Overview of Drivers *behind* Environmental Management Accounting (EMA)

Altohami Othman Alkisher[1]

Abstract

Due to increase global pressures and interest with environmental issues over the past two decades, environmental management accounting (EMA) has been emerged as a new technique in accounting field in order to provide information in regard to environmental issues for various parties. This paper highlight on EMA concept and reviews the most important drivers that were behind its emergence and spread. EMA is an important tool can help to reduce environmental impacts and improve environmental performance of organizations, as well as achieve a sustainability. The past literature review shows that five main factors significantly contributed in emerging and spreading of EMA concept and practices in several countries around the world; however in developing countries the spreading of EMA is still under level comparing with developed countries. In fact, the issue of adoption, implementation and of EMA remains in early stage particularly in developing countries. This paper provides contribution to the literature of EMA through explain the extent of differences between developed countries and

1- Assistant Professor, Accounting Department, Faculty of Economics and Commerce, Al Asmarya University, Zliten, Libya, a.alkisher@asmarya.edu.ly

developing countries in this regard. Thus it offers a basis to make further research on EMA in the future.
Key words: Environmental Management, Environmental costs, EMA.

1. Introduction

Environmental impacts become one of the interesting issues in recent decades on national and international level. More interested discussion is given to address environmental impacts by different parties around the world. These impacts have taken several forms, for example soil, water and air pollution; chemical wastes and global warming which are often caused by industrial activities and growth of economic (Li, 2004). Therefore, many governments in all over the world have long been engaged on establish the policies based on voluntary, regulatory, incentive, cooperative instruments and informational that aim to address environmental problems and promoting sustainable development (Lin, 2001; UNDSD, 2000). In addition, many pressures are growing by various stakeholders on companies in order to reducing environmental impacts and providing information related to their environmental performance (Scavone, 2006a). As consequently, it has been increased attention for the role of accounting information systems in providing sufficient information on environmental impacts and activities for various stakeholders (Li, 2004). In fact, in1970s, there is not a clear interested on the role of accounting to contribution for addressing

environmental issues. However, in 1980s, accounting profession had been become demanding than ever to contribute in solving environmental problems through provide sufficient information for various stakeholders, and the potential role of management accounting was clearly in managing issues-related environment (Bouma & Van der Veen, 2002). Also, this period characterized issuance many environmental regulations in numerous countries such as United States, Canada and United Kingdome. Therefore, organizations were started to develop environmental programs which help reduction environmental impacts, saving money and achieving sustainability (Gibassier & Alcouffe, 2018; Smit & Kotzee, 2016; Walley & Whitehead, 1994). Such regulations were significantly contributed in emergence of environmental accounting and environmental information disclosure, where accounting information become required to assist in evaluating environmental programs by determines costs and benefits related to such programs, as well as such information can be benefit to decision makers for managing, auditing and improving environmental performance. This is considered as a start point to development of Environmental Management Accounting (EMA).

Furthermore, increasingly attention of Environmental Auditing and Environmental management systems in the early 1990s, led to the more development of EMA. Where, corporations need to assess environmental impacts caused by their activities as the main step to implement Environmental Auditing, and managing environmental

performance (Chang, 2007). Also, International Standards Organization issued number of guidelines, such as ISO 14000 series that include mainly environmental management systems, environmental performance evaluation, environment-related auditing, environmental labeling, assessment of life-cycle, as well as environmental aspects to product (Li, 2004). All of this assisted increasingly to adopt and prevalence environmental management systems (EMS) in 1990s. Thus, it has been reflected considerably in the accounting's role in general, and in the management accounting as a vital tool in manage environmental performance (Chang, 2007). Thus, the role of management accounting has become clearer in managing environmental performance and in the early 1990s (Gray & Bebbington, 2000; Stone, 1995). In this regard, according to Li (2004), the rapid development and awarded many firms certificates in ISO 14001, has enhanced the spread of EMA concept in several countries around the world.

