

CIRCULAR SUSTAINABILITY IN UNIVERSITY SYSTEM : THE IDENTIFICATION

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Abstract

Although sustainability is now becoming main issue in any areas including for education, in regards to putting closed-loop thinking at the heart of education system, it is revealed that Indonesia is still lagging behind. This study presents a descriptive analysis aimed to identify the important remarks of sustainability and circular economy based on the literature review, to help Indonesian universities in setting their future direction towards sustainability and circularity.

Keywords: circular economy, sustainability, Indonesian university

1. Background

The diverse interpretations and approaches of sustainability in Indonesian universities, particularly in business schools is argued could hinder the Indonesian management program to move at the same stage towards Indonesian sustainability transition. In addition, the lack of an institutional framework in circular economy is also considered a barrier in creating graduates who actively engage and enhance the human well-being and ecosystem. Although there are some specific rules regulating company responsibilities in social and environmental conservation, such as PP No 47/2012 about Corporate Social Responsibility stressing on social and environment, and UU No 40/2007 about responsibility of limited company, they are still failing in getting wide recognition from most of Indonesian companies. It is suggested that lack of heightened cultural awareness and global social and environment perspectives among the university students becomes one of the biggest obstacles.

2. Literature review of sustainability and circularity in education

2.1 Sustainable education

The Talloires Declaration which stated that universities should mobilize their internal and external resources and provide leadership to respond the urgent challenge became the first commitment made by university administrators to sustainability in higher education (Wright, 2002). However, it is likely that the approach and interpretations of the

stakeholders is another challenge, mainly because of different concept in approaching sustainability in university. Lindsay (2003) mentioned that a sustainable campus community acted upon its local and global responsibilities to protect and enhance the health and well-being of humans and ecosystems. It actively engages the knowledge of the university community to address the ecological and social challenges that we face now and in the future. Velazquez et al (2006), also defined a 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. It is inferred that this term should be translated into a more quantitative index which is measurable and attainable. Therefore, to describe the relationship of its integrity system, a model for building a sustainable university is requisite to allow for its adoption and combination into the system. However, having a model of sustainable university is not the end of the process. The main question afterward is how to set and be in the line to frame sustainability. As approaches to sustainability could differ from one university to another, thus, common principles and criteria are needed to shape the same focus and direction. In Canadian universities for instances, the conceptualization of sustainability in university is mostly scaled into environmental sustainability, specifically energy,

management resources and waste reduction (Wright and Wilton, 2012). Along with that, Wright (2010) also mentioned that university managers (the president and vice president) were more inclined to environmental aspects over economic and social benefits. Based on this, it has been observed that much of the efforts by university, is geared particularly towards addressing physical impacts to achieve a sustainable university.

However, without direct guidance on how to monitor the sustainability progress, the process towards sustainability could be weakened and underscored. Therefore, the need of indicators as - evaluation tools; internally, and externally is mainly necessary. Overall, the primary purpose of developing indicators is to provide objective, credible information on the status of a system to decision-makers and thus help clarify and reach desired outcomes (Geng et al, 2012). The indicators should be explicit and understood by all university levels, and institutionalization of this idea into the system's culture and its daily operation should be done (Lozano, 2006). Lidgren et al (2006) also mentioned the need for awareness, willingness and ability in relation to sustainability becoming a mandatory inclusion into educational curricula. The importance of inclusion of a curricula into a sustainable university is inline with the model proposed by Velazquez et al (2006) under the education aspect. Based on this, for this study, curricula in education can be considered as one of the adopted indicators.

Hansen and Lehmann (2006) also mentioned the important role of universities as hubs to enhance the partnerships between universities, business and civil society. The focus of this hub is on wider applications of valorization aspects to promote economic, ecological and social development. Taking cognizance of the important role of university involvement in this aspect, and since research and valorization within universities are interconnected, this study considers valorization and research as one of the main criteria adopted. In addition to that, Habib and Ismail (2008) also considered campus operation, research, teaching, and efforts to conserve natural resources, as a foundation to monitor the progress towards sustainability. However, Martinez et al (2006) noted that academic research need a long process

in reviewing and validation, while the demand for immediate process of research to communities stands there. Therefore, this study will also give a concern on this matter and will validate through the findings.

