



PROCEEDING INTERNATIONAL CONFERENCE

THE 1ST
WARMADEWA UNIVERSITY
INTERNATIONAL CONFERENCE ON
ARCHITECTURE AND CIVIL ENGINEERING

SUSTAINABILITY DESIGN AND CULTURE

DENPASAR, OCTOBER 20TH, 2017



PROCEEDING INTERNATIONAL CONFERENCE

THE 1ST

WARMADEWA UNIVERSITY
INTERNATIONAL CONFERENCE ON
ARCHITECTURE AND CIVIL ENGINEERING

SUSTAINABILITY DESIGN AND CULTURE

DENPASAR, OCTOBER 20TH, 2017

WARMADEWA UNIVERSITY PRESS
2017

SUPPORTED BY



Scientific Committee :

1. Prof. Tasuku Tanaka, Ph.D. (Graduate School of Science and Engineering Yamaguchi University, Japan).
2. Prof. Dr. Ir. Agus Taufik Mulyono, M.T., ATU., IPU. (Department of Civil Engineering and Environment, Gajah Mada University, Indonesia).
3. Prof. Wimpy Santosa, Ph.D (Faculty of Engineering Parahyangan Catholic University, Bandung, Indonesia).
4. Dr. Takahiro Ozawa (Center for Remote Sensing and Ocean Sciences (CReSOS) Udayana University, Denpasar, Bali).
5. Dr. Ir. Ahmad Rifa'i, MT. (Department of Civil Engineering and Environment, Gajah Mada University, Indonesia).
6. Dr. Ngakan Ketut Acwin Dwijendra, ST., MA. (Campus of Bali Design School (STD Bali)).
7. Prof. Dr. Ir. I Wayan Runa, MT. (Faculty of Engineering Warmadewa University, Denpasar, Bali).
8. Dr. Ir. I Gusti Agung Putu Eryani, MT. (Faculty of Engineering Warmadewa University, Denpasar, Bali).
9. Dr. Ir. I Wayan Parwata, MT. (Faculty of Engineering Warmadewa University, Denpasar, Bali).

Katalog dalam Terbitan : Perpustakaan Nasional Republik Indonesia
 The 1st Warmadewa University International
 Conference on Architecture and Civil Engineering
SUSTAINABILITY, DESIGN AND CULTURE
 Denpasar, 2017, ix, 324 pages, 21.0 x 29.7 Cm



Hak Cipta Dilindungi Undang-undang
 UU RI No. 19 Tahun 2002

Editor : 1. I Kadek Merta Wijaya, S.T., M.Sc.
 2. Putu Aryastana, S.T., M.Eng., M.Si.
 3. Made Suryanatha Prabawa, S.T., M.Ars.

Cover Design : Ni Putu Ratih Pradnyaswari Anasta Putri, S.T., M.Sc.

First Published : October 2017

Copyright : Warmadewa University Press

Editor Address :

Jalan Terompong No. 24, Gedung D Lantai 2,
 Tanjung Bungkak, Denpasar 80234, Bali
 Telp. (0361) 223858; Fax. (0361) 225073
 Web: www.warmadewa.ac.id
 E-mail: univ-warmadewa@yahoo.co.id

Committee

The 1st Warmadewa University International Conference on Architecture and Civil Engineering SUSTAINABILITY, DESIGN AND CULTURE

Board of Committee:

Dr. Drs. A. A. Gede Wisnumurti, M.Si.
Prof. dr. Dewa Putu Widjana, DAP&E.Sp.Park.

Person in Charge:

Prof. Dr. Ir. I Wayan Runa, M.T.

Chairman:

Putu Aryastana, S.T., M.Eng., M.Si.

Members of Committee:

I Wayan Widanan, S.T., M.P.M.
Ni Komang Armaeni, S.T., M.T.
I Gede Surya Darmawan, S.T., M.T.
I Kadek Merta Wijaya, S.T., M.Sc.
Ir. I Nyoman Surayasa, M.Si.
A. A. Gede Raka Gunawarman, S.T., M.T.
Putu Ika Wahyuni, S.T., M.Si., M.T.
Ir. I Wayan Jawat, M.T.

INTRODUCTION

Praise to God for the blessing and protection, because of that Engineering Faculty of Warmadewa University as Conference Committee could organize an International Conference titled **The 1st Warmadewa University International Conference on Architecture and Civil Engineering (WUICACE)** and bring **SUSTAINABILITY, DESIGN AND CULTURE**” as the main theme. This conference held as part of Yayasan Kesejahteraan KORPRI Propinsi Bali (Welfare Foundation of Civil Servants Bali Province) anniversary celebration and the-33th Warmadewa University anniversary, and also celebrating the-33th Engineering Faculty anniversary. The WUICACE International Conference is the 1st ever International Conference that held by engineering faculty of Warmadewa University.

The theme “Sustainability, Design and Culture” which brought to the conference is a representation of Warmadewa University Basic Scientific Patterns (PIP) that based on Tourism Environment, Design, and Culture. Through this International Conference, the committee was hope it could find academics thinking that produce construction planning concept which consider about environmental and local wisdom aspects.

The committee would like to say thank you, as a symbol of gratitude to all people who involved and support the event, more specifically to all participants who donate their thinking through academics writings. The committee was hope that this proceeding could give benefits by improving insights about Tourism Environment with Local Wisdom based on infrastructure concept and implementation.

Denpasar, October 20th 2017

Redactor,

Official Committee

The 1st Warmadewa University International Conference on
Architecture and Civil Engineering

WELCOMING SPEECH BY RECTOR OF WARMADEWA UNIVERSITY

Honorable Keynote Speakers, Contributors, and Moderators

Distinguished participants and guests,

Ladies and Gentlemen; Om Swastyastu; Assalamualaikum Warahmatullahi Wabarukatu; Peace for us all; Namo Budaya. It gives me a great pleasure to welcome all of you and to offer a few words this morning at the opening of The 1st Warmadewa University International Conference on Architecture and Civil Engineering. This conference is expected to be a very inspiring scientific forum and can be optimally used as tools for intensive dialogue and communication to explore various thoughts and creative ideas on Architecture and Civil Engineering.

