

MANAGING THE EFFECT OF ENVIRONMENTAL DEGRADATION ON THE AGRICULTURAL ACTIVITIES OF FEMALE ENTREPRENEURS IN AFRICA

¹Alozie, E.N., ¹Umeh-Idika S.A. and ²Isiwu, E.

1: Department of Home Science/Hospitality Management and Tourism

2: Department of Home Economics and Agricultural Science Education

Michael Okpara University of Agriculture, Umudike.

dilimnedu@yahoo.com

ABSTRACT

This paper explored the effect of environmental degradation on the entrepreneurial growth of rural women in Africa occasioned by biodiversity loss, deforestation, desertification, global warming, flooding, among others. This paper is qualitative in nature, having adopted descriptive analysis of secondary data. Unarguably, rural women increasingly face the challenge of having to adapt to the negative impacts of a fragile ecosystem and other natural disasters. More so, the large differences between men and women in terms of impacts, vulnerabilities, responses and capacity to adapt to environmental degradation largely depends on individuals' access to resources, assets, information, services and decision-making power. Unfortunately, majority of the rural women in Africa are poor, and the gender discriminatory practices which is rife on the continent affects the distribution of social wealth such as land, finance, education, and health; this in turn impedes the development of African women entrepreneurs involved in agricultural activities like cultivation and growing of crops, rearing of livestock, fish farming, among others. This paper therefore maintained that women play an important role in managing the environment given their wide-ranging functions especially in the agricultural sector. Consequently, it concluded that ensuring equal access for women to productive resources, introducing policies that support entrepreneurship and developing action plans to enhance the resilience of women to the effects of environmental degradation is crucial to the entrepreneurial growth of rural women in Africa.

Keywords: Rural Women, Africa, Environmental Degradation, Entrepreneurship, Development

INTRODUCTION

Environmental degradation is a great threat to poverty reduction and achieving sustainable development because it affects people's health, food security, nutrition, production, and earnings. Considering the traditional roles of women in agricultural production, ensuring the availability of water, cooking fuel, and other household resources, they are not only suitable for finding solutions to prevention of further degradation, but also need support to manage the effect of environmental degradation on their entrepreneurial activities. Hence, the first step towards tackling the challenges of environmental degradation is empowering women to safeguard the environment (Wedeman & Petruney, 2015). Undoubtedly, human interactions with the environment have brought about global warming and climate change impacts such as growing unpredictable rainfall patterns, and extreme weather events which have had various effects on the inhabitants, most especially, the most vulnerable. Worldwide, such effects contribute to food

insecurity, water scarcity, droughts, induced alterations of agricultural activities and other livelihood practices, flooding, rise in sea level, among others (Akinbami, Olawoye, Adesinan & Nelson, 2019). Terry (2009) cited in Akinbami et al (2019), notes that deforestation for example affects the environment negatively because people have depended on forests for domestic energy supply, especially, in rural areas. In West Africa, particularly in Nigeria, forests have nearly disappeared, because of increased demand for wood, weak protection mechanisms and viable energy and income generating alternatives. Terry further explains that the quality of the water becomes poor as the deforested hills are severely eroded and the adjoining low land heavily silted with large sediments from higher altitudes. This decline in the quantity and quality of water available for agriculture reduces food production further, even as devastating floods and crop destruction have become common events in most rural areas. The outcome is poor nutrition, low-income generation and poor health for people, especially, the children and women.

Women are disproportionately affected by this change compared to men (New Course, 2010), because they are responsible for 60 to 80% of food production activities around the globe, and are more affected by any strain on agricultural production (wecaninternational.org, 2016). During periods of drought and erratic rainfall, women always work harder to secure food and water for their families (Action Aid, 2016 cited in Wedeman & Petruney, 2015). In some parts of Africa, girls and women spend up to eight hours per day collecting water (WECANInternational, 2016). This undermines productivity and fuels a cycle of poverty that limits the economic and social capacity of women (Alam, Bhatia, & Mawby, 2016). The United Nations Development Programme (UNDP) (2016), states women who are dependent on the natural environment for food and income constitute 60% of the world's poorest and most vulnerable people. On the average, in the developing world, women constitute about 43% of the agricultural labor force (United Nations Women, 2014; Wedeman & Petruney, 2015) and are extremely vulnerable to failing agricultural production (Chakrabart, 2014). Additionally, a drop in production aggravates vulnerabilities, as women do not have the same access to financial and other resources as their men counterparts to cope with the impacts of weather induced natural resource depletion (WECANInternational, 2014).

