these regulations must be redesigned to the extent feasible and environmental must be studied further to substantiate our arguments. The methodology adopted for the study is descriptive and analytical..



## **E Waste Management in Chennai Metropolitan Area: A Study**

**P. Abishek**

3<sup>rd</sup> year M.A. Post Modern Development Administration [5 Year Integrated Course], Anna Centre for Public Affairs, University of Madras, India

### **Abstract**

The electronic industry is the world's largest and fastest growing manufacturing industry. Discarded electronic and electrical equipment with all of their peripherals at the end of life is termed as e-waste. The quantity of e-waste generated in Chennai equals two percent of total solid waste on an average in 2011 and is expected to grow in more percentage in upcoming days and is one of the fastest growing waste streams. The greater chennai corporation produces 5000 tonnes e-waste per day.

E-waste consists of ferrous and non-ferrous metals, plastic, glass, ceramics, rubber etc. E-waste is valuable source for secondary raw material but harmful if treated and discarded improperly as it contains many toxic components such as lead, cadmium, mercury, polychlorinated biphenyl etc. The presence of lead, mercury, arsenic, cadmium, selenium, and hexavalent, chromium and flame retardants beyond threshold quantities in e-waste classifies them as hazardous wastes.

In Chennai people dispose the e-waste in varieties of form. The majority of them dispose of the electronic waste in the form of municipal garbage itself. The ignorant and negligent behaviour of common man. In Chennai 66 percent of the population dumps electronic waste with the municipal waste. Consequently, the electronic wastes are also disposed of through the local agency in minor proportion.

In some places in chennai the e-waste are collected through some re-cycling centres but it also not disposed in a proper manner. The chennai city has pure re-cycling centres and to proper way of dispose e-waste from the city. The municipal corporation of chennai has developed for highly technological inventor for management e-waste. If the awareness about the e-waste is created among the people, the waste production can be reduced to a considerable extend. In chennai, if people are aware of the source of e-waste collection then it will be easy to control the increase in unauthorized dumping. In chennai

the majority of population i.e., 82 percent do not know where are the authorized e-waste collections are located.

Safe disposal methods must be adopted which fastens the progress of the country towards healthy environment. As per the survey results it can be concluded that disposal methods available namely: recycling, dealer collection and others among them 50 percent of the population is disposing the e-waste for recycling.

This article aims to enumerate the issues in E-Waste management processes in Chennai Metropolitan area. This empirical study based on survey collected from 100 households in Chennai.



## **Environmental Governance and Civil Society Activism: A Study**

**Dr. P. Maduraiveeran**

Anna Centre for Public Affairs, University of Madras, India

### **Abstract**

Civil society refers to associational activities of citizens, voluntary in nature and outside their family, friends and workplace. Civil society may consist of Non-Governmental organizations, Community groups, Trade Unions and academic institutions. Civil society can also be identified with collective action of the citizens and fight for common causes in a civilized manner. One such common cause is environmental promotion and adopting green governance or environment friendly administration. Especially, global civil society organisations aim to change the way /policies of government, business, industries or the general public and influence the environment related behaviour through their advocacy lobbying, campaigning and mass mobilization. For instance Green Peace is one such major campaign on several environmental issues such as climate, forest, oceans and world peace etc.

This study reveals the fact that civil society can act as bridge between institution and populations and create capability to cope up with climate change mitigation. Civil society plays a vital role in disseminating knowledge about the impact of climate change in the local languages. They can mitigate and eventually help when the disaster like situation arise.

Citizen led movements like Silent valley movement, Jungle Bachao Andolan, Chipko Movement, Narmada Bachao have been instrumental in bringing knowledge about environmental crisis and need for conservation of nature. More than that Chernobyl disaster and Bhopal gas tragedy brought a turning point on environmental governance and increased the activism of global environmental civil societies.

This research paper has adopted analytical and descriptive methods based on secondary data collected from various published and unpublished books, journals, research works, and occasional publications of civil society organizations. Thus, this research paper strives to enumerate global civil society activities in response to climate change in India. There is several high profile action oriented and research based organizations/movements emphasizing on solution to reduce the impact of climate change in India.

Such Civil society organisations can promote transparency and accountability of various stakeholders by way of constructive criticism and support.

