

Ghana's resilience against climate change: Social transformation and the determinants of vulnerability

Climate vulnerabilities vary across different social groups. Ghana's National Adaptation Plan Framework recognizes the importance of the social disparities. It, therefore, seeks to *'promote a gender-responsive plan', through which 'gender needs will be prioritized in all the different phases of climate adaptation', to address 'issues of social norms and inequalities that may further exacerbate the vulnerability of women to climate change'* (EPA

2018). However, this agenda does not adequately capture the intersections of social transformation and climate vulnerabilities. To address this gap, this brief builds on vulnerability as a *starting point* approach, by proposing additional variables centered on demographic, economic, technological, cultural and political dimensions of social transformation that can be included in the vulnerability assessments.



A woman watering her onion crops in the Upper West Region of Ghana (photo: Joe Ronzio/IWMI).

Introduction

Climate change affects social groups differently based on the extent of their vulnerabilities. Climate vulnerability is in turn influenced not only by changes in biophysical factors (e.g., temperature), but also social transformation, i.e., the persistent structural changes related to demographic, economic, technological, cultural and political factors that affect individuals, households and communities. The various dimensions of social transformation usually trigger outcomes (challenges and opportunities) that influence climate vulnerability at different levels, generating knock-on impacts on development planning and climate action (Bankoff et al. 2004). The manifestations of social transformation and climate change intersections are found in changing gender roles, rural-urban mobility patterns, extent of resilience and level of institutional capabilities for effective climate action (Vago 2003). For example, a persistent change (decrease) in household incomes affects already-existing climate risks, which may further increase the number of men migrating from climate-vulnerable communities. As a result, this may increase the workload of the women left behind in the short term, but also open up social space in which they can take over leadership roles in decision-making in the longer term. However, these intersections of social transformation with climate change are rarely assessed and used to inform decisions on selecting adaptation options for households and communities.

Rather, assessments of climate vulnerabilities and adaptation options are usually embedded in institutional complexities and reveal an over-simplified understanding of 'communities'. Challenges include inadequate capacity for in-depth context-specific analysis, and the inability to account for the intersections of different social groups and factors within and between communities. For instance, there is a need to reconsider the linear assumption that households with more productive assets have higher adaptive capacity, to avoid biased vulnerability assessment outcomes (Djoudi and Brockhaus 2011). More nuanced assessments of the intersections between underlying social transformation processes with climate change vulnerabilities and outcomes are critical to provide a better understanding of and options to help tackle climate risks and vulnerability (O'Brien 2016).

The climate context

Ghana's changing climate situation

Climate change impacts many spheres of the Ghanaian economy, particularly the agriculture, health, energy and water sectors. This is a challenge to achieving sustainable development, food security and enhanced livelihoods in vulnerable regions (Chemura et al. 2020). High climatic uncertainty and economic disadvantages increase

vulnerabilities, especially in areas which are hardest hit (Dapilah and Nielsen 2020). Furthermore, some socioeconomic systems, especially those dependent on agriculture, natural resources and low-lying coastal settlements, are inherently more sensitive to climate change and variability, and likely to influence the adaptive capacity of households (Tucker et al. 2015).

Predictions of future climate scenarios show a continuous rise in temperature with an average increase of 3.9 °C by 2080 (EPA 2007, 5). Annual rainfall is highly variable on interannual and decadal timescales, and evidence suggests increased dry spells during the rainy season (Riede et al. 2016). Average declines in rainfall of 10.9% for 2050 and 18.6% for 2080 are predicted for all agroecological zones within Ghana (EPA 2007, 6). It is estimated that the rise in sea level will reach 16.5 cm per year by 2050 (MESTI 2012). Greenhouse gas (GHG) emissions also increased by about 107% over the period 1990-2006 (Asante and Amuakwa-Mensah 2015).