Recognizing the burdens environmental challenges impose on them, women have a key role to play in managing the impact of environmental degradation. However, women experience barriers ranging from social, political, and economic — that restrict their ability to take active part in managing the environment, further limiting their coping capabilities when it comes to mitigating, adapting, and coping with the effects of an exhausted ecological unit (UNFCCC, 2016). As such, policy makers need to prioritize safeguarding the rights of people, whose lives are affected by a dilapidated ecosystem, recognizing the direct role the environment plays in shaping the economic and social rights of so many individuals especially women.

Consequently, there are indications that a number of policy-oriented publications have examined the adverse effects of environmental degradation on women, particularly women entrepreneurs in Africa. These studies have also proposed strategies for incorporating women's concerns into

environmental policies as well as for ensuring their participation at all levels of development (Steady, 1998). Thus, a report by the African Development bank (2017) reveals that unlocking investment in African women holds incredible return and transformational impact potential. Women make up the backbone of African economies, accounting for a majority of small- and medium-sized businesses, dominating the agriculture sector as primary producers and food processors, as well as in many service sectors. Their full economic empowerment is therefore crucial to increase in productivity levels, enhance economic efficiency, and improve overall development outcomes to achieve inclusive growth. This paper therefore sought for ways to manage the effect of environmental degradation on women entrepreneurial capacity in Africa in order to enhance sustainable development.

Theoretical framework

This study is based on Human Ecology theory, propounded by Gerald L. Young. The theory explains the relationship between the environment and human activities and how such activities impact the environment. According to Marten (2001), human ecology is about relationships between people and their environment. In human ecology, the environment is perceived as an ecosystem and an ecosystem comprises of every element in a specified area - the air, soil, water, living organisms, economic and physical structures, including everything built by humans. The theory therefore advocates for ecological sustainability and development, which makes it suitable for this topic. As a matter of fact, human sought to interrelate with the environment in ways that allow the ecosystem to preserve sufficient functional integrity to continue to provide humans and all other creatures in the system with the food, water, shelter and other resources that they need. One major framework upon which this theory is based, is interaction. Hence, Young's emphasis on linkages and processes set his approach apart from other synthetic attempts in human ecology, which were largely described as complicated.

METHODOLOGY

This paper considered its subject matter within the purview of the on-going effort to empower women and reduce the gap between men and women in terms of vulnerabilities and capacity to adapt to extreme weather factors especially in places like Africa. In this context, the paper applied itself to analyzing the characteristics of women entrepreneurs in Africa with a view to underscoring the effect of environmental degradation on them. The paper is qualitative in nature and employs descriptive analysis of secondary data obtained in the form of reports from the World Bank, International Labour Organisation, African Development Bank, and the United Nations Framework Convention on Climate Change. The paper is presented under a number of select themes below.

Environmental Degradation

Environmental degradation is one of most urgent of environmental issues. Conceptually, environmental degradation covers a range of issues such as pollution, biodiversity loss & animal