## **Biography**

I am working as Professor and Head, Anna Centre for Public Affairs, University of Madras, Chennai. I have thirty years of teaching experience and have guided 20 Ph.D Scholar and more than 120 M.Phil Scholars. My area of specialization is social movements, political behaviouralism and women studies. I have participated Five international conferences organized by Sustainable Development Society at University of Columbia, Newyork and presented papers on Joint forest management, forest fringe community, tribal development and NGO and women empowerment process. Besides i have attended conferences and chaired sessions in China, Canada, Malaysia, Thailand, Indonesia, Chile ,England and USA



## **Green Crackers: an Alternative Technology to Reduce Pollution**

**R. Sriram Prabhu**

3<sup>rd</sup> year M.A. Post Modern Development Administration [5 Year Integrated Course], Anna Centre for Public Affairs, University of Madras, India

### **Abstract**

Many developing countries in recent years have witnessed rising concern about environmental constraints, which will limit development, and it will cause serious environmental damages impairing the quality of life of present and future generations. This paper deal with one such environmental constraints in Sivakasi regions of Tamil Nadu, which is famous for fireworks and crackers, the dimension of environmental threats in Sivakasi and to suggest possible remedial measures for ecological conservation in Sivakasi regions.

The first fireworks factory in India was set up in Kolkata in the nineteenth century. After Independence, Sivakasi in Tamil Nadu has emerged as India's Firecracker hub, benefitting from the restrictions of imports of firecrackers. Sivakasi in Virudhunagar District, Tamil Nadu is known for manufacturing Quality Crackers. Known as the capital of India's firecracker industry with 8,000 factories, 90 percent of fireworks output is churned out from this tiny town. Sivakasi experiences hot and dry weather throughout the year, which is suitable for crackers to remain dry and crackling. Nearly 400 manufacturers cater to the growing demand of Firecrackers across India. The turnover is mammoth in terms of business worth between Rs 800-1000 crore. Due to environment and noise pollution production of crackers were banned and green crackers have been suggested as alternative to traditional fireworks. It has several critical issues which reflect on the livelihood of people in this regions.

Green crackers operate on a technology called Safe Water and Air Sprinklers, where reactants such as aluminium or zeolite absorb water to generate heat and enable the explosion, but where the water also acts as a dust suppressant green. Green crackers, it is claimed, would bring down the emission of pollutants by around 30 per cent while the noise level would be around 125 decibel (dB), down from 160dB. Though it still exceeded the standard of 90dB, efforts were on to fine tune it further.

The industry is the biggest local job creator, directly or indirectly employing thousands of people, many of them uneducated women, churning out boxes of crackers. Some people migrated to other jobs like daily wage labourers, farm labourers and construction workers. Many producers have switched to

manufacturing the "green crackers" after receiving training and assistance from the government. But being more expensive, sales have been slow. Sivakasi firecracker shopkeeper and wholesaler, told news agency AFP that sales have slumped almost 50 percent as orders from across the country have dried up.

Authorities talk about pollution but we don't pollute much compared to others. And one day doesn't make a difference for the rest of the year. The government shouldn't clamp down on us. Everyone in a 30-kilometre radius is dependent on this sector. Sivakasi's existence isn't possible without this sector

## **Biography**

Associate Professor Dr. Zainur Rozikin, MM, MPd born in Malang, 12<sup>th</sup> January, 1962. A Lecturer in Faculty of Political Science, Merdeka University of Malang, Indonesia. Bachelor of Science in Arabic Department, State University of Malang, Indonesia (1985). Master degree in Human Resource Department, Islamic University of Malang, Indonesia (2000). PhD degree in Social Science Department, Merdeka University of Malang, Indonesia (2005). As a speaker in numerous international conferences and national seminars about Management and Social Sciences.



## **Implementation of Green Open Space Using Hydroponics Closed Cycle System**

### **Bambang Sugiyono Agus Purwono**

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### **Masroni**

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APC Mahalaxmi college for women Thoothukudi – India