I believe this conference will enrich your insight, especially in the area of the development of architecture designs which environmentally-friendly and based on local wisdom. This forum is also expected to be a manifestation of commitment and brainstorming platform for academics to implement the concept of sustainability, design, and culture in the field of civil engineering and architectural engineering. With the presence of academics, bureaucrats, professionals, and students at today's Conference forum, we are optimistic to be able to find a proper formula related to the concept of planning and developing environmentally-friendly designs that are relevant to the conditions of Bali province in particular and Indonesia in general. We have great challenges and today we have an opportunity before us to learn from the best experts in this field, and by sharing our experiences, I hope we can elaborate the topics into concrete and practical solutions.

I also would like to take this opportunity to express my sincere thanks to all of you for the initiative in sharing a common understanding; on how important, we, as human being to build and preserve the environment. This initiative deserves to be awarded, given the theme of the conference that holds consistency of our University's vision and commitment to become the center of environment and tourism based knowledge. Special appreciation also goes to the organizing committee for all your efforts preparing this event.

Finally, I would like to welcome all participants and wishing you a great experience and essential knowledge.

Thank you

Om, Shanti, Shanti, Shanti Om

Wassalamu'alaikum Warrahmatullahi Wabarrakatuh

Peace for all of us

CHAIRMAN REPORT

My great honor to Keynote Speakers
Honorable Contributors and Moderators
Rector, vice rector, and all the Dean of Faculty in Warmadewa University, that I respect
Participants of the Conference, Lecturers and Conference Organizers that I am proud of;

It is both an honor and a privilege to deliver this statement, as Chairman of **The 1st Warmadewa University International Conference on Architecture and Civil Engineering**. We really appreciate all of you attending this international conference.

Ladies and gentlemen,

Construction and technology development gives many chances and opportunity for all architects and civil engineers to work creatively in developing their ability to arrange a sustainable building construction and planning which keep staying on local wisdom principal. Sustainability, design, and culture represent how construction and technology development should be considered in practical life. If architect and civil engineer can unify and do that entire three, it will change people perspective that building construction always harms the nature, that's why this conference held and created that focus on how we should design and construct environmentally friendly.

In this conference will discuss some aspects related to the process and the result of construction infrastructure, which is classified in design, culture and sustainability

Keynote speakers in this conference and professional practitioners will share the creation and their research on their own field:

1. The Expert in Remote Sensing and Satellite data, **Prof. Tasuku Tanaka**, from Yamaguchi University, Japan
2. Professor in Transportation field, **Prof. Agus Taufik Mulyono**, from Gadjah Mada University, Indonesia
3. **Mr. Charlie Hearn**, The Principle Architect of Inspiral Architect, responsible for the amazing structure and creativity in Bali.
4. Astd. Prof. of Architecture and Landscape Design, **Mr. Anoop Kumar Sharma**, from Shri Mata Vaishno Devi University, India

In addition, 43 articles including architects and civil engineers, also over than 650 participants will enjoy discussion and share much knowledge through this event, moreover, 1 article has been accepted in Journal of Sustainable Development, 2 articles in reviewing at JSD journal and the other 45 article will be published as proceeding.

This conference is a continuous effort between the Department of Civil Engineering and Architecture at Warmadewa University to facilitate and support dialogue and discussion about the advancement of Design, culture, and sustainability collaboration, by provides an excellent opportunity and serves as the information exchange platform for researcher, latest developments and findings from foreign country.

We try everything, so that we can give unforgettable experience to you. We do really open and welcome to your feedback, advice, and suggestion to make this event even better and bigger. This conference is an annual event that we believe will lead to the fruitful effort in the coming years. And the last, our sincere thanks are to:



- Engineering Faculty in Warmadewa University
- WUICACE committee
- Sponsors, donators, and contributor

Without their supports, and assistance, this conference would not become possible.

Finally, I would like to welcome all of you and wishing you a great experience and essential knowledge.

Thank You

TABLE OF CONTENTS

Introduction	iii
Welcoming Speech by Rector of Warmadewa University	iv
Chairman Report	v – vi
Table of Contents	vii – ix
A. Keynote Speaker	
1. Indonesian Sea Observed By Satellites <i>Prof. Tasuku Tanaka, Ph.D.</i>	1 – 2
2. Hope To The Future: Indicators For Sustainable Transportation Management In Indonesia <i>Prof. Dr. Ir. Agus Taufik Mulyono, M.T., ATU., IPU.</i>	3 – 13
3. Sustainability Viz –A-Viz Architecture & Culture: Case Of Diverse India <i>Anoop Kumar Sharma</i>	14 – 15
B. Theme I : Sustainability	
1. A Sustainable Agriculture Development in Kedungu Resort Project, Tabanan Bali <i>Ngakan Ketut Acwin Dwijendra, I Wayan Yogik Adnyana Putra</i>	16 – 21
2. Arrangement Model Of Saba River Estuary Area Based On Tourism Enviroment For Water Conservation In Buleleng Regency <i>I Gusti Agung Putu Eryani</i>	22 – 29
3. Identification of Physical Changes of Pre- and Post-Reclamation Land in Serangan Island <i>I Gede Surya Darmawan, I Wayan Wirya Sastrawan</i>	30 – 36
4. Impact Resistance of High Strength Self Compacting Concrete With Steel Fiber <i>Gabriella Agnes Luvena S., M. Fauzie Siswanto, Ashar Saputra</i>	37 – 44
5. Mix Design Of High Strength Scc With Polypropylene Fiber Based On Flow Mortar Mix <i>Kristyan Hari Subangkit, Imam Satyarno, Andreas Triwiyono</i>	45 – 52
6. Modelling As An Approach to Understand Resilience of Urban Kampung <i>Imelda Irmawati Damanik, Bakti Setiawan, Sani Roychansyah, Sunyoto Usman</i>	53 – 61
7. Performance Based Contract Risk Relationship Analysis in Bojonegoro- Padangan Road Project <i>Eko Prihartanto, M.Djaya Bakri</i>	62 – 68
8. Priority of ICT Implematation at The Largest Bus Terminal in Bandung, Indonesia <i>A. Caroline Sutandi, Wimpy Santosa, Y. Frans Winanto</i>	69 – 79
9. Sustainable Tourism and Fire Safety of Accommodation Facilities in Tourism Villages <i>I Dewa Gede Agung Diasana Putra, Anak Agung Gde Agung Yana, Ngakan Ketut Acwin Dwijendra</i>	80 – 84
10. Thermal Performance of Wide Span Middle-Rise Building in Surabaya (Case Study: Gedung G ITATS) <i>Dian Pramita Eka Laksmiyanti, Poppy F. Nilasari</i>	85 – 90

