

## **Climate vulnerability as factor among many: ecology of poverty, food insecurity, and HIV/AIDS in Buhaya, northwestern Tanzania**

**Abstract:** Drawing on socio-cultural anthropological research conducted in Nsisha, a rural village located close to the shores of Lake Victoria in northwestern Tanzania, this paper discusses the ‘ecology of poverty and HIV/AIDS’ affecting rural Haya livelihoods. A complex of socio-ecological factors, including climate change, declining soil fertility, and an escalation of pathogens affecting humans, animals, and plants, combine to create a web of vulnerability which intensifies poverty, food insecurity and poor health in the context of Nsisha, and Buhaya at large. The current and projected climatic changes are linked to declining agricultural yields, and increases in food and nutritional insecurity and poverty and therefore, pose a significant challenge to Bahaya agricultural livelihoods. This situation furthermore heightens people’s vulnerability, especially women and children’s, to illness, and sustains an environment conducive to cycles of poverty and HIV/AIDS.

**Keywords:** climate change, agricultural decline, food insecurity, vulnerability, HIV/AIDS

Buhaya is the cultural region located in the northwestern corner of Tanzania and the homeland of the Bahaya people, who are traditionally known as chief banana cultivators. Bananas have held a prominent meaning in the Bahaya agricultural way of life and served as the cultural core and staple food for centuries. In recent decades however, changing ecological conditions and a surge in banana pathogens have resulted in a dramatic decline in banana production (Baijukya 2004), leading to an increase in food and nutrition insecurity, poverty, related illness, and socio-cultural and livelihood transition (Rugalema 1999, Githinji 2008, 2011).

Buhaya forms part of one of the most disease-burdened regions in the world (Rugalema and Mathieson 2009) and the landscape profile dating back to prehistory, is marked by high rates of environmental degradation and change (Schmidt 1997). This is a high rainfall region marked by undulating ridges and acidic soils which lead to progressive siltation, nutrient leaching and soil infertility. The physical features and climate of Buhaya combined with a long history of anthropogenic elements including: intensive agriculture, pastoralism, deforestation, iron smelting, high population density and mobility combine to create a region vulnerable to ecological shocks and disequilibrium.

In terms of national politics and development, this region has experienced both isolation and high rates of social permeability due to its separation from the rest of mainland Tanzania, and to sharing borders with Uganda, Kenya, Rwanda, Burundi, and the second largest freshwater lake in the world, Lake Victoria (Kaijage 1993). The long history of ecological vulnerability in the region combined with missing out on national development initiatives, repercussions of the Kagera War of 1978-79, and forming part of the world’s first epicenters of HIV/AIDS have led to widespread household poverty, poor health and illness in the region (FAO 2007, Rugalema and Mathieson 2009, Rugalema et al 2009). Based on the myriad socio-ecological factors which combine to create an environment and population vulnerable to poverty and related illnesses, I draw on Stillwaggon (2006), current research on climatic change and variability, and ethnographic research to demonstrate that Buhaya is an ‘ecology of poverty and HIV/AIDS’.

Climatic change and variability compound the current challenges affecting Bahaya livelihoods (FAO 2007, Rowhani et al 2010). Due to the effects of climatic change, by the year

2050, seasonal temperature is projected to increase by two degrees Celsius, reaching up to a four degree Celsius increase by 2100 (Rowhani et al 2010). Similarly, annual precipitation is projected to increase by fifty percent by the year 2100 (Rowhani et al 2010). The increase in both seasonal temperature and precipitation are likely having, and expected to have negative consequences on agricultural productivity, specifically for staple foods including bananas (FAO 2007), maize, sorghum, and rice (Rowhani et al 2010). Given that most Bahaya living in the village of Nsisha and rural parts of Buhaya are semi-subsistent farmers, climatic changes pose a grave threat to their livelihood and household food security, poverty, and health situation.