On the other side, several researches were conducted many academic research and made important contributions led to EMA development (e.g. Ansari, Bell, Klammer, & Lawrence, 1997; Bailey & Soyka, 1996; Bartelmus & Parikh, 1998; Bartolomeo et al., 2000; M Bennett & P James, 1998; Boyd, 1998; Burritt, Herzig, & Tadeo, 2009; Chang, 2007, 2013; Chang & Deegan, 2010; Christ & Burritt, 2013; Dayana, Sulaiman, Ahmad, & Nazli, 2010; Ditz, Ranganathan, Banks, & Beloff, 1995; Epstein, 1996; Ferreira , Moulang , & Hendro 2010; Gray, Bebbington, & Walters, 1993; Heidari, 2012; Jalaludin, Sulaiman, &

Ahmad, 2010; Jamil, Mohamed, Muhammad, & Ali, 2015; Jasch, Ayres, & Bernaudat, 2010; Lee, 2011, 2012; Milne, 1996; Mohd Khalid, Lord, & Dixon, 2012; Qian, Burritt, & Monroe, 2011; Schaltegger, Gibassier, & Zvezdov, 2013; Schaltegger & Stinson, 1994; Staniskis & Stasiskiene, 2006; Stone, 1995; Sumathy, 2010; Sutherland, Lord, & Ball, 2008; Ván, 2012; Wahyuni, 2009; Wilmshurst & Frost, 1998). Among the most significant contributions is the identification of numerous concepts and techniques related to EMA, such as environmental cost, environmental reports, and types of EMA information, environmental management and environmental performance indicators. On the other hand, there are other parties such as policy advisors and business people are interested in EMA as an important tool for environmental managers. There are many conferences and workshops hold to conduct regular discussion of EMA developments (Burritt, 2004). In addition, number of countries around the world have interested to support EMA practices. The United States was first country to promote and support EMA. Where, it has established a formal program for investigating and promoting EMA; many initiatives related EMA conducted by Environmental Protection Agency (EPA) for further information (Burritt, 2004). These initiatives significantly contributed in define main concepts and terms related to EMA as well as provide a categorization scheme for identifying environmental costs (UNDSD, 2000; USEPA, 1995). Also, the EPA with collaboration of Tellus Institute made several activities, including summarize definitions, develop a model of

investments appraisal, develop research of practices in various manufactures like electroplating, chemicals and other businesses (Martin. Bennett & Peter. James, 1998; Graff, Reiskin, White, & Bidwell, 1998). In the recent years, EMA activities have been also a strongly interest in several of other countries, such as Australia, Japan, Austria, Germany and Argentina. Beside, Schaltegger and Burritt (2000) indicate that EMA receives growing attention as a support mechanism for various organizations to identify and manage significant financial consequences that shaped by considerable environmental incidents. Many governments over the world are currently involved or interested in promoting EMA practices (Burritt, 2004; Li, 2004; UNDSD, 2000, 2001). For example, government in Japan provided two initiatives contributed effectively in adoption and use of EMA practices in many Japanese companies (Kokubu, 2002). However, EMA has not received any support or attention by government or professional organizations in developing countries so far.

On the other hand, some international organizations and professional accounting bodies have promoted governments to be more effective in supporting EMA adoption through organize the workshops conferences and conduct the academic studies in this regard. For example in 1998, United Nations had organized an Expert Working Group to improve the role of the governments to promote EMA. The Environmental Management Accounting: procedures and principles was the first publication by this Group. This publication explain the concept

of EMA and provides a number of principles for guiding who interested in EMA application (UNDSD, 2001). Also, the International Federation of Accountants (IFAC) (2005) has been published the International Guidance Document to guide the EMA studies and practices of both organizations and individuals those hope to access further information on EMA. Many articles and books have been published about environmental accounting that contributed significantly to understand and practice of EMA (IFAC, 2005). In fact, an increasing number of studies related to EMA in various industry sectors and some of small and medium companies are gradually growing up. Furthermore, the voluntary acceptance from management in several organizations that wish to deal with environmental issues and maintaining of legitimacy also contributed in practice EMA. In present various tools of EMA could be available for the managers (Ambe, 2007; Burritt, Hahn, & Schaltegger, 2002; Deegan, 2002; METI, 2002; Viere, Herzig, Schaltegger, & Burritt, 2006a).

On the mentioned above there is increasingly attention of EMA, several efforts have been made to explain concept, tools, and applications of EMA, as well as promoting its implement, and use within organizations. Most researches, case studies and projects related to EMA have been made in developed countries, nevertheless, there is a lack interest of EMA in developing countries including Libya. The next section will more discuss the drivers behind EMA.