C. Theme II : Design

1. Behavior of Nailed-Slab System on Peat Soil Under Loading <i>Aazokhi Waruwu, Hary Christady Hardiyatmo, Ahmad Rifa'i</i>	91 – 97
2. Changes of Geotechnical Properties of Waste Embankment for Stability Analysis at Piyungan Disposal Site <i>I Wayan Ariyana Basoka, Ahmad Rifa'i, Fikri Faris</i>	98 – 105
3. Coastline Change Analysis in Buleleng Regency by Using Satelite Data <i>Putu Aryastana, I Made Ardantha, Adrianto Eka Nugraha, Kadek Windy Candrayana</i>	106 – 113
4. Comparative Analysis of Effectiveness of "Yellow Box Junction" In The City of Jakarta and Denpasar <i>Cokorda Putra Wirasutama, Tjokorda Istri Praganingrum</i>	114 – 119
5. Comparison of Single Bored Pile Bearing Capacity Based on CPT and SPT <i>I Gusti Ngurah Putu Dharmayasa</i>	120 – 126
6. Development Taman Prestasi Surabaya As Thematic Park Reviewed From The User Behavior and The Nature Of Space <i>Sigit Hadi Laksno, Felicia Trua Nuciferani</i>	127 – 131
7. Durability of Asphalt Concrete Mixture Using Lompoto'o Tras As Fine Aggregate <i>Frice L. Desei, Ayuddin</i>	132 – 138
8. Geotechnical Characteristics of Pumice for Reduce Liquefaction Potential <i>Muhajirah, Ahmad Rifa'i, Agus Darmawan Adi</i>	139 – 146
9. Geotechnical Properties And Characteristics Of Metamorphic Rock Mass On Poboya Gold Mine <i>Sriyati Ramadhani, Ahmad Rifa'i, Kabul Basah Suryolelono, Wahyu Wilopo</i>	147 – 154
10. Influence of Volcanic Ash and Lime on Resilient Modulus for Subgrade <i>Devi Oktaviana Latif, Ahmad Rifa'i, Latif Budi Suparma</i>	155 – 159
11. Landslide Hazards Due to Rainfall Intensity In The Caldera Of Mount Batur, Bali <i>I Nengah Sinarta, Ahmad Rifa'I, Teuku Faisal Fathani, Wahyu Wilopo</i>	160 – 167
12. Optimization of Thermal Comfort on I Gusti Ngurah Made Agung Citypark Design in Denpasar <i>I Wayan Wiryasastrawan, I Gede Surya Darmawan</i>	168 – 175
13. Spatial Distribution of Mercury Concentration in Traditional Gold Mining of Buladu <i>Marika Mahmud, Beby Banteng, Frice Desei, Fitrayane Lihawa, Yanti Saleh</i>	176 – 182
14. Steel Brace Damper with Progressive Failure Mechanism <i>I Putu Ellsa Sarasantika</i>	183 – 187
15. Strength And Stiffness Behavior of Concrete Modular House <i>Yosafat Aji Pranata, Anang Kristianto, Kumbara Kamajaya Cahya Hermawan, Azka Rysdianto</i>	188 – 192
16. The Behavior Of Steel Structure Exposed To Fire : A Review <i>Ni Komang Ayu Agustini, Andreas Triwiyono, Djoko Sulisty, Suyitno</i>	193 – 197
17. The Effect of Water Content Change in Pluto-Volcanic Subsurface Slope Stability Based on Limit Equilibrium And Finite Element Method <i>Indriati Martha Patuti, Ahmad Rifa'I, Kabul Basah Suryolelono, Suprpto Siswosukarto</i>	198 – 205
18. The Influence of Capital Composition to Real Estate Investment Risk in Gianyar by Using @Risk Program <i>Ni Komang Armaeni, Ni Wayan Meidayanti Mustika, Anak Agung Sagung Dewi Rahadiani</i>	206 – 214

19. The Key Success of Commercial Building Construction : A Case Study on Charcara Restaurant Bali 215 – 220
I Wayan Widanan
20. Risk Variables in Collaboration of Private Government (PPP) for Toll Road Contacts 221 – 228
Putu Ika Wahyuni, Wateno Oetomo, Sarwono Hardjomuljadi, Koespiadi
21. Triplet Confinement Induced High Efficiency in Single Layer Doping Of Phosphorescent Organic Light-Emitting Diode 229 – 235
Agus Putu Abiyasa, I Wayan Sukadana, I Wayan Utama, I Wayan Sugrayasa, Yoga Divayana

