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Uganda, Factor 12: Human Diseases (HIV/AIDS)

### **Two Birds, One Stone: The Intersection of HIV/AIDS and Malnutrition in Uganda**

Racked by political unease, epidemic disease, and chronic malnutrition, the Republic of Uganda stands at the precipice of catastrophe. Amidst acute malnourishment and hunger, Ugandans are extremely susceptible to disease. Simultaneously, the HIV epidemic ravages the population. These two immense tragedies are more connected than they initially appear. Women are the primary drivers of agriculture, and women are also the most affected HIV demographic. This relationship drives the entire country's malnutrition, which in turn leads to more work force depletion, feeding the vicious cycle of disease, poverty, and malnourishment. The best way to address Uganda's HIV/AIDS crisis, and therefore lessen the effect of malnutrition, is with widely implemented education and antiretroviral therapy.

Located in East Africa, the Republic of Uganda represents thousands of years of rich culture. Initially populated by the Bantu migration, Britain occupied Uganda in 1888 (Facts and History). After being granted its independence in 1962, the Republic of Uganda established a government similar to the United States', with an Executive, Judiciary, and Legislative branch (The Government). Today, Ugandans speak over 30 different languages and represent many different African tribes and cultures. With a population of 35 million, Uganda has the third fastest rate of population growth in the world at nearly 3.2% percent a year (National Report: Uganda). The average family size is five people, usually a mix of parents, children, and other dependents. As a patriarchal society, men serve as family leaders, but women are considered the laborers. Each wage earner makes about \$1.39 dollars a day or its equivalent in manual labor on a farm. The average rural Ugandan's diet consists primarily of starches like cassava and sweet potatoes, and generally, only one meal a day is consumed. Fruits, vegetables, and meats are rarely eaten due to severely rising costs. Many Ugandans suffer from moderate to severe Vitamin A deficiencies, which can result in chronic dry eye and eventually blindness (Vitamin A). According to Unicef Statistics, 11.8% of children are born underweight, qualified as 2500 grams or lower. Also, 13.8% of all citizens are considered underweight, including adults and children, and 33.4% are considered "stunted", meaning they are markedly below height and weight standards set by UNICEF (Statistics). One of the United Nations Millennium Development Goals strives to "eliminate gender disparity in primary and secondary education" and has largely succeeded (*Millennium Development*). Schools are currently "on track" to fully achieve this goal by 2015; however, the goal of providing a "full course of primary education available for all children" is not as successful. Eighty-nine percent of all men and 85.5% of all females are literate, but secondary schooling is recorded by UNICEF as 16.2% for males and 18.7% for females. The average wage earning Ugandan spends \$108 a year on health care, and the government spends approximately \$10.40 on each citizen (Global Health). National health care costs account for 8% of the GDP.

With an agriculturally dominated economy, farming is the most common occupation for Ugandans, with 80% of all adults working on farms. Thirty percent of Uganda's land is used for agriculture (Shively). The majority of agriculture is executed on small scale farming. Approximately nineteen million Ugandans operate small farms, averaging about 2.5 hectares (Ronner). In total, these small farms cover more than eight million hectares (Statistical Abstract). Over 70% percent of all food grown in Uganda is locally consumed. The most common crop is cassava, which accounts for 15.3% of all agricultural yield, followed by sweet potatoes, cooking bananas and coffee. Half of all agriculture contributes to feeding native Ugandans, followed by 17% for cash crops, 16% for livestock, and 12% for fisheries (Shively). Livestock accounts for 17% of the agricultural GDP with 83% of Ugandans raising chickens, two thirds

raising cattle, and many raising various other types of livestock. While Uganda does efficiently export agricultural goods to its direct neighbors, it struggles to tap into a wider market due to inefficient transportation. Less than .1% of farms in Uganda currently utilize irrigation, although many experts suggest that more widespread irrigation must occur to provide more stability. While certain regions of Uganda, like those bordering the Nile, do have naturally occurring water sources, the availability of this water is seasonally affected and evaporation greatly affects these sources. In the absence of major irrigation infrastructure, Ugandans mostly rely on rainfall to drive agriculture, which makes them extremely vulnerable to variation of weather. Very few farmers use chemical fertilizers, and as of 2006, 85% of all farms are pursuing organic agriculture (Statistical Abstract). Women are the predominant laborers and 73% of rural women participate in agriculture, completing 85% of all planting and weeding as well as 98% of all food processing (Uganda: Division of Labor). Agriculture is vital to Uganda's wellbeing.

