POVERTY AND INJUSTICE OF CLIMATE CHANGE, WHY THE POOR ARE THE MOST VULNERABLE

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Abstract
Climate change will hit the poor hardest and greatest because of their exposure and more vulnerability to impacts of climate change. The poor contribute very little to causes of climate change in terms of their emissions either per capita or aggregate contributions as nations of the developing world. The poor are very vulnerable because of undue exposure to extreme weather events such as droughts, floods, heat waves, hurricanes, typhoons and tropical cyclonic activities. They are also exposed to climate change because of the nature of their economic activities such as agriculture—a sector very sensitive to climate change impacts. Despite the high vulnerability of the poor, they are the least group of persons capable of helping themselves by building necessary resilience or having the resources, technology and knowledge for adaptation aimed at minimizing their harm and hurt by climate change impacts. For example, the poor are not covered by insurance to protect themselves against the risks that climate change brings. The findings of this paper are the outcome of extensive reviews of literature on environment, poverty, sources of greenhouse gas emissions and politics of adaptation. Apart from higher vulnerability and greater exposure of impacts on the poor, the paper also exposes the clear injustice and inequity of climate change which is the fact that the poor with the least contributions to causes of climate change share its greatest negative impacts.

Keywords: Poverty, Vulnerability and Injustice of Climate Change.

Introduction
The relationship between poverty and environment is a very complex one. But one thing is obvious; poverty affects the environment while environment in turn affects poverty. The poor are very close to the environment and hence can impact directly on the environment. The impact can be very strong because of the number of the poor that can run into billions in the world depending on the set of criteria used for classifying the poor.

But poverty should not be equated with only absence of, or lack of income, though income is very important but the poor lack not just income alone, but also other dignified and dignifying possessions such as decent housing, fitting clothing, adequate and quality food, access to basic health and sanitation facilities.

Poverty can be absolute or relative. Absolute poverty is the worst type of deprivation and it is the type of poverty that is explicitly manifested when a poor persons is sighted even from a far. Todaro and Smith (2011) define such extreme or absolute poverty as a situation of being unable to meet the minimum levels of income, food,
clothing, healthcare, shelter and other essentials. Relative poverty is a measure of poverty relative to subsisting standard in a given society. It is a comparative form of poverty. No matter the form of poverty (extreme or relative), poverty insults, it stinks, it demeans, dehumanizes, destroys the body and mind if not the soul so said by Mahtama Ghandi and reported by (Spore, 1999).

Though poverty exists every where across the earth, but the greatest number of the poor and the highest concentration of poverty and deprived persons are located in the developing countries of Africa, Asia, Latin America and Middle East.

The world is economically and developmentally classified as first, second, or third world or as developed and developing world.

The focus of this paper is on the developing world where climate change will have its greatest impacts on the people and their environment because of endemic poverty and undue vulnerability of the people to climate change.

The people of developing world are vulnerable to climate change because of a combination of factors such as poverty, over exposure to extreme weather events; their primary occupations such as agriculture, fishing and livestock that are not insulated from climate shocks; living in hazard-prone geographic spaces such as flood plains, mountain slopes that are exposed to landslides; building and living in sub standard houses and structures that can not withstand impacts of storms and floods and above all, poverty which ensures that the poor can not afford any insurance policy either for their lives or for their property.

Lastly, the poor lack the necessary resources and therefore can not afford any measure of adaptation to impacts of climate change. Though the poor bears the greatest burden of climate change, not minding that the poor contribute little to causes of climate change, and this is perhaps the greatest injustice and inequity of climate change. This paper is out to show why the poor especially in the developing countries of Africa, Asia and Latin America would be hardest hit and would bear the greatest burden of impacts of climate change.

Why the Poor Are Most Vulnerable To Climate Change Impacts

The poor people of the developing countries are very vulnerable to impacts of climate and their vulnerability are accounted for by a number of reasons related to geographic location, dependent on primary and extractive actives, subsisting on low technologies and low knowledge to help themselves; having high population densities that are concentrated on very hazard-prone zones such as flood plains, hill slopes, sea coasts and desert and semi deserts zones that are water and moisture stressed.