Intra-seasonal climatic variability is an important feature of climate change which is projected to uniquely affect agricultural productivity and food security. Precisely how inter- and intra-seasonal increases in precipitation and temperature are projected to synergize and ultimately affect crop production and food security is not known, and is still in the early stages of investigation (Rowhani et al 2010:458). However, climatic changes and variability appear to be negatively affecting agricultural productivity in Nsisha, adding to the general challenges most Bahaya farmers face:

As informants mentioned: ‘in the past we were able to predict the onset and duration of the wet and dry periods, however these days, the rainy seasons and dry seasons are unpredictable and more severe’, – a comment which seems to substantiate the effects of both inter and intra seasonal climate change and variability.

Nsishans mentioned that in general there are currently longer periods of dry, hot seasons - essentially drought, and shorter periods of intense and often disastrous rain. However, informants exclaimed: ‘the unpredictability of the onset, duration and intensity of dry and wet seasons is the chief problem which is causing poverty and hunger’ since farmers haven’t been able to accurately forecast when to plant. ‘Sometimes’ they stated, they ‘plant too soon or too late.’ When they plant too soon, the seeds dry up and die, and when they plant too late, often heavy rain wash away seeds; both events lead to inadequate agricultural yields, food and nutrition insecurity, poverty and ill health.

Based on discussions with Nsishans in regard to how agricultural productivity has changed in the recent past, and which specific challenges they are facing, many of the poorest Nsishans stated that the current climatic changes pose one of their greatest, current agricultural challenges. Because their livelihood and household economic, food, nutrition and health security are interlinked and depend on accurate understanding and prediction of the weather, they often have little to no buffer if their estimates and timing are wrong.

Climatic change and variability are linked to poor health and specifically, to increases in malaria (Jones et al 2007) and cholera incidence in Buhaya (Patz et al 2000, Yanda et al 2005). Both illnesses appear to have increased incidence rates as a result of above average rainfall. Research demonstrates that an increase in malaria cases occur during the heavier rainy periods and in the years following drought, and as Yanda (2005: 12) reports, “malaria outbreaks have been common in years subsequent to the El Niño season of 1997/1998.”

“Mushana” is the word in Luhaya, the native language spoken in Buhaya, which means ‘malaria’. This term also refers to ‘periods of drought’, and hence, reflects the local perception of the interconnection between drought periods and malaria (Yanda et al 2005: 12). Yanda’s (2005:12) study in another rural village in Buhaya suggests that periods subsequent to drought periods, which as mentioned are associated specifically with El Niño rains, are marked by food and nutrition insecurity, poor health and specifically, high incidence rates of malaria and related anemia which predominately affects children.

According to Rugalema et al (2009), people commonly refer to malaria as, “endwala y’omushana”, or ‘the disease of the dry season, which typically emerges at the end of the rainy seasons and at the beginning of the dry season when stagnant pools of water are found. Once a seasonal problem, this type of malaria now occurs throughout the year - a shift which seems to mirror climatic change.

Rugalema et al (2009) also demonstrate that a new form of malaria is emerging, which people in Buhaya term, “malaria ya ajabu”, or ‘strange malaria.’ This variant of malaria presents more severe and complex symptoms, including cerebral cases, compared to the normal variant.

Similarly, cholera incidence tends to be higher during the heavy rain periods, due to the lack of adequate sewage disposal and the overflow of latrines which contaminate water supplies. Often, improper sanitation and treatment of water during these wet periods, lead to diarrhea causing illnesses and outbreaks of cholera (Yanda et al 2005).

As both Yanda’s informants and Nsishans reveal, climatic change and variability -which result in unpredictable onset, duration, and intensity of dry and wet seasons- lead to cycles of food insecurity since staple food crops, specifically bananas, do not grow well. Food insecurity escalates nutritional and economic insecurity, since people lack access to an adequate diet. This in turn, increases people’s vulnerability to poor health and poverty, and the cycle repeats when poor farmers lack the buffers to break out of the cycle, which is often the case in Nsisha, and other poor, rural villages in Buhaya.

The combination of increased precipitation and increased temperatures is also linked to an emergence and reemergence of infectious diseases in the region (Patz et al 2000, FAO 2007, Rugalema and Mathieson 2009, Rugalema et al 2009) Animals, crops and humans are being affected by these diseases, which leads to cycles of low agricultural productivity, and increased food and nutrition insecurity, poor health, illness and poverty. This situation robs people of human development, compromises their ability and potential to cope and adapt, and leads to inherited cycles of impoverishment.