According to a 2012 Review by the professors at the Purdue Department of Agricultural Economics, "Uganda is among the least well-nourished countries in the world" (Shively). The Global Hunger Index represents a cumulative evaluation food security, including prevalence of undernourishment, percentage of children underweight, and child mortality rates (Our Work). Uganda scored 16.7, which places the nation 42nd of 81 countries. While most Ugandan homes, about 74%, are considered "food secure", malnutrition results from a lack of diversity. Ugandans suffer from chronic riboflavin, iron, calcium, vitamin B -12, and zinc deficiencies which contribute to chronic morbidity and malnutrition especially in children. Iron deficiency, for example, contributes to approximately 14% of Ugandan child mortality. In rural areas diversity of consumption relies heavily on seasonal availability. Government officials are aware of this chronic malnutrition and undernourishment, however, and have initiated policies to improve the situation. The Uganda National Food and Nutrition Policy, which was approved in 2003, aims to "ensure food security and adequate nutrition for all the people in Uganda, for their health as well as their social and economic well-being" (Uganda Nutrition). This policy aims to improve food availability, promote more complete nutrition, and to educate individuals about nutrition. Uganda's nutrition crisis is complex and will require a multifaceted solution.

A variety of elements keep Ugandans from food and life security. Because of recent climate change, the rainy season in Uganda is often irregular and can lead to severe rain storms (Ronner). In conjunction with over farming, this leads to soil erosion and depletion. Soil erosion is directly related to population density in an area, but is inversely related to amount of farmer education and land regulation, so these factors reflect a growing population density, a lack of agricultural education, and formal regulation. Almost 50% of all agricultural yields are below production maximum because of these factors. Disease and morbidity also create barriers against achievement. Fatigue and weight loss caused by nearly universal vitamin A deficiency lead to less efficient labor. Availability of clean water also greatly impacts rural Ugandans. Only 63% have access to clean water sources, most of which are more than 1 kilometer from their homes. Most rural Ugandans are unaware of how to purify water after collection, and only 56% of households report even attempting to clean water before consumption (Shively). Global warming has already begun to affect families in Uganda by impacting the rain cycles which causes soil erosion and drought, therefore reducing crop yields and nutrition (Ronner). Natural elements provide significant barriers to Ugandan agriculture.

Human disease prevents agricultural efficiency as well. Schistosomiasis, a disease that affects the urinary or digestive systems, is extremely prevalent. Lymphatic filariasis is also prevalent (WHO). It is currently present in 38 of Uganda's 56 districts. HIV/AIDS affects 7.2% of the population of 15-49 leaving 1.4 million members of the Ugandan workforce ill (Statistics). Depending on the development of the disease, the patient may be totally incapable of working and is extremely vulnerable to other infections. The HIV/AIDS epidemic combined with other challenges reduces the lives of rural and urban Ugandans.

Since the first documented case in 1982, HIV has plagued Uganda, and the HIV/AIDS epidemic directly impedes agricultural efforts in Uganda. According to *AIDS, Poverty, and Hunger* “[Uganda] long ago reached its peak HIV prevalence, is now in the midst of the death wave”. In the 1990’s, Uganda was widely praised as an HIV success story, as infection rates were lowered by several successful education campaigns. When the Millennium Development Goals were established in 2000, Uganda was touted as a model for the 15 year plan to combat future infections. This goal to end future infections however, has not been met, and as of 2013 is not on track to be accomplished by the 2015 deadline. In fact, these infections have actually become more prevalent in the past 15 years. Although Uganda had been praised for its advances against the HIV epidemic, according to the Universal National Development Plan, “past gains in the fight against HIV/AIDS have not been sustained, with a disturbing recent increase in new infections” (*Millennium Development*).

