

EDUCATING FEMALES IN MOZAMBIQUE: THE SIGNIFICANCE OF MATERNAL LITERACY

SHAYLEE WHEELER

POLICY MEMORANDUM

IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTER OF PUBLIC POLICY

SPRING 2014



UNIVERSITY of
DENVER

INSTITUTE FOR PUBLIC
POLICY STUDIES

Literacy is a bridge from misery to hope. It is a tool for daily life in modern society. It is a bulwark against poverty, and a building block of development, an essential complement to investments in roads, dams, clinics and factories. Literacy is a platform for democratization, and a vehicle for the promotion of cultural and national identity. Especially for girls and women, it is an agent of family health and nutrition. For everyone, everywhere, literacy is, along with education in general, a basic human right...

Literacy is, finally, the road to human progress and the means through which every man, woman and child can realize his or her full potential.

Kofi Annan

Cover Photo:

Lizy Mucavel (right), head seamstress and uniform manager for No Poor Among Us, with schoolgirls in Mozambique

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Executive Summary

Addressing the issue of literacy in the developing world is crucial for human and economic development, and therefore, is of utmost importance to policy makers, governments, intergovernmental agencies, non-governmental organizations and - most importantly - the individuals, families and communities whose lives are most directly impacted by this lack of basic reading and writing skills.

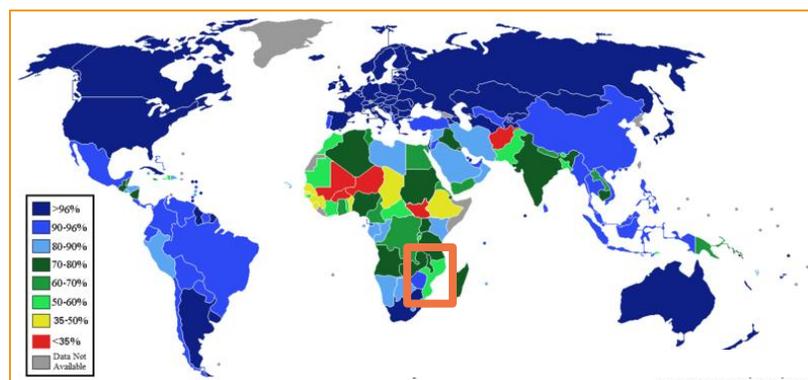
The Republic of Mozambique suffers from unsettling low literacy rates, with the literacy rates among adult women in Mozambique almost 18 percent lower than that of adult men. This means that over half of the adult population of women is illiterate. This gap is not only the product of an ineffective public education system, but also a result of the prevalence of social and structural discrimination against females. The most significant impact of this discrepancy, however, stems from the fact that the vast majority of these illiterate women over the age of fifteen have or will have children at some point in their lives - children whose physical, emotional and social well-being will be significantly impacted by the educational attainment and attitudes of their mother. It is for this reason that promoting and protecting maternal literacy is a critical element to ensure that the cycle of illiteracy in the family and community in developing nations is broken.

This memorandum undertakes a cost-benefit analysis of four alternatives that aim to reduce illiteracy among girls and women in Mozambique: continuing with the status quo of current adult education initiatives, the provision of sanitary pads to females over the age of 12, the provision of uniforms to school-aged individuals and pursuing mobile learning platforms. My recommendation for action is that uniforms be provided to the children and youth of Mozambique (both female and male) whose families cannot afford them in order to increase attendance among school girls and thus eventually generate an increasingly literate population of mothers.

Problem Definition: A disparity exists between literacy rates among females and males in Mozambique, with the rates among the adult population of women being the lowest. This is disconcerting when considering that most of these women are mothers whose educational attainment affects their children’s physical, emotional and social well-being, which in turn impedes Mozambique’s progression in development.

According to the World Literacy Foundation, there are more than 796 million people in the world who cannot read and write (Carr, et al, 2012). This amounts to about 15 percent of the total global population. When literacy rates are further segmented by gender, 79.7 percent of females are literate, as compared to only 88.6 percent of males – an almost 11 percent difference (Central Intelligence Agency, 2011). Unfortunately, the vast majority of these illiterate individuals – both women and men - inhabit the least-developed nations. In fact, nearly three-quarters of the world's illiterate adults are found in only ten countries (CIA). The country of Mozambique is one such country that suffers from unsettling low literacy rates, not only when compared to industrialized countries, but in relation to countries with similar stages of development and GDP, as well (see Figure 1). Addressing the issue of literacy in the developing world is crucial for human and economic development given its significant relationship to important outcomes such as child mortality, and therefore, is of utmost importance to policy makers, governments, NGOs and, most importantly, the individuals, families and communities whose lives are most directly impacted by this lack of basic reading and writing skills.

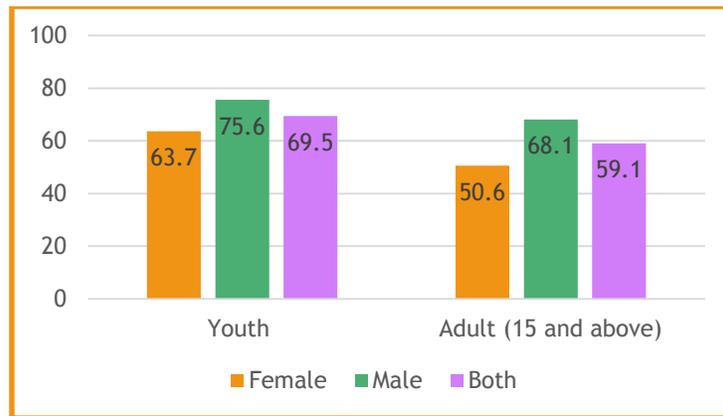
Figure 1: Global Literacy Rates



Source: UN Human Development Report 2011

The literacy rate currently sits at an unsettling 59 percent for all Mozambican adults, with a youth illiteracy rate of 69 percent (see Figure 2). When literacy rates for adults are separated by gender, however, 50 percent of adult women – compared to only 68 percent of adult men - are literate. This means that there almost 4 million women– half of the adult population of women in the country, or, about 16 percent of the total population - who do not have basic literacy skills.

Figure 2: Literacy Rates in Mozambique - 2011 Regional Average



Source: UNESCO 2013

The most significant impact of this discrepancy stems from the fact that the vast majority of these illiterate women over the age of fifteen have or will have children at some point in their lives - children whose lives will be significantly impacted by the educational attainment and attitudes of their mother. It is for this reason that promoting and protecting maternal literacy is a critical element to ensure that the cycle of illiteracy in the family and community in developing nations is broken, as will be discussed later in this memorandum. As Hilary Clinton stated in her remarks at the UN Commission on the Status of Women, “The status of the world’s women is not only a matter of morality and justice. It is also a political, economic, and social imperative. Put simply, the world cannot make lasting progress if women and girls in the 21st century are denied their rights and left behind” (2010).

Issue Analysis

Literacy Defined

The most common measurement in determining literacy rates is calculating the number of individuals over the age of 15 that can read and write (CIA). The United Nations Educational, Scientific and Cultural Organization - the most influential policy institution working with literacy education, particularly in developing nations - defines literacy as follows:

“Literacy is the ability to identify, understand, interpret, create, communicate and compute, using printed and written materials associated with varying contexts. Literacy involves a continuum of learning in enabling individuals to achieve their goals, to develop their knowledge and potential, and to participate fully in their community and wider society.”