extinction, deforestation & desertification, global warming, flooding and a lot more. According to Choudhary, Chauhan & Kushwah (2015), environmental degradation is the deterioration of the environment through depletion of resources such as air, water and soil; the destruction of ecosystems and the extinction of wildlife. It can be perceived as any change or disturbance to the environment believed to be harmful or undesirable. Environmental degradation is one of the ten threats officially cautioned by the High-level Panel on Threats, Challenges and Change of the United Nations (Choudhary et al., 2015). The United Nations International Strategy for Disaster Reduction states that environmental degradation is "the reduction of the capacity of the environment to meet social and ecological objectives, and needs". When natural habitats are destroyed or natural resources are depleted, the environment is degraded and the way to manage it is by protecting the environment from harmful practices. The primary cause of environmental degradation is human disturbance (Choudhary et al., 2015). Basically, the degree of the environmental impact varies with the cause, the habitat, and the plants and animals that inhabit it. Also, air, water, and soil are resources vulnerable to depletion through overuse, as are natural resources like minerals and oil deposits. Pollution is another cause of environmental degradation. When the environment becomes polluted, it means that toxic substances have rendered it unhealthy. Pollution can come from a variety of sources, including vehicle emissions, agricultural runoff, accidental chemical release from factories, and poorly-managed harvesting of natural resources.

Concept of Entrepreneurship

Entrepreneurship is usually associated with risk taking, innovation, creativity, as well as search for investment (Ezibe et al., 2013). Entrepreneurship is an activity that can be operated in different markets, and locations, as well as by individuals with different skill levels. Entrepreneurial actions can be carried out in either a formal or an informal economy (Ezibe et al., 2013), and it's gender neutral; meaning that both men and women can represent it.

Entrepreneur

The United Nations Framework Convention on Climate Change (UNFCCC) (2018), defines an entrepreneur as a person who changes an idea into a product that is of practical use. An entrepreneur may devise and implement a new business model that uses existing technologies in innovative ways; he/she can adapt an idea to the needs of a new market or community. Entrepreneurs are individuals who convert an invention into a product that meets the needs of certain users. Entrepreneurs develop a product they hope will prove attractive to investors and, as a result, secure their financial support. There are numerous reasons why individuals engage in entrepreneurial activities. Entrepreneurs generally seek to generate an income from the activities they undertake. For instance, the International Labour Organisation (ILO) (2016), report shows that the Women Entrepreneurs Survey (WES) assessment indicates that the majority of women entrepreneurs are motivated by the necessity to have income rather than the opportunity to start their own business. However, entrepreneurs are often motivated by reasons beyond financial

gain. For instance, recognition of their efforts and the prestige derived from this may be just as important, if not more, as the economic benefits. Furthermore, entrepreneurs usually tackle specific social or environmental problems, such as creating jobs, lifting people out of poverty and responding to the challenge of the ecosystem (International Labour Organisation, 2016).

Women Entrepreneurs in Africa

According to Clappaert (2012) cited in Welsh, Memili, Kaciak & Ahmed (2013), the rate of women's entrepreneurship in Africa is higher than in any other region of the world, with an estimated two-thirds of women participating in the labour force. Although women-owned businesses are smaller in size relative to those owned by men in Africa, (Amin, 2010), many of these businesses are necessity-based and support extended families. In Nigeria, for instance, even though women provide the majority of labour, their productivity is severely lowered by overall inequality in education and unequal access to land and productivity inputs, and it has been found that women make larger contributions to economic life than men in Nigeria (Bardasi et al., 2007 cited in Welsh, et al., 2013). Similarly, in Niger, Otoo and Fulton (2011) found that women earned four times more than the legal minimum wage and sixteen times higher in Ghana. The researchers found that religious beliefs, stable locations and lack of financial resources all contributed to these women's success. In parts of East Africa, Cohen and Sebstad (2005) cited in Welsh, et al. (2013), writes that in Kenya, Tanzania and Uganda, access to microfinance services enhanced risk management, empowered women and lowered their vulnerability to risk. It also led to more proactive behavior that reduces stress from deleting savings and borrowing or selling of the assets, and enabled women to deal with financial tough times. Also in Central Africa, in a study based on institutional theory (Welsh et al, 2013), a number of environmental barriers were examined, including socio-cultural, legal, economic, political and technological barriers (Amine & Staub, 2009 cited in Welsh et al, 2013). The study also found that negative conditions in the local regulatory environment affected women who desired to become entrepreneurs and start their own businesses in sub-Saharan Africa. In North Africa, Welsh et al (2013), report that while Sudanese female entrepreneurs face many challenges; the most pressing concern is the lack of training, difficulties obtaining funding, the lack of government support and the balance between business and family responsibilities. A study by Hattab (2012), in examining the Global Entrepreneurship Monitor (GEM) data on Algeria, Egypt, Lebanon, Morocco, Syria, West Bank and Gaza Strip, and Yemen from 2008-2009, concluded that more Arab women are starting businesses, but the percentage is low compared to men.

