The 3rd International Conference on Technology and Operations Management
"Sustaining Competitiveness through Green Technology Management"

Bandung – Indonesia, July 4-6, 2012

Eco-sustainable Campus Initiatives: A Web Content Analysis

Gunawan[1,*], Elieser Tarigan[1], Dina Natalia Prayogo[1], Lisa Mardiono[1]

[1] Faculty of Engineering - Universitas Surabaya (Ubaya),
Jl. Raya Kalirungkut, Surabaya 60293, Indonesia

Abstract. Though many prominent universities in the world have been implementing the sustainability programs for many years, few universities in Indonesia are just start taking the initiative to develop eco-campus, sustainable campus or green campus. In this current state, the Indonesian universities are still lack of practical framework to guide their sustainability programs. While some articles offer conceptual or practical sustainability frameworks, the actual campus sustainability practices are not much explored. This paper fills the gap by investigating the actual campus sustainability practices from some major universities in the world. The findings shows that campus sustainability initiative is commonly implemented with an integrated approach covering environmental management, green building, public participation, teaching and research. In addition, the initiative is guided by a high level sustainability policy/plan, and the presence of dedicated organizational unit to manage sustainability program. Furthermore, the investigation of the Indonesian university shows that only four of ten sites have a dedicated a sub-domain web site for the sustainability initiative, the real activities are still minimum, and the absence of a dedicated organizational unit. The findings could help Indonesian universities in their sustainability endeavor.

Keywords: Sustainability, eco-campus, green campus, green technology, web analysis

1. Introduction

Like firms, higher education institutions can generate significant environmental impacts because of their huge use of energy, extensive transportation, massive waste, high consumption of materials, and extensive development of built facilities. As thousands of people (students) come and go every year in these educational institutions, the concern on practicing sustainability and educating the students are highly important. In general, university has responsibility in sustainable development to promote the sustainability culture to its students, staff, and community. Campus sustainability has become an issue of global concern for university policy makers and planners as result of the realization of the impacts the activities and operations of universities have on the environment (Alshuwaikhat and Abubakar, 2008).

Although many prominent universities in the world have been implementing the sustainability programs for many years, Indonesia universities are just start taking initiatives to develop eco-campus, sustainable campus or green campus. In this state, the Indonesian universities are still lack of practical framework to guide them in

---

* Corresponding author.
  E-mail address: gunawan@ubaya.ac.id

their sustainability programs. Though some articles offers conceptual or practical frameworks of campus sustainability, the knowledge on the current and actual campus sustainability practices is still limited.   This paper fills the gap by presentting the investigation of the real sustainability practices from some major universities in the world. The findings could be used by Indonesian universities whether to initiate or to manage their sustainability program.

2. Conceptual Background

The term sustainability and sustainable development were coined in the report "Our Common Future," released by the Brundtland Commission of the United Nations in 1987. This report provides the most popular definition of sustainability: "Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs." (World Commission on Environment and Development, 1987).   The concept is then elaborated by John Brett Elkington who coined a concept of Triple Bottom Line (TBL) in 1994. Elkington argued that companies should be preparing three different bottom lines: (1) corporate profit (and loss) account, (2) company's "people account" which addresses how socially responsible an organisation has been throughout its operations, (3) the company's "planet" account which measures how environmentally responsible it has been (Economist, 2009). This three Ps represents three pillars of sustainability: economic sustainability (profit), sociopolitical sustainability (people) and environmental sustainability (planet) (Adams, 2006). Instead of three separate dimensions, International Union for Conservation of Nature used the interlocking circles model to demonstrate that the three objectives need to be better integrated, with action to redress the balance between dimensions of sustainability (Adams, 2006). Despite the TBL popularities, Norman and MacDonald (2004) criticized this rhetoric concept as "badly misleading, and may in fact provide a smokescreen behind which firms can avoid truly effective social and environmental reporting and performance"especially for the social dimension.

While the concept of sustainability and TBL was originally linked to business, higher education institution has also long history in the sustainability initiative. Lozano et al (2012) identified 24 declarations, with the oldest is   the 1972 Stockholm Declaration on the Human Environment, and the latest is 2009 Torino Declaration on Education and Research for Sustainable and Responsible Development. The Stockholm Declaration recognized the important role of education on an international level in fostering environmental protection and conservation; on the other hand, the Turin Declaration emphasises the importance of the interdependence and interaction between economics, ethics, energy policy, and ecology (the 4 E's) (Lozano, *et al.*, 2012). These two indicate that the sustainability scope has extended from the environmental aspect only to a more comprehensive issue. The comprehensive and multidimensional sustainability issues require an integrated and systematic approach to decisions making, investment and management processes (Saleh et al, 2011).