(UNESCO 2004)

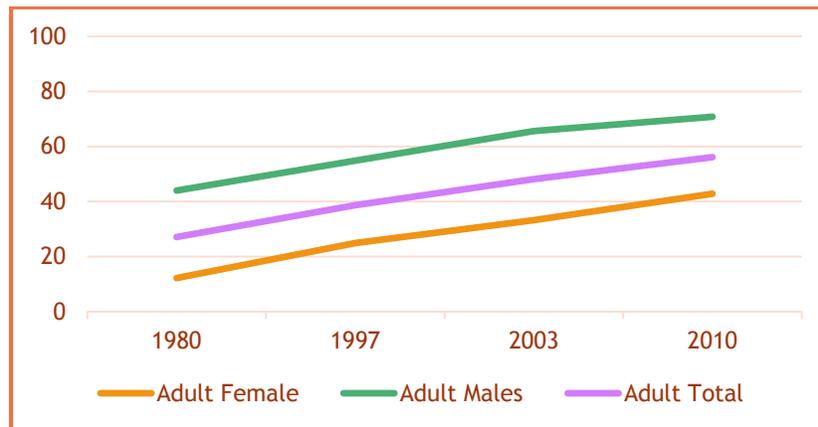
Although there are no universal definitions and standards of literacy, this analysis defines literacy purely as an individual’s ability to read and write.

Literacy and Education in the Mozambican Context

The sources of gender disparity among literacy rates in Mozambique are multi-faceted and cannot be attributed to one specific developmental or educational shortcoming, but rather the combination of many complex political factors and cultural dynamics. Moreover, in a country as diverse as Mozambique, regional deviations among literacy rates are to be expected, especially between rural and urban areas. In fact, the illiteracy rate in rural districts is about 66 percent, while in urban districts, it is only 30 percent (Luis, 2012). In reviewing the research regarding the causes of this gender gap in literacy rates, its origin is two-fold: the existence of a frail primary and adult public education structure and the existence of substantial discrimination against women. In addressing the first of these two influences, the government of Mozambique has only begun to recognize the importance of formal education in the latter portion of the

20th century and have made consistent progress in this area since they began focusing their efforts (see Figure 3).

Figure 3: Literacy Rates in Mozambique – 1980 to 2010



Source: UNESCO Institute for Statistics 2011

When Mozambique gained independence from Portugal in 1975, merely 3 percent of its population was literate (Luis 2012). After this, a large-scale literacy campaign was instigated and by the beginning of the 1980s, literacy rates had risen by almost 25 percent. However, beginning in May of 1977 and lasting until October of 1992, a prolonged civil war delayed such rapid growth, in addition to destroying about 50 percent of the national school infrastructure (Luis).

The Mozambican 1990 Constitution states that “education shall be a right and duty of all citizens” (Mozambique Const., art. XCII § 1) and the government vows to “promote an educational strategy which has as its objective national unity, wiping out illiteracy, mastering science and technology, and providing citizens with moral and civic values” (Mozambique Const. art. LII § 1). Literacy and adult education were given added importance when they were identified as critical factors for Mozambique’s approach to reducing its high levels of poverty in the early 1990s (UNESCO Institute for Lifelong Learning, 2014a). However, the government is failing to adequately supply this service, especially in regard to adult education. The programs are in place, the curriculum is there, and the training is available, but the policies

are fragmented and there is a huge gap between the government's undertakings and its ability to actually implement them (Luis, 2012). This problem indicates a failure of the government to function well in an area where it is traditionally expected to act effectively, that is, providing education to its citizens.

The National System of Education (SNE) was introduced in Mozambique in 1983 and is comprised of three levels (primary, secondary and higher education) and five sub-systems: General Education, Adult Education, Technical/Vocational Education, Teacher Training and Higher Education (SACMEQ, 2014). Primary education is compulsory and free for children from the ages of six through twelve. This level is subdivided into two levels, lower primary which comprises of five years of schooling (Grades 1 to 5) and upper primary which comprises two years (Grade 6 and 7). Due to the critical shortage of schools in Mozambique, primary schools are required to operate in two or three shifts (SACMEQ). After seven years of primary education, students have a choice of enrolling for general secondary education, lower primary teacher training colleges, basic technical and vocational schools or secondary education for adults. The most common option is general secondary education, which is divided into two stages, junior secondary which comprises three years (Grade 8 to 10) and senior secondary (also known as pre-university) which comprises two years (Grades 11 and 12) (SACMEQ). The retention challenge between the primary and secondary levels of education explained in a publication produced by Open Society Initiative for Southern Africa:

“The number of children attending primary school has increased dramatically since the ending of the civil war...In 2010 about 92 percent of the country's children were enrolled. However, in 2011 alone, 300,000 children did not have access to primary school, and about 29 percent of children who had completed the lower primary grades could not find places in the upper primary classes...In 2011 less than 20 percent of those who completed basic primary education succeeded in enrolling in junior secondary education” (Luis).

Therefore, literacy rates among young girls and boys are not extraordinarily problematic in the early stages of education. As dropping out of school is a common occurrence for various reasons, it is the depletion of enrollment rates (particularly among females, as will be discussed below) that lead to greater numbers of illiterate adults. Another massive issue is that Portuguese is typically the sole language of instruction in the public education system, even though it is the mother tongue of only 1.2 percent of the population (Luis). Aside from the obvious infrastructural concerns that inhibit many youth from gaining an adequate education (class capacity, building availability, teacher preparedness, etc.), there are also cultural and social forces at play in completion rates that compound this issue and also aid in the growing disparity between literacy rates among men and women as they increase in age, which fall into the category of the second causal claim of the problem: gender discrimination.

Discrimination and Masculinity Culture

The perception and treatment of girls and women in Mozambique lies at the heart of this problem. As Dr. Eliza Johannes (2010) explains, historically, “most African women have received some sort of informal education, but formal education [had] been reserved for men who occupy the more important and elite roles in government and society.” Although this reality has changed in the last couple of decades, far more girls than boys in Sub-Saharan Africa drop out of school – or don’t even make it to school to begin with (Johannes). This cultural and systemic discrimination is largely due to the pervasive acceptance of the traditional norms of masculinity in the country. Understanding how this masculinity culture functions in Mozambique is critical in creating an analytical framework for policies and programs that will be the most effective and not be nullified by a negative backlash by men. In studying masculinity and male sexual behavior in Mozambique, Macia, Maharaj & Gresh (2011) found that these norms of viewing men as the main providers and figures of authority “continue to exert a strong influence on male attitudes and behavior.” In Mozambique, it is perceived necessary by all individuals to be recognized in the community as a “real man,” as Macia, Maharaj & Gresh explain:

“...To be considered a “real man” one has to assume economic responsibility for the family. Not having a job or a source of income may generate embarrassment for a man because it can be seen as a sign of inability to carry out basic social duties, including obligations to one's own children.”

This means that female education framed in the lens of women’s economic advancement will most likely be a superfluous argument for most Mozambican men. Men are to be the providers and women the caregivers, and therefore girls and women have no need to seek job opportunities that would require a higher skill level than is required, for instance, than the agricultural jobs that provide income for almost 80 percent of the population (VanKlaveren et al, 2009). Mozambique’s market share for women’s labor is very high, in comparison to both developing and developed nations: the overall labor participation rate of the 15 to 64 age group is 89 percent (VanKlaveren et al). However, of this group of women, only 18 percent were employed in the formal sector in wage employment, an indication of the possession of a higher level of skills, and therefore, a higher level of education (Van Klaveren et al). As socioeconomic changes are increasingly bringing more women into the more advanced-skilled labor market, while simultaneously reducing the traditional economic dominance of men in the household, many men are feeling economically disempowered (Macia, Maharaj & Gresh). This means that in conveying the importance of female education to men in the country, it will be more effective to place emphasis on benefits other than financial mobility to avoid having some men feel threatened and not allow their daughters and wives to participate.

