Understanding Structural Vulnerability (to Climate Change) in Africa

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The Most Vulnerable Countries

IN TRANSLATION:

**Climate Change: A List of the Ten Most Vulnerable African Countries**

By Africa Program // Thursday, October 31, 2013

While Bangladesh is the most vulnerable country in the world, six African countries rank within the top ten most at-risk countries, particularly in the west of the continent with Guinea-Bissau, Sierra Leone, and Nigeria. “A large portion of the most vulnerable countries to the potential impacts of climate change and the resulting extreme phenomena are concentrated in Africa,” the report indicates. “The vulnerability of the continent is due in part to its geography,” it adds, mentioning the “large river systems exposed to the dangers of severe floods,” the higher risks of local storms, most common in central Africa, and droughts that occur throughout sub-Saharan Africa.

http://africaupclose.wilsoncenter.org/climate-change-a-list-of-the-ten-most-vulnerable-african-countries/
Projected Death due to CC

Estimated Deaths Attributed to Climate Change in the Year 2000, by Subregion*

*Change in climate compared to baseline 1961-1990 climate

Data Source:

Maps produced by the Center for Sustainability and the Global Environment (SAGE)
Climate-Demography Vulnerability Index (CDVI)

Figure 5 Global climate–demography vulnerability index (CDVI) estimated by subtracting CVI (Fig. 4) from demographic annual growth rates (Fig. S4), expressed as annual growth rates of human population density (see equation 5). Highly negative values, indicated in blue, represent low-vulnerability situations where current demographic growth is much lower than climate-consistent population growth, while highly positive values, indicated in red, represent high-vulnerability situations where current demographic growth vastly exceeds climate-consistent population growth. White regions correspond to human density values of zero in the global gridded population database.

Source: Samson et al. 2011, Figure 5
Overall Human Vulnerability Index (Humanitarian Crises) Next 30 Years

Overlays of WB hazard hotspots
Social vulnerability

Source: CARE and Maplecroft 2008.

Map 1: This map shows overall human vulnerability based on a combination of natural, human, social, financial and physical factors. Areas shown in darkest blue are likely to be most at risk if exposed to extreme weather, such as floods, cyclones and droughts, or other impacts of climate change.
Composite Vulnerability in Africa

Mid 21st Century Climate-Related Hazard Exposure + Population Density + Household & Community Resilience + Governance & Violence

Vulnerability (Quintiles)
- Lowest
- Lower
- Middle
- Higher
- Highest

Unpopulated area (2008)

Data Sources:
- World Bank Governance Indicators
- Polity IV Project
- Political Regime Characteristics and Transitions
- KOF Index of Globalization
- Armed Conflict Location and Event Data (ACLED)
- World Health Organization
- World Development Indicators
- Food and Agriculture Organization of the United Nations
- Food Security Statistics
- UNICEF Multiple Indicator Cluster Survey (MICS)
- Demographic and Health Surveys
- LandScan
- GIESIN
- NCAR/NOAA WRF

Map Author: Kasia While, CCAPS Program (January, 2012)

Busby et al. 2014
Regional Hotspots

Figure S15. Vulnerability hotspots (a. 2008 and b. 2050). (Red values indicate hotspots where people are most likely to be most in need of help adapting to climate stressors, while the blue areas indicate areas of resilience.)

Source: Midgley et al. 2011, Figures 6 and 11.
Faces of Climate Change in Africa

http://africaupclose.wilsoncenter.org/climate-change-a-list-of-the-ten-most-vulnerable-african-countries/

http://www.un.org/womenwatch/feature/climate_change/

http://www.careclimatechange.org/publications/careclimate-change
Hotspot Mapping and Pitfalls

Alex de Sherbinin (2014)

- Vulnerable populations, food security, water resources, conflicts etc.
- Spatial analysis, GIS, modeling (esp. for exposure mapping)
- Frequent use of proxies (e.g. education for adaptive capacity)

Tschakert et al. (2013, Climate & Development)

- Confidence in maps that masks dynamic dimensions of vulnerability
- Overemphasis on inherent vulnerability, obscuring inequalities
- Missing out on the *structural & relational* aspects of marginalization
Understanding Vulnerability: IPCC

**AR4:**

Vulnerability is the degree to which a system is susceptible to, and unable to cope with, adverse effects of climate change, including climate variability and extremes.