HIV/AIDS directly affects agriculture in Uganda by impacting the available workforce. Individuals who contract HIV are initially only lightly affected, but after the virus has elevated to full blown AIDS, laboring for hours in an open field becomes impossible. The majority of those infected by HIV/AIDS are women. While AIDS related deaths directly decimate the workforce, the true number of available laborers is often overestimated. Because of the susceptibility to secondary infections, AIDS further depletes labor by weakening the infected to the point of requiring a caretaker (*AIDS, Poverty, and Hunger*). The role of caretaker is allocated to be “women’s work”, so even more women are removed from farms. In this way, women are simultaneously dying of AIDS related infections and are kept from working in order to take care of other infected individuals. As women are the largest contributors to Ugandan agriculture, these reductions lead to massive decline in agricultural production and the shrinkage of animal and crop yields. This leads to drops in rural nutrition, but also affects the nutrition of urban citizens and demands that meat and crops be imported. This new trend is extremely concerning, as it insinuates that Ugandans are becoming even more threatened by the AIDS crisis. Even those who are not directly infected are affected by the disease through malnutrition, and rural families are increasingly in danger of infection. If this resurgence of infection is not contained and reversed, Uganda will continue to deteriorate.

The HIV/AIDS epidemic also impacts the environment. Because of a loss of available laborers, most farmers have had to resort to alternative methods (Oramasionwu et al). In order to increase crop yield and gain more revenue, farmers have abandoned proper crop rotation and soil fertility management which lead to reduced agricultural efficiency and crop yield. Large plots of lands are left unseeded, so weeds move in and the soil becomes infertile. Labor intensive, and highly nutritious, crops like sorghum and millet, have been abandoned in favor of more manageable, less time consuming plants, which contributes to Ugandan’s persistent vitamin deficiencies. As less people are able to work fields, some farms are entirely abandoned, and as a result some farmers even resort to unlawful charcoal mining, hunting, or fishing in order to provide for their families. Due to the reduced production of crops however, food prices increase, and even those who purchase their food become limited. HIV/AIDS impact on the workforce is extremely detrimental to Uganda’s food security.

Many factors will affect the HIV/AIDS epidemic and families in Uganda. With one of the most rapidly increasing populations in the world, Uganda is experiencing large population growth and urbanization. The HIV rate will only increase as the population increase, as it can be spread between sexual partners and from mother to child. Urbanization will bring previously rural citizens into more crowded areas. The current ratio of Urban to Rural HIV infections is 1:7(Oramasionwu et al). As environmental degradation progresses, more rural individuals will be forced into urban areas to pursue non agricultural jobs, putting them at greater risks for contracting HIV. As Uganda’s agricultural situation becomes even dire, population growth and the resulting urbanization will greatly exacerbate the HIV/AIDS crisis. Through improvement of the HIV/AIDS epidemic in Uganda, food insecurity will be greatly improved by strengthening the labor force. If the rate of HIV can be significantly reduced, these extra workers would greatly affect economic development and nutrition. More men and women would be able to focus on

agriculture and aid in the reversal of malnutrition on a local and national level. The average family income would increase also because there will be more able bodied adults to work. The small farm holders living in urban areas would be able to produce more crops and livestock because of this increase in the labor force. Women, the most affected group, would be healthier and would have less infected dependents to take care of, so they would be able to provide for their families better. By improving the current HIV/AIDS situation, economic and nutritional situations in Uganda would greatly improve.