2. Drivers behind Environmental Management Accounting (EMA)

The interaction of organizations with environment becomes one of the interesting issues around the world. The issue significance appears through increasing government regulations and legislation, communities interest and growing focus by media about organizations' environmental performance (Deegan & Gordon, 1996; Wilmshurst & Frost, 2001). Supporting of this come from Schaltegger, Muller and Hindrichsen (1996) who commented that during the last two decades ,awareness of environment-related issues has been dramatically growing, and membership of environment-related pressure groups has been increasing in many countries around the world over this period. Several perspectives have argued that organizations need to meet the objectives and requirements of its stakeholders, relating to environmental issues (Clarkson, 1995; Holland & Foo, 2003; Kulkarni, 2000). Thus, organizations have come under increasing pressure from various groups regarding the need to improve and report their environmental performance and develop their information systems including accounting systems. The IFAC (2004) argued that pressures from stakeholders are forcing companies to look for new techniques and efficient tactics in order to managing and minimizing environment-related impacts. Wilmshurst & Frost (1998) indicate that, given to the growth in communities concerns and government regulations, organizations should

evaluate and report their environmental performance, as well as, there is an urgent need to incorporate monetary and physical information relating to environment.

The literature review identifies that there are number reasons and drivers for the increasing interest of EMA in over the world. The most important drivers include increasing of environmental legislation, governmental initiatives, environmental pressure groups, growing significance of environment-related costs, and failure of the conventional accounting systems in addressing environmental issues (Burritt & Saka, 2006; Gale, 2006; IFAC, 2004; Jamil, et al., 2015; Kokubu, 2002; Lee, 2012; UNDSD, 2000; Wilmshurst & Frost, 2001). For example, Welford and Gouldson (1993) stated that the environmental legislation development is one of the most important factors that influencing the industry behavior in environment field. In addition, increasing the pressures from various stakeholders groups such as governments, employees, consumers, lenders, shareholders and investors played an important role in emergence of EMA (Gale, 2006; IFAC, 2004).

These pressures have impacted organizations' behavior in regard to environmental responsibility and change their management systems including accounting. In this regard, the UNDSD (2000) stated that number of businesses start to review and change their management procedures as response to stakeholders pressures for more correctly measuring environmental costs and of environmental protection benefits. It is argued that increasing the interest of stakeholders towards the green

issues has forced many managers to provide information on environmental performance of an organizations in their reports (Azzone, Brophy, Noci, Welford, & Young, 1997; Holland & Foo, 2003). Furthermore, the increasing of the significance of environmental costs is also one of the reasons or drives behind emerging and development several guidance documents related to EMA around the world (IFAC, 2004; Sendroiu, Roman, Roman, & Manole, 2006). However, using conventional accounting system not able the firm from accurately identify upon environmental costs (UNDSD, 2000). This is supported through Gale (2006), who indicates to the growing recognition see that traditional management accounting typically does not supply accurate and sufficient information to the management for managing environmental impacts. Hence, both the benefits and costs relating to sound environmental management would be significantly underestimated. This is considered another reason push toward development of conventional management accounting practices to include environment-related issues.

It is worth mentioning that intensities and types of pressures on companies with regard to adoption and use EMA may vary significantly among different countries especially between developed and developing countries, as well as, from sector to sector in different business, depended on a company's participation in international markets (IFAC, 2004). For example, in some countries employees have been powerful force on organizations, whereas consumers and environmentalist groups

were main factors in other countries. Consumers in the United States, Scandinavia, Netherlands and Germany usually take more significant interest with environmental issues than counterparts in the United Kingdome (Ahmad, 2004). Whereas, there is less pressures are exercised from consumers and other interest groups on organizations regarding environmental issues in developing countries (Andrew, Gul, Guthrie, & Teoh, 1989). The following subsections highlight on the most important drivers behind the development and implementation of EMA.