Ghana's vulnerability to climate change

According to 2016 data, Ghana ranks 151 out of 188 countries for per capita GHG emissions, contributing to only about 0.07% of global emissions. The nation is, however, highly vulnerable to climate change, ranking 101 out of 181 but with a higher score for levels of readiness rank of 119 out of 192 countries in the ND-GAIN index.¹ Ghana's vulnerability to climate change and variability is largely felt in six priority economic sectors: agriculture, health, water, coastal areas, energy, and cities and infrastructure (EPA 2015). These sectors are impacted due to the nation's geographic location, low adaptive capacity (especially in northern Ghana), high reliance on agriculture for livelihoods, and huge dependence on hydropower for electricity generation (Arndt et al. 2015).

The changing climate poses threats to national development. Thus, a better understanding of climate change risks and vulnerabilities will support efforts to more effectively adapt to the impacts. Vulnerability is context-specific, dynamic and differs at scales (national, district and household) and for different social groups (e.g., women, elderly men, children, youth, landless farmers, herders). The determinants of vulnerability have been found to have gender dimensions, and are also mediated by (formal and informal) institutions, and demographic, cultural, economic and political structures and processes (Carr and Thompson 2014). It is also shaped by the interactions and transformations of livelihood strategies, social norms, values, power relations and access to assets (Lambrou and Piana 2006). Most communities that are highly vulnerable to climate change are extremely poor. For instance, the Upper West Region of Ghana, which has the highest incidence of poverty, is also the most climate-vulnerable region in the country.

¹ The ND-GAIN index summarizes a country's vulnerability to climate change and other global challenges in combination with readiness to improve resilience. <https://gain.nd.edu/our-work/country-index/>

Core policy discourse on climate change

The Ministry of Environment, Science, Technology and Innovation (MESTI) and its subsidiary body, the Environmental Protection Agency (EPA), have the mandate to develop and monitor climate change policy strategies and actions, in collaboration with relevant organizations. An integrated National Climate Change Policy (NCCP) prioritizes seven economic sectors: agriculture and food security, disaster preparedness and response, natural resource management, equitable social development, energy, industry, and infrastructure development. The policy is formulated within the contexts and priorities of the United Nations Sustainable Development Goals (SDGs), National Development Policy Framework (NDPF) and relevant sectoral policies (e.g., the National Water Policy). The current Medium-Term National Development Policy Framework (2018–2021) seeks to build ‘a strong and resilient economy’ and projects climate change primarily as a development issue (NDPC 2017, 5).

There are plans to implement 20 mitigation and 11 adaptation programs of actions between 2020 and 2030 (Republic of Ghana 2015). Ghana seeks to deliver ‘triple wins’ by pursuing sustainable development, poverty reduction and climate adaptation, while effectively addressing trade-offs between achieving the SDGs and Intended Nationally Determined Contribution (INDC) targets (Antwi-Agyei et al. 2018). As a result, the main political discourse on climate action is, ‘climate-proofing economic development’ or *climate compatible development*. To this end, the NDPF prioritizes efforts to ‘enhance climate change resilience’ under the broader theme of ‘environment, infrastructure and human settlements’ (NDPC 2017). The implementation of interventions is expected to help Ghana attain ‘low carbon climate resilience’, through effective adaptation and mitigation programs (primarily through a reduction in GHG emissions). The National Adaptation Plan (NAP) seeks to provide the enabling framework for the formulation and implementation of adaptation options to build adaptive capacity in line with tenets of the NCCP, National Climate Change Adaptation Strategy (NCCAS), INDCs and SDGs (especially SDGs 1 [no poverty], 5 [gender equality] and 13 [climate action]).

