{, #40@@hidden;, #122@@hidden;Thomson, 2005 #124}The topic of my inaugural speech highlights the dream of the university that social responsiveness and ethical behaviour should be important. One could ask how you connect this topic with my study field of Financial and Management Accounting. The answer to this question brings me to the topic:

Is it possible for accountants to save the planet?

Introduction

Sustainability and sustainable development is often a contested concept with a wide range of meanings and theories connected to the concept. Different worldviews by people and organisations influence the different concepts of sustainable development (Giddings et al., 2002). The classic definition of sustainable development is: "meeting the needs of the present without compromising the ability of future generations to meet their needs"(Keeble, 1988). Despite all the debates about sustainable development there is still no common philosophy. Very often people could mistake sustainability with charity, sustainability is not about philanthropy, to write out a cheque or to "give back" to society, but a true sustainable company conducts its business in such a way that benefits flow naturally to all stakeholders (Savitz and Weber, 2007). A few interesting environmental statistics are provided to contextualise the seriousness of the problem and to introduce the importance of sustainable behaviour:

Each minute:

At least 51 acres of tropical forests are destroyed;

We consume almost 35 000 barrels of oil;

50 tons of fertile soil are washed or blown off cropland;

We add 12 000 tons of carbon dioxide to the atmosphere

Each day:

Over 230 000 babies are born;

372tons of plastic packaging and

372 tons of fishing nets are dumped into the sea. (earthstatistics, 2018).

According to the World Health Organisation, **3.2 million children** under the age of five in developing nations, **die each year** as a result of unsafe drinking water and poor sanitation. A survey done by Food and Water Watch, cites that approximately 3.5 billion people will have

to face water shortages in 2025, mainly due to water pollution and climate change. If we continue with our current consumption pattern, by 2050, (this is 32 years from today) we will need 2.8 planets to provide for our consumption. In the history of our planet, there were 5 times before that a lot of species and biodiversity were lost. The fifth was when the dinosaurs were wiped out. Today scientists and conservationists talk about what is happening now, with reference to the statistics provided above, the 'sixth mass extinction' (populationmatters, 2018). As mentioned by Morales:

"SOONER OR LATER WE HAVE TO RECOGNISE THAT THE PLANET HAS RIGHTS TOO, TO LIVE WITHOUT POLLUTION. WHAT MANKIND MUST KNOW IS THAT HUMANS CANNOT LIVE WITHOUT MOTHER EARTH, BUT THE PLANET CAN LIVE WITHOUT HUMANS. "Evo Morales".

After the introduction, that tries to emphasise the importance of sustainability, the next paragraph attempts to find a connection between the profit motive and sustainability, referred to as the sustainability sweet spot.

Sustainability "sweet spot"

Companies need to find their *common ground* or sometimes referred to as their "**sweet spot**", the place where the chase for profits blends seamlessly with the needs of the community and the environment. Sustainable development is often presented and illustrated as three sectors, namely the economy, society and the environment. They are often refer to as three interconnected rings, which brings them together in a balanced way tending to reconcile any conflict, as illustrated in figure 1.

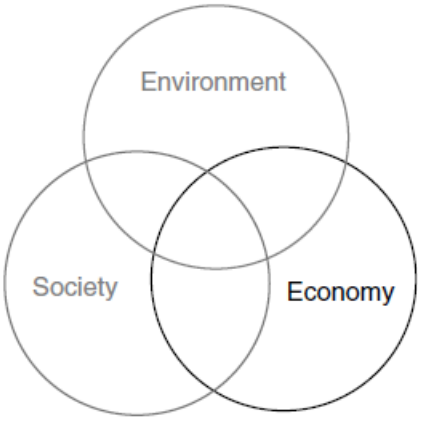

Figure 1: Common three-ring sector view of sustainable development.

Adapted from Giddings, Hopwood and O'Brien, 2002).

This approach, often refers to as the triple bottom-line in the financial world, tends to put each sector into a compartment. It shows the fundamental connections between the three sectors. For example could the number of productive sawmills (economic benefit, income) be compare or substitute for a lost forest (environmental lost, weakening the ozone layer)? Is automatization in the workplace (economic prosperity) versus unemployment (a societal aspect), the best option?

