



Impacts of Climate Change, Vulnerability and Adaptation Opportunities on Gender Livelihoods Activities in Rural Communities of Akwa Ibom State, Nigeria

Ekpo, F. E¹. and Agu, N.N²

¹ Akwa Ibom State University, Mkpato Enin, Akwa Ibom State, P.M.B. 1167, Uyo, Nigeria

² Department of Quantity surveying, Nnamdi Azikiwe University Awka, Anambra State, Nigeria

Corresponding Author: frikpo9@yahoo.com

Abstract:

A study was carried out in rural communities of Akwa Ibom State, Nigeria. The objective of this study was to ascertain the climate change impacts, vulnerability and adaptation measures on livelihoods activities on women in rural communities of Akwa Ibom State. Different Participatory Research Approaches (PRA) methods were used including in-depth interview, focus group discussion and household questionnaires were used. Findings revealed that women in rural communities of Akwa Ibom State constitute 97% of peasant farmers living in rural communities and solely depend on the rain-fed agriculture and natural resources for survival; hence they are more vulnerable to climate related hazards. Gender inequalities practiced in rural communities of Akwa Ibom State increased the levels of vulnerability; such as access to resources, credit facilities, extension services, education, information, technology, decision-making and socio-cultural practices in the area. Increase women's participation in decision-making at all levels, access to land and credit facilities, diversification of their livelihoods and changes in socio-cultural practices in Akwa Ibom State is necessary to support women to fully realize their potential for enhanced adaptive capacity to climate change impact in the area and elsewhere in Nigeria.

Keywords: Adaptation Measures, Climate Change Impacts, Vulnerability Levels ,Gender Activities, Akwa Ibom State.

1.0 Introduction:

In Niger Delta of Nigeria, women make up a large number of the poor in communities that are highly dependent on natural resources for their livelihood and are disproportionately vulnerable to climate related hazards. Women's limited access to resources and decision-making processes increases their vulnerability to climate change. Women in rural areas in Akwa Ibom State have the major responsibility for household water supply and fuel wood for cooking, as well as providing food for family, and are negatively affected by climate related hazards such as flood, saline intrusion, severe wind storms, uncertain rainfall and high temperature. Gender inequalities in access to resources, including land, credit facilities, extension services, information and technology made women in Akwa Ibom State more vulnerable to climate related hazards. Vulnerability is the degree to which a system is susceptible to, or unable to cope with adverse effects of climate change, including climate variability and extremes.

According to IPCC (2001), vulnerability is a function of the character, magnitude, and rate of climate variation to which a system is exposed, its sensitivity, and its adaptive capacity.

The impact of climate change in rural communities of Akwa Ibom State is visible and widespread. The Intergovernmental Panel on Climate Change (IPCC) defines climate change as, any change in climate over time, whether due to natural variability or as a result of human activity" (Parry *et al.*, 2007). Globally, climate change is recognized as a critical phenomenon with strong implications for socio-ecological, biophysical and human systems, and consequently human and structural development. There have been observed changes in rainfall distribution with increased rainfall expected in the coastal region (NEST, 2003). Further physical impacts of climate change in the coastal area of Nigeria include flooding, sea-level rise, changes in temperature extremes (such as heat waves) and an increase in the frequency, intensity of storms, salinity intrusion, coastal erosion and river-bank erosion. Such impacts combined with high

dependence of women on natural resources and rain-fed agriculture mean that the poor farmers that are mostly women are at high risk. Poverty, inequitable land distribution, cultural practices, violent conflict, lack of access to credit facilities, HIV/AIDS and low educational background mean that many women in rural communities of Akwa Ibom State lack the adaptive capacity to cope and adjust to climate change impacts (Duncan, 2007). Akwa Ibom State is one of the Niger Delta states of Nigeria. The area is situated in low lying coastal region that is vulnerable to climate change impact. Climate-related hazards, such as floods, salinity intrusion from Atlantic Ocean, severe wind storms, soil erosion, river bank erosion and excessive rise in temperature make the area more vulnerable to climate change impact (Magbemi, 2008). Though some of these climate-related hazards used to have positive impact on the inhabitants of the area, but of recent times, the frequency of these events has become alarming (Ekpo, 2004). The livelihoods of the inhabitants are at high risk due to the extreme climatic induced events. In Akwa Ibom State, majority of women are peasant farmers. There have been reports of changes in the early onset or late onset of rainfall and early cessation or late cessation of rainfall in the area. Also high temperatures are noted to have increased over the years (Udo, 2006). The changes in the pattern and quantity of rainfall as well as other climate parameters such as temperature, wind storms have negative impact on the lives of farmers and other vulnerable groups mostly women who depend on natural resources for their livelihoods. The environmental degradation of the area as a result of oil exploration, exploitation, gas flaring, urbanization and industrialization has been known to increase the vulnerable level of the women in the area (NEST, 2004). And the socio-cultural believe of the people have negative effects on gender issues in Akwa Ibom State. Given the fundamental role of women in any community, concern has been expressed nationally and locally by scientists and government about the effect of climate change on gender issues. Interest in this issue has motivated the need for this study in Akwa Ibom State, which is one of the Niger Delta States of Nigeria.