Velaquez et al (2006) proposed a comprehensive definition of sustainable university as "a higher educational institution, as a whole or as a part, that addresses, involves and promotes, on a regional or a global level, the minimization of negative environmental, economic, societal, and health effects generated in the use of their resources in order to fulfill its functions of teaching, research, outreach and partnership, and stewardship in ways to help society make the transition to sustainable lifestyles". In line with this definition, Alshuwaikhat and Abubakar (2008) proposed an integrated approach for achieving campus sustainability, which consists of three elements: university environmental management systems, public participation & social responsibility, and sustainability teaching and research.   The article explained that environmental management system consists of two initiatives: (1) environmental management & improvement which are related to waste minimization, energy efficiency, and environmental conservation; and (2) green campus to promote construction of green buildings and transportation facilities such as footpaths, cycle-ways, greenways, etc. The public participation and social responsibility indicates the participation of university stakeholders in achieving sustainability, and university social responsibility of promoting environmental justice and equity to all especially for people of special needs (Alshuwaikhat and Abubakar, 2008). The sustainability in teaching and research indicates the need to promote sustainability through courses taken by students and develop the innovative solution in sustainability through research such as renewable energy sources, electricity generation, green products, and resource conservation. In addition, there are some other frameworks or tools to assess the level of sustainability achievement. Saadatian et al (2011) found 17 different sustainable higher education assessment tools and investigated their comprehensiveness, novelty and popularity.

The effective implementation of campus sustainability could not be done through an individual or a group idea but it should be institutionalized into a university system. Based on Cortese (2003) who proposed four dimensions of a university system, Lozano (2006) add one more so that becoming five dimensions: (1) education, (2) research, (3) campus operations, (4) community outreach, and   (5) assessment and reporting. The first four

have been covered in the Alshuwaikhat and Abubakar's framework (AA's framework). The lack of comprehensive approach could lead to the problems. Some problems occured mostly are related to the low priority of environmental issues on the campus agenda, a lack of coordination between and among activists and key communities (Saleh et al, 2011). Universities often promote sustainable campus in a simple and misleading way. For example, a sustainable campus is just having master plan, environmental plan, or environmental statement (Velaquez et al, 2006), while others may believe that they may have met the challenge of sustainability through signing of national or international declarations (Wright, 2002).

3. Method

The study adopted a web content analysis method for three groups of sample. The first is 10 sites of the campus sustainability program taken from the top list sites searched by Google using search-word 'sustainability university campus.' The second is 10 sites taken from the top 10 universities listed in the UI Greenmetric World University Ranking 2011 (http://greenmetric.ui.ac.id/). The third is top 10 Indonesian universities listed in that Greenmetric ranking. The investigation of the websites is focused mostly on the dedicated web pages for sustainability program. The investigation goes to web menus and the content of web pages. The basic framework used is the one proposed by Alshuwaikhat and Abubakar (AA's framework).

Table 1. Sample of universities

No	Top 10 Google search	top 10 UI Green Metric 2011 ranking	top 10 Indonesian university in UI Green Metric 2011 ranking
1	University of Maryland	University of Nottingham	Universitas Indonesia
2	Northern Arizona University	Northeastern University	Institut Pertanian Bogor
3	University of Sydney	University of Connecticut	Institut Teknologi Bandung
4	University of Melbourne	University College Cork	Institut Teknologi Sepuluh November
5	University of British Columbia	Linkoping University	Universitas Negeri Semarang
6	Cornell University	University of California, Berkeley	Universitas Islam Indonesia
7	Concordia University	University of California, Los Angeles	Universita Gunadarma
8	University of Chicago	Washington University In St. Louis	Universitas Lampung
9	Clark University	University of California Merced	Universitas Bengkulu
10	University of Pennsylvania	University of Bath	Universitas Surabaya

4. Findings and Analysis

Table 2 presents the findings, which show that seven items of environmental management systems are implemented by the majority sites of those 20 overseas universities. Some campuses do not indicate the natural environment program (campus preservation, biodiversity) possibly because they are metropolitan campuses.

The investigation of webpage content shows an example of achievement in waste management as follows:

> *"This brings the University's overall diversion from landfill rate (of both general waste and office paper), to around 75% of all waste produced."*

Furthermore, an example of the action on energy efficiency is as follows

> *"Cornell is reducing energy consumption through conservation and efficiency, and switching to cleaner and renewable sources of energy such as solar, wind, geothermal, and low-impact hydropower. Implementing conservation measures and switching to renewable sources of energy can also help save money."*

One of university sites indicates an example of achievement in the water conservation program:

> *"The campus uses approximately a half billion gallons of water annually, however, water consumption decreased 14.4 percent between 2007 and 2009. The reason for the sharp decrease in water consumption is likely the result of new water saving devices such as low-flow toilets, showers, faucets, and moisture sensors on irrigated fields."*