The reality of today is that in most cases the economic benefits tends to dominate the environment and society. How does money compensate an animal for its loss of habitat or a tree for acid rain? The trend is to refer to the three sectors in economic terms as financial, natural and social capitals. To address these questions an improved presentation of the three rings, called the nested model of sustainable development, is illustrated in figure 2.

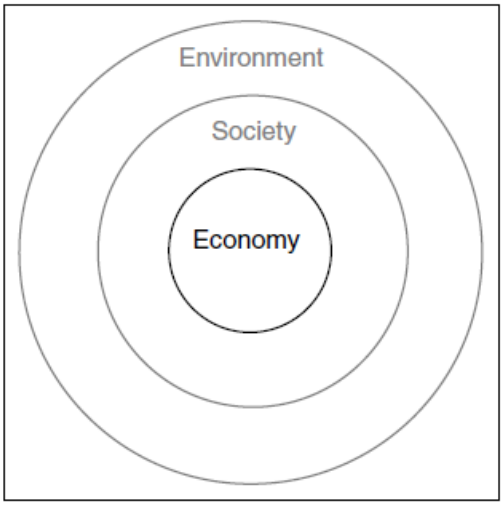

Figure 2 Nested model for sustainable development

Adapted from: **(**Giddings, Hopwood and O'Brien, 2002

This model attempts to illustrate the fact that the economy depends on society and that both depend on the environment. Without society there can be no economy and human society depends on the environment. Until now the discussion assumes that each of the three sectors, is a unified entity, although there are a multitude of environments, societies and economies. For example the dry dessert and the wetlands are different environments. There is not a single economy, the difference in characteristics between the formal and informal economies are evident.

Although the nested model was a step forward, it is important to recognise that the natural world would survive without human beings. The next step is then to remove the separation

between the economy and the actions of human beings (the society). As illustrated in the next figure there is a constant flow of materials and energy between human activities and the environment and both interacts constantly with each other.

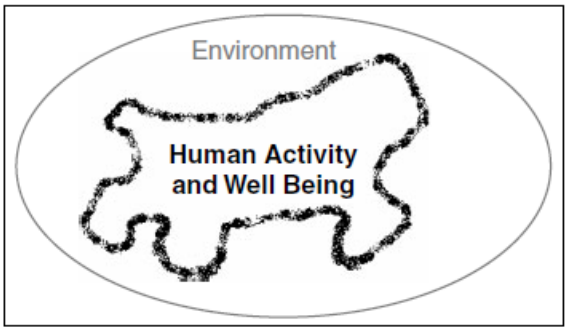

Figure 3 Breaking down the boundaries

Actions moving towards the "sweet spot" could involve many aspects of a company. For example PepsiCo could relook their product mix or their production processes, as illustrated in figure 4 and 5. The overlap between the increase in market share and to support a healthier lifestyle, as illustrated in figure 4, is a sweet spot for PepsiCo.