A hybrid approach to *integrating* climate adaptation considerations into policy formulation and development planning is in place. In line with this, a sectoral- and district-focused adaptation planning and mainstreaming process is being implemented. EPA coordinates the development of the NAP, while the National Development Planning Commission (NDPC) oversees district-level adaptation planning and mainstreaming into district medium-term development plans. In addition, a gender-responsive approach is proposed to ensure that ‘social norms and inequalities that may further worsen the vulnerability of women are addressed’ (NDPC 2017). The key entry points for formulating climate adaptation programs are indicated in Figure 1. The long-term goal is to increase climate resilience and decrease vulnerability to achieve sustainable development, through the development and implementation of stand-alone adaptation plans at sector and district levels (Republic of Ghana 2015).

These policy actions are based on technological adjustments to climate stressors and resilience. The proposed programs focus on the vulnerable (also the poor), and seek to support the marginalized in society to better deal with the negative impacts of climate change and variability. The programs also cut across the transport, energy, waste, agriculture and forestry sectors, all of which are critical for achieving the SDGs (Nunoo et al. 2020), and are implemented at sectoral and district governance levels (Lawson 2016).

The ‘business-as-usual’ vulnerability assessment in adaptation planning

Vulnerability is usually assessed across people, sectors and regions, and anchors the evaluation of climate change impacts to development planning. This is done at different scales: global (comparison of national indicators), national (regional/district development priorities), sectoral (development plan strategies) and local/community (vulnerable groups) levels.

Climate change vulnerability assessment generally falls under two main categories. First, the *end point vulnerability* or *vulnerability as an outcome*, which determines vulnerability as the net impact of problems associated with climate change after adaptation measures are implemented (Kelly and Adger 2000). Second, vulnerability as a *starting point* or a *preexisting condition approach*, which takes into account socioeconomic factors that make a household more vulnerable to climate change impacts (Kelly and Adger 2000). It also views vulnerability as an attribute of social and ecological systems generated by multiple factors and processes (O’Brien et al. 2004). In the second category, vulnerability is assessed as the in(ability) of individuals/socioeconomic groups to respond to, cope with, recover from or adapt to climate stressors on their livelihoods and well-being. Therefore, both biophysical and social processes of vulnerability over space and time form an integral part of the assessment (O’Brien et al. 2004).

Vulnerability assessment in Ghana is largely based on the *end point category*. The adaptation action planning process begins with the review of existing sectoral plans of selected climate-vulnerable sectors (e.g., cocoa production, water resources, poverty, gender and livelihoods). The review is carried out within the context of the NDPF, NCCP and NCCAS using the *Akropong approach*, which is a cross-sector planning process. This *approach* compiles the vulnerability, impact and adaptation assessments of all vulnerable sectors to generate summarized sector-wide information on impacts, core vulnerable groups and prioritized bundles of national climate adaptation options. The options are then downscaled to inform the formulation of adaptation plans at the district level. The central focus of vulnerability assessments under the *Akropong approach* is the climate risks to people and livelihoods and the resources (water, land, ecosystems) they depend on, which have to be protected from the negative impacts of climate change and the outcomes.

The current assessment focuses on the extent of exposure of systems/humans to climate hazards, but not much on how



Figure 1. Key entry points for formulating climate adaptation programs.

Source: Republic of Ghana 2015.

they cope (Brooks 2003). It is informed by risk analysis of the predicted ‘changing’ climate variables (rainfall, temperature, sea-level rise, etc.) and their impact on ‘static’ vulnerable socioeconomic groups, sectors and systems, which are dynamic in reality.

Gaps in policy discourse and vulnerability assessment

1. The climate-proofing development discourse

The core climate policy discourse is based on an *integrated approach*, which inserts ‘climate change’ into the national or sectoral decision cycle. The shortfall of this

approach is that proposed climate interventions may not receive optimal funding for implementation, as there are no separate resources set aside for the interventions. There is a desire to largely pursue a *discrete approach*, which involves program- or project-based ‘stand-alone’ adaptation options that promote adapting to climate change as a primary objective. This approach directly relies on climate change impact and vulnerability assessments and follows a straightforward adaptation planning cycle. **The two approaches (*integrated* and *discrete*) lead to distinct adaptation options for dealing with vulnerabilities and impacts of climate change. This implies that policy makers have to contend with the**

trade-offs of different overarching objectives. Although climate change is framed as a development issue, targeted climate action pathways are necessary for optimal outcomes.