Based on the previous discussion, it was opined that the conceptualization of sustainable university is closer to the environmental aspect. A recent approach in adopting sustainable university is through offsetting the green initiatives. In this regard, Keoy and Padzil (2010) mentioned that ISO 14000 series might be very useful in providing an initial environmental review to take up the green initiatives. They also mentioned that carbon footprint is an important starting point for campus community in reducing the use of resources, mainly from electricity, fuel and paper. Recently, the discussion of sustainable university and its indicators are now becoming more closed related to the circular economy (CE). The CE refers to an industrial economy that is restorative by intention. It focuses on how to rebuild the natural environment through managing the flows of materials, energy, information in an effective way (Ellen MacArthur Foundation, 2013).

2.2 Circular Economy in Education

Currently , there are a lot of researches conducted to address the embedding of CE in universities. One of such studies is a research conducted by Roy et al (2008) who investigated the amount of energy consumption in teaching activities. The study revealed that the environmental impacts of distance learning in Higher Education (HE) courses involve 87% less energy and 85% lower CO₂ emissions compared to the full-time campus-based courses. While for part-time campus, HE courses reduce energy and CO₂ emissions by 65% and 61% respectively compared to full-time campus courses. In the same vein, Geng et al (2012) categorized the indicator sets of the implementation of circular economy into resource output, resource consumption, integrated resource utilization and waste disposal/pollutant emission either for macro and meso level. However, Geng et al (2012) also mentioned the necessity to establish the social indicator along with the environmental and economic indicators. Therefore, they suggested the inclusion of the degree of public awareness,

participation, employment rate, etc, through the CE effort. In this context, waste management is linked to the more general system goals of resource efficiency and climate protection in a manifold way (Karavezyris, 2010). In terms of university context, the zero waste approach is more related to recycle and material recovery. Massey University in New Zealand, for instance, as a zero waste model campus, it has initially introduced two projects; (i) establishing composting park and demonstrated composting option for food residuals, green waste and animal manure, (ii) focusing on separation behavior by installing recycling bins and conducted educational campaign (Mason et al, 2003). In addition to that, a study conducted by Davis et al(2009) also investigated the behavior attitudes associated with sustainability, recycling and waste minimization along with the energy and water efficiency.

3. Methods

The method applied in this study is a descriptive method. The information was collected from the literature review of accessible published journals and articles, as well as the available documents online, which elucidate the sustainable university concept and the implementation of circular economy in a university system. The idea is to draw from the current practice of sustainability and circular economy to give a clear indication and highlight similar important issues based on the literature.

4. Finding and Analysis

It can be underlined the consistency between the idea to designing circularity and sustainability- more as a philosophy of way of thinking rather than being part of environmental movement solely, and to the entire process within university activities. It is revealed that the term of sustainability can be translated in different ways and addressed at various activities. It is more about the way of people think and behave. From the circular economy perspective, it can be seen as a feasible way to attempt a sustainable form in a way that increasing eco-efficiency in the system.

Apparently, it appears that there is no consensus on the exact way of implementing circularity and sustainability. It is up to universities to define the

direction and shape the implementation process, but it seems that an integrative approach which stressing on innovation and critical thinking appears to be an ideal for them, to address sustainability and circularity. Hence, it is assumed that this is the main reason which causes the difference approach in the way of energizing those aspects within their institutions. The vision of Dutch institutions reveals that linear sustainability which being used to define a sustainable university is no longer tenable. Rather, a circularity and sustainability are used as a measure to envision and articulate the future, which are embraced in a wide area of a university system; ranging from curricula, research, procurement and campus operation, to valorization. Circular economy (or often called as cradle to cradle) and its proponents, are seen to be a different way of thinking, not an environment movement solely. This gives a starting point from which to build a circular sustainability for Indonesian universities.