Table 2. Findings

Sustainable programs	UIGM + Google 20 sites		Indonesian 10 sites	
	count	pct	count	pct
1. Environmental Management Systems				
a. Environmental Management and Improvement				
waste management	19	95%	4	40%
energy efficiency	19	95%	4	40%
water	16	80%	4	40%
purchasing	18	90%	0	0%
b. Green campus				
building	18	90%	3	30%
transportation	17	85%	3	30%
campus preservation	12	60%	4	40%
2. Public Participation & Social responsibility				
public participation	9	45%	1	10%
community service	9	45%	1	10%
social justice	1	5%	0	0%
3. Sustainability Teching & Researach				
conference, seminar, workshop	2	10%	0	0%
course & curriculum	15	75%	0	0%
R&D	16	80%	1	10%
4. Additional				
sustainability policy	18	90%	4	40%
organization & governance	18	90%	0	0%
dedicated web	20	100%	4	40%
internal participation	13	65%	3	30%
assesment	9	45%	0	0%
climate change	8	40%	0	0%
food	6	30%	0	0%

Most of the 20 universities indicate the university policy in 'green' purchasing as the following example:

> *"will procure all supplies, services, maintenance, construction and architect-engineer services in a manner consistent with the promotion of sound environmental stewardship and, in particular, promoting the reduction of carbon emissions as envisioned by the University's Climate Action Plan."*

The achievement in green purchasing is also worthy to note as the following example:

> *"The campus spent $6.1 million spent on green purchasing from 2008-2009. Two-thirds went towards Energy Star and/or EPEAT certified electronics, and one-quarter went to recycled-content offices and supplies".*

Furthermore, the public participation and community service is only implemented by less than a half of the 20 sites. Social justice is rarely observed. Promoting sustainability through teaching and research is almost conducted by the majority of campuses, but through seminar is minimum.

In addition to the three elements, the study identified some other major features. First, the university sustainability policy and a dedicated organization/team/structure to manage sustainability program is explicitly found in 90% sites. This reflects a high commitment from the university top management. This dedicated unit is often named as "Office of Sustainability", and in some cases as "Sustainability Committee" and "Sustainable Campus Team". The unit could be placed under the current structure as the following excerpt from the webpage:

"The Sustainable Campus Team, based in Campus Infrastructure & Services, works with staff and students across the campuses to achieve the University's sustainability performance goals".

The sustainability policy is often made as a strategic plan, for example: "Environmental Sustainability Strategic Plan 2011 – 2015" and "Campus Sustainability Plan". About a half of websites publish their assessment and report of sustainability performance, named for example as: "Annual Report on implementation of sustainability initiatives", "Sustainability Metrics Report", and "Energy reduction committee report". This kind of report provides valuable information to university stakeholders about the success of the program every year.

The investigation also found that internal participation from student, academic, and staff often presented in a web menu as "Get involved". Some campuses, expecially US universities join a declaration in climate change programs, as shown in Table 2. Sustainability in food and dining service are also implemented in some campuses (30%). An excerpt of web page shows:

"The University has recently adopted a new policy on sustainable foodservices practices. Cal Dining has increased its percentage of sustainable food purchases by almost 3 points in the past year (26.8%, exceeding the campus goal). Nearly all plastic trays have been eliminated, and Cal Dining offers 100% organic salad bars in all four dining commons and has also partnered with "Buy Fresh Buy Local".

The investigation of Indonesian university sites show that only four out of ten have dedicated web pages for campus sustainability programs, which are belongs to: Universitas Indonesia (UI), Institut Teknologi Bandung (ITB), Institut Teknologi Sepuluh November (ITS), and Universitas Negeri Semarang (Unnes). These four are among the top five in the ranking list. ITS website presents the most comprehensive program covering: energy, waste, water, transportation, biodiversity, socio-engineering, and building (master plan). Unnes also has sustainability plan in the area of clean energy, paperless, waste management, green architecture (built environment), transportation, and biodiversity as well as socio-cultural aspect. ITB web presents waste, infrastructure, and education. UI website presents the policy and biodiversity. The other six university sites have no dedicated web pages on their sustainability program.

Table 2 indicates some differences between the findings of 20 overseas universities and Indonesian universities. Environmental management and green campus seem to be the main focus of sustainable campus (eco-campus) program among Indonesian universities. However, purchasing policy is still missing among Indonesian universities, which indicates that the focus is so far on the waste treatment rather than systematically to reduce the waste through a green purchasing policy. Promoting public participation in sustainability is still not explored. This might indicate that campus sustainability implementation is still in its early stage to share its performance to and to involve public/ external parties. Sustainability in teaching and research is also not taken yet. Furthermore, the finding shows the lack of dedicated organization/ governance to manage the sustainability program. Overall the findings of Indonesian universities reveals that sustainability is still not integrated into university systems, as coined by Lozano, *et al.* (2011), therefore its implementation is partial.