Women Entrepreneurs and the Effects of Environmental Degradation

The Food and Agricultural Organisation (2018) states that, rural women constantly face the challenge of having to acclimatize their production systems to the effects of weather changes, and natural disasters. Thus, Oshwofasa, Anuta and Aiyedogbon (2012) note that since the discovery of petroleum oil by Shell in Oloibiri in 1958, the food chain has been partially truncated by hybrid crops that are a caricature of their former selves. According to Ibaba (2010),

yam tubers have become unusually small and even sweet varieties of yam have lost their natural sweetness. Aquatic life has also been affected as some species of fish have migrated and others have become virtually extinct as a result of oil spillage and industrial waste that are wantonly disposed in mangrove swamps and fresh waters across the Niger-Delta (Oshwofasa et al., 2012). In sub-Saharan Africa, women and girls collectively spend a total of 40 billion hours per year collecting water for their households (Levtov, Van der Gaag, Greene, Kaufman, & Barker, 2015).

This is time, not spent working at income-generating jobs, caring for family members, or attending school (UNICEF, 2015). In Kenya, fetching water may use up to 85% of a woman's daily energy intake while in times of drought women spend up to eight hours a day in search of water. Thus, Skinner (2011) notes that because women and girls are predominantly in charge of unpaid household chores and care-giving in less economically developed countries and especially in rural communities, there is less time, is available for schooling or entrepreneurial ventures. For instance, Atela & Jones (2017) report that in Kenya, water shortage causes tomato farmers to cut production in half, in order to limit the area of land that needs to be watered.

In the same vein, flooding and sea level rise destroy crop production and cause sanitation problems, which seriously affect women's ability to provide resources for themselves and their families (Alam, et al, 2015). In Cotonou, Benin, in West Africa, for instance, sea level rise has resulted in increase in the risk of the resurgence of endemic tropical diseases (Khan, 2014). In their study of women in Bangladesh impacted by floods, Abu & Azad (2013) found that nearly 61 percent of those surveyed were evicted from their normal dwellings in times of severe floods, and the sanitation facilities of 21 percent were damaged. They also found that 89 percent of the women surveyed became ill from wearing wet clothing, since they did not have adequate spare clothing. Women are also susceptible to sexual and other harassment - such as mental torture, verbal abuse, and domestic violence - in the wake of a flood. Abu and Azad (2013) also found that 35 percent of the women surveyed were harassed by a male relative or acquaintance in the aftermath of flooding due to increased stress and social disruption.

Also, deforestation occurs as a result of land-use change and can be prompted by heat, drought, illegal logging, resources extraction, agricultural production, or as communities begin to cut down trees when other resources have been depleted (Alam, et al, 2015). These processes reduce the productivity of the land, leading to declining food production and crop yields (UNFCCC, 2012). Unfortunately, many people in rural areas depend on forests for food, firewood, fiber timber, material for crafts, animal fodder, and medicinal herbs, and it is often women who collect these resources. Deforestation is currently affecting livelihoods across Africa, especially in Tanzania, Sudan, Cameroon, Kenya, and Mali, where women and children collect 60 to 80 percent of all domestic firewood supplies in Africa (Steady, 2014).

Furthermore, desertification of pastoral lands causes the death of livestock used to till the fields

and forces those communities to find other mechanisms for tilling their land, which inevitably affects farming outputs. (Alam, et al, 2015). Atela& Jones (2017) report that women in Semi-arid lands in Kenya who own agriculture-based Micro, Small and Medium Enterprises (MSMEs) like small scale trade in cereal, milk, and poultry products are directly affected by issues such as drought and climate-related livestock disease which leads to losses in their businesses and reduced growth.