Along with the important points of circular sustainability in Netherlands practices, in order to benchmark itself, this study considered to capture the discussion of circularity and sustainability among researchers within university system as a mean to develop the criteria of green university. One important remark is to have a circularity, a university system has to run concurrently with a result-oriented PSS (Product-Service System). Tukker and Tischner (2006) defined PSS as “a mix of tangible products and intangible services designed and combined in a manner that they are jointly capable of fulfilling final customer needs.” They mentioned that it would become much easier to design need-fulfillment systems with lower impacts if more focus is given to the final users needs/ and service rather than the product. The idea is to prolong the service life of products, and re-use parts as much as possible and to make them cost- and material-efficient. It is believed that this could lead to the material minimization in the product flow and hence has generated increased interest among important actors in civil society, business and government. A recent conceptualization is proposed by Boehm and Thomas (2013) which defined PSS as “an integrated bundle of products and services, which aims at creating customer utility and generating value”. Today, PSS-like business models is seen as the most important means of creating a lease society, circular economy or simply

resource evolution . Based on his research, Tukker (2013) revealed that environment solely, is not (if it ever was) the main subjects on PSS papers. From the number of papers published from 2000-2013, there are more papers discuss PSS from a business perspective compared to an environmental perspective. This implies that the business aspect of PSS researches are considered as more important than the environmental aspect. Also, Tukker (2013) stated that though PSS in a business model is not the panacea to ensuring sustainability, it can contribute significantly to resource-efficiency and circularity, through its result-oriented type. It is thought that it could aid in the reduction of material costs albeit with radical changes in business as consequences of it . From this point of view, this study assumes that the implementation of circular sustainability have to be concomitant with result-oriented PSS, which is not merely focused on the environment solely, but also encompasses its entire system flow.

Secondly, in this regard, universities have been constantly considered to have significant contribution to the pursuit of regional sustainability initiatives for over two decades (Karatzoglou, 2013). A university system is better described as a semi system, either semi-open or semi-closed. Varied resources and human capital such as staff and students, food for cafeterias, energy and water used could be considered as input of the system, while educated students, faculty, emissions and effluents, wasted energy might be observed as output. There are also resources that still remain in the system, such as the buildings, laboratories, and organizational routines and behavior. Therefore, as a semi-open system, a university has to deal with their internal process and interact with different stakeholders; social and environmental, outside physical boundaries (Lozano et al, 2013a) . As stated by Cortese (2003), university systems, not only consists of education (courses and curricula), research, and campus operation, but also community outreach, in which these elements are interlinked and interdependent. Nevertheless, Education for Sustainable Development (ESD) has not been incorporated into all courses and curricula by either scholars and university leaders . Thus, it is suggested that it is clearly important to integrate circular sustainability into a business curriculum. However, in the case of the environment, the record

shows that the majority of business and management schools have not yet recognized the extent to which environmental issues significantly affect businesses (Barnes and Ferry, 1992) . In addition to this, Barnes and Ferry(1992) identified two pertinent major branches of studies found in the sustainability literature; descriptive or prescriptive and according to the main dimensions of sustainability it addresses, namely environmental, social, educational, or integrative with all three dimensions tackled.

From this discussion, this study posited that to meet a green university, university systems have to be able to embed sustainability competences such as eco-labeling into curricula, incorporating circularity such as green emission and carbon footprint in campus operation, collaborating the SD and environmental issue with multi-stakeholders in system outreach , and also developing transdisciplinary research . In addition, Lozano et al (2013b) also suggested that it would be beneficial to consider collaborating with other universities; fostering trans-disciplinarity; making SD an integral part of their institutional framework; creating on-campus, SD-life experiences; and 'Educating-the-Educators, into the university systems . They believed that those aspects could catalyze and ensure the embedding of SD into the system, catching up its lag behind companies in helping societies to be more sustainable. Furthermore, Mostafa and Mehran (2013) identified some key factors for sustainable university based on the perception of 379 university students of University Sains Malaysia (USM) and international students from countries of the Association of Southeast Asian Nations. They are including (i) community outreach, (ii) sustainability commitment and monitoring, (iii) waste and energy, and (iv) land use and planning. Based on their finding, they defined a sustainable university as a university that not only to seek academic excellence, but also try to embed human values into the fabric of people's lives. This university integrates sustainability practices into teaching, research, community outreach, waste & energy management, and land use and planning, through its constant sustainability commitment and monitoring.