However, there is a positive component to this masculinity culture. Macia, Maharaj & Gresh state that the “most important and defining characteristic of true manhood” is one’s ability to provide for his family. Most men understand that these provisions don’t just include food, shelter and clothes for their children, but also the responsibility for formal education. Although there are different definitions of success for sons and daughters, both mothers and fathers in Mozambique want their children – regardless of gender - to succeed in all aspects of life and there is generally an understanding that education plays a role in this. Conveying the importance of female education to fathers and husbands in this context will make for more

successful policies, emphasizing the role that they play in providing that education for the overall success of their daughter or wife – not just her economic success.

It is important to realize that it is not just men who show resistance to female education – it is often the women themselves that show apprehension in that they conform to these cultural values, as well. Masculinity culture is such that women are conditioned to follow their husbands and father unquestioningly. In fact, most of the resistance to reform for women in developing countries comes from the families themselves – not the state (Jutting & Morrisson, 2005). It is for this reason that the Organization for Economic Co-Operation and Development (OECD) suggests that “the state can reduce this resistance to its actions with support from the media, local chiefs and religious authorities. Television and radio can play critical roles. Family-series programs, which enjoy increasing interest, can transmit a picture of how families in other societies live” (Jutting & Morrisson). Another even more powerful step the state can take is to better enforce current laws that are facing male resistance (Jutting & Morrisson). As was previously stated, primary education is compulsory in Mozambique, but is obvious that there is a massive group of children who are not attending school – and families are not facing any consequences.

There is still a prevalent attitude among parents and communities that it is more valuable to educate a boy than it is to educate a girl. This is because a female child is not able to perpetuate the family lineage as a male child can, and therefore, they are not perceived as holding the same value (Macia, Maharaj & Gresh). Women’s main role is to conceive men’s children, especially male children, consequently making male education more important so that they can grow and become “real men,” just like their fathers. This can mean that families experiencing economic hardship and are only able to send some of their children to school will, more often than not, choose to educate their sons. Girls are far more likely to be held back or withdrawn from school when financial decisions are being made within a household (Johannes). Poverty-stricken families may not even consider sending their daughters to school because they feel as though her presence in the home will be much more beneficial to the family than her presence in the classroom in both the short term and the long term. The opportunity cost is viewed as simply being just too high, even if they

value education. Daughters are often expected to stay at home to provide domestic and farm labor, take care of their siblings, or even supplement their family's income with small jobs – sometimes specifically for the purpose of providing education for a male sibling. Since it is also the expectation that they will only continue these tasks as they grow and become mothers themselves, many parents cannot see the justification of providing an education for their daughters, and consequently, these young women often get married at a young age. Because domestic responsibilities take up most of a mother's time as she is raising children, her ability to pursue an education is even more limited than before and most illiterate women do not have the skills required to undertake further vocational or educational training to improve their learning capacity.

Literacy and Development

Literacy plays a significant role in a country's economic progress and national development. However, there is some dispute surrounding the causal direction of this claim: does literacy aid in development, or does development lead to increased literacy? This is an important question to consider when determining the effectiveness of literacy initiatives in developing countries, in that there are three different paradigms through which literacy in developing nations are observed:

1. *Modernization Theory*. This approach asserts that industrialization must be in effect in lesser-developed countries for social and economic advancement to take place because it increases material opportunities that can support individuals' well-being (Mazumdar, 2005). It is only through industrialization that the economic growth of a country will be stimulated, creating an “increased capacity to meet basic human needs such as education, housing and health care, [creating a] social affluence and prosperity [to] provide the basis for the development and improvement of...public and community services” (Mazumdar). If this were the case, then female literacy initiatives in Mozambique will be premature and thus unable to have a significant impact at this time.

2. *Social Development.* This approach emphasizes the relationship that literacy has with social contexts and cultural practices and claims that “people feel motivated to acquire literacy in situations where social relations and institutions require the use of reading and writing...in such a context, literate competencies permit individuals and communities to participate in the shaping of their development” (UNESCO Institute for Education, 1997). Social development is defined as the capacity of individuals and communities to take upon themselves the direction of their own development. If this is an accurate perspective, unless literacy is seen as an “activity embedded in social and cultural practice,” (UNESCO Institute for Education) which it currently is not, then female literacy initiatives in Mozambique will not be successful.
3. *Prerequisite to Development.* This approach is the paradigm embraced by UNESCO, as it views literacy rates as a means of assessing economic progress and national development (2006). UNESCO states that literacy is an important indicator of “the extent to which individuals [can] effectively participate in and benefit from a modernizing economy and society...A national literacy threshold, for example [is] viewed as a critical condition for economic ‘take-off’ and modernization” (2006).

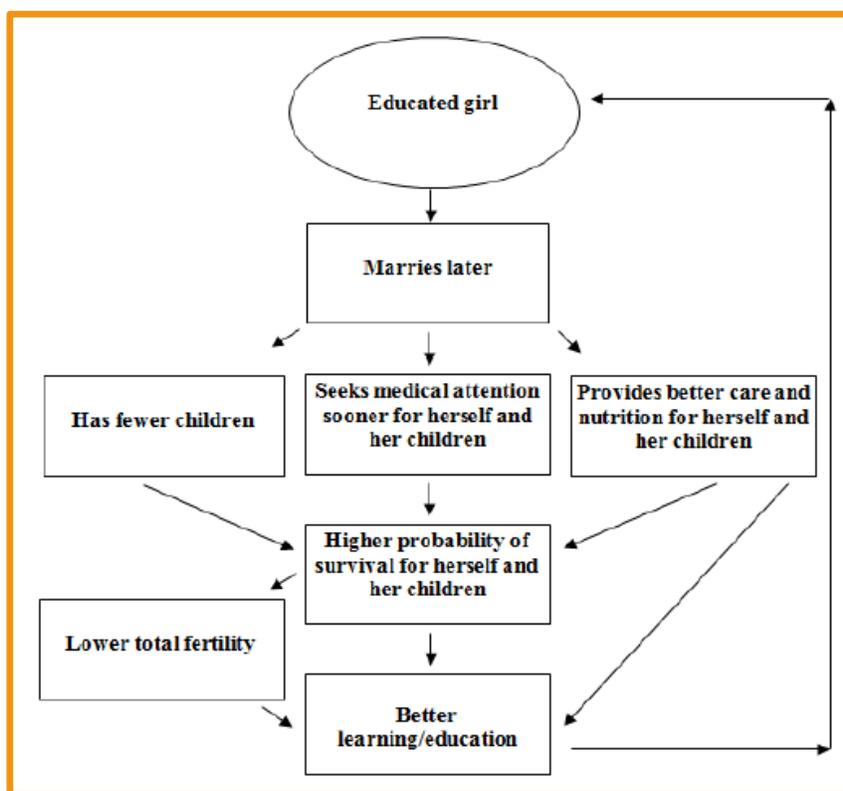
My position in this memorandum is aligned with the third paradigm that views literacy as a requirement in human and economic development. It is not only that literacy helps in this advancement, but the lack of literacy will significantly hinder progress and pose as a threat that carries serious ramifications, as will be discussed in the following section.