2.0 Materials and Methods:

Information on impacts of climate change, levels of vulnerability and adaptive measures in rural communities of Akwa Ibom State were obtained from community chiefs, elders, women groups and other opinion leaders that have lived in the rural communities for the past 20 years. They women were considered to have known the communities

very well and so were engaged during the study. In-dept-Interview (IDI), Focused group discussions (FGD) and structured questionnaires were held separately with the various groups in the communities that were sampled. The groups include the women farmers' association, women trader's group and the youths. The groups separately provided their views on the impacts of climate change, areas of vulnerability and adaptive measures to climate change on their livelihoods activities in the area. Questionnaires were structured to elicit much information as possible on the climate-related extreme events, socio-cultural practices that are gender sensitive and actions which may be taken for adaptation to climatic hazards in the area. Information from secondary data were obtained from various sources including existing data already published on climatic related hazards, conferences, journals, national dailies, and workshop proceedings.

2.1 Vulnerability Assessments

The indices that were used to assess the vulnerability as relate to gender issues in the communities include dependence of climate-sensitive occupation, poverty rating of households, extent of access to resources, land tenure system, socio-cultural believe, level of infrastructure development, level of awareness and education, dependence of natural resources access to new technologies and access to credit facilities.

2.2 Impact Assessment

The indices of climate change impacts as relate to gender issues include poor yield, homeless, loss of farm land, migration, malnutrition, longer distance to access fuel wood, longer distance to access drinking water, sickness and unemployment.

2.3 Adaptation/ Coping Measures

Adaptation in this study involves a process of adjusting in relation to the impact of climate change which includes ecological, social and economic adjustments in anticipation or actual changes in climatic conditions. The method used to assess adaptation measures in the communities were structured questionnaires, in depth interviews and focus group discussion with the women of the area. The indices used in this assessment included identifying the alternative options that sustained their livelihood during climate disasters like flooding, salinity intrusion and severe wind storms, coping measures to climate change events, and new technologies that can be introduced to remedy the situation.

2.4 Methods of data analysis

Descriptive statistical presentations of the data (Seepersad and Henerson, 1984; Shepherd and Roger, 1991) were used to analyze data from questionnaires.

3.0 Results and Discussion:

Awareness of climate Change in the Community

Table 1 shows that about 67.5% of the respondents in the area have heard of the term climate change were men while 32.5% were women. This is because men in the area are educated more than women, and people in the area mostly the rural people do not attached important to women education. They still believe that women place is in the kitchen. About 63.3% of the respondents who were able to identify the causes and effect of climate on their livelihood activities were men while 36.7 % of women could suggest the possible causes of climate change in the area. This also increases the vulnerable level of women to climate change impact. Most women in the area thought the severe flooding, wind storms and prevalence of pest and diseases affecting their crops are as a result of God punishment to mankind. About 54.9% of women could mention some evidences of climate change impact on the livelihoods. Whereas, 45.1% of the respondents were men. The high percentage of women in this issue is that their livelihoods are more affected with climate change impact, since they depend on natural resources for their survival. About 54.3% of the respondents that can relate historical events of climate change hazards in the area were men. Whereas, 45.7% of the respondents who were able to relate some historical events of significance in the development of the community to climate change impacts were women. The result revealed that a lot of women in the area do not have any information, and are not aware on the impact of climate change. They thought and believe that the rising temperatures, increasingly erratic rainfall, and more frequent and severe floods, cyclones and loss of species are consequences of God punishment to humanity. Lack of awareness and low educational qualification of women in the area were observed as major limitations towards understanding the complexity of climate change among the rural poor people, most of whom are farmers and fishermen in Akwa Ibom State. The result was in line with the work of (Abiodun et al., 2000) who reported that educational attainments as well as creating awareness in the farmers and fishermen are capable of enhancing proper understanding of climate change impacts. The fact that majority of people living in rural communities in Akwa Ibom State are women. However, women

living in rural communities in Akwa Ibom State need some technical knowledge, which is outside their local coping system in order to adapt to climate change impacts and to be able to improve their socio-economic activities (Ziervogel *et al.*, 2006). A good level of education is expected to favour adaptation strategies of women in the area.

