The Role Of Agriculture Industry in Sustaining a Human Life

Introduction- An overview of the Agriculture Industry

Agriculture industry plays a huge role in sustaining human life although its practices have a big impact on the environment such as climate change, deforestation, air, water, and land pollution as well as general environmental degradation (Anderson,20110). This industry is the major source of environmental pollution globally that accounts for 11% of global greenhouse gas emission through different agricultural practices(Dincer et al., 2009). This is due to the everyday growing global population that increased the demand for food production. A recent report by estimates that food production will increase by 70% to meet the food demand of the estimated 9 billion global population by 2050 (Bajzelj, 2014). The environmental impacts of agriculture can be minimized by practicing sustainable agricultural practices such as conservation of the available resources and use environmentally friendly agricultural methods (Liebig et al., 2012).

Sustainable agriculture is one that meets society's needs in the present without compromising the ability of the future generations to meet their own needs (Desai et al., 2014). According to Hatfield et al. (1993), sustainable agriculture use methods that are economically viable, environmentally sound and protect public health. This report will focus on crop production as one of the branches of the agriculture industry to study ways in which it causes emissions to water, air, and land and possible ways in which the emissions can be managed. The report will further evaluate different CSR and EMS policies implemented by companies in this sector as well as providing recommendations.

Managing emission to land

Land emissions refers to the deposition of either solid or liquid waste on land in a manner that can contaminate the soil. Land can be polluted in so many ways such as wastes produced by humans in their daily processing and production activities for example in factories, homes, offices to mention a few. Land emissions from crop production are those associated with carbon dioxide following soil drainage during the crop production process (FAO report,). According to Akram?Lodhi (2008), 11% of the globe's land is used for crop production and it is estimated that by 2050 crop production will double to fulfill the need of the increasing population. The main land pollutants in crop production include crop residue and manure retained by farmers after harvesting the crops, land clearing, soil cultivation and the use of fertilizers (Monteny and Hartung, 2007).

Managing emissions to land is faced by the challenge to meet the food demand due to the projected increase of the global population to 9 billion people by 2050 (Alexandratos et al., 2012). The growing populations means high food demand as well as additional land area to grow the crops. Empirical work on this topic suggests biotechnology such as GMO crops as one of the possible ways to produce more on the existing farmland instead of clearing more (Conforti, 2011). According to the American Farm Bureau Federation, GM crops allow crop growers to produce more on less land using less chemicals while conserving land. CropLife

International adds that, more than a third of the world's crop production is lost to insects and diseases; GM crops help to protect the loss of yield and grow more without needing additional land. According to DeHaven (2008), GM crops have helped farmers to reduce dangerous pesticides and herbicides use by 37% to protect crops and land emissions.

Although GM is suggested as one way to reduce emission to land, it is highly criticized by many because of the possible effects the genes added to the seed may have on the soil as well as humans (Rangarajan et al., 2000). Crop growers can explore different methods to protect the land. For example, a Dutch Flower company was contaminating land through its intense cultivation of flowers and the use of pesticides, herbicides, and fertilizers. Due to strict regulation of the release of chemicals, the company responded effectively by growing flowers in water and rock wool and not on the soil which lowered the risk of infestation, reduced the need for fertilizers and pesticides as well as water wastage as the water can be reused for other purposes (Bell, 2010).

Another example of how companies can protect land is practiced by One Acre Fund - an agriculture company based in Kenya. One Acre fund uses innovation through the application of sustainable farming methods such as intercropping, crop rotation, crop diversity, and planting trees. One Acre Fund encourages farmers to plant trees; in 2016 farmers successfully planted 4,000,000 trees in order to protect land as trees prevent soil erosion and reduce atmospheric carbon.

Managing emissions to water

Agriculture is the largest freshwater user in the globe as it claims about 70% of water withdrawal in the world (World Bank, 2005). According to Managi and Kuriyama (2016), the demand for water is increasing due to the rapidly growing population for example In India today, about 93% of all the water withdrawal is used for crop production (Desai and Pujari, 2014). Crop production contributes to water emissions through different activities such as the use of pesticides, insecticides, tillage, irrigation and drainage as well as the sequence of crop rotation (Kumar et al., 2009). Emissions from crop production includes nitrate that penetrate to the soil and leads to groundwater contamination (Monteny, 2007). According to the U.S Environmental Protection Agency, application of pesticides and herbicides in North America have contaminated Lake Eri's water as well as groundwater (USEPA, 2005). More studies have found that groundwater in california exceeded water quality for human use due to nitrate penetration and other pesticides from crop production (Pollard et al., 2004).

Due to changing climatic conditions and rapid modifications of water use across the world driven by the fast growing human population, the threat to water supply has become everyone's concern (Hook et al., 1996). According to UN, water scarcity affects almost every continent; around 1.2 billion people in the world live in areas faced by physical water scarcity yet very few corporations take initiative to manage water use in their operations activities (National Research Council, 2010).

Irrigation is one of the ways in which water is lost during crop production and most of the time, water runs through evaporation before it is used by plants (Tareq et al., 2003). Some irrigation methods wastes water while some try to use less water as possible as they can. Sprinkler system is one irrigation method that wastes a lot of water when watering plants while drip

irrigation is an example of a method that minimizes water loss as it carefully releases just the right amount of water above the plants so that all the water is used by plants (Inocencio et al., 2003). Due to financial challenges facing farmers, not all of them can afford to use the innovative water conservation systems.