2.1 The Environmental Legislation

In recent decades there is a great concern about environmental damages such as climate changes, piercing of the ozone layer and acid rain which created by the negative impacts of organizations' activities. This is leading to the growing the body of regulations and laws that deal with these issues in many countries (Wilmshurst & Frost, 2001). In the United States environmental protection began in the later 1960s when the Environmental Protection Agency (EPA) was set up. The United States and Canada were the first countries established environmental regulations in early1970s (Ahmad, 2004). Then the European countries embarked on a rapid development of the environmental regulations and laws. In 1982, Libya also has published the environmental protection law. Several international conferences and agreements as well, were held for example the World Summit on Sustainability Development in Johannesburg and Kyoto Protocol for reducing emissions.

Environmental issues are influencing economic growth and development international trade as one of the reasons for global pollution. For example the General Agreement on Tariffs and Trade (GATT) started to change its practices by introduction of an environmental code as response to environmental regulations (Ahmad, 2004).

In relation to accounting practices, despite increasing the environmental regulations and laws, there has been a debate regarding whether or not accounting systems should be have a vital role in addressing environmental issues during 1970s. However, this has recently changed when environmental cost and liabilities significantly increased because of the growing pressures in many countries (Burritt & Saka, 2006; IFAC, 2004). For example, the strong environmental regulations in developed countries have led to greatly increase many types of environmental costs. Many companies in developed countries have seen rise the costs resulting to their environmental compliance, these costs include costs of required pollution and control equipment, monitoring of wastes and emissions fees and regulatory paperwork and reporting. In addition, there is increasing in liability costs related to remediation of sites and insurance costs resulted by regulations of pollution clean-up (IFAC, 2004, 2005; Kokubu, 2002; Li, 2004; UNDSD, 2000). In this regard, Sendroiu, et al., (2006), referred to the high level of environmental costs and potential liabilities in the European countries and United States played vital role in spread of EMA practices and pushed businesses to assess their environmental costs.

According to UNDSD (2000), number of the firms started to develop environmental programs to decrease environment-related impacts and saving money, as response from them to increase environmental legalities in many countries. These firms are become need to evaluation these programs by identify costs and revenues of them. That has led to growing the interest and attention of accounting role in regarding to addressing environmental issues (Burritt & Saka, 2006). As a result, management accounting, thus, become required more than before to help organizations for reducing environmental impacts and the improving environmental performance. Therefore, it is safe to say that increased regulations are forced many organizations for adoption and implementation EMA practices in many countries, due to these regulations and legislations led growing some environment-related costs. This is what is widely encourage many organizations to adopt EMA practices that can help organizations to identify, allocate and report many environment-related costs base on the activities that caused of them (Gale, 2006; Smit & Kotzee, 2016; Wilmshurst & Frost, 1998).

It is worth mentioning that, it is safe to say that increased environmental regulations and legislations in developed countries led to adopt and implement EMA practices by many organizations. By contrast, the literature has identified that the level and power of environmental legislation in developing countries, including Libya is still low when compared to developed countries and, moreover, these legislations have little or no direct insinuation for accounting and

reporting practices (Belal, 2001; Jamial , Alwi, & Mohamed, 2002; Rajapakse 2002 ; Surmen & Kaya 2003). This might partly explain the differences among developed and developing countries in term of EMA practices.

2.2 The Governmental Initiatives

The initiatives by governments and local, national and international governmental organizations in different countries contributed to promote of EMA (Burritt & Saka, 2006; Li, 2004; Qian, et al., 2011; Qian, Burritt, & Monroe, 2018). These organizations and bodies have already published many guidance documents, pilot projects and national case studies to identify best practice to EMA (e.g. the United States, the United Kingdom, Spain, the Philippines, Japan, Germany, Finland, the Czech Republic, Canada, Austria, Australia and Argentina) (Bartolomeo, et al., 2000; Martin. Bennett & Peter. James, 1998; Burritt & Saka, 2006; IFAC, 2004; UNDSD, 2000). In 1992, the United States has established project of Environmental Accounting as part of Pollution Prevention Act implementation of 1990 that emphasizes programmers based market and voluntary. Project is funded by its limited resources through outreach efforts, other government departments' education and cooperation with partner organizations. As part of this Project, a range variety of activities with various objectives has undertaken by EPA in cooperation with organizations or other enterprises, these efforts included:

- Definition of the roles, terms and concepts of different enterprises;
- Development of incentives;
- Outreach, guidance, training, and education; and
- Development of analytical systems, methods and tools (UNDSD, 2000).