5. Proposed Framework

Based on the AA's framework and the empirical findings, this study proposed a campus sustainability framework consisting of five elements and its sub-elements as follows:

1. Environmental Management Systems
   - waste management
   - energy efficiency
   - water
   - purchasing
2. Green campus
   - building
   - transportation
   - campus preservation
   - food
3. Teaching & Research
   - course & curriculum
   - R&D
4. Participation
   - internal participation

        - public participation
        - community service
5.   Policy and governance
        - sustainability policy
        - assesment and report
        - organization
        - dedicated web

The first four elements are taken from the AA's three elements. Environmental management systems and green campus are split as they are the two main sustainability operations within campus, and both have different characteristics. Policy and governance is added as it is the important part of campus level sustainability program.

6. Conclusions and Recommendation

The study overall indicates that overseas universities have implemented sustainability comprehensively including environmental management systems, public participation, and teaching & research. However, Indonesian universities are still much lack behind in this sustainability endeavor, in which the sustainability initiative is still starting to emerge. The major sustainability program among Indonesian campuses so far still concentrate on the environmental management; teaching & research are still not explored intensively. Indonesian higher education institutions have also some sustainability policies but it is still not as a university strategic plan, and the implementation is not managed by a dedicated organizational unit.

This study has indicated that the sustainable campus or eco-campus has a broad perspective, and should not be seen as a program for planting trees and making the campus green. The findings of this study could be used by Indonesian universities to plan the sustainability program. This study in more specific suggests them to:

- Develop a comprehensive sustainability strategic plan in the campus level
- Integrating the sustainability in course and curriculum
- Doing research in the sustainability area
- Creating a formal organizational unit or committee to manage the sustainability program
- Developing a website on sustainability programs as a promoting media.

The use of the findings should be seen within the limitation of this study. This study only investigates the program and activities presented in the university web sites. There are possibilities that not all activities are published in the web. However, as a website in world universities is generally managed well, and used as a campaign media, it is likely that the web provides comprehensive information. This condition might be different for Indonesian universities, where their websites might not provide comprehensive and updated information of sustainability programs. Finally, the findings and proposed framework could also be used for further research to identify current condition and develop technological solutions suited Indonesian conditions.

Acknowledgements

References

[1]   Adams, W.M. (2006). "The Future of Sustainability: Re-thinking Environment and Development in the Twenty-first Century." (http://cmsdata.iucn.org/downloads/iucn_future_of_sustanability.pdf) Report of the IUCN Renowned Thinkers Meeting, 29–31 January 2006. Retrieved on: 2012-05-11.

[2]   Alshuwaikhat, H.M. and Abubakar, I. (2008) "An integrated approach to achieving campus sustainability: assessment of the current campus environmental management practices", *Journal of Cleaner Production*, vol. 16, pp. 1777-1785.

[3]   Cortese AD. (2003) "The critical role of higher education in creating a sustainable future", *Planning for Higher Education*, vol 31, no 3, pp. 15-22.

[4]   Economist (2009) "It consists of three Ps: profit, people and planet", Nov 17th 2009 http://goo.gl/BXuE9, accessed 14 May 2012

[5]   Lozano, R. (2006) "Incorporation and institutionalization of SD into universities: breaking through barriers to change", *Journal of Cleaner Production*, vol 14, no 9, pp. 787-796.

[6] Lozano, R., Lukman, R., Lozano, F.J., Huisingh, D., and Lambrechts, W. (2012) "Declarations for sustainability in higher education: becoming better leaders, through addressing the university system", *Journal of Cleaner Production*, article in press.

[7] Norman, W. and MacDonald, C. (2004) "Getting to the bottom of Triple Bottom Line", *Business Ethics Quarterly*, Vol 14, issue 2, pp. 243-262.

[8] Saadatian, O., Dola, K.B., Salleh, E.I., and Tahir, O.M. (2011) "Identifying Strength and Weakness of Sustainable Higher Educational Assessment Approaches", *International Journal of Business and Social Science*, vol. 2, no. 3 , Special Issue - January 2011

[9] Saleh, A. A., Kamarulzaman, N., Hashim, H., Hashim, S.Z. (2011) An Approach to Facilities Management (FM) Practices in Higher Learning Institutions to Attain a Sustainable Campus (Case Study: University Technology Mara - UiTM), *Procedia Engineering*, 20, 269 – 278.

[10] Velaquez L., Munguia N., Platt A. and Taddei J. (2006) "Sustainable University: What Can Be Matter", *Journal of Cleaner Production*, vol 14, no 8, pp.810-819.

[11] World Commission on Environment and Development (1987) "*Our common future*", Oxford University Press, Oxford.

[12] Wright, T.S.A. (2002) "Definitions and Frameworks for the Environment Sustainability in Higher Education". *Higher Eduction Policy*, vol 15, no 2, pp.105-20.