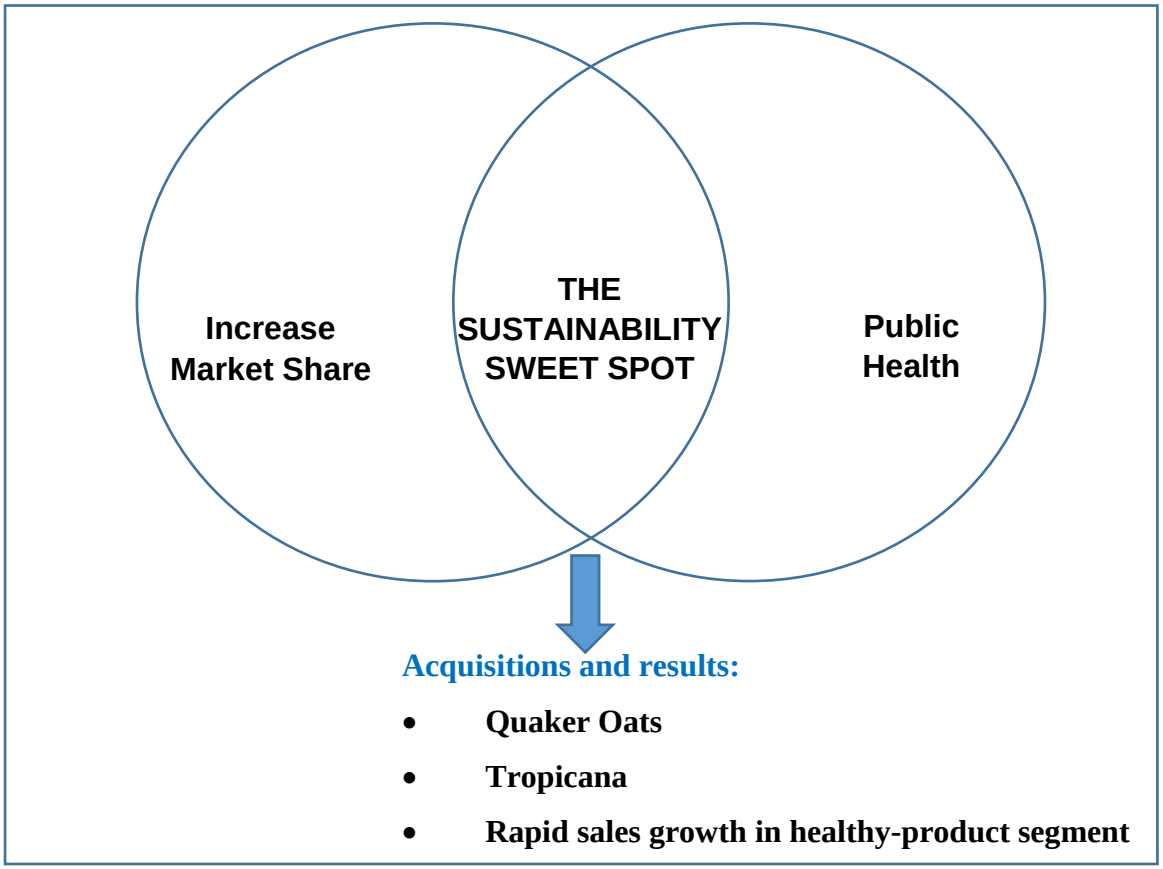

Figure 4: PepsiCo's Sweet Spot (Product Mix)

(Savitz and Weber, 2007:18)