In relation to EMA, USEPA was developed the first formal program for promotion of EMA adoption in the early 1990s. Many case studies had undertaken for supporting the applications and benefits of EMA in different industrialization sectors. Since that time, governmental agencies and other organizations in many countries have started in promoting EMA by a variety range of environmental accounting initiatives (IFAC, 2005; UNDSD, 2000). For example, in the United Kingdome, Environmental Agency has provided an Initiative for Environmental Accounting, which covers its specific activities, comprising financial accounting, environmental planning and management accounting. The initiative has been supported by the local authorities, national government and corporate charges (Bennett, 2006; UNDSD, 2000). In addition, the Environment agency in Canada has made a preliminary guide for environmental accounting covers several aspects such as qualitative information, financial and non-financial information, and some external environment-related costs. Environment agency in Canada also provides several consultant services on EMA, environmental management systems (EMS) and other aspects of

environment protection for small businesses (UNDSD, 2000). In 1999, Finland published several Guidelines related to EMA and Environmental Reporting for corporations (UNDSD, 2000).

The Japanese Environment Agency also has published a draft guideline in order to evaluate environment-related costs, as well as disclose information generated by environmental accounting systems. This guideline explains how to define and calculate environment-related costs, as well as, provides forms about some practices reporting and accounting for internal cost. In addition, Japanese government recently has produced number initiatives to develop environmental accounting including EMA (Burritt & Saka, 2006; Kokubu, 2002; UNDSD, 2000). The both of Ministry of Economy, Trade and Industry (METI) and the Ministry of the Environment (MOE) have produced two initiatives about environmental accounting. Kokubu (2002) found that guidelines of two initiatives are played an important role for influencing on companies in Japan. By contrast, the literature has identified the level of governmental initiatives related to environmental issues in developing countries, including Libya is still low when compared to developed countries and, furthermore, the national and local government agencies have limited influence for accounting and reporting practices (Burritt, 2004; Li, 2004; UNDSD, 2001; Viere, et al., 2006a). This might also partly explain the differences between developing and developed countries in term of EMA.

2.3 The Pressures of Stakeholder

Many organizations in various countries cared about environment-related issues. This is due to several external and internal stakeholders which have showed increasingly interested on the environmental performance to organizations. Internal stakeholders include for example the management or employees who affected through toxic waste in the production sites. Whereas external stakeholders include many parties such as customers, shareholders, suppliers, investors, government regulators, environmental activist groups, communities affected by local pollution and others (Gale, 2006; IFAC, 2004; Mia, 2006; Schaltegger & Burritt, 2000). In spite, those environmental pressures may vary widely whence of the type and intensities among different economic sectors and societies. However, it should be noted, that various stakeholders are continually forcing organizations for managing and minimizing environmental impacts, improving and reporting environmental performance (Gale, 2006; IFAC, 2004, 2005). Wilmshurst & Frost (2001) suggest that given to growth of the government regulation, legislation, and community concern, the organizations should be serious to evaluation of environmental performance. As a result of these pressures, environment-related benefits and costs are on the rising and have become a significant part of decision-making process in organizations (Gale, 2006). Whereby, environmental costs of corporations relatively were low in the past, but

now there is increasing stakeholders pressures in many countries, this is growing environment-related costs (Martin. Bennett & Peter. James, 1998; Gale, 2006; IFAC, 2004; Scavone, 2006a). According to IFAC (2005), several prominent examples at international level of environmental pressures can be include:

- pressures of supply chain , for example large firms require from suppliers to commitment with standards related to environmental management of the ISO; (Schaltegger & Burritt, 2000).
- pressure exerted by various stakeholders on companies to disclose their environmental performance, such as using of Global Reporting Initiative's guidelines; (Schaltegger & Burritt, 2000).
- Pressures of financing, as a result to increase the funds of socially responsible investment, disclosure requirements of investments policy and investments rating systems for example, Sustainability Index (Dow Jones); (IFAC, 2005).
- pressures of regulatory control , such as European Union regulations relating to restricts the using of dangerous substances in electronic and electrical equipment sold in European countries; (Schaltegger & Burritt, 2000).
- Pressures of Environmental taxes, for example, emissions fees, landfill fees energy use taxes and carbon taxes, that imposed by governments; (Martin. Bennett & Peter. James, 1998; IFAC, 2005).