Reasons for the Vulnerability of Women Entrepreneurs to Environmental Degradation in Africa

According to a report by the Georgetown Institute for Women, Peace and Security (2015), women represent half of the world's population, and they bear severe gendered impacts of change in weather patterns without equal representation in decision-making or policy and programmatic design. The differential impacts of such environmental changes on men and women are, demonstrably, more pronounced in settings that are also affected by violent conflict, political instability, and economic strife. For instance, ILO (2016) reports that female and male-owned enterprises operate in the same business environment, but the challenges they face differ.

Undoubtedly, women and men are shaped by the societies in which they live, and societal expectations affect the roles both women and men play in the political, economic, and social spheres. This means that women and men often do different work, have differentiated access to resources and information, and experience natural disasters differently (ILO, 2016). Cultural beliefs in some parts of Africa diminish women's economic roles, while other key challenges facing women entrepreneurs are: lack of government strategy for women entrepreneurship development; disadvantaged in access to labour markets (in terms of being able to gain know-how, experience, and develop networks), financial services that meet the needs of women entrepreneurs at different stages of the business cycle (start-up to growth) and business development support services, as well as inability to meet lender collateral conditions. Markets and technology, business related information, networks of women entrepreneurs, concentration of women entrepreneurs in certain sectors such as agriculture, informality, social responsibilities, and mobility are among the constraints faced by women entrepreneurs (ILO, 2016).

Around the world, women tend to be marginalized from political and economic power and have limited access to financial and material resources, particularly in conflict-affected, post-conflict, or less economically developed settings, which can worsen their vulnerability to the impacts of environmental degradation. A report by the African Development Bank (2018) shows that sub-Saharan Africa hosts close to 13 million formal and informal small and medium sized enterprises with one or more women owners. Yet, more than half lack access to finance. Women can play a key role when efforts are directed at closing the financing gap for women in Africa because, despite their dominance, women's economic potential is dwarfed by multiple challenges to access finance. They find it difficult to secure financing from banks and other financial

institutions due to inherent biases in the system, such as the lack of appropriately designed financial products, weak institutional capacity and lack of incentives within banks to target and lend to women. In Africa, these systemic challenges result in an estimated \$42 billion financing gap for women entrepreneurs across business value chains. Evidence suggests that closing this financing gap for women will lead to growth in GDP for African economies (AFDB, 2018).

In the same vein, women often lack access to productive resources, including land, property rights, markets and networks to grow their businesses. African women are the custodians of food security and nutrition and a crucial force within the agricultural sector. African women represent 52 percent of the total population in agriculture, are responsible for approximately 75 percent of the agricultural labor force, and produce 60 to 80 percent of the food, yet women's productivity is 30 percent lower than men's because women lack access to vital inputs such as lands (FAO, 2011). Furthermore, they are often excluded from the business side of agriculture and are excluded from the most profitable segments of value chains. Their minimal access to resources such as land, credit and technology hamper their capacity to leverage agricultural production into business opportunities, and this has left women within the realm of subsistence farming. Focus on women is of even greater significance given that micro and small enterprise sector is highly dominated by women and contribute to almost half of productive output. In addition, women typically lack access to reliable sources of electricity and the capital to buy efficient, modern processing equipment, resulting in high levels of waste in processing and low-quality of produce. Most women-owned businesses are too small to qualify for financial assistance from the government or loans from banks and majority are unaware that these resources exist. While there are a few African firms managed by women, studies have shown that those that survive are of high quality.

Managing the Effects of Environmental Degradation on Women Entrepreneurs in Africa

In order to control the impacts of environmental degradation and promote entrepreneurship among rural women in Africa, there is need for governments across the African continent to:

- Encourage women entrepreneurs by introducing policies that support entrepreneurship and job creation (UNFCCC, 2018). The Green economy strategies as practiced in countries like South Africa and Nigeria, which involves activities like bee-keeping, snail rearing, growing of mushrooms, etc, is one of such policies that improve human well-being and social equity, while significantly reducing environmental risks and ecological scarcities (UN, 2011 cited in Akinbami et al, 2019). Others may include tax cuts for small businesses, micro-financing, social protection programmes and regulatory reforms that make it easier to do business. As a way to reduce the likelihood of reinforcing existing inequalities, it is important that policies and programmes targeted at alleviating the impact of environmental degradation take into account the differences between men and women at national and international levels, as well as their differential access to resources within communities.