### **Ali Nasith**

Universitas Islam Negeri Maulana Malik Ibrahim, Malang – Indonesia

### **Ida Bagus Suardika**

Institut Teknologi Nasional, Malang – Indonesia

## **Abstract**

**H**ydroponics is the process of growing plants in sand, gravel, or liquid, with added nutrients but without soil. Green Open Space (GOS) is an area of grass, trees, or other vegetation set apart for recreational or aesthetic purposes in an otherwise urban environment. Ipomoea aquatica is a semi-aquatic, tropical plant grown as a vegetable for its tender shoots and it is not known where it originated. This plant is known in English as water spinach, river spinach, water morning glory, water convolvulus, or by the more ambiguous names Chinese spinach, Chinese Watercress, Chinese convolvulus, swamp cabbage or kangkong in Southeast Asia. The organic fertilizer and water circulation is closed cycle system and the pump powered by solar cell. The research objective is to analyze the effect of the variation of the kangkong ages toward the height of the kangkong. The independent variables is the variation of the kangkong ages and the height of the kangkong as the dependent variable. This research applies quantitative method is experimental design using one way classification and data simulation. The finding of this research reveals is the null hypothesis is

rejected, it means that is a difference effect between the kangkong ages and the height of the kangkong at the level of significantly of 5 percents.

## **Keywords**

Hydroponics, GOS, kangkong, closed cycle system, solar cell.

## **Biography**

Dr. Ir. Bambang Sugiyono Agus Purwono, MSc born in Maospati, Indonesia, 5th March 1954. A lecturer in Mechanical Engineering Department - State Polytechnic of Malang, Indonesia. Lecture of subject matters: Production Management, Maintenance Management, Entrepreneurship and Technopreneurship, Quality Management System, Cost Estimation, and Research Methodology.

Bachelor of Science in Mechanical Engineering, Faculty of Technology, University of Brawijaya, Malang, Indonesia (1982). Master degree in Industrial Engineering, Institut Teknologi Bandung (ITB), Bandung, Indonesia (1988). Doctor in Management Science, Faculty of Economics and Business, University of Brawijaya, Malang, Indonesia (2011).

Textbooks have already published are Strategic Planning, Production Management, Thermodynamics, Engineering Manufacturing Process, Heat Transfer, Maintenance Management, Entrepreneur and Technopreneur, and Research Methodology.

Also as a speaker in numerous international conferences and national seminars about Entrepreneurship and Cooperative, Balance Scorecard, SWOT Analysis, Strategic management, and Renewable Energy, Wind Turbine, Plastic Waste, Quality Control, Water Treatment Plants, and Micro Hydro Power Plants in Malang, Bali, Yogyakarta, Bandung, Jakarta - Indonesia, Timor Leste, Melbourne - Australia, Hong Kong Polytechnics University - Hong Kong (2013), National Institute of Technology, Tiruchirappalli, India (2014), Bangkok- Thailand (2017), Manila – Philippines (2018), Kuala Lumpur – Malaysia (2018, 2019), and Beijing (2019). As a Keynote speaker at 4th Go Green Summit International Conference at Kuala Lumpur, Malaysia (2018).

As a conference chair in International Conference on Smart Green Technology in Malang – Indonesia (August 27-28, 2018), 4th Go Green Summit International Conference at Kuala Lumpur, Malaysia (December 29-30, 2018), and Climate Change International Conference in Beijing (April 11, 2019).

HIV AIDS advocacy in Bangkok – Thailand (1998) and Wuppertal – German (2002) as a participants are sponsored by UN AIDS.



## **Characterization of the Extruded Analog Rice from Arrowroot Starch Added With Seaweed and Spices**

### **Damat**

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### **Rahayu Relawati**

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### **Joko Susilo Utomo**

Bean and Tuber Crops Research Institute, Kendalpayak, Malang, Jawa Timur

### **Abstract**

Analog rice is a processed non-rice product which similar with rice, contents carbohydrates same or more than rice. Arrowroot, one of carbohydrates source grown better in Indonesia, could be used as raw material of analog rice. Seaweed is added to increase fiber of analog rice. Meanwhile, one disadvantage of analog rice is less tasty. The addition of spices can improve the taste of analog rice. The addition of spices and seaweed is expected to increase the functional value of the analog rice. The objective of this research is to determine the interaction of the addition of variations in seaweed pulp concentration and spice formulation on the characteristics of analog rice. This study used various formulas with seaweed pulp concentration, which consisted of three levels (5, 10, 15 g) and spice formulations (onion, garlic, ginger, turmeric and lemongrass). The experiment used Randomized Block Design (RBD), in which the observation parameters included analysis of water content, ash,

carbohydrate, protein, fat, antioxidant activity, fiber content, water absorption index, color intensity, and sensory evaluation. The results showed that all formula of analog rice produced from arrowroot starch, added with seaweed pulp and spices, still proper with the chemical and physical properties of paddy rice according to SNI (Standardisasi Nasional Indonesia or Indonesia Standard Requirement). As seaweed pulp concentration increased, the food fiber content enhanced. Meanwhile, the activity of antioxidant of analog rice was increased along with the addition of spices. Moreover, usage of spices gave more attractive color, tasty and aromatic sensation.