Stressing the inequity of climate change, and the skewness of its negative impacts, Stern (2006) observed that impacts of climate change are not evenly distributed-the poorest countries and people will suffer earliest and most because of a number of reasons. First, developing regions have a geographic disadvantage because of their location on already warmer environment. Second, developing countries depend heavily on agriculture, the most climate-sensitive economic sector and third, the low incomes of the poor countries make adaptation particularly difficult. Supporting the skewness of climate impacts, World Development Report (2010) noted that climate change is disproportionally affecting developing countries because of their heavy
reliance on ecosystem services and natural capital for production in climate –sensitive sectors and much of their populations live in physically exposed locations and economically precarious condition and their financial and institutional capacity to adapt is limited.

Agriculture is one sector that provides a lot for the sustenance of the livelihoods of the people of developing world. This sector provides food, income, raw materials, items of trade and employment to millions of people, but this sector is perhaps the most vulnerable to climate change risks and shocks. Agriculture is vulnerable because it is highly exposed to the risks that come with drought and uncertain rainfall (Human Development Report 2007). Of the countries that will be hardest hit by climate change, Green (2008) identified that tropical and sub-tropical countries especially in sub-Saharan Africa and South Asia where poor people have few alternatives to farming and pastoralism and the zones that will become hotter, drier, and more drought-prone or weather with more intense rainfall and flood risks.

Apart from agricultural vulnerability, poor people of the world are also exposed in their homes and places of businesses. The poor usually settle in climate change impact exposed locations such as flood plains, hill slopes and coastlines. For example, in August more than 1000 persons were buried by landslides that were triggered by heavy rains in the slum settlements of the city of Freetown (Sierra Leone).

Collaborating unenviable role poverty plays on making the African continent very vulnerable to climate change impacts even as it contributes little to observed global warming, an empirical study by Ziervogel et al (2008) titled: Climate change and Adaptation in African Agriculture found that the relative low economic activity and poverty render African countries, especially the poorest communities in these countries disproportionately vulnerable to climate change impacts.

Perhaps, the greatest danger which the poor communities in developing countries of Asia, Africa and Latin America are exposed to as result of climate change impact is that of extreme weather events. Extreme weather events include droughts, floods, heatwaves, cyclonic storms (hurricanes, typhoons and cyclones) and forest fires. These extreme weathers are not only increasing in frequency of occurrence but also in magnitude of each event. Poor communities not having resources to protect themselves and their environment from the hazards posed by these events suffer greatest losses whenever disasters occur. Poverty will also make recovery from any disaster almost impossible.

Insurance plays a strong role in managing risks including climate change risks such as floods, storm surges and drought. These meteorological events are exacerbated by prevailing climate change. Developed countries of the world such as Europe and North America are covered by social insurance polices but in poor developing countries, social insurance are rare. Insurance polices are negotiated on person to person bases and as expected, only few people, the elites take insurance policies. Limited access to insurance means that poor developing countries can not buffer against their vulnerability to climate change risks even when it is already established that climate change risks are greatest in developing poor countries of the world.

The fact that impacts of disaster are greatly and disproportionately shared by the poor is clearly manifested by the impacts of Hurricane Jeanne that affected United States, Haiti and Dominican Republic in 2004, (Giddens, 2009). In USA, a rich country, people were only rendered homeless but in Haiti, one of the poorest countries in the western
hemisphere, 1500 deaths were recorded when the hurricane landed in Haiti. Dominican Republic which shares half of the island with Haiti but a middle income nation, only 25 persons died as a result of the hurricane (Giddens,2009).

The connection between the level of income and capacity to withstand damaging human disaster was proved further by Giddens (2009) when deaths from three countries of Ethiopia, Sudan and Chad because of the great drought that devastated East Africa in 1984 were counted. About 500,000 people died in the above named countries and many suffered from malnutrition and many more were made homeless because of the drought. The high damage recorded was connected to many factors including ineffective and corrupt government, dependence on low value tropical crops; the existence of sprawling shanty towns, poor transportation and communication systems all converge to increase vulnerability of the people and their environment to disasters (Giddens 2009).