- Collaborate to develop action plans to enhance the resilience of women entrepreneurs to the effects of environmental degradation. Each country can proceed to implement such adaption and mitigation plans respectively. However, it is vital to state that there already exist a lot of strategies designed to manage weather conditions and environmental issues; such policies should be deployed as expected.
- Promote opportunities for women entrepreneurship through massive communication and awareness programmes targeted at women especially (UNFCCC, 2018). Such awareness programmes must also be geared toward changing the prevailing assumptions about women entrepreneurs that are derived largely from information on poorer, uneducated women operating informal sector microenterprises. This is because such assumptions are capable of generating or reinforcing stereotyped profiles of women entrepreneurs, and these are not consistent with the reality of a varied picture of women's entrepreneurship (Richardson, Howarth & Finnegan, 2004). These stereotypes also work to maintain the status quo as regards discriminatory beliefs, attitudes and practices. Such traditional and largely negative views about women entrepreneurs have adverse implications. In the same vein, massive awareness creation should be used to address the cultural and social barriers that hinder women from becoming successful entrepreneurs.
- Enable women's equal access to land ownership and other productive resources needed for effective socio-economic participation, such as capital, technical assistance, technology, tools, equipment, markets, and time. Also, as a way of tackling water scarcity, the development of irrigation schemes and lining canals can contribute to the availability of water not only for agriculture but also for domestic use by rural households (Meijer, et al., 2006, cited in Akinbami, et al., 2019).
- Build the capacity of women entrepreneurs by implementing suitable education and training programmes. By focusing on capacity-building to augment women's opportunities, initiatives on managing environmental degradation can also boost women's economic participation and bolster growth. Capacity-building efforts can promote women's knowledge of issues and ability to take leadership or decision-making positions, which in turn leads to changing social norms and outcomes especially.
- Female entrepreneurs should endeavour to support each other by introducing support services such as soft loans which can stimulate enterprise development activity and business growth. Rural women can be encouraged to organise themselves into groups and have such loans revolve among them, helping to build up financial capital and boosting livelihood and entrepreneurial activities.

CONCLUSION

This study explored the several ways by which the effect of environmental degradation on the entrepreneurial growth of rural women in Africa can be managed. Basically, the paper established that though the rate of women's entrepreneurship in Africa is higher than in any other region of the world rural women increasingly face the challenge of having to adapt their

productive abilities to the effects environmental degradation. The environment has been deteriorating for the last two centuries and almost every part of the planet has been touched by it in one way or the other (Choudhary, et al. 2015). Environmental degradation is a result of socio-economical, technological and institutional activities, and occurs when earth's natural resources are depleted. The resources which are affected include water, air and soil. Environmental degradation largely affects wildlife, plants, animals and micro-organisms, as well as humans, particularly women. In this case, investing in women is one of the most effective means of managing the impact of environmental problems and promoting inclusive and sustainable economic growth. Specifically, when women enterprises are supported, they contribute to gender equality, employment creation, expanding the pool of human resources and talents, economic growth and poverty reduction. However, large gender gaps still exist in business ownership and entrepreneurial activity that have major opportunity costs for sustainable development in Africa (ILO, 2016). Thus, given their wide-ranging functions in the agricultural sector and in livestock, fisheries, energy, forestry, water and land management sectors, ensuring equal access for women to productive resources, labour-saving technologies and practices is crucial to enhance the sustainability of agriculture, achieve food security and nutrition, eradicate poverty and build the resilience of rural women to entrepreneurial degradation.