The Social and Economic Costs of Illiteracy

The fundamental right of women and girls to have access to education to become literate has been recognized as a human rights issue. In fact, *Promoting Gender Equality and Empowering Women* is the third of the Millennium Development Goals (MDGs), a set of eight international development goals established following the Millennium Summit of the United Nations in 2000 (United Nations, 2013). The

United Nations Population Fund argues that “reaching this goal underpins success towards all the others” in that it will “release a powerful force for development in other areas” (UNFPA 2005), further supporting the view that literacy is a prerequisite to development. This is mainly due to the fact that these girls and women will most likely become mothers who play a critical role in their children’s emotional, social and physical well-being. Figure 4 depicts a visualization of this virtuous cycle, demonstrating that educating a girl not only affects her well-being for the rest of her life, but also that of generations to come:

Figure 4: Generational Impact of Educating Girls

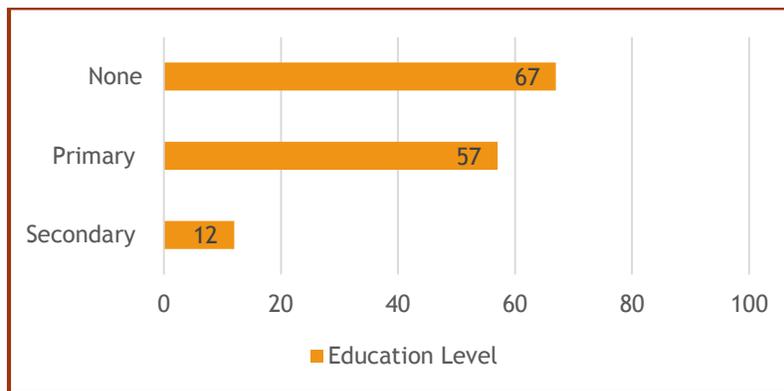


Source: Mehrotra & Jolly, 1997

Educated mothers are more likely to use greater autonomy to treat their sons and daughters more equitably and encourage their daughters to attend school (Cleland & Van Ginneken, 1988). They also encourage their daughters to succeed in school, instill in them a love of learning, help them with their homework, and read to them.

The consequence of an educated girl marrying later in life is of particular importance in this cycle in Mozambique, considering that it ranks 6th in the world for rates of child marriage, with 52 percent of females married by the age of 18 (UNFPA, 2006). This is not only has negative consequences on human development for the young girl involved, but also ripple-effects on the economic development of the country as a whole because of her decreased likelihood of becoming educated or gaining skilled employment. UNFPA explains that child marriage is “often referred to as ‘early and forced’ marriage because the girls, given their young age, can rarely make a free and informed decision about their marriage partner, the timing or the implications of this binding commitment.” However, a girls’ level of education has an effect on when she will marry, with greater levels of education lessening the likelihood of her being married by the age of 18, as shown in Figure 5. Additionally, since marriage later in life results in females having less children, this has a positive effect on literacy rates within a country, as Mazumdar (2005) observed that where population rates are low, literacy rates are higher, making economic growth faster.

Figure 5: Percent of Girls Married by the Age of 18 by Level of Education, Mozambique



Source: UNFPA, 2006

From a personal finance standpoint, illiterate individuals earn 30 to 42 percent less than their literate counterparts (Martinez & Fernandez, 2010). This is inevitably more problematic for female-heads of households who are the sole providers for their families. And if these women’s daughters also do not gain

literacy skills, they will find it much more difficult to obtain proper training and employment opportunities, thus perpetuating the cycle of poverty.

There are also numerous health implications related to illiteracy. Illiterate mothers have limited accessibility and information regarding healthcare and hygiene and have an increased likelihood of participating in high-risk sexual behavior (Cree, Kay & Steward, 2012). Because of this, individuals with little or no education are 2.2 times more likely to contract HIV as those who have completed primary education (De Walque 2004). Perhaps most disconcerting, however, is the fact that a child born to a mother in who can read in a developing country is 50 percent more likely to survive past the age of 5 (UNESCO, 2010). In fact, a mother's education is a more decisive determining factor of child mortality than any other economic factor. This is due to the fact that educated mothers are more likely to:

- Attach a higher value to the welfare and health of children;
- Have a greater decision-making power on health-related matters;
- Be better nourished and more willing to avoid harmful behaviors during pregnancy;
- Be more knowledgeable about disease causation, prevention and cure;
- Be more innovative in the use of remedies;
- Make more use of modern health facilities;
- Place a greater emphasis on personal and home cleanliness (Cleland & Van Ginneken).

Thus, there is a strong and dangerous correlation between maternal education and child mortality, either due illiterate mothers' poor health and hygiene knowledge and practices or risks associated with young girls bearing children (if a mother is under the age of 18, her infant's risk of dying in its first year of life is 60 percent greater than that of an infant born to a mother older than 19) (UNICEF, 2012). This loss of life associated with female illiteracy is a devastating cost and is what I would consider to be the most compelling impetus for implementing female literacy initiatives.

There are also broader implications of illiteracy on the state level, with one study showing that investing in the education of girls is one of the most effective means of reducing poverty: countries that do not meet the MDG target of gender parity in education are at risk of foregoing 0.1 to 0.3 percentage points annually in per capita economic growth (Abu-Ghaida & Klasen, 2004). And according to the World Literacy Foundation, illiteracy in general costs a developing country 0.5 percent of GDP (Cree, Kay & Steward 2012). These estimates reflect a higher level of spending on social services such as welfare, health and the justice system as illiterate individuals are more likely to be in need of welfare services and take part in the Social Protection system, have an increased amount of health problems due to lack of health information and services and are more likely to commit crime (Cree, Kay & Steward, 2012). The demand for improved literacy skills is growing on a global level in the “wake of economic globalization, increasingly internal and international migration, rapid technological change, and the shift towards knowledge-based societies” (UNESCO 2006). Those who do not keep up with literacy skills in this context will essentially be excluded from full participation in these advancing societies.

The Economics of Public Education in Mozambique

The previous discussions regarding the political and cultural factors contributing to illiteracy among females in Mozambique provide a foundation for understanding the interaction of economic factors at play when analyzing public education in Mozambique. Valerio et al (2004) identifies three plausible approaches that may provide an explanation for the low enrollment and retention rates of students in Mozambique, particularly among females:

1. *Demand-Side Constraints*. High costs – mainly in the form of uniform provision and opportunity costs associated with unpaid and paid labor – prevent many families from sending their daughters to school and increases the likelihood that they will pull their daughters out early.

2. *Supply-Side Constraints*. The public education system has a poor infrastructure that does not provide enough buildings, teachers, training, and learning materials necessary to educate the population of Mozambique.
3. *Contextual Factors*. Other variables such as socioeconomic conditions, local traditional practices, food insecurity and chronic illness can have harmful influences on children's presence in school.

As can be ascertained from previous discussion of these issues, the research indicates that it is a mixture of all three of these influences that contribute to enrollment and retention rates (Valerio et al). Education is considered to be a merit good in that it is a public good established on need rather than ability to pay. But in the case of Mozambique, a combination of demand-side constraints and contextual factors are preventing families from consuming this good. As a merit good, education's net private benefit to the consumer is not fully recognized at the time of consumption, meaning, a student would not be able to recognize the personal benefit of additional earnings and/or decreased child mortality until many years after their education has been completed. This circumstance indicates a substantial level information failure for the consumer that results in under-consumption: families of Mozambique oftentimes fail to recognize the private benefit of education for their daughters. The primary market failure of this problem is that of an incomplete information regarding investment in human capital and also one where short-term gains from household labor are valued over education. On the government's end, there is a supply-side problem in that it is apparent that they are not supplying an adequate provision of this merit good for its citizens. The conditions necessary for the education of the citizens of Mozambique exist (i.e. the infrastructure) but it is very weak and inadequate and inhibits consumption for many individuals. This may also be a result of incomplete information in that the government may not recognize the external benefit to society generated by the consumption of education, most significantly in the area of decreased national spending on social services such as welfare, health and criminal justice.