Cite this paper

Conference Proceedings

The 3rd INTERNATIONAL CONFERENCE on
Technology and Operations Management (ICTOM)
"Sustaining Competitiveness through Green Technology Management"

East Hall Auditorium - ITB
Bandung - Indonesia, July 4-6, 2012

Hosted by
- School of Business and Management (SBM), Institut Teknologi Bandung (ITB), Indonesia
- College of Business (CoB), Universiti Utara Malaysia (UUM), Malaysia

Sponsored by
PT Bank Mandiri (Persero), Tbk., PT Krakatau Wajatama, PT PLN (Persero), PT Telekomunikasi Indonesia, Tbk., PT Angkasa Pura II (Persero), Bank BNI Cabang PTB Bandung

Supported by
- Asian Journal of Technology Management (AJTM)
- Journal of Technology and Operations Management (JTOM)
- Jurnal Manajemen Teknologi (ManTek)

Conference Chair   Mursyid Hasan Basri

Editors   Dermawan Wibisono, Akbar Adhiutama, Corinthias Pamatang Morgana Sianipar

Proceedings of

The 3rd International Conference
on
Technology and Operations Management

"Sustaining Competitiveness through Green Technology Management"

Editors:

Dermawan Wibisono

Akbar Adhiutama

Corinthias P. Morgana Sianipar

School of Business and Management (SBM)
Institut Teknologi Bandung (ITB)
Indonesia

Proceedings of The 3ʳᵈ International Conference on Technology and Operations Management: Sustaining Competitiveness through Green Technology Management

by: Operations and Performance Management (OPM) Interest Group, School of Business and Management (SBM), Institut Teknologi Bandung (ITB), Indonesia

Editors: Dermawan Wibisono, Akbar Adhiutama, Corinthias Pamatang Morgana Sianipar

Preface

Mursyid Hasan Basri

Dr., S.T., M.T.

(The 3rd ICTOM Conference Chair)

Operations and Performance Management (OPM) Interest Group

School of Business and Management (SBM)

Institut Teknologi Bandung (ITB)

Indonesia

The world needs to reduce its dependency on fossil fuel (non-renewable energy) as it is fast depleting and due to the harmful impact to the environment – most notably 'Climate Change'. Therefore, Green Technology now becomes an even greater significance. We expect that academic scientists, leading engineers, industry researchers and scholar students would exchange and share their experiences and discuss research results on how we can survive and sustain in the future with green technology. The issues are not only about developing technologies, but also how to manage them properly in order to gain maximum benefit for the societies.

This volume contains papers accepted to The 3rd International Conference on Technology and Operations Management (ICTOM 2012) which themed *Sustaining Competitiveness through Green Technology Management*. The conference was held in East Hall – ITB and SBM-ITB (School of Business and Management - ITB) on July 4-6, 2012.

Nowadays, the entire world is experiencing very complex and chaotic economic situations. Despite the global economic slowdown, it is very encouraging for us to receive over than one hundred submissions from various countries, and accept less than three-fourth submitted papers written by one hundred forty-eight authors for oral presentation to share their knowledges. We are also very grateful for the acceptance of keynote speakerships by well-known senior researchers and international as well as regional practicioners in Technology and Operations Management discipline specifically in Green Technology Management area.

ICTOM 2012 was organized by SBM-ITB, especially Operations and Performance Management (OPM) Interest Group. This conference shows our third collaboration with the esteemed College of Business - Universiti Utara Malaysia. We have been successfully organized the previous conferences at West Hall ITB in 2006 and at Langkawi, Malaysia in 2010.

We hope that this 3rd scientific meeting forum could contribute to introduce and promote Technology and Operations Management especially in Indonesia, to open the way for possible collaboration between local and international academicians and practitioners to promote ITB, in particular SBM-ITB, as a world class university and as the leading higher institution in the field of technology and operations management.

On this occasion, we would like to say a big thank you to everyone who has helped in organizing this international conference and the preparation of proceedings. We also apologize for any shortcomings, both in the organizing of the conference and in the preparation of conference proceedings.

We look forward for your continuing supports and active participations in the next International Conference on Technology and Operations Management.

Committees

The 3rd INTERNATIONAL CONFERENCE on
TECHNOLOGY and OPERATIONS MANAGEMENT (ICTOM 2012)
"Sustaining Competitiveness through Green Technology Management"
East Hall - ITB, Bandung - Indonesia, Wednesday, July 4-6, 2012

TRUSTEE **:** Rector of Institut Teknologi Bandung

ADVISORY COMMITTEE

Prof. Dr. Sudarso Kaderi Wiryono	Institut Teknologi Bandung (ITB)	Indonesia
Prof. Ir. Dr. Che Sobry bin Abdullah	Universiti Utara Malaysia (UUM)	Malaysia
Prof. Madya Dr. Zulkifli Mohamed Udin	Universiti Utara Malaysia (UUM)	Malaysia

CONFERENCE CHAIR

Dr. Mursyid Hasan Basri	Institut Teknologi Bandung (ITB)	Indonesia

SCIENTIFIC COMMITTEE

Chairman **:** Dr. Dermawan Wibisono — Institut Teknologi Bandung (ITB) — Indonesia
Members **:**

