Environmental Management Accounting Implementation in Higher Education: Case Study in Universitas Negeri Semarang

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Abstract: Environmental problem issues that increasingly worrisome has become a central focus of all entire community, including educational institution. As a form of the University Social Responsibility (USR), Universitas Negeri Semarang (UNNES) is committed to becoming a conservation university. This research methodology uses a qualitative method utilizing an in-depth interview. The research subjects were the Technical Implementation Unit (UPT) of the University Conservation Development and the Group Conservation Unit. UNNES not fully implementing yet Environmental Management Accounting; only information about the use of electricity and paper has physical and monetary. Although there are several obstacles to implementing EMA, UNNES has applied to the movements and activities related to the environment. These environmental care movements have proven to produce cost efficiencies.

1 INTRODUCTION

The issue of environmental problems is still a significant concern around us. ALMI (Indonesian Young Scientists Academy) and Thamrin School of Climate Change and Sustainability researches warn this global warming problem to be solved immediately. If it is not to be solved immediately, then the risks will occur. Such as the threat of ecosystem and biodiversity diversity, food security, health, and even economic stability (din/evn, 2019). The impact of global warming is increasingly evident that forces us to begin to fix our behavior so that the rate of increase in the earth's temperature slows. The role of the community is needed to realize the slowing increase in the earth's temperature. The role of management in every organization, both the private sector and government, need the implementation of environmental accounting.

Environmental accounting is one means of reporting costs incurred related to the environment in operational activities. In the environmental accounting sub-section, there is an environmental management accounting (EMA) as a reference in making decisions related to information on environmental costs. The definition of EMA is an identification, collection of analysis, and use of two types of information used for internal decision making. The information used includes physical information (in the use of energy, water, and materials) and also financial information on costs associated with the environment (IFAC, 2005).

EMA has begun to be applied to government, especially Higher education institutions. Higher education activities have direct and indirect impacts on environmental issues, although not as significant as the manufacturing industry (Chang, 2013). The consumption of paper, electricity (for air conditioners and lamps), and water excessively are examples of causes of rising earth temperatures, which are a direct impact of activities in educational institutions. Embedding the character towards the environment through both the education system and the research conducted are the indirect impacts in an educational activity. Managing and reducing total energy, water use, and materials used by organizations helps to reduce the impact of organizational activities on the environment indirectly (IFAC, 2005).

Increasingly, more and more universities have begun implementing University Social Responsibility (USR) as a form of university responsibility towards the environment. One of the Higher Education institutions implementing USR is Universitas Negeri Semarang (UNNES). UNNES is the first Conservation University in Indonesia. Based on the website of the UNNES Conservation Unit, on March 12, 2010, UNNES declared itself a

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conservation university. Since then, UNNES was determined to apply conservation principles. UNNES implemented through its vision and mission both within the University and in each faculty (Bangvasi UNNES, 2017).

As the first conservation university, UNNES has the mission to be a conservation-oriented and internationally reputable university. Unfortunately, UNNES never becomes the first on the Indonesia Top 10 greenest campuses. Based on the UI Green Metric Ranking 2017, UNNES was at the fourth position on Indonesia's top 10 greenest campuses. Even in 2018, UNNES's position dropped to the fifth position. It caught the researcher's attention to see how management implementing the environmental activity, especially in the management accounting field at University.

Previous research in the public sector found that several states and local governments have compiled environmental reports that show trends in ecological and ecosystem functions. At different levels, the United Kingdom is encouraging governments in every government department to report on environmental costs, including the use of water, garbage, and energy use (Ball & Bebbington, 2008). Another research that focuses on green accounting in public hospitals in Denmark found that environmental reports record with financial and non-financial measurements (Füssel & Georg, 2000). The University exert resources and funds in carrying out programs related to conservation, so environmental accounting is needed to measure whether the eco-efficiency method used has had an impact on the environment (Sutherland, Lord, & Ball, 2008). Now accounting faces a big challenge for environmental preservation efforts not only through the role of recording and reporting but also has a role in managing environmental performance.