D. Theme III : Culture

1. Architecture Knowledge in Manuscript of Lontar Asta Kosala Kosali (In the Perspective of Architecture is a Contruction Process) 236 – 241
I Nyoman Nuri Arthana, Josef Prijotomo, Murni Rachmawati
2. Cultural Landscape and Conservation of Balinese Cemetery, Meaning and Threatening 242 – 246
Ni Made Yudiantini
3. Cultural Practice of Traditional Security Officers (*Pecalang*), Tourism and The Meaning of the Local Wisdom Value in Bali 247 – 251
I Wayan Wesna Astara
4. Form and Meaning of Aesthetic Elements on Architecture of Traditional House (Case Study of Traditional House in Bayung Gede, Bangli) 252 – 259
Siluh Putu Natha Primadewi, I Gede Ngurah Sunatha, Ni Putu Suda Nurjani
5. Local Wisdom in Environmental Management in Tenganan Pegringsingan, Karangasem, Bali 260 – 267
I Gusti Bagus Suryawan, Ni Made Jaya Senastri
6. Proportion Identification of Candi Tebing Gunung Kawi in Tampaksiring, Gianyar - Bali 268 – 274
A.A. Gede Raka Gunawarman, I Kadek Merta Wijaya
7. Soundscape Mapping in Heritage Area (Case study : ‘Legi’ Market, Kotagede, Yogyakarta, Indonesia) 275– 282
Patricia Pahlevi Noviandri
8. The Execution of Bali Architecture in Public Buildings as A Cultural Tourism Potential of The City of Denpasar in The Era of Globalization 283 – 293
Made Novia Indriani, Cornelia Hildegardis
9. The Influence of Cultural Life on Spatial System in Tenganan Pagringsingan, Karangasem - Bali. 294 – 303
I Wayan Runa
10. The Roles of Market Orientation and Knowledge Competency on The Relationship Between Innovation and Business Performance 304 – 308
Ni Made Wahyuni, I Made Wardana, Gusti Ayu Ketut Giantari
11. Traditional Concept of Space and Building in Puri Agung Karangasem, Bali 309 – 316
Agus Kurniawan
12. Typology of *Angkul-Angkul* Forms at Balinese Ethnic Houses in Denpasar 317 – 324
I Kadek Merta Wijaya, A. A. Gede Raka Gunawarman

LOCAL WISDOM IN ENVIRONMENTAL MANAGEMENT IN TENGANAN PEGRINGSINGAN, KARANGASEM, BALI

I Gusti Bagus Suryawan¹, Ni Made Jaya Senastri²

^{1,2}Faculty of Law, Warmadewa University, Jl. Terompong No. 24, Denpasar, Indonesia
suryawanmeraku@gmail.com¹

ABSTRACT

Environmental issues in the past decade do not concern only Indonesia, a country with unique landscape, but also other countries in various parts of the world. In Act Number 32 Year 2009, the environmental management system is implemented as an integrated effort in order to preserve the functions of the environment, which includes environmental planning policy, utilization, development, maintenance, recovery, supervision, and environmental control. Local wisdom in environmental management does not contradict the principles of environmental management as regulated in Act Number 32 Year 2009. Local wisdom in environmental management in Tenganan Pegringsingan, through interpretive approach, shows that the locals' behavior is magical and religious in nature, prioritizing harmonization between humans and God, between humans and the others, and between humans and the environment. These types of human relationships are a philosophy known as *Tri Hita Karana* in Hinduism. In addition to that, the locals have their own belief that is still going strong, proved by the megalithic history. *Tri Hita Karana* and local wisdom in environmental management in Tenganan Pegringsingan manifest in the locals' behavior, both in sacred and profane relationships. Their obedience cannot be separated from their consistency in believing the power of *Tri Hita Karana*, which promotes three types of human relationships: relationship between human and God (*Ida Sang Hyang Widhi Wasa*), relationship among fellow humans in social life, and relationship between human and the environment. To anticipate the changes that occur, *Tri Hita Karana* is strengthened by legal products created by the indigenous people called *Awig-Awig* of Tenganan Pegringsingan. This *Awig-Awig* regulates its people's behavior, rights and obligations, and firm sanctions, both material and immaterial, which are imposed to the community members who violate the provisions in *Awig-Awig*. Tenganan Pegringsingan's status as a tourist destination does not affect the behavior of its people.

Keywords: *Local wisdom; Tri Hita Karana; Environmental Management*

A. INTRODUCTION

The idea of good environmental management, as an effort to protect the environment, is a consequence of human activities that cause harmful effects and affect various aspects of human life and the environment. In fact, environmental damage is caused mostly by humans who explore natural resource with economic benefit as their only purpose, which can threaten human survival if it has negative impact.

Environment in Indonesia faces serious issues, such as river pollution, air pollution, excessive logging, forest fires, and so on. There is also global warming, another concerning issue caused by environmental degradation, whether it is due to pollution, industrial activity or destruction of tropical forests. These issues are the concern of every country in the world and also a costly impact for not considering environmental aspect in the development process, in both developed and developing countries.

In fulfilling human needs of environment, the influence of environmental carrying capacity plays a significant role. The significance of environmental carrying capacity is related to the efforts humans done in order to save the environment. The constant change of era and modernization can affect the way people perceive environmental management.

The way of thinking today can no longer solve all the environmental issues. In such situation, people turn to local wisdom so that they can find long-term solutions to solve environmental issues, which become more alarming and can pose a threat to the ability of the future generations to meet their own needs.

Bali as one of the world's tourist destinations has both natural and cultural tourism potentials. The area in Bali is divided into Bali plains and Bali mountains. Villages in mountainous areas, known as *Bali Aga* villages, still uphold local

wisdom in vertical and horizontal relationships through a philosophy called *Tri Hita Karana*.

Tri Hita Karana is implemented using local wisdom. Local wisdom in Bali is a tourism asset. However, tourism may have negative impact if there is no filtering from people possessing local wisdom.