- pressures of cap and trade, for example Kyoto Protocol which included important aspects on trading and emissions cap (IFAC, 2005, pp. 10,11).

As mentioned earlier, it is clear that organizations are facing growing concerns from stakeholders about their environment-related impacts; and those stakeholders need various types of information. For example, company's management requires data about revenues, costs and profits. Community and environment protection agencies need information about the environment-related impacts, whereas the tax authorities, shareholders, and investors are concerned on the environmental assets and liabilities. Thus, environmental accounting emerged in order to supply needed information that meets all stakeholders (IFAC, 2004; Staniskis & Stasiskiene, 2006; UNDSD, 2000). According to IFAC (2005), organizations become more recognizing the importance of potential benefits gained by improving environmental performance. The organizations have discovered that effective use of main resources (materials, energy and water) would bring environmental improvements such as minimize resources used, wastes and emissions, beside the profits resulting for decrease costs of materials purchased and wastes treatment. Moreover, there are many other benefits could be gained through improvement of environmental performance, such as ability of products design that are sensitive for the environment, and improved relationships with different stakeholders in society. Therefore, organizations need a big range of expertise in

different aspects, such as the management, technical, finance, accounting and environmental for making effective decisions to reduce the environment-related costs, and gain more benefits, as well as the pressures mentioned above (IFAC, 2005). In this respect, arguably that accountants can play important role given to easily their access to monetary information of a company and their ability to validate the quality of this information, beside that they have needed skills to use information to assist sound decisions-making in different businesses, for example budgeting, strategic planning, and investment appraisal (Martin. Bennett & Peter. James, 1998; Gray, et al., 1993; IFAC, 2005; Jasch, 2006; Scavone, 2006b; Wilmshurst & Frost, 2001). For example, Gray et al. (1993) have indicated that, accounting profession and accountants have a lot to contribute with regard to measure and report environmental performance. This because they have experience in many aspects including:

- the generate, collect and analyze data and other information that existing within accounting systems and records;
- verification of analysis methods and data collection;
- report and communicate of quantitative data (Martin. Bennett & Peter. James, 1998, p. 22).

In addition, it should be noted that benefits resulting for popularizing environmental accounting become known, and environmental performance reports of organizations become more important for several stakeholders in the society. These reports reveal the

extent commitment of organizations in regard with environment protection (Li, 2004). Many companies in the first world countries (e.g. Australia, Japan, United States, United Kingdom, and other European countries) have started to develop links among environmental management and management accounting, and use their accounting systems for accessing data on environment-related costs and reporting. For instance, most companies in the United States and some in European countries used their accounting systems as main sources of on the environmental costs data (Bartolomeo, et al., 2000). In Japan, there is steeply increasing in number of the firms that disclose in their reports many important information generated by environmental accounting systems (Kokubu, 2002). Although, that the environmental accounting information now forms an important element of decision-making in developed countries, however there is a general lack of similar commitment with regard to practice environmental accounting and reporting and environment-related issues in the developing countries (Ahmad, 2004; Beer & Friend, 2006; Li, 2004). This is because of differing pressures power of stakeholders between developed and developing countries, whereby that stakeholders and communities in general do not have sufficient power to pressure on the companies in developing countries. Viere, Schaltegger, Herzig and Burritt (2006b) argue that the companies in the developing countries would not be worry on the environment and sustainability issues in the absence pressures

from stakeholders. This also may partly explain the differences among developing and developed countries in term of EMA.

2.4 The Importance of Environmental Costs

Indeed, the costs related to poor environmental performance were comparatively low in the past (Gale, 2006; IFAC, 2004; Scavone, 2006a). In this regard , the IFAC (2004) states that stakeholder pressure and environmental regulations were very few to force companies for managing and minimizing their environmental impacts. Now, that is changed given to increasing stakeholder pressures and forcing environmental legislation, where this led to increase environmental costs in many countries. For instance, most developed countries have seen a significant rising of the environmental costs. This is due to the strong regulators regimes and environmental legislative in these countries. For supporting this Bennett & James (1998) indicated that, several additional costs are growing in many countries. For example, large financial liabilities as a result to number of criminal and civil actions linked to accidents, and increased several environmental and energy taxes, for example landfill tax, carbon tax given to increase the environmental legislation and pressures on businesses.