There was previous research on the application of EMA at Universitas Negeri Semarang. The results showed that budgeting for funding the implementation of EMA at UNNES had proceeded after the SOP using the SIANGGAR budget system and recorded in the accounting system, SIKEU. Whereas for the assessment of the performance of UNNES uses benchmarks in the UI Green Metric and ranked 6 in 2016. However, from the limitations of previous research, innovations in the application of EMA in universities are still needed (Latifah, Kardiyem, & Susilowati, 2019). Therefore, researchers want to dig deeper related to the application of EMA in Universitas Negeri Semarang.

2 RESEARCH PURPOSES

This research aims to know how extent Universitas Negeri Semarang (UNNES) to implementing Environmental Management Accounting (EMA). Further, the explanation of the research question in detail as follows:

1. What policies have been implemented to support the implementation of EMA in universities?
2. To what extent can EMA be implemented in teaching and learning activities and administrative activities within the University?
3. What are the obstacles to implementing EMA in universities?
4. Is EMA useful in creating cost efficiency?

Through this research, it is expected to provide a clear picture of the implementation of EMA information. From the EMA Information, we will see the obstacle and the benefits of UNNES as a conservation university.

3 THEORETICAL BASIS

Contingency theory is the application of various management accounting studies in the era of the 70s. Contingency variables classify into three groups, namely environment, organizational structure, and technology (Emmanuel, Otley, & Merchant, 1990). These three variables occur in almost all research in management accounting. The role of business strategy in designing accounting systems is another flow in contingency research. An uncertain environment is one of the variables that can be linked to environmental accounting management (Osborn, 2005). Because the focus of this research is on the natural environment, the attention and focus are on the uncertainty associated with the natural environment.

Environmental accountability requires an organization to be involved in environmental management and provide financial and non-financial resources for environmental impacts and the implementation of environmental-related management activities (Burritt & Welch, 1997). The development of environmental accountability in management accounting is environmental costs, investment appraisals, environmental performance indicators, capital budgets, and environmental-related management strategies (Parker, 2000). Environmental accountability is the result of managers' responsibility towards environmental performance if the concept of information transparency is applied. Managers are responsible for

environmental improvement in a sustainable manner (Gray, Owen, & Adams, 1996). The major territory environmental accounting can be described as below:

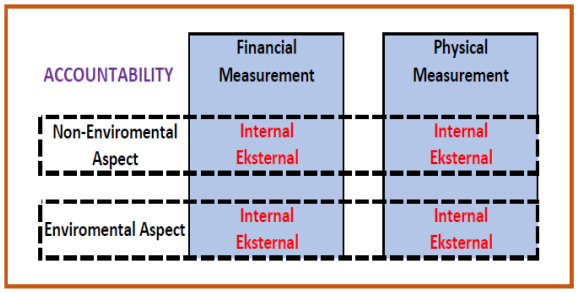

Figure 1: The fundamental territory of environmental accounting

The pressure through regulations on organizational responsibility for the environment has arisen lately. Organizations are required to minimize their activities that have an impact on the environment.

For this reason, the information on environmental costs needed to become one of the benchmarks of an organization's responsibility to the environment. The information on environmental costs, namely, a cost that appears from prevention and environmental management, materials and energy used, waste from activities of the organization activities. By applying environmental management cost, it can help identify cost savings (Wang, Wang, & Wang, 2018).

The main focus of the EMA concept is to foster manager awareness about potential interests, both positive and negative, of the environmental impact on company performance. So the information presented by EMA must include hidden costs in overhead or the future period and impacts that occur outside the organization that cannot be provided by conventional accounting (Burritt, Hahn, & Schaltegger, 2002; Qian, Burritt, & Monroe, 2011). The implementation of EMA has attracted the attention of managers to help regulate environmental performance. EMA implementation provides benefits as a decisive decision-maker because they highlight environmental costs and allocate these costs appropriately. So, Environmental Management Accounting (EMA) is a tool used by management in improving financial performance through increased environmental accountability (Jalaludin, Sulaiman, & Ahmad, 2011; Chang, 2013; Latifah, Kardiyem, & Susilowati, 2019). The application of EMA requires the classification of different information, including (IFAC, 2005; Qian, Burritt, & S.Monroe, 2018):