Prof. Dr. Ir. Jann H. Tjakraatmadja, MSIE.	Institut Teknologi Bandung (ITB)	Indonesia
Prof. Togar M. Simatupang, M.Tech., Ph.D.	Institut Teknologi Bandung (ITB)	Indonesia
Prof. Ir. Dr. Che Sobry bin Abdullah	Universiti Utara Malaysia (UUM)	Malaysia
Prof. Kazuhiro Fukuyo, Ph.D.	Yamaguchi University	Japan
Assoc. Prof. Dr. Hartini Ahmad	Universiti Utara Malaysia (UUM)	Malaysia
Assoc. Prof. Dr. Shahimi Mohtar	Universiti Utara Malaysia (UUM)	Malaysia
Ir. Gatot Yudoko, MASC., Ph.D.	Institut Teknologi Bandung (ITB)	Indonesia
Ade Febransyah, Ph.D.	Prasetiya Mulya Business School	Indonesia
Deddy P. Koesrindartoto, Ph.D.	Institut Teknologi Bandung (ITB)	Indonesia
Catharina Badra Nawangpalupi, Ph.D.	Parahyangan University (Unpar)	Indonesia
Yudi Azis, Ph.D.	Padjadjaran University (Unpad)	Indonesia
Wawan Dhewanto, Ph.D.	Institut Teknologi Bandung (ITB)	Indonesia
Dr. Eng. Utomo Sarjono Putro	Institut Teknologi Bandung (ITB)	Indonesia
Dr. Ir. Mustika Sufiati Purwanegara, M.Sc.	Institut Teknologi Bandung (ITB)	Indonesia
Dr. Ir. Budhi Arta Surya, M.Sc.	Institut Teknologi Bandung (ITB)	Indonesia
Dr. Akbar Adhiutama	Institut Teknologi Bandung (ITB)	Indonesia
Dr. Kamal Ab. Hamid	Universiti Utara Malaysia (UUM)	Malaysia
Dr. Rika Ampuh Hadiguna	Andalas University	Indonesia
Dr. Mursyid Hasan Basri	Institut Teknologi Bandung (ITB)	Indonesia
Dr. Norani Nordin	Universiti Utara Malaysia (UUM)	Malaysia
Dr. Norlena Hasnan	Universiti Utara Malaysia (UUM)	Malaysia
Dr. Tomy Perdana, SP., MM.	Padjadjaran University (Unpad)	Indonesia
Dr. Mohd. Rizal Razali	Universiti Utara Malaysia (UUM)	Malaysia
En. Faisal Zulhumadi	Universiti Utara Malaysia (UUM)	Malaysia
Ir. John Welly, M.Sc.	Institut Teknologi Bandung (ITB)	Indonesia
Ir. Subiakto Soekarno, MBA.	Institut Teknologi Bandung (ITB)	Indonesia
Ir. Bambang P. Kusumo Bintoro, MBA.	Institut Teknologi Bandung (ITB)	Indonesia
Anggoro Budi Nugroho, S.E., MBA.	Institut Teknologi Bandung (ITB)	Indonesia
Achmad Ghazali, S.T., MBA.	Institut Teknologi Bandung (ITB)	Indonesia

ORGANIZING COMMITTEE

Chairman	:	Dr. Akbar Adhiutama
Treasurer	:	Sitti Choiriah, S.T., MBA.
		Julyafanny Asnawiyah, S.T.
Field Coordinator	:	Marina Natalia Tampubolon, S.Si., Apt.
Program	:	Santi Setyaningsih, S.T.
		Adita Pritasari, S.T.
		Koji Sasaki, B.Eng.
		Ruben Juliarto, S.E.
Administration & Registration	:	Fitri Rakhmayani, S.Sos.
		Ummu Hani, S.T.
		Estav Huda, S.I.P.
Accommodation	:	Fatma Poni Mardiah, S.E.
Sponsorship & Media Partnership	:	Merlyn Rakhmaniar, S.T.
		Imelda Febrina, S.Si.
		Yulianthy Azani Putri Pane, S.E.
Publication	:	Nunik Rahayu, S.Psi.
Logistics	:	Corinthias P. Morgana Sianipar, AET., BASC.
		Arif Adrian, S.E.
		Rucita Cahyawati Putri, S.K.M.
		Ilma Nurul Rachmania, S.Sos.
		Febri Andika, S.M.B.
Documentation	:	Faturochman

Table of Contents

	BEST PAPERS	1

Topic	Green Technology and Initiatives	31

3rd International Conference on
Technology and Operation Management 2012

Certificate

Awarded to

Gunawan

As Presenter

The 3rd International Conference on Technology and Operations Management
'Sustaining Competitiveness through Green Technology Management'