Throughout North Africa, the physical dangers and vulnerabilities that exacerbate HIV/AIDS are further augmented by cultural practices and taboo. Christianity is the most widespread religion in Uganda, and the inhibition towards discussing sex greatly impacts the spread of HIV/AIDS (Inunga). Parents and teachers are extremely unlikely to discuss concepts like safe sex and contraception with the younger generations, therefore young Ugandans are largely unaware of how to protect themselves from STD's and HIV/AIDS. Some extreme religious groups even believe that HIV is a punishment for being sexually promiscuous. These factors contribute to the stigma surrounding an HIV diagnosis as many individuals who have access to HIV tests are unwilling to discover their status for fear of being socially ostracized.

Vast differences in expectations between men and women also stimulate the HIV/AIDS crisis in Uganda. Cultural practices that endanger and marginalize women fuel transmissions (Inunga). Women are generally expected to be subservient to their husbands, domestically and socially as well as sexually. Therefore, even women with some level of education are not able to make decisions about their sexual activities. Also, cultural traditions can stimulate the spread of HIV. For example, if a woman's husband dies, the husband's brother is expected to marry the widow. If the husband has died of HIV/AIDS, there is a high probability that the wife will also be infected, and as a result of polygamous marriages, the HIV virus can be introduced to the new family. In contrast, Ugandan culture suggests "that men are biologically programmed to need sexual intercourse with many women." (Inunga). Widespread beliefs that HIV is related to magic increase infection rates. One of these theories is that a man can be cured of HIV by engaging in intercourse with a virgin. Scientifically these theories are impossible, and these practices can greatly contribute to the spread of HIV.

Fueled by massive malnutrition, unstable agricultural practices, poverty, social taboo, and unsafe cultural practices, the HIV/AIDS crisis in Uganda demands a multifaceted response. As HIV and AIDS are incurable, treatment will be necessary for the remaining life time. Culturally, unsafe sexual practices and the stigma surrounding HIV and its diagnosis contribute to the complex nature of this epidemic. This crisis cannot be "solved" within the next year, or maybe even the next decade. Even if a cure for AIDS is discovered, it will not be available to developing nations like Uganda for years. Therefore, "solutions" to HIV/AIDS must include long term implementation to address the scientific and social repercussions. The social implementation of HIV can be combated by widespread education and testing, but the biological nature is less easily addressed. The growing popularity and effectiveness of antiretroviral therapy (ART) presents a significant opportunity to lessen the physical impact of HIV/AIDS.

In the United States, antiretroviral therapy is widely available, and customarily after a HIV positive diagnosis, patients are given a myriad of different treatment courses. Antiretroviral "cocktails" have decreased in price with the creation of competitors (Antiretroviral Drug Prices). Even today however, these medications are still substantially costly. In 2013, the initial treatment for HIV positive patients costs on average 115 dollars per year. For Ugandans who earn about \$1.30 a day, this cost is extremely preventative. Also, Uganda faces a severe shortage of physicians and medical staff (Okero). Successful antiretroviral treatment requires the patient's strenuous adherence to the regimen, and physicians and nurses must be trained to teach their patients how to follow these regimens. Despite numerous barriers to ART in Uganda, this treatment represents the only chance to halt the progression of HIV. Therefore,

while antiretroviral therapies are not necessarily ideal for developing nations, they are an absolute necessity.

International organisations are equipped to lessen the issues which ART presents in Uganda. Due to the severe lack of trained medical professionals, Uganda is unable to adequately treat its HIV positive citizens and effectively administer ART treatments. Organizations like Doctors without Borders are already attempting to treat infected Ugandans, however teaching natives to recognize the signs and symptoms of AIDS as well as formally training Ugandans as nurses and doctors is also vital. In order to provide universal access to antiretroviral therapy, groups like the World Bank could fund hospitals and clinics throughout Uganda. The United Nations has already established its Millennium Development Goals, and has done extensive work in Uganda to address the HIV/AIDS crisis. There are two Millennium Development Goals currently being pursued in regards to HIV: halting and reversing the spread of HIV, and providing universal access to treatment. Foreign aid, however presents some potential dangers in any nation especially when health care is concerned. The World Bank found in a 2006 study that “nearly half of all donate funds for sub Saharan African health efforts never reached the care providers in clinics and hospitals.” (Quigley). Also, foreign aid managed solely by wealthy countries and organizations can hinder developing nations autonomy and ability to “sustain their own health care efforts”. These potential dangers must be carefully navigated in order to successfully implement internationally supported health initiatives in Uganda.