Table 1: Knowledge and Awareness of climate change impact in Gender Issues

Awareness of Climate Change impacts	% response of Men	% response of women
Knowledge of Climate Change	67.5	32.5
Causes of Climate Change	63.3	36.7
Evidence of Climate Change	45.1	54.9
Identifying effect of climate change in livelihoods	52.7	47.3
Relate historical events of climate change in the community	54.3	45.7

3.1 Climate Change Impacts implications on Gender Activities in the Area

Fig. 1 shows the impacts of climate change on gender activities in the study area. 65% of women and 35% of men are engage in agricultural production (land cultivation, weeding, harvesting and fish processing that involve the use of firewood or wood products). Women are facing high risks of loss due to incessant flooding and unpredictable pattern of rainfall in the area. On dependence to natural resources, 75%of women dependent on land and natural resources while 25% of men dependent on these natural resources in the study area. The high dependency of women on land and natural resources for livelihood generation makes them more vulnerable to climate change impacts. Climate change adds to water insecurity which increases the work level of women that involved in subsistence farming in the community, as they spend more time and effort on land preparation, crop watering and protection from disease.

On income generation about 80% of women are affected by climate change impacts while men represent only 20%. This is because more women than men work in household/micro and small enterprises, they are often worst hit and least able to recover as a result of disasters. Natural hazards in the area cause women to lose their source of

livelihood, also concentration in informal sector also makes women in the community more vulnerable to climate change hazards. On providing domestic care to the family, about 82% of women are face with more difficulties in feeding and caring for others when resources are scarce as a result of climate change hazards. More time and effort is spent on collecting fuel wood, drinking water and domestic care including care for the sick and injured. Also the opportunities of young girl in the rural communities of Akwa Ibom state to go to school are affected since they are engage in income generating activities to sustain the family. While 18% of men are involve in domestic care in their families. About 90% of women and children are more vulnerable to climate change impacts on health related issues. The women and children in rural communities of Akwa Ibom State face high health risks as a result of increased of disease vectors during flooding in the area such as dengue fever, malaria. Polluted water bodies in flood time in this community lead to hygiene-related problems due to lack of adequate sanitation and drinking water. A number of indirect impacts of climate change on human health observed in the rural communities studied were nutritional

imbalance (poor nutrition and malnutrition) as a result of food shortage that is cause by climate change hazards. On access to land and services, women hold only 34% of Land Tenure Certificates (LTCs) while 66% of land and services are owned by men. Land inheritance rights limits women’s access to credit facilities since most of the Banks in the area will be looking for collateral before any loan is given to individual. Also less access to market and extension services seriously affected the poor women in the rural communities of Akwa Ibom State and limits their coping strategies. On decision making, only 5% of rural women were involved in decision making power regarding their family businesses. Attending village or community meetings is commonly considered a man’s task. Women’s involvement in decision making in the rural community of Akwa Ibom state for development and socio economic welfare is limited to child-care and food distribution, women tend not to be involved in decision-making therefore the needs and views of women may be not taken into account in adaptation plans (PIK, 2008).