The proposed solutions discussed in this memorandum attempt to address the issues of demand-side, supply-side and contextual factors separately, as one alternative is not able to be inclusive of all

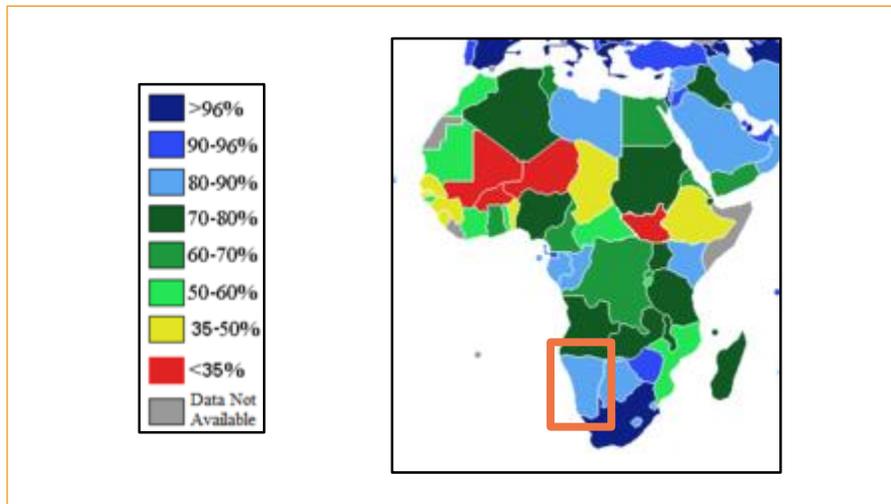
approaches. It is evident, however, that this is a problem that will require a multi-dimensional solution that mitigates all three of the aforementioned constraints to be most effective.

Case Study: Namibia

In searching for literacy strategies undertaken in other countries, I anticipated finding a myriad of proven innovative strategies. But what I found was that each country's approach was very similar: a poor government trying their best to educate their poor citizens by attempting to improve various aspects of their frail education system with the help of donor organizations. The only countries that seem to be doing this better than others are those with more resources to allocate and more political will to actually devote significant attention to the issue. In other words, the key was essentially the government's ability to actually execute on their commitment to education. This made it very difficult to examine supply-side solutions in that the solution seemed to be to just "do it" and "do it right." Because of this, I decided that it would be more effective to look at solutions that focused more on the demand-side constraints and contextual factors.

That being said, I feel it useful to include an example of another developing country in Africa who come from similar roots as Mozambique but has now surpassed them in their literacy outcomes: Namibia. Namibia is a country in southwest Africa no further than 1,000 miles away from Mozambique. These two countries have similar GDP (\$12.81 billion in Namibia compared to \$14.59 in Mozambique). Namibia has a relatively small population of only 2.1 million and 60 percent of the population lives below the poverty threshold (UNESCO Institute for Lifelong Learning, 2014b). The remarkable thing about Namibia, however, is its high rate of literacy, not only compared to Mozambique, but also in comparison to other African countries (see Figure 6). The total youth literacy rate is an astounding 92 percent, and the total adult literacy rate is 85 percent (87 percent of males and 83 percent of females – only a 5 percent difference compared to Mozambique's 18 percent gender disparity) (UNESCO Institute for Lifelong Learning, 2014b).

Figure 6: Literacy Rates in Africa



Source: UN Human Development Report 2011

After the country gained independence from South Africa in March 1990, the new Government of the Republic of Namibia (GRN) immediately set out to create one unified education system and mobilized itself to achieve five education sector goals: access, equity, quality, democracy and efficiency (USAID, 2006). The National Literacy Programme in Namibia (NLPN) was established in September 1992 and is designed to target out-of-school youth and illiterate and disadvantaged adults. The following objectives of NLPN are not only aims on which the program commendably achieves, but are also aims which any literacy initiative must successfully execute against in order to be effective:

- Promote literacy and numeracy skills in local (mother-tongue) languages and in English in order to enhance multicultural and multi-religious tolerance and understanding;
- Promote further learning among out-of-school youth and adults with a view to reducing existing educational inequalities;
- Improve people's communication capacity and self-confidence in order to create a well-informed citizenry;
- Enhance the participation of all people in the democratic process, including the exercising of their rights and responsibilities as citizens;

- Enhance the capacity of both youth and adults to become more productive and self-reliant; and
- Enable parents to participate in the improvement of their children's lives, particularly by exposing the parents to useful health practices and enabling them to share the knowledge, skills and educational practices gained through NLPN with their children (UNESCO Institute for Lifelong Learning, 2014b).

Perhaps the most impressive aspect of Namibia's education efforts is that it currently allocates more than 20 percent of its national budget to education, which represents six to seven percent of the country's total GDP, making it one of the three countries in the world with the highest percentage outlay towards education (USAID). Considering that a budget is a reflection of priorities, it is evident that Namibia is making concerted effort to achieve their education goals.

Methodology & Framework

The main purpose of this memorandum is to provide a cost-benefit analysis of the most effective strategies to improve literacy rates among females in Mozambique. My research identified which proposed solutions may be the most relevant and effective in the Mozambican context and then data was gathered to quantify the economic and social costs and benefits of implementation in order to see which alternative would produce the greatest net benefit for the stakeholders involved.

Success or failure of a strategy is determined solely on school attendance - that is, whether the said strategy actually increases females' access to schooling, making the assumption that a reduction in absenteeism would increase in the number of literate individuals. This metric was chosen for two main reasons. First, literacy rates increase significantly as the levels of completed schooling increase, in both developing and developed countries. Whether or not an individual ever went to school has the strongest and most significant effect on literacy, followed closely by highest grade completed and whether or not that individual is male (UNESCO, 2006). When looking at Census data across the world, most countries with

90 percent literacy rates or higher were found among those whose majority of citizens had at least four to six years of primary schooling (UNESCO, 2006). In fact, many statisticians use the number of years of schooling as a proxy variable for individual literacy due to the notion that the two are intimately linked.

The second justification for basing recommendations on school attendance is that educational outcomes are notoriously difficult to measure and education is often a hard sell for decision makers because of what they perceive as elusive outcomes. It would be extremely difficult to analyze the extent of the impact of a particular strategy on a learning outcome; whether or not that learning outcome was actually made available to an individual is a more realistic approach. What is being taught in the schools and how it is being taught is inconsequential when the learner is not even able to attend the school in the first place. In other words, it doesn't matter how well you teach a classroom that is half empty. Hence, development issues preventing females from attending school were the main focus – not educational pedagogy. Although this is not a perfect reflection of educational results, for purposes of this analysis, it will be assumed that if a girl is able to increase her attendance at school, then she will become “literate,” per the common definition of being able to read and write.

Strategic recommendations are based mainly on the net benefit total, which includes both the economic costs and social costs of the given alternative. However, moral considerations of fairness are also taken into account when considering recommendations.

Stakeholders

The Families of Mozambique

The families of Mozambique are the most substantial stakeholders in this analysis given that they personally bear the majority of the economic, emotional and physical costs of illiteracy, such as the health and financial disparities as previously discussed. They are also responsible for the direct costs of school attendance in the form of fees, uniforms, transportation, etc., and also the indirect opportunity costs. Although the focus of this analysis is the female population, particularly mothers, this stakeholder

comprises Mozambican families as a whole due to the fact that limiting data to only small segments of the population (such as *only* school-aged girls or *only* adult mothers) was essentially impossible with the available data.