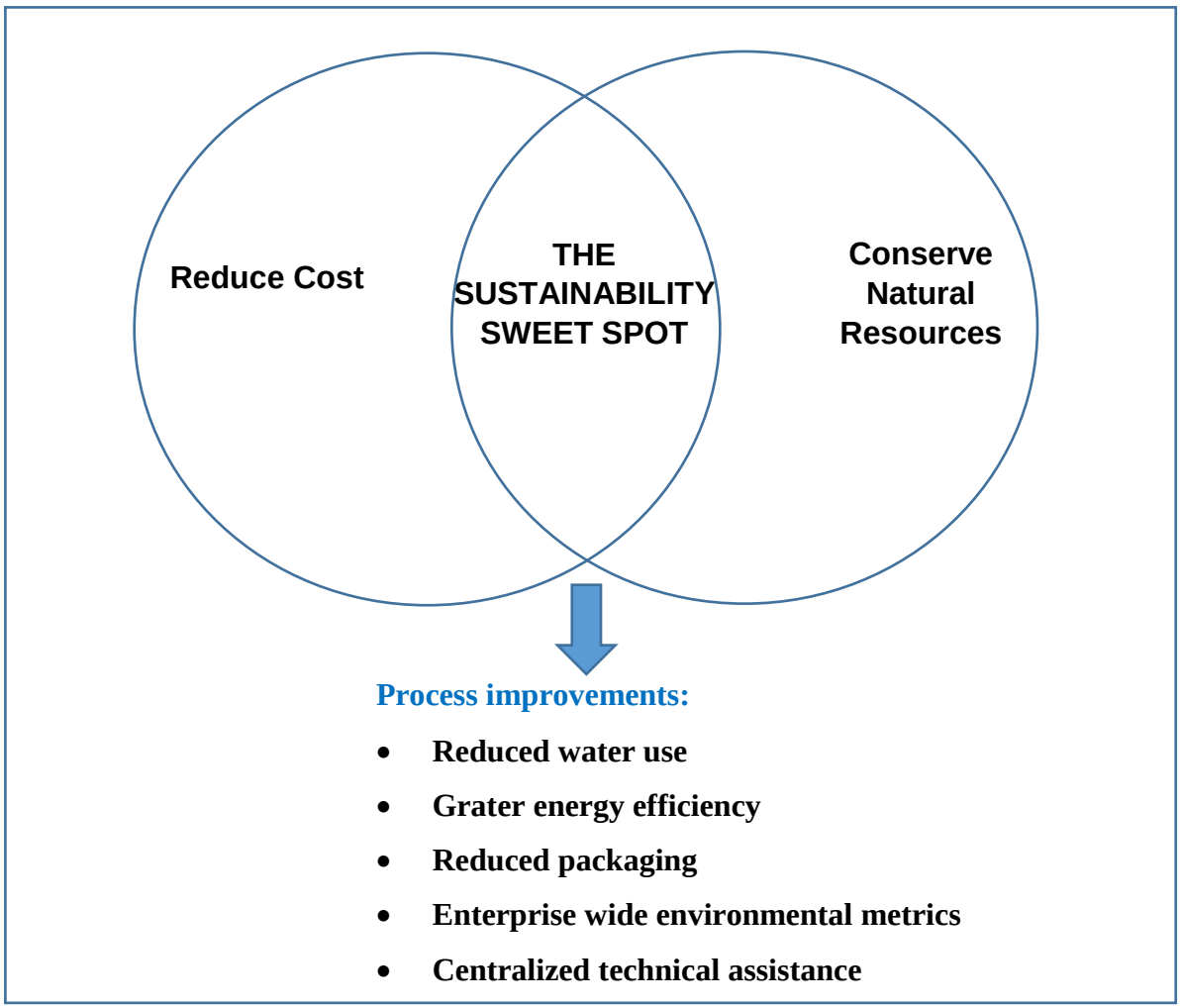

Figure 5: PepsiCo's Sweet Spot (Environmental Processes)

(Savitz and Weber, 2007:18)

By relooking at their processes, it was possible for PepsiCo to identify their Sweet Spot as illustrated in Figure 5 above.

This breaking of boundaries resulted in an integrated approach that integrates the three sectors, taking a holistic view and overcome barriers between disciplines. Sustainable development is now based on an integrated view and reduce trade-offs between aspects such as poverty in society, depletion of natural resources and the growth in Gross Domestic Product (GDP). This is now a win-win situation for example appreciating the shift from coal to renewable energy as a benefit to the environment and human well-being in general. We as human beings could not separate the impact of our actions into separate compartments. We have to overcome barriers between disciplines to an interdisciplinary or even trans-disciplinary view of the world. The question is now, how could sustainability be part of an MBA curriculum?

Sustainability and the MBA

Earlier this year the AMBA conference was hosted in Stockholm, Sweden to emphasise the needs of a quality MBA program. As the NWU Business School is accredited by this international body, the emphasis of such a conference is to identify which kind of information our prospective students need. It was evident that the leaders of tomorrow need to be taught about sustainability, good corporate governance and ethics.

The NWU Business School should therefor make sure that our curriculum includes these topics as indicated as relevant. In addition the NWU Business School tries to teach our students, to think around barriers, to be an ethical leader and to address any problem in an integrated and holistic way. This introduction provides context to my field of research and the underlying principles of sustainability and integration. In the next paragraphs a discussion about the connection between the dreams of the university as expressed in the mission of the NWU, and the researcher's own environment, will follow. The researcher is teaching MBA students in the field of Accounting, starting with **Financial Accounting** and then move to **Management Accounting**. The fact that companies should find the middle ground between profits and long term sustainability is crucial.

Financial Accounting and sustainability

In the field of **Financial Accounting** the aim within the context of MBA students, is to focus more on the reporting and decision making sides than on the technical side of Accounting. Relating back to the introduction, the focus is on how "financial information" could be communicated to its various stakeholders. In Accounting, the undertaking is to adjust from individual reports (reporting only the financials) to combine financial as well as non-financial information in one report (Anderson & Varney, 2015). After a long journey of development, the triple bottom line (TBL) approach was proposed by Elkington in 1997 as a tool to stimulate sustainable development.