As the era changes, globalization occurs in all aspects of life, characterized by modernization. Modernization that occurs will certainly affect the society's views on environmental management. The impact of modernization is seen in apathetic, materialistic, and exploitative behavior (Rato, 2004:8)

Research Questions

Based on the background, the writers formulated two problems as follows:

1. How *Tri Hita Karana* and local wisdom affect environmental management in Tenganan Pegringsingan?
2. How to strengthen *Tri Hita Karana* using local wisdom in anticipating the changes that occur?

B. LITERATURE STUDY

This systems theory, also known as Organic Analogy theory (Rasjidi, 2003:60), sees any part of a unity as inseparable. Thus, in reality, this analysis emphasizes on the sharpening of the studies of each part of a unity. People in Indonesia who join indigenous communities are a unity within the Unitary State of the Republic of Indonesia. Hence indigenous peoples become an integral part of the Republic of Indonesia founding history. They also become an integral part in meeting the state objectives as elaborated in paragraph IV of the 1945 Constitution Preamble.

The concept of organic analysis resembles the principle of holism, emphasizing that the best method in organic analysis is the interrelationship between parts. When organic theory is combined with other approaches, it will become the systems theory. Thus, basically the systems theory is the organic theory that has been perfected through the process of development. In addition to that, the systems theory is a reaction to various weaknesses of analytical-mechanical theory, especially in human sciences perspective (Rasjidi, 2003:59). The characteristics of the systems theory are as follows:

1. A system is a complexity of elements that formed in an entity of interaction;

2. Each element is bound to an entity of relations which is interdependent to each other;
3. The entity of the complex elements forms a larger entity, which includes the whole element of its formation;
4. The whole element determines the characteristic of each of its constituent parts;
5. That part of the whole element cannot be understood if it is separated from the whole element;
6. The parts move dynamically and independently or as a whole within the system.

The systems theory emphasizes the essence of a system of a unity: the essence of a system of a unity, the essence of the parts that make up the system, the essence of how to analyze a large unity and the parts that make up the unity. This systems theory, when related to an adage *Ubi Societas, Ibi Ius* coined by Cicero, provides a complete understanding of the relation between the law and the community.

Friedman argues that every community within the state has a legal culture. However, this does not mean that everyone has similar notions, so that in the context of Carl Von Savigny's legal culture with the doctrine of the *volkgeist*. This doctrine states that the law is not created but grows and develops together with society. According to Van Vollenhoven's reality theory, this concept is influenced by religion with the enactment of customary law, which is determined by the balance between magic and religion (Rajagukguk, 2001:496).

This means that the establishment and existence of the law is inseparable from the objective of obtaining the best solution in handling a conflict. Hence, the relation between legal culture and the effectiveness of the positive law established by the state cannot be separated from the way and where the material of the established law originated.

"When viewed from the perspective of Legal Anthropology, it is said that the law which is evidently enforced in society, besides being manifested as state law, is also manifested as religious law and customary law." (Nurjaya, 2006:6) In addition, the law can also be manifested in local regulatory mechanisms that are evidently enforced, which serves as a means of social control in society as well. "As explained in the Madhhab of History, the life of the legal community is governed by the laws derived from their culture, as every legal

community has its own legal culture."
 (Nurjaya, 2006:131)

C. METHODOLOGY

1. Types of Research

This research is socio-juridical, that is legal research which refers to legal norm by combining field research.

2. Research Sites

Tenganan Village in Karangasem Regency, and library in Faculty of Law. Warmadewa University.

3. Research Data

The data use in this research are secondary legal materials obtained from text books, legal journals, and legal articles

D. RESULTS AND DISCUSSION

1. Local Wisdom and Its Development in Indonesia

In order to understand the implementation of local wisdom in environmental management in Indonesia, ones must start by knowing the implementation of the systems theory, which serves as the history of colonialism of human intellectuality in finding the most appropriate way to study a complex unity. In ancient Roman, Menenius Agrippa has used this way to explain the nature of the state: the state as a living entity, an integrated unity, and a unity composed of inseparable parts (Rasjidi: 2003:52)

In Indonesia, the indigenous people's local wisdom in environmental management stems from the systems of value and religion embraced by the community. Then it becomes an integral part of their status as legal subjects in the state. There is no society without law and no law without society. It means that law is held by society to manage their lives. It can be interpreted that as a form of relationship, there is a component which consists of society-law-society. Thus, the law is constituted by and enforced for society. This adage is justified by the fact that customary law in society still prevails and binds the society.

The pluralistic nature of Indonesia leads to a diversity of laws that bind the society, which can be customary law, national law and international law. Any interest that involves the enforceability of customary law with national law and international

law requires a process of harmonization between interests. This harmonization aims at justice or fair law that can be enforced in society. The concept of justice to be achieved is closely related to the ideas or the ideals of Indonesia's people in Indonesia's philosophy.

2. Local Wisdom in Environmental Management in Indonesia

Pancasila is the root of the ideals of Indonesia's people. Materially, the values of Pancasila include cultural aspects in living as a member of society, a member of a nation, and a member of a state. Therefore, philosophically speaking, there is a balance between the value of Godhead, the value of Humanity, the value of Nationality, the value of Society, and the value of Democracy in Pancasila (Bakry, 2001:32) This philosophical foundation is the basic principle that underlying the development and environment in Indonesia. This philosophical foundation is elaborated in the Preamble of the 1945 Constitution of the Republic of Indonesia, specifically in the fourth paragraph, which states:

"Then, to form a Government of the State of Indonesia that protects the whole people of Indonesia and the entire homeland of Indonesia and to advance general prosperity, develop the intellectual life of the nation, and participate in implementing the world order based on freedom, eternal peace and social justice, Indonesia's National Independence shall be laid down in a Constitution of the State of Indonesia, with the sovereignty of the people based on the belief of the One and Only God, the just and civilized Humanity, the Unity of Indonesia, and Democracy led by wisdom resulting from Deliberation / representation, and to realize social Justice for the people of Indonesia".