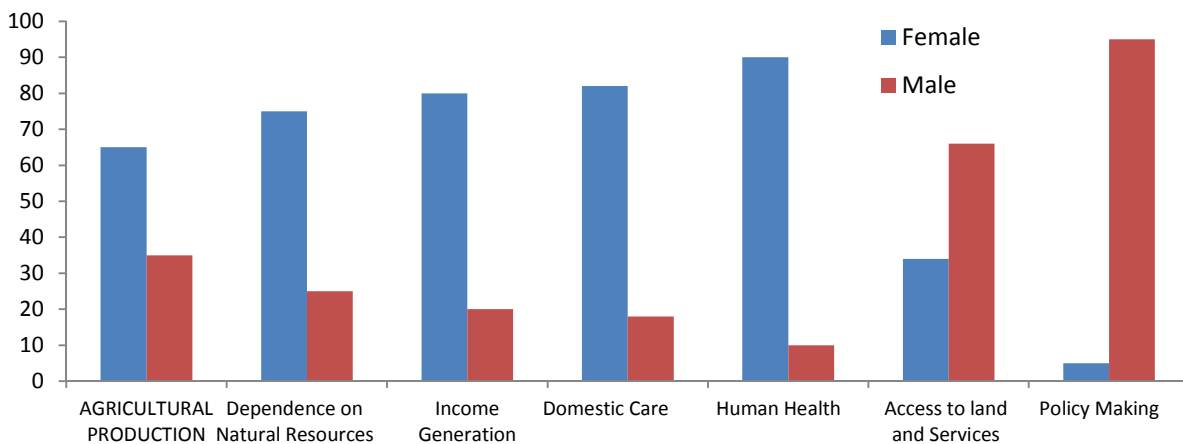


Figure 1: Vulnerability Areas to Climate Change and Gender Issues in the Study Area.

3.2 Major Causes of Climate Change in the Study Area

Figure 2 shows the major causes of climate change in Akwa Ibom State. Deforestation had the highest percentage 58% and was rated as the greatest caused of climate change in the study area. Fossil fuel burning and land use system and had 45% and 30% respectively. While population and pollution recorded 27% and 25%, respectively. For decades, deforestation (through the conversion of forest lands to other land uses) has been the second

major source of greenhouse gas (GHG) emissions, after fossil fuel combustion (IPCC 2007). There has been a global increase in deforestation in Akwa Ibom State. This accounts for the loss of these forests. The rate of development and industrialization in the state of recent is alarming and this development does not consider the implication to the environment. Also the oil exploration and exploitation in rural communities of Akwa Ibom State result in the environmental degradation in these communities. The huge

implication of these activities in terms of climate change is not just carbon emissions; more importantly, it is increasing the vulnerability of forest ecosystems and affects the livelihoods of the rural women who depend on these natural resources of their survival. The oil exploration and exploitation in these communities will pollute the water bodies, degrade the agricultural land and loss of biodiversity. According to UNEP,(2004). The livelihoods of the rural people depend on natural resources for their survival such as forestry products and biodiversity.

Nzegbule, (2009) reported that deforestation is a major environmental problem facing rural communities of the Niger Delta region of Nigeria, with about 3% of forest lost every year. And this figure is increasing, this is because the oil companies in the Niger Delta are continuing in their oil exploitation and exploration activities and the pollution associated with it. Also wood is the most commonly used source of energy among the rural poor in Akwa Ibom State. Women collect firewood in the village, along river banks, in forest plantations and in the forest reserve for domestic use. Sometimes both women and men in the rural communities collect wood to sell to urban dwellers. The market for wood is strong in the state because hydro-power is neither reliable nor cheap, and the high cost of kerosene and gas encouraged the poor people who cannot afford these expensive items to patronize the fire wood business. Firewood sellers prefer to collect wood from the forest reserve, since buyers demand the superior quality of indigenous hard wood. Again, although not a traditional livelihood or energy source in Akwa Ibom State, charcoal production is becoming widespread due to the increasing demand from cities like Uyo, Ikot Ekpene, Eket and Abak. This also increases in the number of people joining the charcoal business. Charcoal production has become a major threat to the biodiversity and other forests in term of deforestation (Ekpo, 2004). The release of greenhouse gases (GHG) such as CO₂, nitrous oxides, chlorofluorocarbon, hydrocarbons such as methane, ozone, aldehydes and water vapour into the atmosphere is another source of climate change in the state . Some of these gases especially CO₂ and the oxides of nitrogen are dissolved in rain water and fall to the earth as acid rain. CO₂ dissolved in water to form carbonate acid while nitrous oxides dissolve in water to form nitric acids. Because of the high level of ionization of these acids, they erode metallic surfaces and destroy biodiversity. Acid rains erode roofing sheets of houses at alarming rate, this force the people in the Niger Delta region