## **Keywords**

Analog Rice, Arrowroot Starch, Functional Ingredients, Nutrition, Seaweed, Spices

## **Biography**

Dr. Ir. Damat, MP born in Malang – Indonesia, February 28, 1964. Associate Professor in University of Muhammadiyah Malang, East Java – Indonesia.

Under Graduate Degree in agricultural industry technology study program, faculty of agricultural technology, Bogor Agricultural University (1989). Master Degree in Plantation Product Technology, Gadjah Mada University, Yogyakarta (1996). PhD Degree in Food Science, Universitas Gadjah Mada, Yogyakarta, Indonesia (2009).

As a speaker in numerous national and international conferences, such as: Comparative and International Education Society (CIES) in Washington DC, USA (2015), The 1st UMM International Conference on Pure and Applied Research in UMM (2015); Invited speaker: Forum on Global Ecology, Agriculture and Rural-Uplift Programs, National Chung Hsing University, Taiwan (2015). International Conference on Food Innovations: Asean Economic Community (AEC) Challenges, Jakarta International Expo Kemayoran, in Jakarta, Indonesia (2016); Invited speaker: Forum on Global Ecology, Agriculture and Rural-Uplift Programs, in National Chung Hsing University, Taiwan (2016); ISER-7th International Conference on Agricultural and Biological Science (ICABS -2017) in Bangkok, Thailand (2017); IC-STAR (The 4th International Conference on Science, Technology and Interdisciplinary Research in Belitung, Indonesia (2018).

Dr. Ir. Rahayu Relawati, MM born in Banyumas - Indonesia, January 1st, 1965. Associate Professor in University of Muhammadiyah Malang, East Java – Indonesia.

Under Graduate Degree in Department of Socio-Economic of Agriculture, University of Jenderal Soedirman, Purwokerto, Indonesia (1989). Master Degree in Management, University of Muhammadiyah Malang, Indonesia (1997). PhD Degree in Agribusiness Management, Universitas Gadjah Mada, Yogyakarta, Indonesia (2018).

As a speaker in numerous national and international conferences, such as: University Consortium Graduate Forum in Kualalumpur (2015), 4th International Conference the Community Development in ASEAN (AMCA) in Cambodia (2017); Food, Agriculture and Natural Resources (FANRes) in Yogyakarta, Indonesia (2018). National Seminar of Research Results in Yogyakarta, Indonesia (2019), The 5th Go Green Summit, Singapore, 2019.



## **Study of Logung Water Reservoir and Pollution Loading In Logung River and Gajah River**

**Maria Rara Palupi**

Diponegoro University, India

### **Abstract**

This research was performed at Logung Reservoir, Logung Reservoir is located in the Kudus district of Central Java province. Logung Reservoir is a new reservoir where the dam dam building was inaugurated or started to function early in 2019, and has a pool area of 144.06 Ha.

The research used test on parameters of water pollution compared with those required by Government Act No. 82/2001 on Water Quality Management and Water Pollution Control, which includes physics parameters (temperature and TSS); chemical parameters (Nitrat, Nitrit, Amonia, N Total, Phospor); and microbiological parameters (total coliform bacteria). The determination of water quality status was done by using pollution index method compared with that being required by Government Act No. 82/2001 as well as notified in the Decree of the Minister of Environment No. 115/2003 on Water Quality Status Determination.

In order to create a healthy, sustainable environment, the research recommended a control on water pollution by increasing the inventory and identification of sources of water pollutants, improving waste management, establish waste load capacity, increasing knowledge and public participation in waste management, increasing oversight of wastewater disposal and improving river water quality monitoring.

### **Biography**

Maria Rara Palupi was born on December, 1990 in Jakarta. The second of three children, she was nicknamed “Upi” at an early age. As a child Palupi liked swimming, reading, and travelling.

After graduating with a bachelor degree geo enviromental engineering from the Pembangunan Veteran University. After that, Palupi continued master of environmental science in Diponegoro University, because Palupi’s interest with enviromental science especially ecology. As a research enviromental scientist and engineer, she helped engineering consultant and managemnet at PT Virama Karya until now. For mainly people, Palupi is known as the genius woman who problem solution of engineering enviromental.