This paragraph emphasizes the state obligations and the duty of the government to protect all resources in Indonesia in order to achieve the happiness of all Indonesian people. This basic thought is then formulated more concretely in Article 33 Section (3) of the 1945 Constitution: "Land and water and natural resources contained therein are controlled by the state and utilized for the greatest prosperity of the people".

This means that the 1945 Constitution has provided a constitutional basis for the state to fulfill its obligation to utilize natural resources for the greatest prosperity of the people, so that the present and the future generation are able to utilize the resources in a sustainable manner. The community

can participate by forming a harmonious, balanced relationship between humans and the environment using local wisdom. According to Lawrence M. Friedman, there are three elements or aspects of the legal system: Structure, substance, and legal culture (Rajagukguk, 2001:495)

The first element, Structure concerns the institutions which are authorized to create and enforce the law. In positive law, the institutions authorized to create and enforce the law are the legislature and the executive, respectively. The executive is required to enforce the law that has been created by the legislature. Additionally, the law is enforced universally within Indonesian territory. Meanwhile in customary law, the indigenous village has the authority on creating the law which is adjusted to the concept of *desa* (place), *kala* (time), *patra* (circumstances).

The second element, substance is the material or the form of legislation. It is divided into two categories: written law and common law system. Written law covers public needs as a follow-up to the provisions of the 1945 Constitution and the source of its authority, which is attributable. On the other hand, the legal substance of unwritten law is strongly influenced by the legal aspect of its community as the construction of the mind elaborated in local law that takes form in an *awig-awig*;

Finally, the third element is legal culture. Legal culture means people's attitude toward the law and the legal system, which includes belief in values, thoughts or ideas. In TengananPegringsingan, the legal culture of its people is influenced by Hinduism and belief in their ancestors. Additionally, the behavior of its people is always related to the sacred and profane. Therefore their law is not only material but also immaterial.

State law is not the only form of law that is enforced in society. This shows that based on the legal basis, the community is given an unlimited role in its involvement to actively participate in environmental management. This means that legal domain also has legal meaning as cultural instrument that serves to maintain social order or as a means of social control. Therefore, in addition to state law, there are other legal systems as well, such as customary law. This shows that Indonesia has legal pluralism. In legal compliance, there is an approach called Moral Approach. Moral controls human action as human beings, in terms of good and bad, regarded from its relations with the ultimate goal of human life based on natural law. In

its implementation, moral is never forced. Moral demands an absolute submission (Thaib, 2015:77)

With these acknowledgments and beliefs, humans know belief in religion to refer to God, who is believed to have power over themselves and their lives. Moral basically guides humans to realize their humanity as well as their existence, which is not only enough to fulfill the physical needs. In addition to that, there is a metaphysical necessity: faith (aware of limitations) (Erwin, 2015:106)

3. Local Wisdom in Environmental Management in TengananPegringsingan

The fact that legal pluralism exist can be used to explain a situation in which two or more legal systems are enforced side by side in certain scope of social life or to explain two or more prevailing social control systems in society. It also can be used to explain a situation about two or more legal systems that interact in social life. Legal basis in society is useful to fully understand the law in society. Therefore law must be studied as an integral part of its cultural aspects, such as social structure, kinship system or religious system.

In its development, law as a rule is highly dependent on several components such as the rationality of indigenous people, history, customs, guidelines of proper behavior as a force that affect the development of the law, and the consistency of each component in the legal compliance by indigenous people, so that the law can be used as a means to develop the potentials possessed by the community. Local wisdom in TengananPegringsingan cannot be separated from its socio-cultural life and religion related to the settlement planning, the management of water resources, and the management of the forest protection.

Local wisdom in environmental management in TengananPegringsingan cannot be separated from the existence of customary land rights in the community as the strongest unity of the land and everything on it and is elaborated in *awig-awig* as the law that must be adhered to. If *awig-awig* is violated, sanctions must be imposed.

In the settlement planning, the settlement area in TengananPegringsingan stretches from the North and further down to the South, developing a centralized pattern. On the other hand, a traditional irrigation system known as *subak* is utilized for managing water resources. As for the management of forest protection, *awig-awig* regulates the community actions toward protected forests, such

as logging, picking fruits, and managing trees that collapsed naturally.

Conceptually, local wisdom is a part of culture and more specifically a part of traditional knowledge system. Local wisdom that possess universal values such as historical, religious, ethical, aesthetic, science, and technology are called *local genius* (Geriya, 2005:3) Indonesia as a country that writes its motto, *Bhinneka Tunggal Ika*, in the symbol of the country, Garuda, becomes a *condition sine qua non* to consistently accommodate and pay attention to indigenous people's wisdom in creating policy and drafting legislation as a manifest of the acknowledgment of legal pluralism, which is empirically alive and developing in Indonesia.

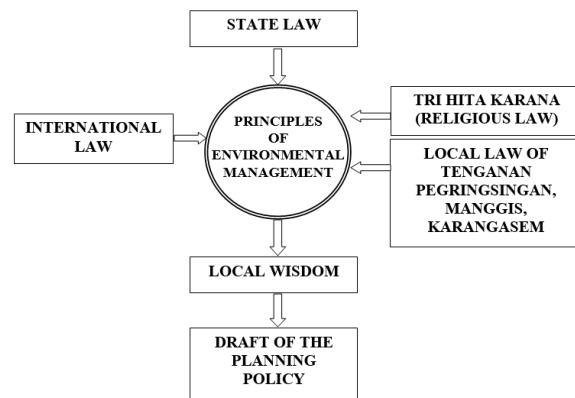
Substantively the primary content of local wisdom covers these elements: local concepts, folklore, religious rituals, local beliefs, various taboos and advices that manifest as a system of public behavior and customs. While functionally one of the aspects of local wisdom in environmental management is the methods and approaches that prioritize wisdom and policy, and also the direction and goals that emphasize on harmony, balance and sustainability. In the minds of indigenous people who believe in magic and religion, human beings are tasked with maintaining the balance of the universe. If humans become greedy, destroy the balance of nature, or are not in harmony with nature, it will shake the balance of the universe that can result in natural disaster.