The IFAC (2004) also stated that most companies specially in western countries have seen rise costs resulting from compliance with environmental regulations, such as costs of equipment required for monitoring and controlling of pollution, and emission fees, as well as,

costs related to waste treatment, and insurance. However, the scale of environmental costs and liabilities might be different from country to country by differing environmental legislations and regulations. In addition, Bartolomeo et al. (2000) pointed out that environmental liabilities of companies in European countries are less than in the USA because of differing legislative and regulatory regimes. In relation to EMA, growing the significance of environment-related costs and liabilities has led to development many guidance documents of EMA around the world. In addition, international bodies such as United Nations and IFAC developed EMA concept, and explain its relation with other key terms including environmental costs and environmental management. It is worth mentioning, increasing of the environmental costs and liabilities have contributed significantly in spreading EMA in many countries. In this regard, Sendroiu et al. (2006) stated that in the United States, the high level of potential financial liabilities resulting of environmental accidents pushed many companies to improve on their accounting systems for better evaluating their environmental costs.

In addition, programmer of Pollution Prevention Pays in European countries played a critical role in understanding and spreading EMA concept. Many firms have realized potential benefits of environmental improvements and enhancing the eco-efficiency, such as reduced use of the raw materials, energy and water, reduced wastes, and also financial savings of reduced costs of purchased materials and wastes treatment (IFAC, 2004). Also, several studies and experiences of

corporations showed that the environmental costs can be significant and reducing these costs can be profitable through suitable management actions. According to Environmental Protection Agency in the United States (USEPA) (2000), several industries obtained good financial benefits by incorporating environmental accounting into their systems. For example, General Motors Company was established a program for reusing the containers with its suppliers and saved $12 million by reducing its disposal costs. in addition, Commonwealth Edison Company have gained $25 million financial earnings by using resources more effectively, also Andersen company had internal of return more than fifty percent by implemented number programs which reduced wastes at their sources (Beer & Friend, 2006). On the other hand, Ditz et al. (1995) reported that the environment-related costs in the number of corporations may exceed twenty percent in some cases. For example, the environmental costs amounted to over nineteen percent from manufacturing costs of an agricultural pesticide at Du Pont Company, and almost twenty two percent of Amoco Oil's Yorktown refinery operating costs excluding feedstock. Several projects in Europe, especially in United Kingdom and Netherlands have been found similar findings on the scale of environment-related costs and financial benefits resulting by reducing the environmental impacts (Bartolomeo, et al., 2000). Moreover, several cases demonstrate that EMA practices can assist the businesses to reduce the environmental impacts, costs and liabilities, leading to increase profits (Lawrence & Cerf, 1995; Lober,

1998). According to Bartolomeo et al. (2000), most companies in the United States and in European countries are tracking costs for measuring environmental performance and reporting. Not so, apparently, in developing countries, where the potential importance of environmental costs are low. This is due to decrease the influence of environmental legislation, stakeholder pressures, lack of the environmental compliance and poor environmental performance in these countries (Ahmad, 2004; Scavone, 2006a; Viere, et al., 2006b). This may also partly explain differences among developing and developed countries in regard to EMA practices.

2.5 The Challenges of Current Accounting Practices

In spite, there is growing concern in many countries in all over the world about environmental issues and related benefits and costs. However, there is an increasing consensus that simply traditional practices of accounting do not supply adequate information for environmental management (Gunarathne & Lee, 2015; IFAC, 2005; Jasch, 2003; Smit & Kotzee, 2016; UNDSD, 2001). Russell et al. (1994) pointed out that conventional accounting systems have failed to allocate environment-related costs to particular processes or products which generated these costs. Thus, that could mean aggregated environment-related costs within cost pools and allocated them to the products based on the production volume measures for instance labor hours or machines, or, instead, they might be deducted as a lump amount from