Since there is no paper which was found to examine the correlation between the activities chosen and

specific characteristics of the university such as the size, nature, type of faculties, or degree of embeddedness in the area (Karatzoglou, 2013), this study does not take consideration of these factors. Based on literature review, Table 4.1 depicts the circular economy practices and sustainability in higher education. The salient points of combination of these remarks will be used as impetus to defining green university and building its framework.

Tabel 4.1 The important remarks of sustainability and circularity in education

Authors	Important remarks
Tukker and Tischner (2006), Boehm and Thomas (2013), Tukker (2013), Su et al (2013), Ellen MacArthur Foundation (2013), Geng et al (2012), Preston (2012), Bechtel et al (2013), Karavezyris (2010), Mason et al (2003)	Result-oriented PSS, Resource-efficiency, circularity/circular economy, recycling
Karatzoglou (2013),Lozano et al(2013a)	Dealing with internal and external system
Habib and Ismail (2008), Green alliance (2012), Cortese (2003), Matter and Moon (2004), Fien (2002), Barnes and Ferry (1992), Elkington (1998), Lindsay (2003)	Courses and curricula Research Campus operation Community outreach Environmental, Social, Educational or integrative with all three dimension TBL
Lambrechts et al (2013), Keoy and Padzil (2010)	Sustainability competences, ISO, awarding scheme, recognition
Boman and Andersson (2013)	Eco-labeling in curricula
Klein-Banai (2013), Geng et al (2012), Velazquez et al (2006), Wright and Wilton (2012), Roy et al (2008), Escobedo et al (2014)	GHGs emission, energy efficiency, material and water consumption, waste reduction
Larsen et al (2013)	Carbon footprint
Sedlacek (2013), Benn and Dunphy (2009), Hansen and Lehmann (2006)	Collaboration with multi stakeholders/ partnership
Lozano et al (2013b), Karatzoglou. B (2013)	Collaborating with other universities, fostering transdisciplinarity, SD-life experiences, Educating-the-Educators
Mostafa and Mehran (2013)	community outreach, sustainability commitment and monitoring, waste and energy, and land use planning
Gitsham et al(2012), Stephens and Graham (2010), Wright (2002), Foo (2013), Keoy and Padzil (2010), Geng et al (2012), Davis et al(2009)	Leadership, Management, Policy formulation Social indicator, Awareness campaign
Gao et al (2006), Benn and Dunphy (2009), Bradbury (2003), Steiner and Posch (2006), Juarez et al (2006), Habib and Ismail (2008)	Teaching and Learning approach

To sum up, it is revealed that circularity and sustainability become emerging fields of studies which have been receiving growing attention for most researchers. Even so, based on their recent researches, as a whole, it can be inferred that there is no unified platform to the promoting of those particular aspects. Perhaps the most insightful findings in this study is that those terms offer a wide range of level of adoption. The opportunity of collaborating and capturing them at different fields is huge. Even so, this study took the opportunity to solicit and draw weighty points, and came with a preferred list of characteristics which are assumed to underlining the applications of circular economy and sustainability, and identifying some mechanisms which enable to facilitate them in

education institution. This study opines that some of the mentioned characteristics cannot be considered as a trend, but it serves as a particular way of being alert and to label a university with circular sustainability.

n overall, these remarks seems to also offer at developing operational rules in a way of addressing them. They are assured to be a good start in achieving wider participation and adoption within a university system toward circular sustainability. Similarly, it also consider what aspect which serves as a basis for successful implementation of the initiatives in institutions that can outgrow from its work. Considering these reasons thus, this study determined to highlight certain ideas among those

remarks, which later be used to construct the framework of green university. In this regards, it can be stated as follows: (i) leadership, management and policy formulation and its associates, (ii) education and learning and its surrounding, (iii) green processes in wide range of campus operation, (iv) transdisciplinary research and its collaboration, (v) external system and its relations, (vi) competencies and a wide range of recognition, and also (vii) cultural awareness campaign and its relation.

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