As an initial illustration of *Tri Hita Karana* that based on local wisdom, society participation in environmental management can be presented in the form of customary law in TengananPegringsingan, Manggis, Karangasem, Bali as follows: TengananPegringsingan as an agrarian community manifests the concept of living in harmony with the environment in *TumpekUduh*, a ritual in which people give offerings to the God as a sign of gratitude to the God who has provided humans with resources which allow them to survive.

Based on the existing belief system, it can be seen that the community inTenganan Pegringsingan is religious. In a religious community, various elements that are regarded as sacred are to be distinguished from other profane elements, in accordance with the classification of binary opposition. The indigenous people regard forests as a sacred environment. Efforts on saving the environment are carried out on the basis of the

value of harmony, the value of magic and religion, and the value of mutual cooperation.

The Graphic of Conceptual Framework



4. The Principles of Environmental Management in Act Number 32 Year 2009

In legal studies as a system, it can be explained how law works in society or to examine the legal system in the context of legal pluralism that interact in social life. The goal is to achieve order, as a concrete legal ideal that manifest as legal certainty, merit, and justice.

The legal theory states that the rule of law has the power to apply in philosophical manner, in which it must be in accordance with the legal ideals that reflect justice in society. Furthermore, the rule of law has the power to apply in sociological manner, which means it has to be accepted and acknowledged as the norm that suits the values believed by the people and to apply in juridical manner (Nurjaya, 2006:9). Additionally, the rule of law has two principal characteristics that can be examined: 1) a rule that regulates people behavior to create order, tranquility, and peace in life, and 2) a rule that force, which takes form in repressive sanction.

Indonesia is a multicultural country, and its legal systems are also pluralistic. This is because Indonesia has *de facto* customary law in addition to state law. Therefore, community participation in environmental management is vital, because the maintenance of natural resources will provide the people with opportunities to live the optimal life. In order to encourage people to participate through local wisdom, there must be a partnership between the government and the community through the strengthening of customary law. The living law in the midst of society is inevitable, as it is also

regarded as one of the prevailing laws despite the dominance of state law (Yas, 2007:1)

If the paradigm of the government's legal development is only based on the centralistic nature of the law through the implementation of politics of unification and codification of the law, it will give an implication that the state law tends to displace, ignore and dominate customary law. Indonesia has applied an environmental management system which is elaborated in Act Number 32 Year 2009. It cannot be denied that the people have been managing the environment with their own customary law as the guidelines, which has already embraced the principle of sustainable development and is environment-oriented.

Increasing the community participation in managing natural resources and the environment is implemented through partnerships (Hardjasoemantri, 2005:61) To prove that the partnerships exist in the interaction between state law and customary law in society, customary law must be acknowledged and protected in order to achieve multiculturalism as a characteristic of law, to strengthen national integrity. In the context of environmental management, social life in the form of ethics, religion, environmental wisdom, and customary law are a cultural treasure that must be taken into account and accommodated in policy making and the establishment of state law on environmental management.

Humans are part of the ecosystem. Humans are the managers in the system. Human actions can affect the environment and can result in environmental damage. In Indonesia, the relationship between human and the environment has merged with human culture. Thus, humans act as a party that take advantage of nature and devote to the nature through conservation efforts.

In terms of groups, human environment can be classified into three:

- a. Physical environment, which refers to everything around humans that is abiotic such as mountains, air, water, river, sunshine, and so on.
- b. Biological environment, which refers to living organisms other than humans such as animals, plants, microorganisms, and so on.
- c. Social environment, which refers to the environment that possess aspects of attitude, such as social attitudes, psychological attitude, spiritual attitude, and so on (Nurjaya, 1985:7).

The concept of "humans affect nature and nature affects humans" means human beings, in

relation to nature, must take other values into account, in addition to technical and economic values. It carries the consequence that humans, either as self-reliant individuals, or as members of a community, must bear the responsibility when there are threats to nature (Hardjasoemantri, 2005:5)

From the previous explanation, there are basic principles of environmental management: the environment as a gift bestowed by God. The principle of integration in environmental management, the principle of harmony and balance, and the principle of sustainable environmental management through the process of creating legal norms by taking into account the level of public awareness. These principles are the unity of principles that can be implemented in human attitude to the environment around them through a series of efforts undertaken to maintain the sustainability of environmental carrying capacity and biocapacity.

The optimization of community participation is supported by Article 70 Section (3), community participation is carried out in order to:

- a. Increase the awareness of environmental protection and management;
- b. Increase self-reliance, community empowerment, and partnerships;
- c. Increase the community capability and pioneering;
- d. Increase the community ability to conduct social supervision;
- e. Develop and promote local culture and wisdom in order to preserve the functions of the environment.

Article 70 Section (3) of Act Number 32 of 2009 regulates the role of the community: communities have equal and extensive opportunity to participate in environmental management. "Referring to contextualism in interpretation, there is a principle '*noscitur a sociis*' which means something known from its association or that a word must be interpreted from its sequence" (Hajon, 2005:26); thus, the provisions in Article 70 Section (3) allow the community to possess an extensive environmental management system through the empowerment of their rationality in regarding the relationship between human and the environment.

Actually, development is a cultural process that is pursued by humans, either by interacting with human beings and their natural environment to achieve prosperity. Human value in development process is based on the philosophy that human

nature is *essential up operator*, that human is an essence that exists in all its activity. Sociologically, human is always involved in a movement of change (Siahaan, 2007:86)

In addition to that, there is another thing to be considered: regulatory measures in development and improvement of tourism must be increased, especially ones that are able to realize integrity in tourism, maintain sustainability, and increase the improvement of the environment and tourism attractions.