The AMPATH program, a partnership between the Indiana University Medical School and Moi Medical School in Kenya, is a shining example of the partnership between foreign aid and local support to provide superior AIDS education and treatment. AMPATH strives to ensure that the "focus is on the patient, not the disease" by providing holistic care for 140,000 afflicted Kenyans (AMPATH). In addition to antiretroviral therapy, they also partner with the World Food Programme to provide nutrition for thirty one thousand HIV positive Kenyans a day and provide funding for education and agricultural support. The AMPATH model in Kenya has been widely praised for its effectiveness. International AIDS researchers, like Dr. Marty Markowitz, state “The IU-Moi model seeks to train Kenyan health care workers to be equipped to deal with the HIV/AIDS epidemic, which is critical if there is going to be any headway made” (Quigley). This model effectively manages international aid, emphasizes the importance of native staff, and stresses the importance of treating the whole person. The American physicians who initially implemented AMPATH were very familiar with Kenyan culture, and today AMPATH is being managed by both American and Kenyan doctors. If this model could be implemented in Uganda, it would greatly improve the decimation caused by the HIV/AIDS epidemic.

Antiretrovirals are effective in prolonging the lives of patients and allowing them to return to some extent back to the work force. By improving AIDS care, more infected individuals and their caretakers will be able to contribute to agricultural production, greatly improving both farming procedures and agricultural yield. The United Nations is currently spearheading this movement, but with WHO and CDC support, this number could be brought up to universal access to HIV/AIDS treatments. Programs like the AMPATH initiative can provide effective implementation of the treatments funded by these groups. Antiretroviral therapy presents a promising solution to rehabilitate those who have already been infected by HIV, yet it cannot completely remedy Uganda’s crisis.

In the past years, the spread of AIDS in Uganda has actually increased. Even with successfully implemented antiretroviral therapy, HIV/AIDS is difficult to treat and currently impossible to heal. A severe lack of education inhibits Ugandans from protecting themselves against HIV. Studies show that those who are educated about the nature and transmission of HIV are significantly less likely to be infected (*AIDS, Poverty, and Hunger*). The first step, therefore, in the prevention and reversal of AIDS in Uganda is universal education and instruction. By reducing the number of those infected, the AIDS crisis will improve in coming generations. Groups like the World Health Organization and the Center for

Disease Control already have some programs to educate Ugandans, but these programs must be invested in to educate all of Uganda. The Ugandan Ministry of Health must partner with rural and urban families in order to provide effective education. By implementing large scale educational programs, the number of infections would be drastically reduced.

A lack of education is not the only cause of the increased infection rates. The taboo which surrounds HIV in Uganda leads to an unwillingness to discuss and learn about the dangers that unsafe sexual practices pose. Gender roles also play a significant role in propagating these unsafe and unjust customs. In order to effectively educate the population, these cultural aspects that lead to increased infection rates must be addressed. If the Ugandan people are not willing to attend educational sessions about HIV and discuss safe health practices with their families, the HIV crisis will continue to expand. These beliefs also reinforce the marginalization of HIV positive Ugandans. As long as those who have been diagnosed as HIV positive continue to be ostracized by society, Ugandans will continue to be unwilling to get tested and discover their status. An individual who is both unaware of their HIV status and undereducated in safe sex practices poses a significant risk of infecting others. The cultural obstacles pose a problem equally as difficult to address as the logistical obstacles proposed by antiretroviral therapies however it is also equally as important to address.