Some criteria of key vulnerabilities:
- size (magnitude)
- time
- persistence of impacts.

**AR5:**

Vulnerability is the propensity or predisposition to be adversely affected.

Much **stronger focus** on:
- (uneven) development processes
- inequalities in societies

African agricultural lands

Heat wave 2003, France
Multidimensional Vulnerability

Inequalities

Olsson, Opondo, Tschakert et al., 2014 (IPCC, AR5, WGII, Ch13, TS)
Observed evidence suggests that climate change and climate variability worsen existing poverty, exacerbate inequalities, and trigger both new vulnerabilities and some opportunities for individuals and communities. Climate change interacts with non-climatic stressors and entrenched structural inequalities to shape vulnerabilities (high confidence, based on medium evidence, high agreement).

Differences in vulnerability and exposure arise from non-climatic factors and from multidimensional inequalities often produced by uneven development processes (very high confidence). People who are socially, economically, culturally, politically, institutionally, or otherwise marginalized are especially vulnerable to climate change and also to some adaptation and mitigation responses (medium evidence, high agreement).
Focus: Structural Vulnerability

- Poverty, inequality, and vulnerability are largely driven by power differentials (social relations, haves/have-nots, institutions, policies)

- Impacts from climate change & climate change policies are funneled through uneven power relations, typically at the expense of the poor, disadvantaged, and less powerful

- Structural/systemic inequalities and mechanisms of exclusion produce deserving and undeserving poor
Africa’s Vulnerability

20 May 2015, 2.27pm AEST

Why Africa is particularly vulnerable to climate change

A Mozambican woman tries to salvage her belongings after severe flooding. Grant Lee Neuenburg /Reuters

Africa’s Vulnerability

Why Africa is particularly vulnerable to climate change

When it comes to climate change Africa is in the eye of the storm. This is partly because of human factors - but the continent’s climate also makes it extremely vulnerable.

The continent also has low adaptive capacity making it particularly vulnerable and exposed because of high rates of poverty, financial and technological constraints as well as a heavy reliance on rain-fed agriculture.

A Mozambican woman tries to salvage her belongings after severe flooding. Grant Lee Neuenburg /Reuters

Lagos: Sea Level Rise, Flooding, and Institutional Neglect

Idowu Ajibade et al. 2013
## Gender, Class, Social Exclusion, and Discriminatory Health Policies

### Comparing flood impacts on women by geographic areas

| Impacts                       | Badia (B) (n=262) (%) | Ajah (A) (n=72) (%) | Victoria Island (VI) (n=119) (%) | P-value ($\chi^2$)  
|------------------------------|-----------------------|---------------------|----------------------------------|---------------------
|                              |                       |                     |                                  | B-A     | B-VI | A-VI |
| Human lives                  |                       |                     |                                  |         |      |      |
| Death                        | 7.6                   | 0.0                 | 0.0                              | *       | **   | NA   |
| Personal health problems     | 56.9                  | 6.9                 | 6.7                              | NS      | **   | NS   |
| Illness of household member  | 56.1                  | 26.4                | 37.8                             | **      | **   | NA   |
| Injury of household member   | 14.1                  | 0.0                 | 0.0                              | **      | **   | NA   |
| Displacement and hardship    | 56.9                  | 6.9                 | 6.7                              | **      | **   | NS   |
| Livelihoods                  |                       |                     |                                  |         |      |      |
| Loss of income               | 45.8                  | 0.0                 | 9.2                              | **      | **   | **   |
| Low business sales           | 29.8                  | 0.0                 | 21.8                             | **      | **   | **   |
| Missed-out on productive work| 36.6                  | 0.0                 | 28.6                             | **      | **   | **   |
| Assets                       |                       |                     |                                  |         |      |      |
| Collapsed building           | 1.9                   | 0.0                 | 0.8                              | NS      | *    | NS   |
| Damage to properties         | 82.4                  | 31.9                | 52.9                             | **      | **   | **   |
| Damage to homes              | 80.5                  | 18.1                | 3.8                              | **      | **   | **   |
| No impact at all             | 0.4                   | 34.7                | 43.7                             | *       | **   | NS   |