1. Information on monetary units and physical units related to environmental activities and the use of relevant materials and energy.
2. Indirect internal costs to the organization but are hidden in overhead or ignored in future periods.
3. Recognition of external environmental costs, impacts, and opportunities not seen in a conventional accounting

Environmental Management Accounting (EMA) classified into two categories, as follow (Ambe, Ambe, & Fortune, 2015):

1. Monetary Environmental Management Accounting (MEMA)
2. Physically Environmental Management Accounting (PEMA)

3.1 Monetary Environmental Management Accounting (MEMA)

The application of environmental management accounting requires information as a management tool in making decisions related to environmental costs. Monetary Environmental Management Accounting or MEMA is a sub-system of EMA that only looks at the financial impact of environmental performance (Ambe, Ambe, & Fortune, 2015). MEMA is used by internal managers to help evaluate better in monetary terms when making decisions. Examples of monetary unit information, namely, costs to prevent environmental pollution, costs for material purchases to costs incurred to overcome environmental problems that occur due to organizational activities.

3.2 Physically Environmental Management Accounting (PEMA)

Managements need monetary and physical unit information to make decisions regarding environmental costs. PEMA is the generalization and recording of physical data from energy inputs, use of materials, waste products, and emissions used by internal managers to make decisions (Ambe, Ambe, & Fortune, 2015; Gunarathne & Lee, 2015). Examples of physical Information needed in higher education activities include the use of water and gasoline measured in litters, electricity measured in kWh, use of paper in reams, and others. PEMA, as an internal environmental accounting approach provides (Burritt, Hahn, & Schaltegger, 2002):

1. Analyze tools designed to detect ecological strengths and deficiencies
2. Techniques that support decisions that focus on the quality of the relative environment
3. Measurement tools that are an integral part of other environmental measurements such as environmental efficiency

4. Tool for controlling both, directly and indirectly, the environmental consequences
5. A neutral and transparent accountability tool for internal, indirect and communication with the external
6. A close and complementary tool with a set of tools developed to help sustainably develop ecology.

4 RESEARCH METHODS

This research uses a qualitative approach, namely, case studies. The reason for using case studies is that they are considered more flexible. It helps researchers find essential factors that arise from real-life contexts. This research will produce a model of environmental management accounting records so that what is budgeted (planned), implemented (program), and produced (evaluation and monitoring) can be measured economically. Besides, the records of management accounting will obtain information related to environmental performance, so that the program can be measured both financially and non-financially. In subsequent studies, the environmental accounting records is an embryo of environmental management accounting. So that University can achieve environmental accounting reporting and can report environmental responsibility to the public.

The subjects of this study were all members and staff of the University Conservation Unit and conservation groups in each faculty unit. Conservation UPT members are people chosen by the University to be responsible for the University's conservation program. They are very aware of the activities carried out related to the environment at the university level. Meanwhile, the conservation group is responsible for all types of activities related to the environment at the faculty level. The type of research data is quantitative and qualitative data. Quantitative data in this research is the document that related to budget information for conservation or environmental purposes. The research also needs the data that report relates to achieving conservation or environment program. Qualitative data in this research is information on what activities are carried out in the field of conservation or the environment. In-depth interviews with the head of the University's conservation UPT and conservation groups in each faculty unit have done to obtain the data.

Data analysis techniques used in this study were carried out with quantitative and qualitative approaches. When the researcher analyses the budget document data during the context analysis activity was using the quantitative technique. Also, when the researcher was analyzing the results of the activity-based environmental management accounting model validation. Through Focus Group Discussion (FGD), the qualitative techniques were done to obtain the data. Focus Group Discussion (FGD) was held to discuss the environmental cost budgeting mechanism in each unit and the implementation of the budget planning of it. The participants of FGD were 8 participants that are the head of conservation groups in every faculty at UNNES.