East Hall - School of Business and Management ITB

Bandung, July 4-6, 2012

D e a n,
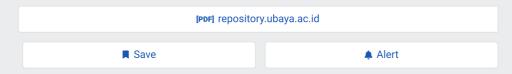
Prof. Dr. Sudarso Kaderi Wiryono

Eco-sustainable Campus Initiatives: A Web Content Analysis

G. Gunawan, E. Tarigan, +1 author Lisa Mardiono • Published 4 July 2012 • Education

Though many prominent universities in the world have been implementing the sustainability programs for many years, few universities in Indonesia are just start taking the initiative to develop eco-campus, sustainable campus or green campus. In this current state, the Indonesian universities are still lack of practical framework to guide their sustainability programs. While some articles offer conceptual or practical sustainability frameworks, the actual campus sustainability practices are not much explored. This paper fills the gap by investigating the actual campus sustainability practices from some major universities in the world. The findings shows that campus sustainability initiative is commonly implemented with
an integrated approach covering environmental management, green building, public participation, teaching and research. In addition, the initiative is guided by a high level sustainability policy/plan, and the presence of dedicated organizational unit to manage sustainability program. Furthermore, the investigation of the Indonesian university shows that only four of ten sites have a dedicated a sub-domain web site for the sustainability initiative, the real activities are still minimum, and the absence of a dedicated organizational unit. The findings could help Indonesian universities in their sustainability endeavor. Collapse

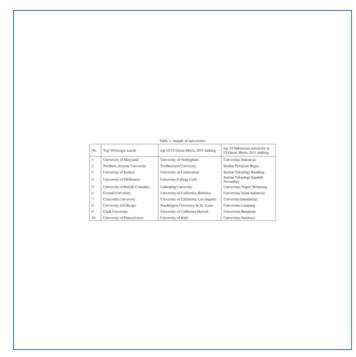[PDF] repository.ubaya.ac.id

🔖 Save   🔔 Alert

Share This Paper

8 Citations

Background Citations   1

View All

Tables

8 Citations

10 References

Related Papers

Tables from this paper

Table 1

Table 2

8 Citations

Web Content Analysis On Sustainable Campus Operation (SCO) Initiatives

R. Razman, A. H. Abdullah, A. Wahid, R. Muslim · Education, Business · 2017

The purpose of this paper is to identify and analyse the current practices implemented in global universities for achieving sustainability throughout campus operations. This study adopted a web… Expand

❝ 5 | PDF • ≡ View 2 excerpts, cites background | 🔖 Save | 🔔 Alert

A review of empirical data of sustainability initiatives in university campus operations

A. Amaral, Eugénio Rodrigues, A. Gaspar, Á. Gomes · Engineering · 2020

❝ 37 | PDF • 🔖 Save | 🔔 Alert

STRATEGIES, CHALLENGES AND SOLUTIONS TOWARDS THE IMPLEMENTATION OF GREEN CAMPUS IN UiTM PERAK

Haryati Mohd Isa, Daljeet Singh Sedhu, N. S. Lop, Kushairi Rashid, Othman Mohd Nor, Mohd Iffahd · Business · 2021

Green initiatives have become a phenomenon globally now. This has taken seriously all parties regarding the process of environmental sustainability. Sustainable Development Goals had been used as a… Expand

❝ 4 | PDF • 🔖 Save | 🔔 Alert

Key Performance Indicators for Sustainable Campus Assessment: A Case of Andalas University

E. Amrina, F. Imansuri · Education · 2015

Sustainable campus has became an important issue amongst universities around the world. Universities can generate a significant impacts to environment due to the high usage of energy, extensive… Expand

❝ 10 | PDF • 🔖 Save | 🔔 Alert

Tracking ' eco ' footprint in university web

Gunawan, D. Prayogo, R. D. Wahyudi, S. Wibowo · Education · 2016

Higher education institutions (HEIs) in less developed countries such as Indonesia might start taking the initiative to create plans for incorporating sustainability and environmental literacy in… Expand

PDF • 🔖 Save | 🔔 Alert

Elements and Dimensions of Sustainability in Iran's Higher Education System, and Comparison of Public and Non-Governmental Academic Approaches

S. Darabi, N. Azizi, J. Salimi, Naser Shirabegi · Education · Iranian Journal of Educational Sociology · 2019

Purpose : The main objective was to research the elements and dimensions of university sustainability and to provide a comprehensive conceptual model for the realization of a sustainable university… Expand

PDF • 🔖 Save | 🔔 Alert

Industrial Engineering, Management Science and Applications 2015

M. Gen, Kuinam J. Kim, Xiao-Bo Huang, Yabe Hiroshi · Education · Lecture Notes in Electrical Engineering · 2015

TSS Batik Study Design for Different Study Location Environment, A Comparison Approach for Accuracy Feature of Requirements Approach on Operation and Maintenance Guideline Abstract. Sustainable… Expand