The TBL concept was presented as the "three pillars" approach" while Savitz & Weber (2007) gave credit to this approach by stated "*a sustainable company should be one that creates profits for its shareholders while protecting the environment and improving the lives of those with whom it interacts"*. As sustainability reporting or triple bottom line (TBL) reporting evolves, it becomes challenging to report on every aspect and the result was the foundation of Integrated Reporting.

The rationale behind integrated reporting is to enable stakeholders to view and assess the organisation's capability to create and sustain values over the short, medium, and long term,

without depleting the resources of the business (Bouten and Hoozée, 2015; Hughen et al., 2014). The Integrated Committee of South Africa (IRC of SA) started to work on a framework for an integrated report. This resulted into the development of an International Framework on IR, released by the International Integrated Reporting Council (IIRC) in 2013. The aim of the IIRC is to improve the quality of information available to providers of financial capital to enable a more efficient and productive allocation of capital" (IIRC, 2013). The latest King IV report was published in 2016 which put an emphasis on integrated reporting and integrated thinking (IoDSA, 2016). In terms of research in the field of accountancy, sustainability issues gain emphasis and investigation on how financial as well as management accounting practices could contribute to the sustainability of companies, are considered (Albelda, 2011; Guenther et al., 2016).

As mentioned before sustainability is a crucial aspect which could not be ignored by companies. Previous studies indicate that Financial Accounting is more standardised and regulated by international and local accounting standards. Financial Accounting has to adhere to more laws and regulations and thus not fully support sustainable development (Tsui, 2014:5).

A number of theoretical frameworks such as the institutional theory, legitimacy theory, agency theory and stakeholder theory have been utilised in explaining the importance of CSR reporting (Chan *et al*., 2014; Snider *et.al*. 2003). Various studies performed in the field of Financial Accounting are founded on the legitimacy theory. The viewpoint or worldview of this theory is based on the notion of a social contract between a company and society and therefor the company should disclose social responsible information to project a socially responsible image. The legitimacy theory adopts the view that companies will engage using public disclosures to alleviate societal pressures. As Financial Accounting is highly regulated with specific accounting rules, it resulted in incomplete capturing and presentation of environmental and societal costs.

Numerous reports by accounting bodies advocated that the accounting profession should play a role in justifying companies to take a leadership position in relation to sustainability (CIMA, 2011; Gibassier, 2017). As mentioned by Jones (2010) accounting as practiced in the modern corporation, is extremely *short –term orientated*, while environmental problems, such as global warming, have very *long time* spans. This viewpoint was earlier confirmed by Bebbington and Thomson (2013) who wrote in their editorial of the *Management Accounting Research*, a special issue on "Sustainable Development, Management and Accounting: Boundary crossing", that none of the papers really engaged with sustainable development literature or the

most recent thinking therein. This viewpoint is shared by Christensen & Himme (2017) that makes the statement that a clear approach to sustainability in accounting is still lacking.

Many questions have been asked, many research papers have emerged but the question that remains, was how; “more or less integration could take organisations closer to being sustainable?” Accounting bodies have constantly motivated that the accounting profession should play a role to ensure that companies take a leadership position in relation to sustainability (Gibassier et. al., 2018). In response to the challenges faced by traditional accounting systems to accommodate sustainability, the search for the answer moves to Management Accounting.

Management Accounting and Sustainability

Management Accounting has overcome the problem of laws and regulations but studies indicate that environmental and society costs were still not visible but absorbed into overhead accounts (Ditz et al. 1995; Jamil et.al, 2015). Environmental costs are often miscalculate and misallocate due to the lack of a good accounting system that should provide sound cost allocations.

When any company identifies more risks and become more uncertain, a broader level of accounting information is needed. More sustainable, non-financial and future-orientated information is required in order to manage and to strategize in this dynamic and uncertain environment. Management Accounting that focusses on sustainability performance can promote organisational change by addressing the risks and opportunities associated with sustainability (Burritt, et. al., 2010). In this context an example is the introduction of tax on carbon emissions to contest climate change and in this sense establishes an additional business risk. These risks need to be measured, reported and managed. Companies have to evaluate the risk of climate change, the payment of carbon tax and then quantify the risk and adjust their strategies accordingly.