The Poor Lack resources for Adaptation to Climate Change

Adaptation and mitigation are the twin ways in which impacts of climate change can be minimized on people and their environment. Mitigation is all about emission reduction to ensure that greenhouse gases that contribute to global warming are drastically reduced by employing energy efficiency, renewable energy and the adaptation of efficient forest and land use best practices.

Adaptation is concerned with building necessary resilience to deliberately buffer human and physical structures from negative impacts of climate change. It is important to stress here that some climate change mitigation measures can qualify as both mitigation and adaptation responses to climate change. For example, planting trees mitigate climate change because trees act as sinks for sequestration of carbon dioxide. Trees protect also soils from erosion and serve as wind breaks in arid and semiarid environments. Here trees perform adaptive function and not a mitigation one.

Adaptation is particularly necessary because adverse impacts of climate change are already manifesting in various degrees across the world and will continue to do so even if emissions are stabilized as proposed by 2050.

But adaptation is a very expensive activity and requires a lot of resources, planning and execution. For example, constructing dykes and sea walls to protect vulnerable coastal settlements from storm surges and coastal flooding require a lot of finance, and technical know how and diligent execution. The same is true for river dredging, construction of canals and dams to regulate water flow in rivers susceptible to flooding such as Rivers Niger and Benue in Nigeria. For example, Nigeria is exposed to yearly annual flooding in the flood plains of Rivers Niger and Benue. The 2012 super flood in Nigeria was largely attributed to the release of excess water in Lagdo Dam in Cameroon. The 2012 floods in Nigeria was the worst in 80 years and would have been avoided or minimized if Nigeria had constructed buffer dams on river Benue to regulate the water flow from Cameroon.
Clear Injustice and Inequity of Climate Change

Anthropogenic emissions that contribute to enhanced-greenhouse effects, global warming and climate change have been largely caused by developed countries of United States, Europe, Japan and Australia.

Stern (2006) observed that since 1850, North America and Europe have produced around 70 percent of all the carbon dioxide emissions due to energy production, while developing countries have accounted for less than one quarter.

Supporting the inequity of carbon emissions, Adams and Luchsinger (2009) said that since 1950, Annex One countries (developed countries) have contributed up to three-quarters of the increase in emissions, despite accounting for only 21 percent of the world’s population.

Green (2008) sharing his thought on the injustice and inequity of climate change wrote that the deep injustice of climate change is that those with the least historical responsibility stand to suffer most from its predicted consequences. The developing countries with very low levels of greenhouse gases per capita will be hardest hit.

Anan (2005) still highlighting the inequity and injustice, and disproportionate impacts of climate change on poor developing countries of the world because of their high vulnerability remarked that countries most vulnerable to climate change include small island developing states, coastal nations with large numbers of people living in low-lying areas; arid and semi-arid tropical nations. These countries are the least able to protect themselves. These countries also contribute least to the global emissions but will pay a bitter price for the action of others.

The inequity of high greenhouse emissions between developed and developing countries may be better appreciated when expressed statistically. The World Resources Institute on contributions by both industrialized and developing countries between 1990 and 1999 cited by Abutu (2007) is shown in Table 1.

Table 1: Contributions of Greenhouse Gas Emissions of Developed and Developing World between 1990 and 1999

<table>
<thead>
<tr>
<th>Region</th>
<th>Percentage Emission Contribution between 1990 and 1999</th>
</tr>
</thead>
<tbody>
<tr>
<td>United States and Canada</td>
<td>25</td>
</tr>
<tr>
<td>Europe</td>
<td>21</td>
</tr>
<tr>
<td>Developing Asia</td>
<td>19</td>
</tr>
<tr>
<td>Former Soviet Union</td>
<td>12</td>
</tr>
<tr>
<td>South and Central America</td>
<td>11</td>
</tr>
<tr>
<td>Pacific Asia</td>
<td>5</td>
</tr>
<tr>
<td>Sub-Saharan Africa</td>
<td>4</td>
</tr>
<tr>
<td>Middle East and North Africa</td>
<td>3</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
</tr>
</tbody>
</table>