The Government of Mozambique

It is the government of Mozambique that is responsible for funding much of the cost of education and literacy initiatives. As seen in the bolded rows in Figure 7, Mozambique’s Directorate of Literacy and Adult Education primarily oversees and funds all primary, secondary and adult education efforts. This entails the provision of buildings and facilities, teachers, training and curriculum. The government also bears the economic and social costs of having a high percentage illiterate population, which is translated into welfare, health and justice costs.

Figure 7: Provision and Administration of Youth and Adult Education in Mozambique

Type of Provision	Administrative Agency	Provider Category
Literacy	Directorate of Literacy and Adult Education	Government (with donor, NGO and church support)
Adult Education (Adult Basic Education or Post-Literacy)		
Teenagers and Children’s Literacy		
Functional Literacy	NGOs such as ALFALIT and REFLECT	NGOs
Non-Formal Education	NGOs	NGOs
Technical and Vocational Education and Training	Training centers (about 100)	Government
Private Sector		
Continuing Education and Professional Development	Eduardo Mondlane University Pedagogical University	Government, parastatal, private sector, professional bodies, etc.
Information, Communication Technology (ICT)	Various	Various
Higher Education	23 institutions of higher education	Public and private universities and other higher education institutions
Special Needs		NGOs, government
Religious, Cultural, Political	Churches, political parties	Faith-based organizations, political organizations

Source: Luis, 2012

Donors

Donors in the form of international community aid and non-governmental organizations play a large role in funding education and literacy initiatives (refer again to Figure 7) and providing humanitarian support. As Ruffer (2013) notes, “Mozambique is one of the most aid-dependent countries, with between 40 and 55 percent of the government budget financed through aid [from] development partners.” These entities are known as Programme Aid Partners (PAPs), a group of 19 nations and funding agencies that provide assistance to Mozambique to help the country reduce poverty under the *Millennial Development Goals*. Although this amount of donor support varies according to the policy or program and does not translate into a 50/50 split of the funding of education with the government of Mozambique, they play a large role in support for both primary and adult education and other literacy initiatives. It was not possible to distinguish between what the PAPs and the government funded and how the costs were split between the two, so I divided the costs separately with the recognition that there would be overlap. It is very common for the treatment of HIV/AIDS to be funded by external donors, and for purposes of this analysis, it was assumed that the PAPs would be primarily responsible for the provision of the materials required in the proposed alternatives.

Data Sources

Intergovernmental Agencies and Other International Institutions

All of the data regarding literacy rates in Mozambique were obtained through data obtained by The World Bank, United Nations Educational, Scientific and Cultural Organization (UNESCO) and the Open Society Initiative for Southern Africa (OSISA). Due to lack of proper reporting and evaluating techniques in lesser-developed countries such as Mozambique, I found this information to vary significantly from source to source, causing me to make estimates often. Nevertheless, these entities still possess the most credible data that can be obtained at this time and the variations should not undermine the reliability of this

analysis. And although cultures vary on their conceptualization of literacy, data on literacy tends to be the most easily available and valid for international comparisons (CIA).

Non-Governmental Organizations and Social Businesses

In order to assess the options of the most effective strategies for increasing literacy among females, I used data from NGOs and social businesses who work specifically in this arena. I had direct contact with No Poor Among Us and AfriPads, but many others were analyzed simply for their initiatives. It was through these entities that I discovered which of the development strategies were most crucial in aiding female's access to education, and then consequently reached out to these groups to obtain monetary estimates on how much they expend to address the given issue.

Research Studies

I obtained credible research studies for two purposes. First, to determine the costs of illiteracy in developing nations, particularly among the mothers. The majority of this data was found from the World Literacy Foundation's comprehensive assessment of the economic and social costs of illiteracy. Second, to establish the link between the proposed strategies and the actual impact they may or may not have on increasing school attendance.

Proposed Solutions

The proposed solutions for this policy memorandum include strategies undertaken in countries with a similar stage of development, namely, poverty-stricken countries with high levels of discrimination against women in Africa, the Middle East, and South Asia. I chose these alternatives based on what was made apparent in the research and also the priorities of the organizations who work in these countries to reduce illiteracy rates among females.

Notice that the alternatives are more specifically focused on school-aged girls rather than mothers, who remain the focal point of this memorandum due to the importance of maternal literacy. My intention

was to shift to focus from that of a reactive approach to a proactive approach. Maternal education entails concentrating efforts on educating women *after* they have gotten married and had children, rather than getting to the core of the issue, which is ensuring that girls are educated *before* they even become mothers. It is only when the barriers of entry to school for young girls are removed that Mozambique can realistically expect a reduction in illiteracy rates among adult women and a decrease in the disparity between illiteracy rates among females and males. Therefore, I chose to analyze solutions that will assist in preventing the problem, rather than trying to fix it after it has already occurred.

It should also be noted that only one of these proposed solutions would solely affect female school attendance (Alternative B), while the rest will also have an effect on the illiterate male population in Mozambique. I did not deem it necessary to separate the effects among genders in these circumstances. Male literacy rates in Mozambique are also at low levels compared to other developing countries and any efforts that would assist in raising rates among both genders are encouraged, although females will remain the focal point. Moreover, any gender-neutral solutions that raise literacy rates will naturally disproportionately benefit females in that they make up a greater percentage of the illiterate population.

The following are the four proposed solutions analyzed in this memorandum:

Status Quo: Adult Education

Since Mozambique began to recognize the importance of education and adult literacy in the late 1970s, literacy rates have risen significantly and are on a continuous upward trend, albeit gradual. The formal adult education program was established in 2002 and the government has given it strategic priority (UNESCO Institute for Lifelong Learning, 2014a). It lasts three years and ends with an examination at Grade 5 level and runs in regular school buildings, but resources are extremely limited and are unevenly distributed and oftentimes, adults have to use books that are designed for children (Luis). Retention rates remain problematic as adults have other familial and occupational claims on their time and many find it frustrating to spend one to three years merely learning the ability to read and write (Luis.)

Considering that it has not been that long since these policies and initiatives were put in place and notable progress has been made in this area in a relatively short while, if left to itself, the market may eventually just correct this problem with the existing infrastructure already in place. Literacy rates will most likely continue to rise at the same pace if Mozambique's government continues to implement current literacy adult education initiatives and as they naturally progress in their stages of development, as noted previously.

It should also be noted here that not all adult education programs analyzed were limited to women only, but women did make up the vast majority of the attendees. This was mainly due to the fact that there are far more adult women who are illiterate than there are adult men who are illiterate, but also because of the stigmatization and shame that many men feel by occupying a classroom full of women.

The barriers to adult education are not unique to developing countries in that the opportunity cost associated with requiring adult workers (those either officially employment or taking part in household labor) to attend class can be a major challenge for adults in the developed world, as well. Chao (2009) identified eight barriers to participation in adult learning, irrespective of development status:

1. *Situational*: A person's situation at a given time
2. *Institutional*: All practices and procedures that discourage adults from participation
3. *Dispositional / Psychological*: A person's attitudes about self and learning
4. *Informational*: A person is not aware of educational activities available
5. *Geographic Conditions*: Urban / rural / suburban divisions in relation to education opportunities
6. *Demographic Factors*: Age and sex influence who participates and does not participate
7. *Socio-Economic Conditions*: A person's background and place in society
8. *Cultural Determinants*: Minority groups more likely to be deterred than majority groups

In 2005, 662,416 adults were enrolled in the formal program of literacy and adult education in Mozambique; however, only 340,953 completed the programs with satisfactory learning results, making a

passing rate of only 51 percent (with only a little over half of these individuals being women.) This means that the adult education programs currently in place in Mozambique account for a 5.9 percent increase in literacy rates.