RECOMMENDATION

The Africa Economic Outlook 2017 reveals that women in Africa are twice more likely to start a business than women elsewhere in the world. Thus, in addressing the environmental barriers that reduce the participation of rural women in entrepreneurial endeavours, it is pertinent to deploy gender-sensitive strategies that would facilitate more entrepreneurship by increasing the livelihood assets of a household, and also arrest the declining trends of environmental degradation. More importantly, there is need to re-examine social systems and ensure the maintenance of a balance in production, reproduction and consumption patterns, while making certain that people develop environmental consciousness. This however calls for a re-conceptualization of our relationship with the environment and an ecological perspective in which women are central to the search for ecological sustainability, considering the fact that women especially in developing countries tend to maintain strong and close daily interaction with their environment.

REFERENCES

- Abu, K. & Azad, H. N.(2013).Flood-Induced Vulnerabilities and Problems Encountered by Women in Northern Bangladesh. *International Journal of Disaster Risk Science*,4(4): 193-194.
- ActionAID (2011). How the Drought affects Women.
<http://www.actionaidusa.org/2011/07/how-drought-affects-women>
- African Development Bank (2018). Affirmative Finance Action for Women in Africa: Unleashing Women’s Entrepreneurship Through Strategic Partnerships. *A Proposal from the African Development Bank Group*. www.afdb.org
- Akinbami, C. A., Olawoye, J. E., Adesina, F.A. & Nelson, V.(2019).Exploring Potential Climate-related Entrepreneurship Opportunities and Challenges for Rural Nigerian Women..*Journal of Global Entrepreneurship Research*, 9(19)
<https://doi.org/10.1186/s40497-018-0141-3>
- Alam, M., Bhatia, R. & Mawby, B. (2015). Women and Climate Change: Impact and Agency in Human Rights, Security, and Economic Development.” Washington: *Georgetown Institute for Women, Peace and Security*. <https://giwps.georgetown.edu/sites/giwps/>
- Amin, M. (2010). Gender and firm-size: Evidence from Africa. *Economics Bulletin*, 30(1): 663–668.
- Atela, J. & Gannon, K. (2017). How can Women-led SMEs in Kenya’s semi-arid lands build resilience to climate change? <https://www.kenyamarkets.org>
- Chakrabarti, S. (2014). The Gender Advantage: Women on the Front Line of Climate Change. *International Fund for Agricultural Development*;
http://reliefweb.int/sites/reliefweb.int/files/resources/gender_0.pdf
- Choudhary, M. P. & Chauhan, G, S. & Kushwah, Y. K. (2015). Environmental Degradation: Causes, Impacts and Mitigation: <https://www.researchgate.net/publication/279201881>
- Clappaert, S. (2012). Entrepreneurs and women: Keys to growth in Africa. *Inter Press Service News Agency*: www.ipsnews.net/2012/10/entrepreneurs-and-women-keys-to-growthin-africa/
- Ezibe, A. B. C., Diogu, A. N., Eze, J. U., & Uzoamaka, J. -T. (2013). Developing the active participation of African women in science, technology and innovation: The

- entrepreneurial approach. *European Journal of Business and Management*, 5(13), 55–62.
Retrieved from <http://www.iiste.org/>
- Freedom House (2010). Women's rights in the Middle East and North Africa. Washington, DC:
www.freedomhouse.org/report-types/womens-rights-middle-east-and-north-africa
- Food & Agriculture Organization, (2014). The State of Food and Agriculture.
- Food & Agricultural Organization, (2018). Tackling Climate Change through Rural Women Empowerment; <http://www.fao.org/climate-change>
- Glazebrook, T. (2011). Women and Climate Change: A Case-Study from Northeast Ghana. *Hypatia*, 26(4); 763.
- Hattab, H., (2012). Global entrepreneurship monitor: GEM Egypt report 2012. *British University in Egypt (BUE), Silatech, and The International Development Research Centre (IDRC)*.
- Ibaba S. I. (2010). Environmental Protection Laws and Sustainable Development in the Niger Delta; *Africana*, 4(2)
- International Labour Organization, (2016). Women's Entrepreneurship Development Assessment – Egypt. *International Labour Organization, ILO DWT for North Africa and ILO Country Offices for Egypt and Eritrea*. Retrieved from <http://www.ilo.org/cairo>
- Karla, D. & Wolfenson, M. (2013). Coping with the Food and Agriculture Challenge: Smallholders Agenda; *Food and Agricultural Organization*, 22.
- Khan, A. E., (2014). Salinity in drinking water and the risk of (pre)eclampsia and gestational hypertension in Coastal Bangladesh: A Case-Control Study. *PLOS One*.
- Lake, O.O. (2015). Why Women Are Central to Climate Justice and Solutions.
<http://ecowatch.com/2015/09/24/women>
- Levtov, R., Van der Gaag, N., Greene, M., Kaufman, M. & Barker, G., (2015). State of the World's Fathers: *A Men Care Advocacy Publication*, Washington, D.C.
- Marten, G. G. (2001). Human Ecology - Basic Concepts for Sustainable Development: *Earthscan publications*.
- New Course (2010). Women, Natural Resource Management, and Poverty: A Review of Issues