Article 5 Number 10 Year 2009 concerning Tourism states that Tourism is organized with this principle: upholding religious norms and cultural values as the embodiment of the concept of life in a balanced relationship between humans and the God, the relationship among fellow humans, and the relationship between humans and the environment. This principle is a form of *Tri Hita Karana* in Hinduism. The law should be based on moral principles, and not only being accepted by people, as it follows people's conscience and is accepted by religion. In this case, the purpose of religion is to change people or to make social transformation. To understand this transformative message, an analytic approach should be applied toward the revelations that have been given (Hamidi, 2012:238)

The previous explanation indicates that the concept of conservation in environmental management will be a potential that can create sustainability of tourism, especially cultural tourism. The environment and cultural tourism in TengananPegringsingan are interconnected, making TengananPegringsingan a *Bali Age* village as well as a tourist destination and being promoted to be World Cultural Heritage.

According to the cosmic-magical mind, humans are integral part of their natural environment. Humans influence and are influenced by the environment. Humans also have interconnectedness and dependence on the environment. As a result, their insight becomes comprehensive and holistic. This holistic insight builds the awareness that human survival depends on the preserve of environment functions and the sustainability of the environment.

"Cosmology in this context is a conceptual construction of the society and individual's knowledge, from which anything hidden is socialized, studied, understood, and therefore applied by the members of society, so that the hidden things (such as magic, myths, rituals) exist in life that continues to proceed towards harmony." (Rato, 2006:2)

In this case, harmony means micro-realm (human or *buana alit*) and macro-realm (the universe or *buanaagung*). This type of customary law is a norm system that implements values, principles, structures, institutions, mechanisms, and religions that are developed and embraced by local communities. It functions as an instrument to maintain the order of interaction among people in society and the order of relationship with God.

E. CONCLUSION

1. *Tri Hita Karana* and local wisdom in environmental management in TengananPegringsingan manifest in its people behavior, in their sacred and profane relationships. Their devotion cannot be separated from their consistent belief in the power of *Tri Hita Karana* in human relationships: relationship between human and God (*Ida Sang Hyang Widhi Wasa*), relationship among fellow humans in social life, and the relationship between human and the environment.
2. In order to anticipate the change that occurs, *Tri Hita Karana* through local wisdom, strengthens by means of legal products created by people, known as *Awig-Awig* of TengananPegringsingan. The *Awig-Awig* regulates people behavior, rights, obligations, and sanctions, both material and immaterial, which are imposed to those who violate the provisions in *Awig-Awig*. The status of TengananPegringsingan as a Tourist Destination does not affect the principle of its people behavior.

Suggestion

Indonesia believes that a state is an integral entity of the elements that constitute it. Thus as the consequence, in environmental management system, there should be encouragement from the legislature and executive on national and regional level to the locals to empower their potentials in order to preserve the environment by a means of strengthening the local law.

REFERENCES

- Bakry, Noor Ms. (2001). *Orientasi Filsafat Pancasila*, Yogyakarta: Liberty.
- Erwin, Muhamad. (2015). *Filsafat Hukum, Refleksi Kritis terhadap Hukum Indonesia (dalam Dimensi Ide dan Aplikasi)*, Jakarta: PT Raja Grafindi Persada.

- Geriya, I Wayan. (2005). *Konsep dan Strategi Revitalisasi Kearifan Lokal Dalam Penataan Lingkungan Hidup* (Makalah Seminar Nasional), Denpasar: Lemlit Universitas Udayana.
- Hajon, Philipus M.; Djatmiati, Tatiek Sri. (2005). *Argumentasi Hukum*, Gajah Mada University Press.
- Hamidi, Jazim (Contributor); Harianto, Aries, dkk (editor). (2012). *Pengembangan Ilmu Hukum berbasis Religiusitas Sains dengan pendekatan Profetik*, Malang: UB Press.
- Hardjasoemantri, Koesnadi. (2005). *Hukum Tata Lingkungan*, Edisikedelapan, UGM Press.
- Ibrahim, Johnny. (2005). *Teori & Metodoogi Penelitian Hukum Normatif*, Bayu Media.
- Nurjaya, I Nyoman. (1985). *Hukum Lingkungan Adat Tenganan Pagringsingan Bali* (Master Thesis).
- Nurjaya, I Nyoman. (2006). *Pengelolaan Sumber Daya Alam dalam Perspektif Antropologi Hukum*, UM Press.
- Rajagukguk, Erman dan Khairandy, Ridwan (Ed). (2001). *Hukum dan Lingkungan Hidup Di Indonesia, 75 Tahun Prof. Dr. Koesnadi Hardjasoemantri, SH.ML*, Jakarta: Program Pasca Sarjana Fakultas Hukum Universitas Indonesia.
- Rasjidi, Lili. (1989). *Dasar-Dasar Filsafat Hukum*, Alumni Bandung.
- Rasjidi, Lili; Putra, Wyasa. (2003). *Hukum Sebagai Suatu Sistem, Mandar Maju*, Bandung.
- Rato, Dominikus. (2004). *Hukum yang Berkenaan Dengan Tanah Dalam Kosmologi Masyarakat Osing* (Dissertation)
- Siahaan, NHT. (2007). *Hutan, Lingkungan dan Paradigma Pembangunan*, Pancuranalam.
- Thaib, Dahlan; Hamidi, Jazim; dan Huda, Ni'matul, (2015). *Teori dan Hukum Konstitusi*, Rajawali Press.
- Yas, Abdia, et. all. (2007). *Potret Pluralisme Hukum Dalam Penyelesaian Konflik Sumber Daya Alam, Pengalaman Dan Perspektif Aktivis*, Huma.

LOCAL REGULATION :

Awig-Awig of Tenganan Pegringsingan.

ACTS :

Act Number 10 Year 2009

Act Number 32 Year 2009

The 1945 Constitution of the Republic of Indonesia