Source: Compiled from data provided by the World Resources Institute

Data in Table 1 shows that Sub-Saharan Africa that is projected to be hit hardest by climate change contributes only 4 percent as against Europe’s 21 percent and North America’s 25 percent of global emissions.
The Responsibility and Capacity Indicator (RCI) which defines each country’s contribution to climate change and their ability to address consequent impacts as proposed by Worldwatch Institute (2009) and published by Adams and Luchsinger (2009) shows that developed countries (Annex 1 countries under 1999 Kyoto Protocol) have emission responsibility of 78 percent and their capacity to deal with consequences of emissions of 75.8 percent in 2010 and projected (RCI) of 69 percent in 2020 and (RCI) of 61 percent in 2030. The Annex 1 countries have global population of only 18.7 percent. (Adams and Luchsinger, 2009) (Table 2) But Non Annex 1 countries (developing countries under 1997 Kyoto Protocol) with 81.3 percent of world population have emission responsibility of only 22.0 percent; capacity of 24.2 and RCI of 23 percent in 2010 and projected RCI of 31 percent in 2020 and 39 percent in 2030 (Details in Table 2).

**Table 2 Greenhouse Emission Responsibility and Capacity Index for Selected Countries of the World.**

<table>
<thead>
<tr>
<th>Year</th>
<th>Population (percentage of global)</th>
<th>Capacity (percentage of global)</th>
<th>Responsibility (percentage of global)</th>
<th>RCI (percentage of global)</th>
<th>RCI (percentage of global)</th>
<th>RCI (percentage of global)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Annex 1</td>
<td>18.7</td>
<td>75.8</td>
<td>78.0</td>
<td>77</td>
<td>69</td>
<td>61</td>
</tr>
<tr>
<td>Non-Annex 1</td>
<td>81.3</td>
<td>24.2</td>
<td>22.0</td>
<td>23</td>
<td>31</td>
<td>39</td>
</tr>
<tr>
<td>High Income</td>
<td>15.5</td>
<td>76.9</td>
<td>77.9</td>
<td>77</td>
<td>69</td>
<td>61</td>
</tr>
<tr>
<td>Middle Income</td>
<td>63.3</td>
<td>22.9</td>
<td>21.9</td>
<td>22</td>
<td>30</td>
<td>38</td>
</tr>
<tr>
<td>Low Income</td>
<td>21.2</td>
<td>0.2</td>
<td>0.2</td>
<td>0.2</td>
<td>0.3</td>
<td>0.5</td>
</tr>
<tr>
<td>World</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
</tr>
</tbody>
</table>

Source: Extracted and Compiled from Data from Adams and Luchsinger (2009)

Table 2 shows clearly the injustice and inequity of climate change between developed and developing countries of the world. The developed world (Annex 1 countries) that have only 18.7 percentage of world population are responsible for as high as 78 percentage of global emissions in 2010 while the developing countries that have 81.3 percentage of global population are responsible for only 22 percent of the world emissions. On ability to contain impacts of emissions, high income countries have capability of 77 percent in 2010 and projected capabilities of 69 percent by 2020 and 61 percent by 2030. While the low income poor countries of the world have capability of only 0.2 percent in 2010 and projected 0.3 percent by 2020 and 0.5 percent by 2030.

It is probably in considering emission per capita between developed and developing countries that inequity of global emissions is better demonstrated. This inequity is captured by Stern (2008) when he calculated per capital emissions for most developed countries in Europe to be about 10-12 tonnes per carbon equivalent (TCO₂e), with United States of America having the highest per capita emissions of about 20-25 TCO₂e and China 5 TCO₂e and the developing world with only about 2TCO₂e.