Alternative A: Sanitary Pads

According to the World Health Organization (2010), one in ten schoolgirls in Africa miss classes or drop out completely due to menstruation. Because of a lack of accessible, affordable and proper sanitary pads, some are forced to substitute pads or tampons with materials such as rags, newspaper, leaves, bark or even cow dung (Taylor, 2011). This leads to many females dropping out of school while they are on their menstrual cycle out of fear of embarrassment that their blood will not be contained and their classmates will notice stains on their clothing. This severely limits their mobility and thus, productivity, for about 20 percent of the school year (WHO). Having a girl start her period may also be used as a justification for her parents pulling her out of school, with the idea that if a girl is ready for motherhood, then she is ready for marriage.

However, this is part of a broader sanitation issue that creates implications for how a girl will properly manage her period while at school. Even if sanitary pads are available and utilized, the schools most often do not have facilities to privately change and wash them. Many schools, especially in the rural areas, do not even have running water or toilets and even if there is a water source nearby, it is not sanitary to wash sanitary pads in. Girls may also be very fearful or embarrassed having anyone know that they are menstruating with the prevalence of the cultural myth that exposed blood is believed to be used to cast spells (Macia). Sexual maturation is considered to be a taboo topic that is rarely discussed in households or schools, which is preventing this issue from being effectively addressed and raising awareness about the stigma of menstruation is also a factor that should be considered when approaching this topic. Because of a lack of education around this issue, many girls feel as though menstruation something to be ashamed of and is a form of pollution. In light of all of these additional concerns, however, it is merely the provision of

sanitary pads that will be addressed in this memo, based on the scenario that donors will provide for these products for all females over the age of 12. A study by the University of Oxford (2010) showed that by providing free sanitary protection at secondary schools in Ghana, girls the rate of absenteeism over six months was cut from about 21 percent of school days to about 9 percent of school days.

Alternative B: School Uniforms

Primary education is free in Mozambique, with the exception of some matriculated fees that families in poverty can get waived. However, all children attending school are required to wear a uniform, a cost borne directly by the families that is often prohibitive, especially if they have many children. If they are only able to afford a limited amount uniforms, the boys are usually sent to school while the girls stay home. Although this requirement can be difficult for many families, there is actually a rational explanation as to why students must wear uniforms. As George Ndege (2006) explains in *Customs and Culture of Mozambique*:

“[School uniforms] allow the students to see themselves as equal, thereby minimizing the problem of poor vs. rich children when children are allowed to dress as they deem fit. In such cases, students from poor families are inclined to see themselves as less fortunate, a development that can have an adverse impact on their learning.”

A second and more significant justification for uniforms is that they ensure the safety and easy identification of students. In a country with civil unrest, it is important to be able to know who should and should not be at the school, and in the terrible instances when something may happen to a child during their travel to or from school, a uniform can allow individuals to determine the school to which he or she belonged.

As mentioned above, only primary education is free in Mozambique, meaning that families are required to pay school fees in order to undertake secondary education. These fees also place a heavy financial burden on the family and it is a major reason for why both girls and boys do not go on to attend. However, fees for secondary education was not taken into consideration in this memorandum due to the

fact that the objective is only to gain basic literacy skills, which can be gained through completion of primary education (i.e. primary education goes up to Grade 7, but in order for adults to pass the basic literacy requirements in adult education, they are required to take a Grade 5-level examination.)

For girls, the uniform is typically a simple cotton dress that reaches to the knee and a pair of shoes, although some students in rural areas cannot afford shoes and they are still able to attend. Teachers enforce this uniform code, and therefore, it is not optional to attend school without the procurement of a uniform in most areas (although there are some instances in rural areas where it may not be as strictly enforced). Since this is major barrier preventing many females from attending school, supplying children with donated uniforms would greatly increase the number of children who are able to gain an education. In fact, a study undertaken by Innovation for Poverty Action in Kenya concluded that there is a strong correlation between receiving a school uniform and student school participation – the provision of a uniform reduced school absenteeism by 6.4 percentage points from a base of 15 percent school absenteeism (Kremer, 2004). Therefore, this alternative is based on the scenario that donors will provide for uniforms for all female and male children and youth whose families cannot afford them.

Alternative C: Mobile Learning

The potential threat of sexual harassment is a constant and pervasive problem for many young girls in Africa. And this threat exists in two different scopes. First, the location of many schools (particularly in rural areas) require that children travel substantial distances to attend. Not only are there often geographical barriers over lengthy or inhospitable terrain, but parents fear letting their girls travel alone to school with the danger of sexual assault along the way. Second, this danger persists once the girl is actually at the school where they are at risk of being sexually harassed and exploited by male teachers and students. Teachers have taken advantage of their position of authority to coerce sex from their female students (Anzia, 2007). Magnifying these problems is the fact that many schools do not have separate bathrooms for girls and boys, increasing the likelihood of sexual assault in non-supervised rooms (Anzia). These difficult conditions have

a serious effect on female school attendance, as Erika George, counsel to the Academic Freedom Program at Human Rights Watch, states, “Girls are learning that sexual violence and abuse are an inescapable part of going to school every day – so they don’t go.”

In a comprehensive report by Human Rights Watch (2001) regarding sexual violence against girls in South African schools, the recommendations included such strategies as adopting a National Plan of Action, providing funding for mental health and medical services of victims, having sexual violence and its prevention as an agenda item in schools and making training available to teachers (2001). But none of the solutions provided for any alternative form of education to be made available to the students whose parents did not feel comfortable sending them to school for fear of sexual assault. A mobile learning approach to learning would combat this issue of sexual harassment in schools. Although personal computers are more often associated with distance learning approaches, mobile phones are considered to be an appropriate device for educational delivery in the developing world according to a study by Kumar et al (2010):

“It is a low-power device that can be used in places without reliable electricity. Even though it is largely purchased for voice communications – which semi-literate users rely on for their social and economic needs – it is also able to run educational software that support visuals and voiceovers. Most of all, the cellphone is the fastest growing technology platform in the developing world. There are 2.2 billion mobile phones in developing regions like Africa and India, as compared to only 11 million desktops.”

In Mozambique, mobile networks provide the basis of their telecommunications infrastructure and there is a mobile penetration rate of 31.7 percent with 7.7 million mobile subscribers at the end of 2011 (Infoasaid, 2012). However, mobile phone ownership is heavily concentrated in urban areas and signals often do not extend far beyond the main urban centers of each district. This being said, The Kumar et al study regarding unsupervised mobile learning in rural India concluded with cautious optimism that providing mobile service and phones to students in rural areas would effectively enable them to supplement their formal education

with informal learning and result in the desired education outcomes (2010). It is a technology that has the potential to essentially enable policy makers to leapfrog e-learning. Mobile learning approaches would allow students to learn in a safer environment, while also providing flexibility with their school schedules by drastically minimizing the amount of time and distance they are required to travel to school, allowing children and youth to fit their school schedule around the work they are required to do at home.

Cost-Benefit Analysis

I conducted an ex ante cost-benefit analysis to assess the viability of the proposed policy recommendations and measure the extent of the impact of implementation on school attendance in Mozambique. This quantification is displayed in the full monetization matrix below.

However, I found that Alternative C regarding mobile learning was not a viable alternative to be included in the CBA at this time because, as indicated by The World Bank (2013b), “There are still precious few widespread examples of the use of [mobile] phones for education purposes inside or outside of classrooms in developing countries that have been well documented, and fewer still that have been evaluated with any sort of rigor.” Because its potential and practicality is only barely starting to be realized and Mozambique’s telecommunication infrastructure is not quite robust enough yet to support such a platform for the education of its citizens, the costs and benefits of mobile learning are not able to be quantified at this time and only the status quo and alternatives A and B were included in the full monetization. A second matrix consisting of a qualitative ranking of the status quo and all three alternatives is provided to compensate for this lack of quantifiable data.