2. Inadequate climate financing

Climate action requires readily-available funds. Investments of approximately USD 22.6 billion from domestic and international sources are needed to implement the 31 programs of actions outlined in the 10-year post-2020 climate action plan (Republic of Ghana 2015). **However, there is no clear pathway to identify how these funds will be generated and used.**

3. Low capacity in climate science and vulnerability assessment

The complexity of adaptation assessment, and the challenges of linking such information into policy making creates a unique capacity challenge. There is **inadequate capacity among decision makers on utilizing climate science, conducting in-depth vulnerability assessments (in the local context), and using appropriate tools to select effective adaptation options across different sites and scales. There is a lack of skills and knowledge on relevant tools for capturing climate uncertainties for long-term adaptation planning.** Also, different planning actors work in intra-sectoral 'silos'. Although the NAP touches on capacity strengthening, building capacities in the aforementioned critical skills are not elaborated.

4. Inadequate disaggregation of data on the sociocultural embeddedness in climate action

Most adaptation plans conceptualize communities as comprising homogenous entities, and fail to account for the intersectionality of different social groups and their specific experiences. Therefore, heterogeneity is critical for better understanding the vulnerabilities and impacts of climate change. Ghana's NAP recognizes the need for climate adaptation planning that takes into account the vulnerabilities of different social groups. **However, it is not clear at what level (national or district) and timescale intersectional data will be analyzed to inform the formulation of the most suitable adaptation options for different social groups.** There is a deliberate attempt to address social disparities in the NDPF and NCCP, **but it does not ensure that adaptation options proposed for communities lead to reinforcing inequalities of the already vulnerable groups.**

5. Inability to address complexities in assessing climate vulnerability

Vulnerability is influenced by persistent structural shifts in underlying social, ecological, economic, cultural and political factors. Generally, critical embedded issues that shape levels of exposure to climate change impacts are not assessed to inform decisions on adaptation options.

For instance, the contribution of a changing climate to migration is largely through the impacts of underlying socioeconomic factors (income levels, education, social networks). These factors worsen the already existing vulnerabilities of households. However, not every household affected by a changing climate will migrate (Barnett and Webber 2010). Others may not be able to or may choose not to migrate for several reasons such as poverty, remoteness, ill-health and age (Kothari 2014). These dynamics and issues on social infrastructure (e.g., collective action, social capital and learning), as well as traditional adaptation processes within communities are usually ignored in national policy making (Reed 2017). **These are complex transformational issues that require in-depth data and analytical frameworks to bridge the gap in current vulnerability assessments. However, quantitative and qualitative datasets that capture the complexity of climate vulnerability are not readily available for adaptation planning at different scales.**

Integrating social transformation into vulnerability assessment

Social transformation refers to the persistent social changes in culture, institutions, power relations and structures over a period of time (Vago 2003). It particularly focuses on structural changes in economic and social relations of individuals, households and communities.

Responses to the impacts of climate change and variability should be based on a critical analysis of social transformation within a local context, without losing sight of the wider policy strategies at the global and national levels. A social transformation approach (Figure 2) can guide critical reflections on the pathways that unravel both natural and social climate vulnerabilities, and enhance the effectiveness of climate adaptation planning and selection of options.

An analysis of social transformation provides additional insights, especially on local (district)-level dynamics, to better inform adaptation action. Data on the changing variables can be derived from different national living standard survey datasets over time. Secondary data, as well as primary data, can also be gathered through observations, verbal interactions, semi-structured interviews and focus group discussions (Castles 2001). Participatory methods (Chambers 1997) emphasize the vulnerable and are, therefore, likely to find the real causes of climate risks and provide cost-effective and socially-viable adaptation options. However, these methods alone cannot resolve deep-rooted issues such as land ownership, and use and protection of natural resources. It is, therefore, important to combine top-down methods (large surveys, statistical analysis, econometrics and policy analysis) with bottom-up approaches using participatory methods.