In-depth interviews use the checklist sheet as follows to obtain the data:

Table 1: Checklist sheet on Data Analysis

Budgeting	
1	The budget on garden management and maintenance
2	The budget on using eco-friendly materials building
3	The budget on the internal transportation system
4	The budget on waste management cost
5	The budget on training for UPT management and conservation groups
6	The budget on conservation activity.
7	The budget for art and culture activity
8	The budget on conservation research
9	The budget for renewable energy
Environmental Management Accounting (EMA) Implementation	
1	Environmental cost identified and calculated separately
2	Each of environmental cost recorded physically
3	Each of environmental cost recorded monetary
4	Information on waste produced
5	Policy on saving electricity usage
6	Policy on saving water usage
7	Policy on paperless
8	Policy on reducing waste yields
9	Conservation activity annually
10	Art and culture activity annually
11	Training for UPT management and conservation groups annually
12	UPT management and conservation groups have a green building concept program
13	Policy on Internal transportation system to reduce pollution.
14	Plant care was doing routinely
Realization and Supervision of Budget Cost Usage	
1	Supervision on the realization of environmental cost budget.
2	Supervision on garden management and maintenance realization
3	Supervision on conservation activity realization

4	Supervision on art and culture activity realization
5	Supervision on conservation research realization
6	Supervision on training for UPT management and conservation groups realization
7	Electricity cost reduce since the policy of saving electricity implemented
8	Water cost reduce since the policy of saving water implemented
9	Paper purchase cost decrease due to the policy of paperless implemented
10	Waste management cost decrease due to the policy of waste produce restriction
11	All the budget that has prepared used following with budget planning

In-depth interviews conducted during context analysis activities and checklist sheets when conducting alternative solutions (brainstorming) and product reviews. Therefore, in this study, the position of the two analytical techniques is expected to be complementary.

5 DISCUSSION

5.1 The Policies That Have Been Implemented to Support the Application of EMA in Universities

Universitas Negeri Semarang, which is one of the state universities in Semarang, Central Java province, Indonesia, as a place for a case study of this research. UNNES declared itself a Conservation University on March 12, 2010. Principles to be implemented soon include protecting, ordering, and utilizing natural resources more wisely, reserving arts and culture, and applying the University's Tri Dharma (Three Principles) with a friendly insight environment. In its efforts to implement it, a conservation team was formed and then tasked with designing and making a blueprint to prepare UNNES as a Conservation University. The specifical task of the conservation team is to develop policies and activities related to biodiversity, green architecture, and internal campus transportation management, waste management, clean energy, paperless policies, arts, and cultural conservation, and management of conservation cadres. The issuance of the Minister of National Education Regulation of the Republic of Indonesia Number 8 of 2011 concerning the Statute of the Universitas Negeri Semarang was confirming the position of UNNES as a conservation university. At that statute, stated that the vision of UNNES was to become a world-class, healthy, superior, and prosperous conservation university in 2020. In 2011, under UNNES, Rector Decree No. 35 / P / 2011 was transforming the conservation team into the Conservation University Development Board. In 2016, the Conservation Development Agency was changed to become the Conservation Development Technical Implementation Unit (UPT).

The supporting policies of EMA are Rector of Universitas Negeri Semarang Regulation No. 21 of 2019 concerning the prohibition of the use of disposable plastics, Rector of Universitas Negeri Semarang Regulation No. 51 of 2018 concerning accounting guidelines and management of Public Service Agency accounts receivable, and Rector of Universitas Negeri Semarang Regulation No. 41 of 2018 concerning electronic budget monitoring and evaluation. Head of UPT Development Conservation in University states there are not much-written policies yet related to the conservation program.

"*No written policies yet related to the conservation that implemented in UNNES except the prohibition of the use of disposable plastics. All the conservation program only is written appeals, such as stickers to wisely use water and electricity when not in use and culture for cycling or walking in UNNES.*"

Going forward, UNNES is currently negotiating the concept of issuing other regulations relating to other environments as a form of commitment by the Conservation University.

5.2 Implementation of Environmental Management Accounting (EMA)

Accounting records at UNNES have used an integrated system, namely SIKEU. This financial information system allows accountants to make accounting records following the budget that has planned. The reports uploaded into the system with the transaction receipt attached to control the payment. Decisions concerning the environment made based on budget and financial accounting, according to SIANGGAR (budget system) and SIKEU (financial accounting system).

Universitas Negeri Semarang pays full attention to the environment and its preservation. The Conservation Development Technical Implementation Unit (UPT) is proof of it. The team has a task to manage conservation and environment issues in UNNES. Their responsibility is to manage funds for various activities such as biodiversity, green architecture, waste management, clean energy, paperless policies, arts and cultural conservation, and management of conservation cadres for students. Conservation UPT embeds and maintains the character in students as agents of change to care about environmental issues.