The Uganda Village Project, which focuses on the rural Iganga region, provides a successful example of combatting the cultural and educational aspects of HIV spread in Uganda. The UVP targets three main projects in their work- accessing safe water, repairing obstetric fistula, and the “Healthy Villages Project” (Uganda Village Project). This project focuses on improving the general health of Iganga’s villages with a grassroots approach, although they have been extremely successful in combating the HIV epidemic locally. Firstly, the group strives to normalize the stigma associated with HIV through public presentations. In 2013 alone, UVP educated over 3500 villagers about HIV transmission and treatments. Education about sex related topics can initially be awkward for Ugandans, but by becoming more willing to discuss sex and protection, Ugandans can educate their families about the dangers of HIV. UVP also offers personal counseling and HIV testing. Most Ugandans know that they can be tested for HIV, but less than half are ever actually tested. Through their counseling services, the UVP tests and educates villagers about the risks of HIV. When a villager is diagnosed as HIV positive, the Uganda Village Project provides in village support, but also arranges transportation to free treatments centers where villagers can receive antiretroviral therapy, like the AIDS Support Organization. This project is widely successful because of its personal approach and its mission to lessen the shame and fear associated with being diagnosed. This approach could be scaled up to reach across the entire country. Regionally focused chapters, however, as opposed to a nationwide organization, appear to be strongest.

International groups who specialize in HIV education must also train Ugandans to advocate for safe sexual practices and protection. Cultural traditions like widow inheritance and polygamy endanger entire families. The sexual subjugation of women in Uganda inhibits even educated women from protecting themselves against HIV and STDs in general. These issues however are obviously extremely sensitive. Traditions that have been a part of Ugandan culture for centuries will not be easily changed and negative attitudes against western encroachment on native culture may present another layer of controversy. These issues highlight the grave need for Ugandans to lead educational initiatives; however these Ugandans are not currently prepared to educate their families and communities. In order to enable Ugandans to change social norms, groups like the UVP must provide adequate sexual education in order to prepare Ugandans to lead educational initiatives and cultural change.

Despite Uganda’s rich cultural history and traditions, Ugandans face many challenges. Faced with chronic malnutrition and plagued by HIV, the Republic of Uganda must forge a new path to a stronger future. While hunger and starvation do not directly threaten the majority of Uganda’s population, acute malnutrition leads to almost universal morbidity. This malnutrition results from a lack of agricultural

diversity, primarily driven by a severely limited workforce. As women are customarily the primary agricultural laborers, and women are increasingly infected by HIV/AIDS, many individuals are rendered unable to work, either by the effects of AIDS or the traditional demand for women to care for sick members of the community. For those who are infected with HIV, early and consistent access to obtainable antiretroviral therapy is integral to returning the ill to the work force. If Uganda's workforce is revived, farmers will both produce more consumable and profitable goods while growing a wider array of plants. Providing ART in Uganda has already been successful, but in conjunction with increased efforts to educate the population about HIV/AIDS, the impact of this epidemic could be significantly decreased, leading to, among other benefits, higher agricultural production, and therefore better overall well being. By educating communities locally, the rate of new HIV infections could be drastically reduced. Uganda's nutritional struggles are very complex, and many different factors affect the malnutrition crisis, but by addressing the HIV/AIDS epidemic, Uganda's chronic malnutrition would be significantly reduced.