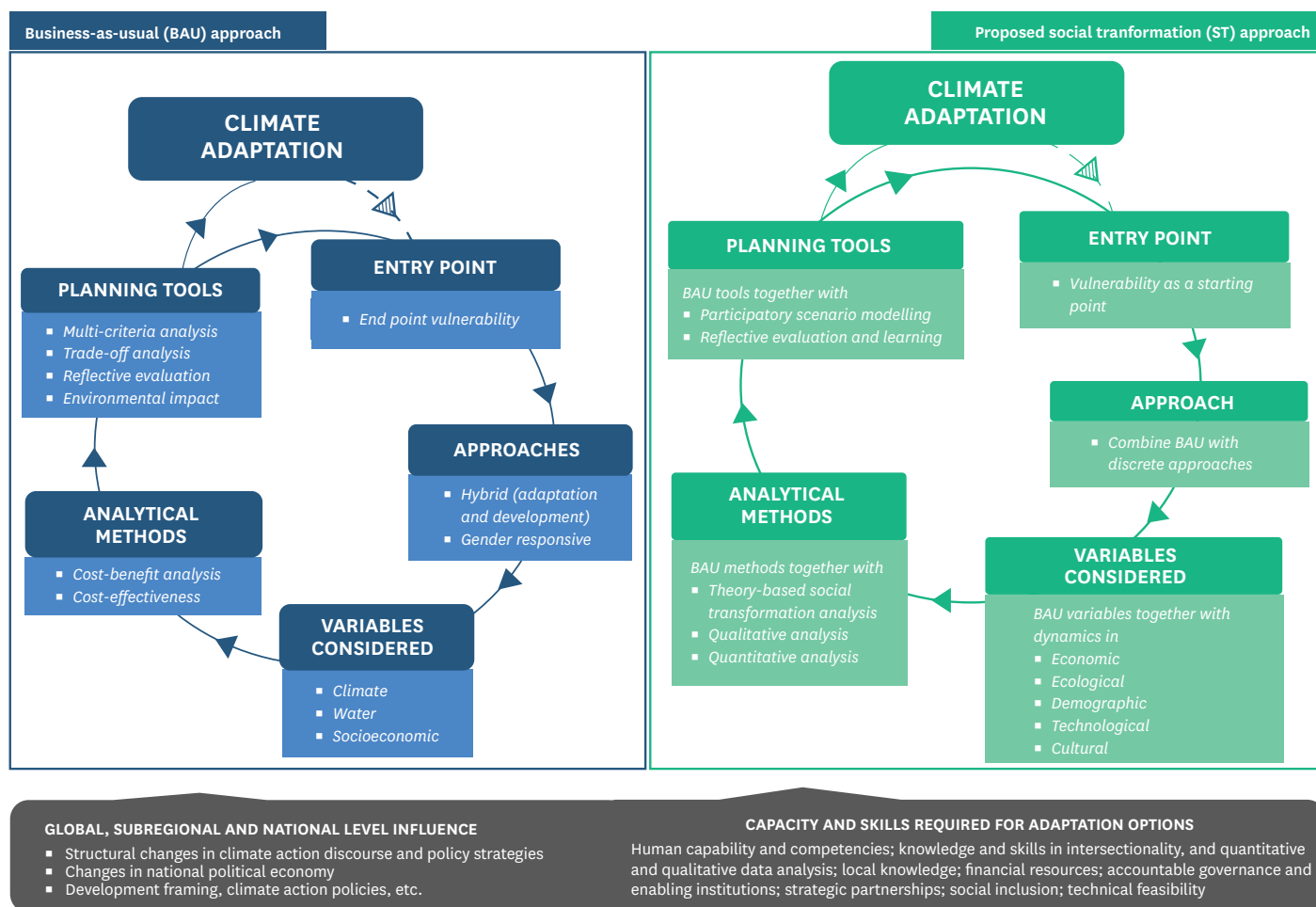


Figure 2. Diagram of business-as-usual and proposed social transformation vulnerability assessment approaches.