Cattle were traditionally an integral part of the Bahaya agricultural system, providing fertilizer essential for the prosperity of banana plants on the *kibanja*. Less than a century ago, most households owned cattle and other livestock (Rugalema 1999). However, less than 18% of households in Nsisha own cattle, and most who do, own only one. As informants stated, because of poverty, most people in Nsisha can no longer afford to engage in animal husbandry, as in the past when their parents and grandparents typically owned several cattle and other small livestock including chicken, goats and pigs. Generalized poverty inhibits people from providing veterinary care for their livestock, which are increasingly infected with diseases (FAO 2007, Rugalema and Mathieson 2009, Rugalema et al 2009). The same poverty prevents owners of livestock from maintaining ownership since they are a disposable asset sold at times of economic need, such as periods of drought, food insecurity, sickness and funerals, which have become increasingly common in the past decades due to the increase in socio-ecological shocks. For example:

**George<sup>i</sup>** was once a prosperous mason and was economically well-off compared to most of his neighbors in Nsisha. He had a nice home, large prosperous *kibanja* and owned a few cattle and other small livestock. However, in the past five years his wealth, status and disposable assets, including cattle, declined due to the loss of his first wife and two children to HIV/AIDS, and his own worsening health and inability to work. However, even as he was in the progressed state of HIV/AIDS, he admitted that the fact that he was able to maintain ownership of just one goat provided

nutritious milk which he and his family needed and which he could also sell, as well as needed fertilizer for the *kibanja*. George and his wife believed that just the one goat prolonged his life and was instrumental in staving off poverty in the household and on the *kibanja*, and this is something that his wife, Leticia, mentioned in her lamentations at his funeral.

As a counterpoint, most Nsishans do not own cattle and other livestock, and these are the same people who are generally most vulnerable to socio-ecological shocks and least able to fertilize their *kibanja*. This situation leads to increasing soil infertility since the fragile, acidic soils are not replenished and revitalized by manure, and heavy rainfall leads to nutrient leaching and siltation. Similarly to the connection of climatic change and variability and its link with poor health, declining animal husbandry leads to agricultural decline, food and nutrition insecurity and fuels cycles of poverty and its emanations.

The negative effects of climatic change and variability follow socio-cultural hierarchical patterns, affecting the poor, women, and children asymmetrically (Githinji 2009a, b, Yanda et al 2005, FAO 2007). For example, although treated bed nets protect against mosquito bites and malaria, only the more economically well off can afford to purchase enough to protect *each* household member. Similarly, access to healthcare, medicines, and timely treatment is generally out of reach for the poor (Rugalema 1999, Yanda et al 2005, Githinji 2009a, b). The poor are also more prone to living in impoverished environments lacking adequate sewage disposal, and resources, such as firewood, needed for boiling and preparing water safe for consumption.

Women and children are more vulnerable to poor health than men in general (Sweetman 2001, FAO 2005, Hecht et al 2006, Githinji 2009a, b). Specifically in the context of Buhaya, women and children are more prone to malaria than men because they generally engage in weeding and are therefore more in contact with mosquito habitats (Yanda et al 2005). Women and children also tend to have poorer nutrition than men; men, on the other hand, tend to have access to more protein rich diets (Yanda et al 2005) which assists in maintaining the immune system and fighting infections (Leonard-Green et al 1989). Thus, climatic change and variability and its link to increased malaria and poor health marginalizes women and children, who are already more vulnerable in general to poor health, poverty and related illness (Githinji 2009a, b). Kokushubira's case illustrates women's and children's vulnerability well:

**Kokushubira** is a double-HIV/AIDS widow who has four children. Chronically and progressively ill, she is unable to maintain the *kibanja*. This situation renders her household food and nutrition insecure and deepens their poverty and vulnerability to poor health. Three sides of the house were falling down to the point that when it rained, puddles accumulated, providing a good habitat for mosquitoes and malaria. She mentioned because of her unfortunate position as an HIV infected widow, they were living in dire poverty which prevented her and her children from accessing healthcare of any kind, even for her 'HIV infected child who was chronically ill and took long to recover'. One of her children was 'chronically hungry' and she was unable to take care of him well so she sent him to live with her mother in a nearby village, who was taking care of several HIV/AIDS family orphans. In addition, her six year-old daughter was not able to attend kindergarten because Kokushubira could not afford the \$0.50 monthly to pay for fees. She mentioned that her *kibanja* was turning to into a bush and was visibly infiltrated with stubborn weeds, due to the fact that her bouts of illness diverted time away from