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Nadia was about six months pregnant when she was urged by her friends to seek obstetric care at the public hospital. When she got there, she was confronted by the ‘Compulsory Spousal Blood Donation’ (CSBD) policy which requires pregnant women to bring their husband to donate blood before they could register for prenatal care. Nadia’s husband, Karim, refused to donate blood on behalf of his wife because he considered blood donation as ‘Haram’–a sin against God. Karim offered to pay in lieu of donating his blood but his offer was rejected on the grounds that if everyone paid then the policy is ineffective. Constrained by the inability to meet the blood donation requirement, Nadia was forced to have her baby at home with the help of a midwife. Her delivery day coincided with the July rainstorm, which flooded the Badia community and swept raw sewage, urine, and refuse into Nadia’s home, thus contaminating the water and instruments used during the delivery.
Beyond Exposure: Structural Violence & Social Stigma

Legacy of a dual city – relocations
Denial of housing rights & tenure security
Encroachment of hazardous landscapes
Erosion of natural resilience against flooding
Environmentally intolerable coping strategies

Waste filling (house construction, flood control)
Symbol of livelihood struggle + pollution
Threats of eviction – wooden fragile houses
Distrust in early warning – legacy of evictions
Exclusion from safety nets – “Badia/Bad Area”
FRANCE: Five homeless die as cold snap hits France

Five homeless men have died of hypothermia or in a fire they had apparently lit to warm up as a cold snap hit France in the past few days, authorities announced on Tuesday.

Discursive framing of the poor (‘othering’) protects the privileged (relational poverty)

Five homeless people have died due to the cold weather in France in December 2014. Commons Wikimedia

http://metro.co.uk/2014/12/27/france-puts-up-anti-homeless-cages-around-park-benches-on-christmas-eve-5000952/
Community-Based Adaptation Projects
Climate Change Mental Models

Tschakert & Sagoe, 2009. PLA Notes
Leadership
Anticipation (vision)
Working together (unity)
Environmental awareness
Agency (freedom of speech)
Learning from the past (culture)
Agents of change
Monitoring change

Anticipatory Capacity
Community Level
Anticipatory Capacity (cont.)
Observe
Remember
Fast and Slow Changes

Good leadership
Poverty
Alcohol
Immigrants
Climate change
Deforestation
Land scarcity
Population growth

Scenario Building

Tschakert et al. 2014. Environment & Planning A

Kete-Krachi: CCMA
July Anomalies: 2046-2065

Rainfall anomaly (mm)

year
Preparing to Plan

→ Blending of locally monitored & managed changes with district level planning
Community Theatre

- More empowering than ‘hegemonic modelling’ (Barnett)
- Scaffolding – learning vs certainty
- Facilitates ownership over narratives
- Explores visions, values, power differentials, and trade-offs
Artisanal Mining: Status Injury (N. Fraser)
Miners’ Views on Risks

Health Body Mapping

Tschakert. 2009. Antipode
Flourishing

Tschakert. 2009. Antipode

ERTEP 2007 - First International Conference on Environmental Research, Technology and Policy

Building Tools and Capacity for Sustainable Production

July 17 - 19, 2007, La Palm Royal Beach Hotel, Accra, Ghana, AFRICA
Criminalization of Miners


WE ARE:
A team of researchers, students, teachers, health professionals, and community members from Ghana and the United States examining Buruli ulcer outbreaks in Ghana.

HYPOTHESIS:
We believe land disturbance from galamsey activities combine with flooding events to create ideal conditions for the bacteria that cause Buruli ulcer. We also believe people are exposed to the bacteria according to their everyday activities (swimming, wading in swamps, crossing rivers, etc).

FIELD ACTIVITIES CARRIED OUT SO FAR:
- Community mapping
- Questionnaires with people who had Buruli ulcer, and their match cases
- Using photographs to detect expansion of mining activities over time
- Water and soil testing
- Video activities with community members

Hausermann et al. 2012, EcoHealth; Wu et al. 2015, PLoS
https://sites.google.com/site/rebuildghana/
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NSF/CNH Award #0909447

https://sites.google.com/site/rebuildghana/
New Research Partnerships
New Research Partnerships

Tschakert et al. 2013, Climate & Development

Vulnerabilities and barriers to adaptive capacity

Iterative reflective dialogue and problem solving

Engagement, responsibility and, connectedness

Priority-setting, accountability, and trade-offs

Assessments
Enhancing capacities for change

Regional institutions
Administrative units
Households and communities

Tschakert et al. 2013, Climate & Development
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