Another problem in identifying environmental costs is the lack of communication between accountants and environmental experts (Tsui, 2014). Schaltegger (2018) mentioned that most of the academic publications on Management Accounting has little to do with the concept of sustainability. Professional accounting bodies have been advocated since the CICA in 1993 until today, that accountants should take the lead to implement sustainability accounting into an organisation, but accounting research surveys demonstrated that this is not the case (Gibassier and Alcouffe, 2018).

Gibassier and Alcouffe as recent as in this year 2018 suggest that **Environmental Management Accounting (EMA)** could be the missing link to sustainability!! EMA should incorporate sustainable development and by doing this it could be a welcome move to reconcile organisations with sustainability. Gibassier and Alcouffe (2018) also suggest that professional bodies, practitioners and academics should evaluate their current practices to incorporate sustainability in shaping new tools and standards.

Environmental Management Accounting and Sustainability

EMA should not be seen as a separate system according to the International Federation of Accountants, but that it is a system that adds value to the conventional system (IFAC, 2005). EMA provides useful information to businesses to manage and to improve performance and most importantly to emphasise sustainable development.

Environmental Management Accounting (EMA) is defined *as the management of monetary, physical and qualitative information on the environmental impacts and the financial consequences of environmentally relevant business activities –information that supports internal and external decision making, reporting and accountability* (Latan, et.al., 2018).

Johnstone (2018) argued that the corporate culture of a company should also reflect its relation with the environment. This should include the reference to the environment in the mission and vision of the company. A way to implement this is to develop key performance indicators that reflect and measure strategically important sustainability issues. As we can recall previous environmental disasters like BP's oil spill in the Gulf of Mexico, hurricanes, the Asian tsunami and global warming, it is evident that these incidents create awareness of the public and also a greater demand from stakeholders for companies to act in a sustainable way (Gunarathne & Lee, 2015).

In order to address the problem and to operationalise sustainability into a company, three stages were identified, namely:

Stage 1. To develop an environmental strategy for the company;

Stage 2. To achieve a competitive advantage and;

Stage 3. To complete the environmental integration (IMA, 2016).

In stage 3 where the focus is on integrating environmental concerns into the day-to-day operations of the company, it is crucial to make sure that environmental aspects are also part of the long-term sustainability strategy of the company. The environmental strategy includes

aspects like: how to measure integrated environmental performance, how to generate revenue out of green products and how to market green/environmental friendly products?

EMA could support companies towards sustainable performance in the following ways:

- Support companies by quantifying their environmental impacts on workers, community and other stakeholders;
- Supply sustainable performance measures for operational processes and reporting guidance;
- Gather information that identifies costs and savings;
- Provide companies a chance to recognise risks and opportunities;
- Produce physical and monetary measurements that are vital in all sustainable management practices (Gunarathne, et.al, 2015).

As evident in previous discussions, sustainability is recognised as an important aspect in any business, but the identified challenges are how to operationalise sustainability aspects in a company. Part of this challenge, is to measure the usage of inputs factors, for example energy consumption in the output of production. As mentioned by Christensen and Himme (2017) environmental management accounting needs better tools to improve internal decision making as well as eco-efficiency for better resource allocation. With this in mind a new field of research, namely **efficiency measurement in management accounting,** is introduced. As we all know economic activity is the main reason for the depletion of our natural resources (Virtanen et al., 2013). Accordingly EMA needs better tools to improve decision making on how to manage these limited resources. This takes us to the term: **eco-efficiency**.

Environmental Management Accounting and Eco-efficiency

Elkington has already indicated in 1997 that there is actually an overlap between a company's economic and environmental performance and that it could be expressed in an eco-efficiency ratio. According to various authors (Bebbington & Gray, 2001; Burnett & Hansen, 2008; Fonseca & Chiappetta Jabbour, 2012) eco-efficiency claims that it is possible to *increase* productivity and *reduce costs* while at the same time *improving environmental performance*.

By applying the concept of eco-efficiency in a company it is considered that a company needs an **Environmental Accounting System** (EAS) that is able to identify, to measure and to report **physical information** such as the use and flow of materials, water and energy consumption

and amount of waste generated. The physical information should then be applied into a relationship with the monetary information. The relationship between the monetary information (input costs in Rand) and increased output (increase in units produced) while at the same time reducing the pollution or carbon emissions, should confirm the need for an eco-efficiency ratio's or an Economic-Efficiency Indicator (EEI) (Burnett & Hansen, 2008).