Policy recommendations

1. *Sufficient attention should be given to climate adaptation policy action integrated into the broader NDPF:* Climate action is currently integrated into Ghana's development agenda and not pursued as a stand-alone agenda with its own budget. Climate change issues should not be treated as 'crosscutting' other issues, rather it should be prioritized with adequate resources allocated to it.
2. *The Ghana Statistical Service and academic organizations should be supported to collect and provide access to data on the dimensions of social transformation:* Reliable, accessible and accurate data are important for climate action policy planning. The data collected should be analyzed and interpreted in appropriate formats that can easily be used for policy formulations. It should include both biophysical and social indicators, as well as narratives on social transformations, including community/household intersectionality, changing division of labor and local power structures. For example, the mapping of transforming gender-specific vulnerability assessments, as well as mitigative and adaptive capacity to inform the development of better policy instruments.
3. *Capacity of policy makers and development planners should be strengthened:* The knowledge capacity of climate policy makers and development planners must be strengthened in the areas of climate science and intersections of the 'social' and 'natural' or biophysical factors within different structural scales of the priority sectors. This will enable better interpretation and understanding of the complexity and uncertainty of climate vulnerabilities. They should also be trained on integrative and reflexive practices, action learning and adaptive pathways to support the integration of social transformation analysis into identifying effective adaptation options. There is also the need for capacity strengthening to ensure effective coordination and harmonization of the institutional structures vis-a-vis the implementation of adaptation activities at all scales.
4. *Funding for national and district adaptation planning and implementation of program actions should be increased:* This calls for the involvement of the private sector in climate financing, supported by an enabling investment policy environment by the government.

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Changes in rural housing structures, Poyentanga community, Wa West District, Upper West Region, Ghana (photo: Charity Osei-Amponsah).

Source

This is the third brief in the Policy Insights Series produced as part of the REACH-STR project. It was prepared by Charity Osei-Amponsah and William Quarmin from the International Water Management Institute (IWMI), Accra, Ghana.

Project

The *Resilience Against Climate Change - Social Transformation Research and Policy Advocacy* (REACH-STR) project is implemented by the International Water Management Institute (IWMI) in collaboration with the Centre for Migration Studies at the University of Ghana, Council for Scientific and Industrial Research - Science and Technology Policy Research Institute (CSIR-STEPRI), and the Simon Diedong Dombo University of Business and Integrated Development Studies (SDD-UBIDS) (formerly University for Development Studies, Wa Campus), with funding from the European Union under the Ghana Agriculture Programme (EUGAP). The project expects that, by 2025, local, national and regional decision makers will understand social transformation interventions that promote sustainable and inclusive rural development, and climate change adaptation and mitigation practices. Decision makers should also be able to apply and implement social transformation analysis in their developmental planning processes.

Acknowledgements

The support provided by Diana Suhardiman (IWMI) and Alan Nicol (IWMI) in reviewing the content of the brief, and Mahen Chandrasoma (IWMI) for editing and proofreading is greatly appreciated. This research was funded by the European Union under the Ghana Agriculture Programme (EUGAP), and was carried out as part of the CGIAR Research Program on Water, Land and Ecosystems (WLE) and supported by Funders contributing to the CGIAR Trust Fund (<https://www.cgiar.org/funders/>).

Disclaimer: This document has been produced with the financial assistance of the European Union. The contents of this document are the sole responsibility of the authors and can under no circumstances be regarded as reflecting the position of the European Union.

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