operating income (UNDSD, 2001). On the other hand, Wilmshurst and Frost (2001) argued that the conventional accounting practices may underestimate the producing costs of the items which generate great amount of wastes, or overestimate costs of items which generate little amount of wastes. Also legal costs and potential financial liabilities for violations of environmental regulations frequently are not accounted for. Hence, developing and adopting procedures relating to environmental accounting might refer to importance of particular issues for individual organization. In addition, the IFAC (2004) argues that several limitations of traditional management accounting practices or systems may make it difficult to effective collect and assess environmental information. This could mean that management decision making, can being on the base of missing, inaccurate or misinterpreted information because of these limitations. Thus, managers might misunderstand many aspects relating to environmental issues such as a range of potential benefits and costs that they can gain through to improve the environmental performance and a range of negative financial effects that can occur due to the poor environmental performance. As well as, some of these limitations may due to, some general practices of management accounting in several organizations. For example some limitations are due to usual focus about performance in the past rather than performance in the future, and others are specifically due to nature of environmental information itself. Furthermore, literature review (e.g. Burritt, 2004; Burritt & Saka, 2006; IFAC, 2004; UNDSD, 2001; Wilmshurst & Frost, 2001) shows there are

some prominent examples of problems and barriers of the traditional accounting practices and systems with regards to environmental issues and related costs and benefits, including:

- Communications among the other functions and accounting frequently are not well developed. For example, the accountants often are not providing the information that may be most useful for the staff in the environmental or technical departments. Also there are different perspectives between different departments with respect to the responsibility for managing environment-related costs (Chang & Deegan, 2006; IFAC, 2004, 2005).
- Environmental costs information is usually hidden in overhead accounts rather than assigns them directly to products or processes which created these costs. Thus, number problems can create through this practice, for example there is difficultly to find such information into accounting records, or, may be allocation of these costs by use an inaccurate way, and hence, distortion of product pricing or another decision (Burritt, 2004; Burritt & Saka, 2006; IFAC, 2004; UNDSD, 2001; Wilmshurst & Frost, 2001)
- The information related to cost, flow and use materials frequently not tracked effectively, where that conventional accounting systems put all materials purchased into one account, and typically do not recording the information related to material inputs for each one from production cost centers. Thus, there is not detailed data about the split between costs of purchased materials and other processes, as well as,

there is a little information on the actual losses which may occur during production (IFAC, 2004; Jasch, 2003; Wilmshurst & Frost, 2001).

- The information related to many kinds of environmental cost not found in a firm's accounting records especially information on the future environmental costs that might be quite significant. For example, costs of the lost sales, lost access to markets and lost access to insurance and financing given to poor environmental performance (IFAC, 2004; UNDSD, 2001).

In relation to the role of EMA in this regard, many organizations in different countries have shown further interest and attention of EMA role with regard to overcome the problems and barriers that face conventional accounting systems in to deal with environmental issues. The role of EMA focuses on more efficiency use of the main resources and reduce of their consumption (IFAC, 2005). Supporting that come from Jasch (2003, 2006) who commented that EMA is simply doing better management with focusing on flows of material and consistency of information systems. In present many organizations in developed countries (e.g. Australia, Austria, Canada, Germany, Japan, United Kingdome, and United States) are using EMA to track environmental costs and providing the needed information to help the management for managing, improving and reporting environmental performance (Bartolomeo, et al., 2000; Burritt, 2004; IFAC, 2004; UNDSD, 2000). By contrast, implementation and spread EMA practices still quite limited

in the most developing countries including Libya with absent of environmental pressures, governments' promotion, and lack forcing legislations. Most companies have poor environmental performance and no sufficient information related to environmental activities in their reports of Libyan firms (Ahmad, 2004; Staniskis & Stasiskiene, 2006). In addition, these companies do not use environmental accounting information systems to decisions making. Hence, both accountants and managers in developing countries are will be not have any idea, or less awareness about extent improvement of economic and environmental performance and potential benefits which can be obtain by using EMA information in comparison with counterparts in developed countries (Beer & Friend, 2006; Scavone, 2006a). This might also partly explain the differences among developed and developing countries with regard to spread use EMA practices. Burrit (2004) argues that there is an urgent need for further work to identify problems and barriers that face use and spread of EMA practices wide world especially in developing countries.

3. Conclusion

This paper summarizes the important drivers behind emerging of EMA. These drivers included the environmental legislation, governmental initiatives, stakeholder pressures, environmental costs, and challenges of current accounting practices. Also it showed the opinions related to differences among developed and developing countries with regard to spread and use of EMA practices. Thus, this might refer to a

need for further efforts to identify and examine significant factors that may influence the acceptance, adoption and use of EMA in wider regions around the world.

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