Funding for the activities related to the environment at UNNES comes from previously budgeted funds. As for the amount, it depends on the budget proposed by the Conservation Development Technical Implementation Unit (UPT) by submitting a program proposal along with its costs. Furthermore, after the submission of this proposal, the amount will be distributed, depending on the decision made by the Governance Organization. The preparation of the budget itself involved many parties, such as members of the Conservation Technical Implementation Unit (UPT), the leader, in this case, the Vice-Rector IV, and the University's budget department. The budgeting process has used a particular system, namely, SIANGGAR (budget system).

UNNES has not been entirely applying physical recording as management information or Physically Environmental Management Accounting (PEMA). Most of the environmental costs in monetary terms or Monetary Environmental Management Accounting (MEMA).

"*Physical records are only applied to the use of electricity and paper. We record the physically of electricity used based on the bill that we paid monthly. For paper, we record it physically to ask to the procurement department. Based on the usage of paper, we spent 40 reams in a year for administrative purposes.*"

There is a budget for the environmental activities are held regularly to support the conservation program.

"*There is an annual conservation event that new students have to join. All new students have to plant trees in the university environment, and they have the responsibility to take care of the tree that they plant.*"

UNNES also held environmental activities for all employees. Every Friday morning, all employees require to join in sports activities. Besides, UNNES held wayang performances regularly that rarely found now. That is a conservation movement to preserve art and culture. So, the budget will always be prepared for all of those environmental activities that are held regularly.

On the academic side, there is also a particular budget for lecturers who will conduct research or service related to conservation or the environment. It is an effort to have an indirect impact on conservation. The more research and service on the environment has done, the more environment knowledge will be spread.

The recently adopted regulation is a prohibition on the use of disposable plastics in the university environment. This regulation is applying as an effort to reduce plastic waste. All activities at UNNES, such as meetings, workshops, seminars, or other activities, have required participants to bring their drinking bottles. A refill water station will be available in every room to support this program. Also, to reducing paper waste from these activities, the packaged consumption provided using bamboo baskets and buffet dishes. So, the regulation is expecting to create that "zero waste" even from the meeting activities. As an effort to limit the use of paper or other paperless activities, UNNES utilizes technology such as WhatsApp and telegram to share the information. Also, all other administrative matters. Such as semester learning plans, attendance for students and employees, published annual financial reports have also utilized technology to upload and download the data. UNNES collaborates with third parties to manage waste generated from daily activities.

Another implementation of environmental management is to replace the lights in the rectorate building. Rectorate building is the main building that consuming the most electricity. The movement to reduce electricity is by changing the CFL lamp using an LED lamp. Also, install the sensors that can turn off the lights automatically if no one is in a particular room. The new buildings also have the guidelines as "green buildings" or buildings with an environmentally friendly concept. The form of renewable energy from natural processes was to build solar panels and bio pores. The effort to reduce pollution, UNNES, provides electric cars as a means of transportation in the UNNES environment.

5.3 The Obstacle to EMA Implementation

As a conservation university, there are several obstacles to implementing environmental management accounting. According to the head of the UPT University Conservation, the main obstacle in implementing EMA is the lack of human resources that individually handle conservation activities within the University. The board of UPT University Conservation and conservation groups in the faculty is lecturers and students who are volunteers.

"The Head of Division and the conservation group at UNNES are lecturers who have their activities. Lecturers have responsibility for tri dharma, namely, teaching, research, and serving. So, it is tough to hold UPT officials and groups to always be on standby in conservation activities."

While students as agents of change only have volunteer status, so there are no special funds that can be used to maximize the operational UPT of conservation development. The limitation of human resources is the cause of the absence of detail the environmental reporting as information. No one has a task to do individual supervision and to classify the

more detailed costs associated with environmental costs.

The next obstacle for the implementation of EMA, according to the chairperson of the UPT University Development Conservation, is the limited budget funds for developing conservation activities within the University.

UPT University Development Conservation also lacks "power" as the organization is under the Rector so they cannot drive the conservation activities.