Crop growers need to come up with ways to manage the usage of water for a sustainable future. Olam International Agri-business is a good example of a company taking initiative to tackle the water problem. In its 2016 strategy, Olam committed to reduce the consumption of water in its operation activities by 31% through improved irrigation. Olam has also committed to support other farmers to reduce their water impact in order to create a sustainable future for agriculture (World Environment Center, 2005)

Managing Emissions to air

Air pollution refers to the emissions of gases, dust particles, fumes or odor into the air in a way that it becomes harmful to humans, animals, and the plants (Boubel et al., 2013). According to Cheremisinoff (2002), air emissions from farms outweigh all other human sources of air pollution in the United States, Russia, Europe, and Russia.

Air pollution in crop production happens when burning crops for harvesting and field clearing for the next growing season which causes fumes, dust, and odors. The emissions from these pollutants consist of methane and nitrous oxide which comes in the form of ammonia caused by agriculture - manure and fertilizer that enters the air as gas (Hester and Harrison, 1996). While agriculture does not come immediately to mind when you think of air pollution, it has been found that emissions from agriculture are the main cause of mortality in Europe due to ammonia which is the main contributor of harmful air pollution (WHO). Apart from the effects it has on human health, air pollution also damages crops and the environment (Gerber et al., 2013). According to (), air pollution is one of the hardest environmental issues to control however, corporations are becoming more cautious of air pollution due to implemented standard limits, for example, the Clean Air Act that set and enforce air quality regulations (Bourne, 2015).

It is important that companies see the impact of air pollution to human health and the planet as a whole. According to (WHO), approximately 12.6 people die due to problems caused by environmental issues; air pollution has been marked as the fourth highest factor causing the deaths. In 2016, The World Bank group played the good citizenship role by partnering with different countries in order to solve the air pollution problem across the globe. An example of a company that the World Bank partnered with is Morocco through the adaptation of policies to reduce the emission of air and greenhouse gas emissions by installing energy efficiency requirements in order to foster the development of renewable energy resources. The bank also invested in the development of cleaner economic activities. Corporations should learn from Word bank in order to get rid of environmental issues caused by pollutants (World Bank, 2005).

Corporate Social Responsibility

Corporate Social Responsibility can be defined as the way for companies to take responsibility of the social and environmental impacts as a result of their business operations (Zu, 2008). According to Porter and Linde (1995), CSR is about people, planet and revenue. The World Business Council for Sustainable development defined CSR as "the continuing commitment by

businesses to behave ethically and contribute to economic development while improving the quality of life of the workforce and their families as well as of the local community and the society at large". Corporate Social Responsibility can also be referred to “the voluntary actions that companies undertake to address social, economic and environmental of their businesses operations and the concerns of their principal stakeholders” (Hartman et al., 2018 pg. 226).

CSR has also been defined based on three theories: shareholder's theory in which CSR is seen as a tool for wealth creation by executives, activities performed are a means to achieve economic benefits as supported by Friedman (1970), that ‘‘the only one responsibility of business towards society is the maximization of profits to the shareholders within the legal framework and the ethical custom of the country’’; stakeholder theory of CSR that ensures that no stakeholder's values and interests are underestimated or violated (Freema, 1984); and lastly business ethics theory of CSR which focuses on ethical consideration of the corporation to the society by doing the right things in order to achieve a good society(Bigg, 2004).

In today’s highly competitive business environment organizations are forced to show that their activities add value to the society in which they operate and do not have any harm to the environment by laws and regulations in which the organizations work under (Nandi, 2017). While the rules to protect the planet and the society are there, organizations implement CSR strategies not mainly for the purpose of meeting their stakeholders expectation but rather to gain competitive advantage in terms of financial organizational performance (Hatfield and Karlen, 1993). It has been found that, CSR increases an organization’s market value; a 2017 CSR study found out that 87% of consumers will purchase a product if they find out that a company is supporting an issue they care about (Idowu, 2009).

While this is the case, companies still finds it difficult to to implement CSR strategies that fully benefit the society. Nestlé, for example use child labour to harvest cocoa in Ivory Coast because it is cheaper (FAO, 2009). At the same time, Nestlé’s code of conduct prohibit the use of child labour. According to International Labour Organization, there are approximately 59 million African children aged between 5-17 working in farms and other sectors. Nestlé can learn from Olam - a leading and the third largest agribusiness in the world, operating from seed to shelf through its Child Labour Monitoring and Remediation Systems. Olam International also ensured access to school in order that the children being used as cheap labour can have access to education which led to a 30% reduction in child labour in Ivory Coast (World Environment Center, 2005).

Environmental management system

This refers to a set of practices and processes that enable an organization to reduce its environmental impacts and increase operational efficiency (Environmental Protection Agency). An EMS act as a framework that an organization follows in order to achieve its environmental management goals through reviews , evaluation and continuous improvement of environmental performance (Bergeson, 2004). An EMS is meant to help organizations to better understand the standards of what they are offering as it consist of a set of procedures that helps to identify environmental issues and improve the management of these issues (Pollard et al., 2004).

Most companies are motivated to implement an EMS because it is cost effective and it helps to improve operations process in order to increase organizational performance(Sheldon, 2002).

According to Hartman et al. (2018), companies implement EMS for business benefits or in response to government regulations and environmental reasons.