The EEI is designed to capture the ecological efficiency of growth by measuring the efficiency of economic activity both in terms of consumption and production (resource-use) and its corresponding environmental impacts. A formula that could be used to calculate eco-efficiency is the following:

Environmental Cost/ Economic Output

Environmental costs can be:

- Pollution emissions (CO2 or carbon emissions, etc.)
- Resource-used (energy or water used)
- Cost associated with an environmental burden (traffic congestion costs) and

Economic output can be:

- Value added of benefit (GDP per capita)
- Unit of product or service (per km, per m2)

The use of EEI has been identified as one of the key tools for measuring Sustainability. EEI can be used to:

- Measure the eco-efficiency of different sectors within the country
- Compare the eco-efficiency of economic growth of different countries
- Identify policy areas for improvement in achieving economic benefit
- Track trends in eco-efficiency over time. (sustainable development, 2017)

Another way to conceptualise eco-efficiency is to judge it as an indicator on how efficiently companies use limited natural resources, such as water, oil and carbon (Passetti & Tenucci, 2016). These kind of positive evidence, illustrating that good environmental performance is positively associated with good economic performance, will stimulate investors to invest in "green" companies. The European Union see eco-efficiency as a tool for companies to reduce their ecological footprint and to integrate the measurement of environmental and economic performance. Examples of output in relation to water used, is illustrated in table 1 below.

Table 1 Output in relation to water used

Foodstuff	Quantity	Water consumption, litres
Chocolate	1 kg	17 196
Beef	1 kg	15 415
Mutton	1 kg	10 412
Chicken meat	1 kg	4 325
Cheese	1 kg	3 178
Olives	1 kg	3 025
Bread	1 kg	1 608
Wheat	1 kg	1 500

IISD, 2016.

Several companies integrate eco-efficiency into their business strategy, including their operational, product innovation and marketing strategies. A study by Passetti and Tenucci (2016:237) concludes that eco-efficiency measurements can inform strategic as well as operational decisions. In the same study the results indicated a very modest use of eco-efficiency measurement which reveals that environmental assessment is still subordinated to economic assessment. The study recommends that legislation is needed to push companies to adopt environmental management accountings instruments such as eco-efficiently indicators.

Companies such as Toyota and Toshiba have implemented eco-efficiency in their production and operations to assess the product's environmental performance relative to their business and production operation performance and communicate the results openly to the public. Eco-efficiency is also being promoted to influence consumer buying behaviour with regard to a wide array of products available on the market.

The problem which is experienced by many companies is how to **physically collect** the consumption of a specific resource, such as energy, at a specific point of consumption, without additional costs? This brings us to the latest development and a new direction in Environmental

Management Accounting and Eco-efficiently, namely the emerging of totally new sub-disciplines in EMA, namely: Water Management Accounting, Cost Efficient measure of Energy Consumption, Carbon Management Accounting and Natural Capital Accounting.

In the conclusions of a study recently performed by Burritt and Christ (2017), they emphasised the need for improved corporate water accounting, which links physical water information with monetary related impacts and effects of water. As stated by Christ and Burritt (2013) a proactive environmental strategy is likely to promote the use of EMA. To understand the relationship between risks, strategies and the integration of sustainability into accounting, we need information like carbon-related management accounting (CMA) (Bui & De Villiers, 2017:5).

To include sustainability issues such as the disclosure of topics that deal with society and the environment, have proven to create new opportunities for companies, to advance their image, to create value within a company and to strengthen the credibility of a company (Deloitte, 2013; Andrea, 2017:10).

If companies avoid their environmental responsibilities and fail to implement environmental performance indicators, companies might underestimate their risks, they cannot really evaluate their environmental footprint, and might experience more stringent regulations and more pressure from stakeholders. Companies have to make more efforts to improve their eco-efficiency measurement and this should be integrated into business planning. The implementation of a large set of environmental management accounting tools become fundamental to promote integration paths (Passetti &Tenucci, 2016). Companies and other institutions need to create and to maintain environmental measurements and reporting systems in response to the ever increasing pressures from the social, political and economic surroundings.

To conclude other researchers, academics, professional accounting bodies and other stakeholders are urged to engage in sustainability, to find their sustainability “sweet spot” and to save our planet!

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