maintaining the farm. This situation was further compounded by the fact that when she had the opportunity, ‘she chased money’ in the form of *kibarua*, or day wage labor which entails farming other people’s farms for money, in attempt to provide household food security. When she lived with her husband, they had livestock which enabled them to maintain soil fertility and food and nutrition security. However, his death and her burden of HIV infection and widowhood progressively led to her and her children’s entrenched poverty and vulnerability. Climatic change and variability added to this layer by intensifying her inability to deal with this additional ecological shock. Her *kibanja* became a mass of tangled weeds which lacked banana plants and the heavy rain was literally destroying her house, increasing her and her children’s household insecurity in terms of shelter, food, nutrition, and health.

As this case illustrates, climate change and variability adds another layer to Kokushubira’s and her children’s ecology of poverty and HIV/AIDS, and vulnerability to food and nutrition insecurity, poor health, and lack of access to education and a safe living environment.

HIV/AIDS first made its impact in the region thirty years ago, and those most severely affected worked in and lived along the border areas between Tanzania and Uganda (Rugalema 1999). As infection rates spread and infiltrated rural and urban areas, Buhaya formed part of the world’s first epicenters of HIV/AIDS. At its height in 1988, HIV incidence rates reached 24%, but since then, rates have decreased significantly, to about 3.4% (Rugalema and Mathieson 2009a: 44). Although rates have decreased, no family or household remains unscathed by HIV/AIDS and its reverberating affects of poverty, as my research in Nsisha shows. Although people have become somehow used to the disease, seeing it as essentially, another challenging aspect of their agricultural livelihood like climate change, an increase in crop pests, and declining banana and other food-crop yields, the issues of silence, stigma, shame and mistrust continue to fuel the epidemic (FAO 2007, Rugalema and Mathieson 2009a). This results in fueling cycles of poverty, ill health, marginalization and HIV/AIDS for many.

For example, when discussing HIV/AIDS with Nsishans who were in their twenties and thirties, many of them laughingly referred to HIV/AIDS as ‘the disease of the time that will kill them all’ – an illness as common and ubiquitous to them as malaria. One mother who had lost several children to HIV/AIDS blamed jealous neighbors and their use of witchcraft for her children’s deaths. However, in discussing more with her and other Nsishans about witchcraft accusation as cause of HIV/AIDS, it was unveiled that this is an excuse used even though it is widely known and accepted that HIV is primarily, transmitted sexually. The rationale for HIV/AIDS blame, denial, and silence is to hide the pain, judgment and shame associated with the disease. In their perspective, HIV/AIDS is a sexually transmitted, deadly disease which has robbed a generation, leaving parents without their social security net, *and* which coincides with other major socio-cultural and ecological travesties which are uprooting their banana based culture and livelihood, leading to shock, turmoil, deepening poverty, and grief (Githinji 2008, 2011).

The ecology of poverty in Buhaya heightens people’s vulnerability to food and nutrition insecurity and poor health. Given this environmental situation, I argue that people, particularly women and children, are increasingly more vulnerable to HIV and AIDS. Food and nutrition insecurity and poverty lead to compromised immunity and inability to fight infections. This situation increases all people’s vulnerability to any infection, including HIV/AIDS (Beck et al

2004, Stillwaggon 2006). Living a life of poverty often makes people lose a sense of hope for the future, since living and getting by day to day is often the main concern. This situation can increase people's risky behavior, leading to HIV/AIDS.