## **The Correlation between Production and Availability of Beef Cattle and Climate Change in Daerah Istimewa Yogyakarta, Indonesia**

### **Rahayu Relawati**

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### **Dwi Aulia Puspitaningrum**

Department of Agribusiness, Faculty of Agriculture, Universitas Pembangunan Nasional Veteran, Yogyakarta, Indonesia

### **Liana Fatma Leslie Pratiwi**

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### **Abstract**

Recently many people says that the animal husbandry business around the world shared for about 20 percent of global greenhouse gas emissions. Another astounding fact of the study was that even though it was not as good as the production of carbon emissions from the beef consumption of poultry meat and cow's milk also accounted for considerable carbon emissions. The United Nations report on animal husbandry farms and environmentalists published in 2006 revealed that "the livestock industry is the largest greenhouse gas emission producer (18%), this number is more than the combined greenhouse gas emissions glass throughout worldwide transport (13%). "Nearly one-fifth (20 percent) of carbon emissions come from livestock farms. This amount exceeds the number of combined emissions originating from all vehicles in the world. Based on this condition, this research aimed to analyze whether there is a relationship between the production and also the availability of beef in Daerah Istimewa Yogyakarta (DIY), Indonesia, with the amount of carbon emissions in the past five years from 2014 until 2019. The method was conducted by descriptive analysis with the time series secondary data about production and the carbon emission in DIY. To reached the aims of the study, the availability of beef was analyzed by Dynamic System. The research results showed that there is correlation between production an availability of beef cattle and carbon emission. A number of policy

might be taken to solve the problem. The suggestion for the future might be to keep the environment wisely and also must handle all of activities in animal husbandry business in order to decrease the air pollution in DIY.

## **Keywords**

Availability, beef, climate change, emission, production, Yogyakarta.

## **Biography**

Dr. Ir. Rahayu Relawati, MM born in Banyumas - Indonesia, January 1st, 1965. Associate Professor in University of Muhammadiyah Malang, East Java – Indonesia.

Under Graduate Degree in Department of Socio-Economic of Agriculture, University of Jenderal Soedirman, Purwokerto, Indonesia (1989). Master Degree in Management, University of Muhammadiyah Malang, Indonesia (1997). PhD Degree in Agribusiness Management, Universitas Gadjah Mada, Yogyakarta, Indonesia (2018).

As a speaker in numerous national and international conferences, such as: University Consortium Graduate Forum in Kuala Lumpur (2015), 4th International Conference the Community Development in ASEAN (AMCA) in Cambodia (2017); Food, Agriculture and Natural Resources (FANRes) in Yogyakarta, Indonesia (2018). National Seminar of Research Results in Yogyakarta, Indonesia (2019), The 5th Go Green Summit, Singapore, 2019.

Dr. Dwi Aulia Puspitaningrum, SP, MP, is a lecturer in Agribusiness Department, Faculty of Agriculture, Universitas Pembangunan Nasional Veteran, Yogyakarta, Indonesia.

The author is active in Professional Organization, such as: Indonesian Agricultural Economic Association/Perhimpunan Ekonomi Pertanian (PERHEPI), Chapter, Yogyakarta, Perhimpunan Sarjana Pertanian Indonesia/Indonesian Agricultural Association (PISPI), Chapter, Yogyakarta.

The research focus in the inventory control, business feasibility, value-added agroindustry, and supply demand on marketing in agribusiness.

As a lecturer in under graduated program in the Agribusiness Department, Faculty of Agriculture, Universitas Pembangunan Nasional Veteran, Yogyakarta, Indonesia, and actively teaching the Post Graduate Program on the Master of Agribusiness Management (MMA), the author is also active in internal and external research as the lead author with more than 100 research titles at this university since 1994.

Liana Fatma Leslie Pratiwi, SP, MSc, was born in Yogyakarta, June 16th, 1990.

As a lecturer in Agribusiness Study Program, Faculty of Agriculture, Universitas Pembangunan Nasional Veteran Yogyakarta since 2019.

Bachelor of science in Social Economic Agriculture (2012), and Master Degree in Agribusiness Management, Universitas Gadjah Mada, Yogyakarta, Indonesia (2016).

The research focus on the marginal land and the livelihoods of rural communities.