**Discussion, Recommendations and Conclusion**

This paper has explored the various connections between the poor and the environment but more specific, climate change. Specific areas of climate change such as emissions of carbon dioxide generated by developed and developing countries including per capita generations, vulnerability of the poor to impacts of climate change; the low
capability of the poor to build necessary resilience to impending climate change impacts and their low adaptation capacities were all x-rayed by this paper.

What comes out very clearly is that the poor contributes very little to historical emissions of greenhouse gases that cause the present global warming and climate change. Either collectively or individually, the poor countries of the world had very low greenhouse imprints on the earth.

Though the poor developing countries contributed little, they would be first and hardest hit by the impacts of global warming and climate change. This is so because of a combination of factors such as high vulnerability, lack of means to build necessary resilience and to adapt to climate change.

Poor people are particularly vulnerable because of their high dependence on primary activities such as agriculture and this sector is highly sensitive to climate change shocks. The poor also pitch their settlements where they are most exposed not just to extreme weather events such as heat waves, storms, droughts, floods, hurricanes, forest fires and typhoons but also to strong seismic hazards such as earthquakes, volcanoes and tsunamis.

This paper shows that the rich and poor are impacted very differently when hit by the same magnitude of hazards. For example, the different impacts of Hurricane Jeanne that effected the three countries of different income and infrastructural status (USA, Haiti and the Dominican Republic) brought out the different impacts. These three countries are actually located in very close geographic zone, but the disaster of the hurricane was heaviest in the poorest nation of Haiti because of poverty and higher vulnerability. It was minimal in the Dominican Republic and least in USA that had better buildings codes and hence reinforced against storms and floods; and better and faster responses to disasters.

The rich also recover from disaster faster because of better insurance coverage especially social insurance which is part of social security net in most developed countries of the world. But the poor especially in Africa, Latin America and Asia lack social insurance from their governments and too poor to provide insurance polices for themselves and when disasters occur, they will never recover and this may even deepen their poverty status.

That the poor is hit hardest and greatest by the impacts of climate change, even though they contributed least on emissions that cause climate change is the greatest irony on the principle of cause and effect and this is also against the law of equity and justice.

To redress this injustice, the following recommendations are proffered.

**Recommendations**

First, the risks and vulnerability especially of the poor countries of the world should be prioritized by ensuring heavy emission cut backs by developed and emerging economies such as India, China, Brazil and Turkey. This will help in ensuring that the poor are protected from impacts of the climate change and at the same time achieve the main objective of 2015 Paris Climate Change, which is to hold global average temperature to below 2°C above pre-industrial levels by 2100 (The Paris 2015 Agreement 2016).

Second, adaptation should be upgraded and treated as one of the imperatives of addressing climate change by minimizing the over all vulnerability by increasing the resilience of both natural and human systems to buffer climate change impacts. These can happen by
transferring funding, technology and knowledge from developed economies to developing economies of the world.

Lastly, the developed world should ensure climate justice by fully implementing the Cancun Adaptation Framework which emphasized among other things, assisting developing countries in identifying effective adaptation practices, adaptation needs priorities and support adaptation actions and efforts and challenges all aimed at improving the effectiveness and durability of adaptation actions (The Paris 2015 Agreement, 2016).

**Conclusion**

The poor and their environments are interlinked in various ways. The poor impacts on the environment to extract their livelihoods but the environment in turn ensures that the poor are hit hardest whenever the environment is degraded, polluted or stressed for whatever reason.

Climate change is one of the identified greatest stressors of the environment. Global warming is caused by overloading of the atmosphere with greenhouse gases resulting from various human activities.

This paper has shown that the poor face the greatest impacts of climate change for the simple reason that they have higher vulnerability and lack resources to build necessary resilience against impacts of climate change. Climate change is a reality and some of the impacts are already evident in many parts of the world. These impacts will disproportionately hit the poor and their environment even though that they contributed very little or nothing to global warming. This irony is perhaps the greatest injustice of climate change because the principle of cause and effect has not applied.

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