"*Besides human resources, another obstacle is limited funds, so the UPT cannot execute the activities directly, especially related to research in the UNNES environment. So, we are only able to provide concepts and give to the Rector for the implementation. For example, the construction of new buildings, we always give the concept of green building, but to be implemented or not*, *the decision is on the Rector and not our authority."*

The readiness of budget implementers who do not fully understand the accountability of activities is the obstacle in implementing EMA. The budget-related environmental issues that have planned cannot be implemented by 100%. They only aim to spend the budget that has been provided by not giving a real and apparent contribution. Another obstacle is that several University policies do not legally yet. So that implementation in each unit cannot be entirely executed.

5.4 The Benefits of EMA in Creating Cost-Efficiency

Although Universitas Negeri Semarang has not been entirely implementing the application of EMA, the information on the use of electricity and paper has been recorded physically and monetarily. This information encourages environmental management in the UNNES Rectorate Building to use LED lights and sensors that can turn off lights automatically when there is no one in a room. Also, several buildings have been built using solar panels.

"The decision to changes on LED Lamp and install the sensor at the rectorate building. The sensor can turn off lights automatically when there is no one in a room. It impacts on reducing a lot the cost. It has an impact on saving electricity costs paid every month compared to before applying the concept. However, it is the only implementation in the Rectorate Building and not the whole building yet at UNNES."

The physical recording of paper usage helps universities to control excessive use of paper. One of the paperless efforts undertaken by UNNES is to utilize technology as an administrative tool. Implementing the paperless movement creates cost efficiency and work time effectiveness in managing matters related to the administration.

The presence of bipori in several university buildings also has an impact on cost savings. According to Wulandari, Banowati, and Putro (2015), plant roots and soil organisms activate biopori infiltration holes and will maintain groundwater infiltration without human intervention. It certainly saves energy and costs for the maintenance of biopori itself. Biopori is also useful for optimally absorbing rainwater into the soil, so there is no rainwater in the University environment. Puddles of rain that do not flow can be a source of disease and the risk of flooding in the rainy season. With this biopori, it can reduce the allocation of costs for flood mitigation and can be maximized for other cost allocations.

6 CONCLUSION

Environmental Management Accounting (EMA) is a management tool for improving financial performance through increased environmental accountability. The main focus of the EMA concept is to foster manager awareness about potential interests, both positive and negative, of the environmental impact on company performance. So, the information presented by EMA must include hidden costs, both physically and monetary information. As a conservation university, UNNES has not applied environmental management accounting entirely. Lack of detailed information regarding environmental costs is proof that it does not implement entirely. Physical and monetary recordings or units just can be seen from the use of electricity and paper. The use of water only records as monetary units. Besides, there is no specific supervision in environmental activities. The lack of human resources and some regulations that do not legally yet are considered to be the main obstacles in implementing environmental management accounting in UNNES. There is no particular person in charge to supervise the environmental activists in the field and records the environmental cost, both physically and monetary. The absorption of funds is the benchmark of environmental activities evaluation from the year's budget that has prepared.

Fully implementation of EMA can be seen only from the use of paper and electricity. Restrictions on the use of paper and utilization technology on administrative matters prove efficiency cost. Also, the decision to changes on LED Lamp and install the sensor that can turn off lights automatically in the Rectorate Building prove it too. However, it just applied at rectorate building and not the entire buildings in University. For the future, UNNES is

expected to implement environmental management accounting in full, to realize the efficiency of costs related to the environment. Also, the decision taken by management is expected to provide benefits to support environmental preservation efforts.

As a place of education, UNNES also embed the characteristics of students to care for environmental issues and preserve nature. It can be realized by planting trees and regenerating students as agents of change that will help campaign for environmental issues. As a conservation university, UNNES has committed to continue to implement activities that support the environment following the University's vision and mission. The electricity and paper saving movement, the building of green buildings with solar panels and biopores, and the provision of electric cars as operational cars within the University are examples of UNNES 'commitment to becoming a conservation university.

REFERENCES

Ambe, C. M., Ambe, Q. N., & Fortune, G. (2015). Assessment of Environmental ManagementAccounting at South African Universities: Case of Tshwane University of Technology. Journal of Governance and Regulation Vol. 4, Issue 1, 274-288.