Furthermore, this ecology of poverty and HIV/AIDS can lead women, who are already more vulnerable than men to poor health, poor nutrition, and HIV infection (McNamara 1997), to engage in poverty-induced transactional sex in attempt to provide food security for their children (Githinji 2009b). Because children's health is contingent on their mothers', both are in a precarious situation (Githinji 2009a). For example:

**Geti**, in her late twenties, is a single mother of four young, chronically ill children. Often ill herself, Geti feared she was infected with HIV/AIDS. She had left her abusive husband and returned to live with her elderly mother and nephew, an HIV/AIDS orphan. Geti farmed the slice of the family farm she inherited, and several other marginal farmlands which she borrowed and rented from neighbors. In spite of her daily attempt to provide household food security, she frequently failed. Like many other married, single, male and female Nsishans, Geti too exclaimed that single women with children are often driven to prostitution to feed their hungry children. 'It is one of the only ways for single women to provision for their children amidst difficult times,' she said defensively. She picked up a handful of small potatoes which were affected by disease, and complained, 'this handful is not enough to feed my children and me, but was all I could get today.'

As her case illustrates, coping and adapting to the myriad socio-ecological challenges in Nsisha can be especially daunting for single women with children who are already more vulnerable to poverty, poor nutrition and poor health. Marginalized women are specifically challenged in their ability to provision for their dependents. Ironically, prostitution poses as one of the only economic alternatives, and coping and adapting strategies available. In the process, this common survival strategy assists in perpetuating an environment conducive to poverty, poor health and illness, engendering women's and children's particular vulnerabilities. Climatic change and variability and resultant decline in food crops specifically assists in this situation by adding an additional layer to women's and children's heightened vulnerability to food and nutritional insecurity, poor health and illness.

In conclusion, climate change is yet another significant and contributing factor which sustains 'an ecology of poverty and HIV/AIDS, in Nsisha and Buhaya at large, specifically because of the role it plays in aggravating food insecurity, poor health and poverty in an environment that is already experiencing agricultural and socio-cultural shocks and a surge in diseases affecting humans, animals and agricultural crops. For at least the past thirty years, an influx of crop pathogens have been wreaking havoc on the banana plants, causing widening poverty, food and nutrition insecurity, and leading to sociocultural transition (Githinji 2008, 2010). People have had to turn to secondary crops, cassava and potatoes, to replace their traditional and diminishing banana meals, but these crops and others, are also under threat from disease (FAO 2007, Rugalema and Mathieson 2009a). HIV/AIDS, although diminishing compared to thirty years ago, is still affecting the people and escalating livelihood hardship, poverty and future generations' vulnerabilities (FAO 2007). Similar to poverty and poor health, women and children are more negatively affected by the effects of climatic change, and resulting

increases in malaria and cholera incidence in Buhaya. This situation poses great threats to achieving the millennium development goals premised on poverty reduction, food, nutrition, and health security, gender equality and women's and children's advancement (FAO 2005, Hecht et al 2006).

In response to this, I recommend the prioritization of multidisciplinary research on the socially and gendered distribution of vulnerability, and the 'ecology of poverty' as a means to enrich our understanding of vulnerability to climatic change and variability. This research should highlight specifically how livelihoods are being, and are expected to be affected. Projections should be made in regard to how climatic shifts are expected to affect food and nutrition insecurity, and consequently generalized poverty. Intervention strategies aimed to target poverty and enhance human development need to be premised on the understanding of how the matrix of socio-ecological factors – including climatic change and variability, human, crop and animal disease, and a region with a long history of environmental vulnerability, poverty, and women's marginalization - converge to sustain an ecology of poverty and compound vulnerability to multiple stressors. Climate vulnerability and adaptation are always situated in a context where numerous non-climate factors are in play. In order to gain an accurate and nuanced understanding of vulnerability and adaptation, realist analysis needs to acknowledge complexity by actively integrating multiple cross-currents and drivers, rather than bracketing them out in favor of an exclusively climatic focus.

Ethnographic research plays an essential role in deepening our understanding of the effects of climatic change and variability, because it portrays how climatic stressors interact with other challenges and contexts in people's daily lives (Roncoli et al. 2009). Ethnographies of vulnerability add the human dimension to this important research by capturing nuances and complexities of vulnerabilities that aggregate-focused, macro social science research and reports miss. Furthermore, ethnographies of vulnerability and detailed micro-social research portray how socio-ecological factors create and sustain an ecology of poverty, who specifically is most affected and vulnerable to climatic change and variability, and how they are coping and adapting.

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<sup>i</sup> Pseudonyms are used in this document.