## Works Cited

- AIDS, Poverty, and Hunger: Challenges and Responses*. Washington: International Food Policy Research Institute, Apr. 2005. PDF. <http://www.ifpri.org/sites/default/files/publications/oc50.pdf>
- AMPATH-Kenya Home | AMPATH-Kenya." *AMPATH-Kenya Home | AMPATH-Kenya*. Indiana Institute for Global Health, n.d. Web. 09 June 2015.
- "Antiretroviral Drug Prices." *Antiretroviral Drug Prices*. AVERT, n.d. Web. 30 July 2015.
- "Facts and History." *Facts and History*. N.p., n.d. Web. 10 Mar. 2015 <http://www.visituganda.com/about-uganda/?ItemId=MQ==>
- "Global Health Observatory Data Repository." *WHO African Region: Uganda*. WHO, 2014. Web. 27 May 2014.<http://apps.who.int/gho/data/node.country.country-UGA?lang=en>
- Inungu, Joseph, and Sarah Karl. "Understanding the Scourge of HIV/AIDS in Sub-Saharan Africa." *Medscape General Medicine*. Medscape, 2006. Web. 15 July 2015.
- Millennium Development Goals Report for Uganda 2013*. Kampala: Ministry of Finance, Planning and Economic Development (Uganda), Sept. 2013. PDF. <http://planipolis.iiep.unesco.org/upload/Uganda/Uganda%20MDG%20Report-Oct%202013.pdf>
- National Report: Uganda*. London: Commonwealth Foundation, 2013. PDF. <http://www.un.org/en/conf/ldc/pdf/uganda.pdf>
- Okero, F. Amolo, et al. *Scaling Up Antiretroviral Therapy: Experience in Uganda*. Geneva: WHO, n.d. Print.
- Oramasionwu, Christine U., Kelly R. Daniels, Matthew J. Labreche, and Christopher R. Frei. "Abstract." *National Center for Biotechnology Information*. U.S. National Library of Medicine, 19 July 2011. Web. 27 May 2014. <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3155340/>
- "Our Work" *Global Hunger Index* International Food Policy Research Institute, n.d, Web. 5 Mar. 2015 <http://www.ifpri.org/book-8018/ourwork/researcharea/global-hunger-index>
- Quigley, Fran. *Walking Together, Walking Far: How a U.S. and African Medical School Partnership Is Winning the Fight against HIV/AIDS*. Bloomington: Indiana UP, 2009. Print.
- Ronner, Esther, and Ken E. Giller. *Background Information on Agronomy, Farming Systems and Ongoing Projects on Grain Legumes in Uganda*. N.p.: N2Africa, 29 Jan. 2013. PDF.
- Statistical Abstract*. Entebbe: MINISTRY OF AGRICULTURE, ANIMAL INDUSTRY AND FISHERIES , 2011. PDF. [http://www.n2africa.org/sites/n2africa.org/files/images/N2Africa\\_Characterization%20Uganda.pdf](http://www.n2africa.org/sites/n2africa.org/files/images/N2Africa_Characterization%20Uganda.pdf)
- "Statistics: Uganda" *UNICEF*. UNICEF, 31 Dec. 2013. Web. 26 May 2014. [http://www.unicef.org/infobycountry/uganda\\_statistics.html](http://www.unicef.org/infobycountry/uganda_statistics.html)
- "The Government" *The Government*. Republic of Uganda, n.d. Web. 8 Mar. 2015. <http://www.statehouse.go.ug/government>



“Uganda: Division of Labour in Agriculture.” *Uganda: Division of Labour in Agriculture*. IFAD, 2000. Web. 27 May 2014. <http://www.ifad.org/gender/learning/role/labour/54.htm>

“Uganda Nutrition Action Plan” UNICEF. Government of Uganda. 2011. PDF  
[http://www.unicef.org/uganda/Nutrition\\_Plan\\_2011.pdf](http://www.unicef.org/uganda/Nutrition_Plan_2011.pdf)

“Uganda Village Project:2012 Annual Report” UVP, 2013. PDF. <http://www.ugandavillageproject.org/wp-content/uploads/2014/02/2012-UVP-annual-report.pdf>

Shively, Gerald, Hao, Jing “A Review of Agriculture, Food Security and Human Nutrition Issues in Uganda” Purdue University Department of Agricultural Economics. August 2012. PDF  
[http://www.agecon.purdue.edu/staff/shively/uganda\\_review.pdf](http://www.agecon.purdue.edu/staff/shively/uganda_review.pdf)

“Vitamin A(retinol)” *Background*. WHO., 01 Nov. 2013. Web. 07 Mar 2015  
<http://www.who.int/nutrition/topics/vad/en/>

“WHO| Neglected Diseases in Uganda” WHO. World Health Organization, n.d. Web. 09 Mar. 2015.  
[http://www.who.int/neglected\\_diseases/countries/uga/en/](http://www.who.int/neglected_diseases/countries/uga/en/)