Ball, A., & Bebbington, J. (2008). Editorial: Accounting and Reporting for Sustainable Development in Public Service Organizations. Public Money and Management, 323-326. doi:http://dx.doi.org/10.1111/j.1467-9302.2008.00662.x

Bangvasi UNNES. (2017). Retrieved from http://konservasi.unnes.ac.id/badan-konservasi-unnes/.

Burritt, R. L., & Welch, S. (1997). Accountability for environmental performance of the Australian Commonwealth public sector. Accounting, Auditing & Accountability Journal, Vol. 10 No. 4, 532-561. doi:https://doi.org/10.1108/09513579710367494

Burritt, R. L., Hahn, T., & Schaltegger, S. (2002). Towards a Comprehensive Framework for Environmental Management Accounting - Links BetweenBusiness Actors and Environmental Management Accounting Tools. Australian Accounting Review, Vol. 12, No. 2, 39-50.

Chang, H.-C. (2013). International Journal of Sustainability in Higher EducationEnvironmental management accounting in the Taiwanese higher education sector: Issues and opportunities. International Journal of Sustainability in Higher Education: Vol. 14 No. 2, 2013, 133-145. doi:https://doi.org/10.1108/14676371311312851

din/evn. (2019). Pemanasan Global Ancam Ketahanan Pangan Hingga Ekosistem. Retrieved from cnnindonesia.com.

Emmanuel, C., Otley, D., & Merchant, K. (1990). Accounting for Management Control. Boston, MA: Springer. doi:https://doi.org/10.1007/978-1-4899-6952-1_13

Füssel, L., & Georg, S. (2000). The Institutionalization of Environmental Concerns: Making the Environment Perform. International Studies of Management and Organisation, Vol. 30 No. 3, 41-58.

Gray, R., Owen, D., & Adams, C. (1996). Accounting & Accountability: Changes and Challenges in Corporate Social and Environmental Reporting. London: Prentice Hall.

Gunarathne, N., & Lee, K.-H. (2015). Environmental Management Accounting(EMA) for Environmental Management and Organizational Change: An Eco-control Approach. Journal of Accounting & Organizational Change, Vol. 11 Iss 3, 1-25. doi:http://dx.doi.org/10.1108/JAOC-10-2013-0078

IFAC. (2005). International Guidance Document: Environmental Management Accounting, International Federation of Accountants. New York.

Jalaludin, D., Sulaiman, M., & Ahmad, N. N. (2011). Understanding Environmental Management Accounting(EMA) Adoption: a New Institutional Sociology Perspective. Social Responsibility Journal, Vol. 7 Issue: 4, 540-557. doi:https://doi.org/10.1108/17471111111175128

Latifah, L., Kardiyem, & Susilowati, N. (2019). Investigating the Existing of Environmental Management Accounting for Better Environment Management: A Case Study in a University. European Journal of Business and Management, Vol 11, No. 8, 46-51. doi:10.7176/EJBM/11-8-06

Osborn, D. (2005). Process and Content: Visualizing the Policy Challenges of Environmental. Implementing Environmental Management Accounting: Status and, 81-104.

Parker, L. D. (2000). Green Strategy Costing: Early Days. Australian Accounting Review 10 (1), 46-55.

Qian, W., Burritt, R. L., & S.Monroe, G. (2018). Environmental Management Accounting in Local Government: Functional and Institutional Imperatives. Financial Accounting& Management, 1-18. doi:DOI: 10.1111/faam.12151

Qian, W., Burritt, R., & Monroe, G. (2011). Environmental Management Accounting in Local Government: A Case of Waste Management. Accounting, Auditing & Accountability Journal, Vol. 24 Issue: 1, 93-128. doi:https://doi.org/10.1108/09513571111098072

Sutherland, M., Lord, B., & Ball, A. (2008). Environmental Management Accounting. Social and Environmental Accounting Research. Adelaide.

Wang, S., Wang, H., & Wang, J. (2018). Exploring the effects of institutional pressures on the implementation of environmental management accounting: Do top management support and perceived benefit work? Bus Strat Env, 1-11. doi:DOI: 10.1002/bse.2252