❝ 6 | PDF • 🔖 Save | 🔔 Alert

Design and Validation of Instrument for Evaluating Indicators of Pedagogy in Sustainable Teaching- Learning Process in Higher Education

S. Darabi, N. Azizi, J. Salimi, N. Shirbegi · Education · Research in Medical Education · 2021

Introduction: In recent years, higher education has faced three major paradigm shifts: "Development of lifelong learning", "Democratization of knowledge" and "Development of the global knowledge… Expand

PDF • 🔖 Save | 🔔 Alert

References

SHOWING 1-10 OF 10 REFERENCES

An integrated approach to achieving campus sustainability: Assessment of the current campus environmental management practices

Habib M. Alshuwaikhat, I. Abubakar · Education · 2008

66 730 · 💡 Highly Influential · PDF · ☰ View 5 excerpts, references background · 🔖 Save · 🔔 Alert

Sustainable university: what can be the matter?

L. Velazquez, N. Munguia, Alberto Platt, Jorge Taddei · Education · 2006

66 597 · PDF · ☰ View 2 excerpts, references background · 🔖 Save · 🔔 Alert

Declarations for sustainability in higher education: becoming better leaders, through addressing the university system

R. Lozano, R. Lukman, F. J. Lozano, D. Huisingh, W. Lambrechts · Education · 2013

66 758 · ☰ View 1 excerpt, references background · 🔖 Save · 🔔 Alert

An Approach to Facilities Management (FM) Practices in Higher Learning Institutions to Attain a Sustainable Campus (Case Study: University Technology Mara - UiTM)

A. A. Saleh, N. Kamarulzaman, Hasnan Hashim, S. Z. Hashim · Business · 2011

66 27 · 🔓 PDF · ☰ View 2 excerpts, references background · 🔖 Save · 🔔 Alert

Identifying Strength and Weakness of Sustainable Higher Educational Assessment Approaches

O. Saadatian, K. Dola, I. Salleh, O. M. Tahir · Education · 2011

Sustainable Higher Education (SHE) is regarded as one of the most influential medium of facilitating sustainable development movement in the world. SHE assessment approaches are tools or frameworks… Expand

66 31 · ☰ View 1 excerpt, references background · 🔖 Save · 🔔 Alert

THE CRITICAL ROLE OF HIGHER EDUCATION IN CREATING A SUSTAINABLE FUTURE

A. Cortese · Education · 2003

Anthony D. Cortese is a sustainability consultant and president and cofounder of Second Nature, a national nonprofit organization in Boston, Massachusetts, that works to make sustainability a… Expand

66 1,049 · PDF · ☰ View 2 excerpts, references background · 🔖 Save · 🔔 Alert

Getting to the Bottom of "Triple Bottom Line"

Wayne J. Norman, C. MacDonald · Philosophy · Business Ethics Quarterly · 2004

Abstract: In this paper, we examine critically the notion of "Triple Bottom Line" accounting. We begin by asking just what it is that supporters of the Triple Bottom Line idea advocate, and attempt… Expand

66 989 · PDF · ☰ View 1 excerpt, references background · 🔖 Save · 🔔 Alert

The Future of Sustainability: Re-thinking Environment and Development in the Twenty-first Century

W. Adams · Economics · 2006

66 815 · 💡 Highly Influential · PDF · ☰ View 5 excerpts, references background and methods · 🔖 Save · 🔔 Alert

Incorporation and institutionalization of SD into universities: breaking through barriers to change

R. Lozano · Economics · 2006

66 688 · ☰ View 1 excerpt, references background · 🔖 Save · 🔔 Alert

Eco-sustainable Campus Initiatives: A Web Content Analysis

Proceedings of The 3 International Conference on Technology and Operations Management: Sustaining Competitiveness through Green Technology Management, Bandung−Indonesia (July 4-6), pp. 59-65. ISBN: 978-979- 15458-4-6.
1545

Related Papers

Optimizing the Value of Green IT Projects within Organizations

N. Bachour, L. Chasteen

Engineering, Business · IEEE Green Technologies Conference

2010

Off-Grid Electrical Systems in Developing Countries

H. Louie

Engineering

2018

This book provides students and practicing engineers with a comprehensive guide to off-grid electrification: from microg...

With the constant evolution of technology and the world critical environmental status, all private and public informatio...

Save   Alert

Show More

Save   Alert

Stay Connected With Semantic Scholar

Your E-mail Address   Sign Up

What Is Semantic Scholar?

Semantic Scholar is a free, AI-powered research tool for scientific literature, based at the Allen Institute for AI.

Learn More

About
About Us
Publishers
Blog
AI2 Careers

Product
Product Overview
Beta Program
S2AG API
Semantic Reader

Research
Publications
Team
Research Careers
Resources

Help
FAQ
Librarians
Tutorials
Contact

Proudly built by AI2

Collaborators & Attributions • Terms of Service • Privacy Policy

AI2 Allen Institute for AI