of Nigeria to change their roofing sheets every now and then. Most houses in the Akwa Ibom State are roofed with zinc-plated galvanized sheets. These sheets are susceptible to rusting when they come in contact with rain water (acid rain). The life span of zinc-plated roofing sheets is greatly reduced when acid rain fall on them. Owners of these houses mostly widow women are made to change their roofing sheets more often than usual. They are often forced to spend the little resources replacing their roofing sheets. Money that would have been spent on other areas of the home that will improve the standard of living of the people is used for changing the roofs of houses. This further impoverishes the inhabitants, especially those in the rural communities. Again, an alternative to zinc-plated roofing sheets is the use of aluminum roofing sheets. Aluminum sheets are highly resistant to corrosion by acid rain. However, they are much more expensive than the zinc plated sheets, hence the poor people mostly women in the rural area cannot afford aluminum roofing sheets. Acid rain also leads to loss of biodiversity, forests and economic crops are also destroyed by acid rain. The dominance of grasses and shrubs state is an indication of loss of natural forest (NEST, 2009). This may be mainly due to acid rain, although there are other factors that may lead to this such as agricultural activities and exploration and exploitation activities of multinational oil companies. Some respondents opined that their farm land had been destroyed and is no longer fertile for cultivation of crops, hence they can no longer involve in farming activities.

According to Udo, (2006) human beings, like other living things, relate to their environment in the following ways: the environment provides the resources needed for the existence and survival of human beings; the environment also provides the site for the physical presence of all living things with human being occupying space per capita; and also, the environment serves as the sink for waste and human being produced the greatest amount of waste. Rapid population growth can push a region beyond its economic and natural resources, "limits-its carrying capacity" or long term ability to support the people who live there without degrading the regions resources (Schuster, 2003). The number of people, the nature and quantity of productions and consumption, and the cumulative impact on resources and environment are all factors that determine a given areas carrying capacity. In rural communities of Akwa Ibom State, widespread malnutrition, high level of poverty and loss of farm land especially if accompanied by

environmental deterioration such as rapid loss of soil fertility, sea level rise and flooding may be one indication that the rural communities especially the coastal region is exceeding its carrying capacity. The rural community in Akwa Ibom State is continually degraded by frequent oil spills. Seismic blasts and the discharge of untreated effluents directly into water bodies, some of which serve as the only source of water for the people. Water bodies polluted with oil affects the amount of dissolved oxygen in the water, which resulted in water borne diseases in the area. Oil spills occur with high frequency in the communities. The devastating impacts of these incidents on the farmlands, crops, economic trees, creeks, lakes, fishing equipment is such that the people can no longer engage in productive farming and fishing (Iyayi 2004).

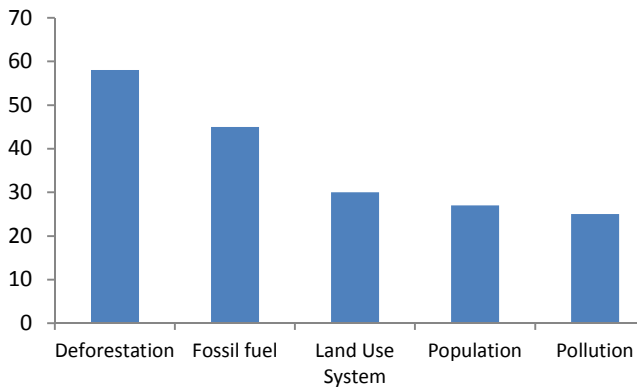


Figure 2: Causes of Climate Change in the Area

3.3 Influence of Socio- Cultural Practices on Gender Issues

Climate change and socio- cultural practices affect gender issues in rural communities of Akwa Ibom State. According to Stavenhagen (1998), culture is defined as the sum total of the material and spiritual activities and products of a given social group of a coherent and self-contained system of values and symbols as well as a set of practices that a specific group reproduces over time and provides individuals with the signposts and meanings for behavior. Rural women from Akwa Ibom State suffered double deprivation due to cultural practice and climate change impact. They inherit land and property rights from neither their fathers nor husbands. Although some colonial influence (Christianity) alleviate some gender-based violence against women such as killing of twins, female circumcisions and female education, yet many women in the rural areas in Akwa Ibom State still suffered unjustly table 2. This is because,

the land custom in the area leaves many single women, especially widows, divorcees and their daughters, at risk of destitution and poverty (Umeh,2008). According to Ozor *et al.*, (2005), many widows in Nigeria are subjected to horrible health hazards and their human rights are trampled upon in the name of traditional widowhood rites, rituals, and practices.