- and Opportunities. <http://anewcourse.org/wp-content/uploads/2014/04/women-natural-resource-management-and-poverty-PEW.pdf>
- Oshwofasa, B. O., Anuta, D. E. & Aiyedogbon, J. O., (2012). Environmental Degradation and Oil Industry Activities in the Niger-Delta Region. *African Journal of Scientific Research*, 9(1)
- Otoo, M. & Fulton, J., (2011). Women entrepreneurship in West Africa: The Cowpea Street Food Sector in Niger and Ghana. *Journal of Developmental Entrepreneurship*, 16(1), 37–63
- Oyerinde, O. V., (2008). Potentials of Common Property Resources in a Nigerian Rainforest Ecosystem: An Antidote to Rural Poverty among Women. A paper presented at the Governing Shared Resources: Connecting local experience to global challenges, the *Twelfth Biennial Conference of the International Association for the Study of Commons*. <http://hdl.handle.net/10535/326>
- Richardson, P. Howarth, R. & Finnegan, G. (2004). The Challenges of Growing Small Businesses: Insights from Women Entrepreneurs in Africa. *International Labour Office*, Geneva
- Roy, S. B. L., Chen, E. H., Girvetz, E. P., Maurer, W. B. Mills, & Grieb, T. M., (2012). Projecting Water Withdrawal and Supply for Future Decades in the U.S. under Climate Change Scenarios. *Environmental Science & Technology*, 46, [2545–2556](#), doi:[10.1021/es2030774](#)
- Skinner, E., (2011). Gender and Climate Change Overview Report; *BRIDGE*, Institute of Development Studies.
- Steady, F. C., (1998). Gender Equality and Eco System Balance: Women and Sustainable Development in Developing Countries. *Race, Gender & Class*, 6(1), 13-32.
- United Nations Children’s Fund (UNICEF) (2015). “UNICEF Water, Sanitation, and Hygiene.” http://www.unicef.org/wash/index_43084.html.
- United Nations Framework Convention on Climate Change (UNFCCC)(2018). TEC Brief #12: Energizing Entrepreneurs to Tackle Climate Change; addressing Climate Change through Innovation. Bonn: *UNFCCC secretariat*.
- United Nations Development Programme, (1998). Nigerian Human Development Report,

UNDP, Lagos.

United Nations Development Programme (UNDP) (2006). Beyond scarcity: Power, Poverty and the Global Water Crisis. *Human Development Report*

United Nations Development Programme (UNDP) (2016). “Gender and Climate Change.” http://www.undp.org/content/undp/en/home/librarypage/environment-energy/climate_change/gender/africa-adaptation-programme-experiences-gender-and-climate-change.html

Wedeman, N. & Petruney, T., (2015). Invest in Women to Tackle Climate Change and Conserve the Environment. *FHI*, 360. womendeliver.org

Welsh, H. B., Esra, M., Kaciak, E., & Ahmed, S., (2013). Sudanese Women Entrepreneurs. *Journal of Developmental Entrepreneurship*, 18(2)

Women’s Earth & Climate Action Network, International (2016). Why Women Are Key. <http://wecaninternational.org/why-women-are-key>

World Bank (1996). Nigeria Poverty in the Midst of Plenty: The Challenge of Growth with Inclusion, World Bank, Lagos.