Akwa Ibom State believes on patrilineal systems in which property rights are held and transferred through men. However, women will only acquire this property largely through their relationships with men and this increase their vulnerability level to climate change impact. For example, women are responsible for tilling the land, providing clean water, cultivating income-yielding crops for home consumption and marketing, nurturing the children, and preparing food for the family and they are restricted from access to land and other essential services. Additionally, a widow in some parts of Akwa Ibom State such as Annang and Ibibio and Oron tribes can only inherit land as a trustee for her young sons (Akpan, 2002). Also in Akwa Ibom state, a man is the heads of households, but bread-winning is a shared responsibility with women in control of the domestic domain. Property rights, although in favor of the male, have never been absolute (Iko, 2001). The influence of biological, cultural, historical, legal, political, religious, socio-economic in the area affect gender issues and place men more superior than women there by exposing women to more danger in climate related hazards. For instance, in most of the rural communities in Akwa Ibom State, the application of inorganic fertilizer to the farm is forbidden, the customary law forbid the poor farmers to apply fertilizer to the crops and this affect the livelihood of farmers as they depend on the crops for surviving.

Table 2. Influence of Socio-cultural practices on gender activities in Akwa Ibom State

Socio-cultural practices	% response affected men	% response affected female
Killing of twins	0	100
Genital Mutilation	0	100
Education	10	90
Traditional widowhood rites practices	0	100
Customary law or taboo	12	88

4. Adaptation Measures

IPCC (2001) defined adaptation as adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities. This means that adaptation would not only deal with reducing vulnerability to climate change, but it might utilize the opportunities provided by changes in hydro-geophysical (natural) system to climate-affected communities. Therefore, in order to reduce the vulnerability of the rural Akwa Ibom State to climate change and climate variability, adaptation measures that can be adopted by the women were identified and alternative livelihood options that are sustainable under climate change were suggested.

4.1 Adopt improved varieties of crops:

Developing and using new varieties/species of crop with increased tolerance to flooding, salinity and can survive under declining soil fertility was introduced to the rural women in Akwa Ibom state. Planting of short-duration crop varieties such as rice, okra, pepper and garden egg etc. also enhance the ability of women to cope with variable climatic conditions in the area (Akpan,2002).

4.2 Diversification of livelihoods. In rural communities of Akwa Ibom State, vulnerability to climate change is influenced by high level of poverty associated with limited options for coping with economic shocks. This can be reduced by diversifying livelihoods. Women farmers can combine farming and with livestock rearing such as chickens, rabbits, snails and goats in an integrated manner to enhance their income. They can engage in these activities particularly during raining season when most of their farm lands are flooded (NEST, 2004).

4.3 Accurate and timely weather forecasting. A major factor contributing to crop failure is poor weather information dissemination in the area. Farmers usually rush to plant their crops with the first rains which may not necessarily signal the actual onset of the growing season. Better weather forecasting skills and information sharing is needed to assist farmers in this respect. Responsible agencies such as Nigerian Meteorological Agency (NIMET) and other relevant research institutes should support the farmers in the area with timely information and in a way they rural women can understand.

4.4 Access to education, training.

Training programmes on adaptation measures with a special focus on the needs of women (e.g., second season farming or late planting that will not be affected by flood and more resistant crops should be introduced in the area. Training programmes on the use of new technologies (e.g., means of agricultural production, energy-efficient cooking stoves and ovens, renewable energy systems, information and communication technologies). Awareness of existing rights and laying claim to these rights in different spheres of life (e.g., land ownership or land use rights, ownership rights for means of production).

4.5 Access to land and ownership rights

Women in Akwa Ibom State should be allowed to own land and be able to use it according to one's own needs and wishes in order to be active in climate mitigation and adaptation:

To procure, own and be able to use the means of production, particularly new technologies, and the related technical know-how to improve their livelihood.

To obtain, own, and be able to deploy financial capital for one's own undertakings in order to have investments available for the adoption or development of climate-related work.

4.6 Access to services:

Women in Akwa Ibom State should have free access to (medical) care and child-care services in order to ease the burden on women, stop genital mutilation that reduce time and increase poverty level in the area:

To have access to the (agricultural) extension services required, for example, improved seedlings, fertilizer and farm inputs.

To have access to loan and credit facilities for the rural women in Akwa Ibom State.

Government should develop strategies to enhance women's access to and control over natural resources,

Increase women's participation in decision-making at all levels in climate change

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