Full Monetization Matrix

The three stakeholders previously identified are assigned weights in the left column of the matrix. All weights sum to 1.0. This CBA does not multiply these weights throughout the relevant cells and instead is merely an indication of each stakeholders’ degree of importance. All variables are in annual units and

therefore reflect the impact over a given year. Explanations for each of the line items and their corresponding data sources and calculations can be found in Appendices I and II. The costs and benefits associated with each stakeholder were extracted from the previously identified research on the economic and social costs of illiteracy. After calculating the cost for each line item, I applied the applicable percent increase or decrease for each of the given alternatives, for example, what the cost of child mortality would be due to increased attendance in school. As explained in detail in Appendix II, I applied a 5.9 percent difference for the status quo (accounting for the impact of current adult education efforts), a 17.7 percent difference for Alternative A (accounting for the impact if every girl over the age of 12 was provided with sanitary pads) and a 43.7 percent difference for Alternative B (accounting for the impact if every child were provided with a uniform). Any amount of decrease in cost for a given alternative is expressed as a benefit in the corresponding benefit cell. A brief synopsis of the costs (and corresponding benefits) for each of the stakeholders are as follows:

- *The Families of Mozambique*
 - The cost of providing school uniforms for their children
 - The cost of decreased earnings due to illiteracy
 - The cost of life due to increased child mortality rates due to illiteracy
 - The opportunity cost of attending school in place of paid or unpaid labor
- *The Government of Mozambique*
 - The percent cost of Gross Domestic Product that illiteracy causes due to increased spending on social services such as welfare, health and justice
 - The cost of providing education to its citizens (including primary, secondary and adult)
- *Donors*
 - The cost of treating individuals with HIV/AIDS due to illiteracy
 - The cost of providing sanitary pads (Alternative A) or uniforms (Alternative B)

Cost-Benefit Analysis for Female Literacy Initiatives in Mozambique, 2013			
	SQ: Adult Education	A: Sanitary Pads	B: Uniforms
COSTS			
Families of Mozambique (.6)			
Uniform Provision	34,364,743	40,447,300	34,364,743
Lost Earnings	517,641,930	517,641,930	517,641,930
Increased Child Mortality	324,428,279,697	324,428,279,697	324,428,279,697
Opportunity Cost	436,942,518	436,942,518	436,942,518
Government of Mozambique (.2)			
GDP Cost (Welfare, Health & Justice)	72,950,000	72,950,000	72,950,000
Education Spending (Increased Primary/Secondary)	730,959,000	779,581,154	851,003,529
Donors (.2)			
HIV/AIDS Treatment	105,881,250	105,881,250	105,881,250
Uniform Provision	N/A	N/A	19,079,970
Sanitary Product Provision	N/A	2,930,800	N/A
TOTAL COSTS	326,327,019,138	326,381,723,849	326,466,143,637
BENEFITS			
Families of Mozambique (.6)			
Uniform Provision	0	0	0
Additional Earnings	30,539,280	91,622,621	226,209,523
Decreased Child Mortality	19,141,268,502	57,423,805,506	141,775,158,227
Reduced Opportunity Cost	0	77,338,825	190,943,880
Government of Mozambique (.2)			
GDP Benefit (Welfare, Health & Justice)	4,304,050	12,912,150	31,879,150
Education Spending (Decreased Adult)	0	10,280,272	25,381,237
Donors (.2)			
HIV/AIDS Treatment	6,246,993	18,740,981	46,270,106
Uniform Provision	N/A	N/A	0
Sanitary Product Provision	N/A	0	N/A
TOTAL BENEFITS	19,182,358,825	57,634,700,355	142,295,842,123
NET BENEFITS	-307,144,660,313	-268,747,023,494	-184,170,301,514

Data calculated and extracted from Excel (2013) spreadsheet by author

Sensitivity Analysis

Because the above CBA is a product of many assumptions, it is necessary to perform a sensitivity analysis in order to demonstrate how the results would respond to changes in demographics and market forces. I undertook this analysis on with the proposed solution with the greatest net benefit: the provision of uniforms.

Two types of sensitivity analyses were conducted. First, an analysis with a ± 10 percent variance in Mozambique's mortality rate to see how would impact the costs and benefits associated with child mortality. The original calculation was based on a mortality rate of 168 / 1000:

Sensitivity Analysis of Alternative B: Uniforms			
With a $\pm 10\%$ Variance in Mortality Rate			
	Original	10% Increase	10% Decrease
COSTS			
Families of Mozambique	325,417,228,888	357,860,056,857	292,974,400,919
Government of Mozambique	923,953,529	923,953,529	923,953,529
Donors	124,961,220	124,961,220	124,961,220
TOTAL COSTS	326,466,143,637	358,908,971,606	294,023,315,668
BENEFITS			
Families of Mozambique	142,192,311,630	156,369,827,453	128,014,795,808
Government of Mozambique	57,260,387	57,260,387	57,260,387
Donors	46,270,106	46,270,106	46,270,106
TOTAL BENEFITS	142,295,842,123	156,473,357,946	128,118,326,301
NET BENEFITS	-184,170,301,514	-202,435,613,660	-165,904,989,367

Data calculated and extracted from Excel (2013) spreadsheet by author

As is shown in the total net benefit calculations above, these deviations in Mozambique's mortality rate would significantly impact the costs associated with the loss of life of children of illiterate mothers.

The second analysis calculated a ± 10 percent variance in Mozambique's level of gross domestic product to see how it would impact the costs and benefits associated with the social services provided to its citizens in the form of welfare, health and justice spending. The original calculation was based off of .05 percent of GDP cost associated with illiteracy:

Sensitivity Analysis of Alternative B: Uniforms			
With a <u>±</u> 10% Variance in Level of Gross Domestic Product			
	Original	10% Increase	10% Decrease
COSTS			
Families of Mozambique	325,417,228,888	325,417,228,888	325,417,228,888
Government of Mozambique	923,953,529	931,248,529	916,658,529
Donors	124,961,220	124,961,220	124,961,220
TOTAL COSTS	326,466,143,637	326,473,438,637	326,458,848,637
BENEFITS			
Families of Mozambique	142,192,311,630	142,192,311,630	142,192,311,630
Government of Mozambique	57,260,387	60,448,302	54,072,472
Donors	46,270,106	46,270,106	46,270,106
TOTAL BENEFITS	142,295,842,123	142,299,030,038	142,292,654,208
NET BENEFITS	-184,170,301,514	-184,174,408,599	-184,166,194,429

Data calculated and extracted from Excel (2013) spreadsheet by author

Although not as substantial as deviations in the mortality rate, deviations in the level of GDP would change the amount of national spending on welfare, health and criminal justice due to illiterate individuals by about a \$4 million increase or decrease.

Qualitative Ranking Matrix

Given that the mobile learning alternative does not lend itself to quantification at this time, I have provided a second matrix that ranks the status quo and each alternative qualitatively so that the strengths and weaknesses of each solution can still be given proper consideration. In the following matrix, I have given the status quo and each of the alternatives a score from 1 to 5 with one being less favorable and five being more favorable. These scores are subjectively based on data and information identified in the previously mentioned research studies and projects undertaken by intergovernmental agencies and non-governmental organizations. For example, safety scores were high for mobile learning as the children are not required to travel to school and submit themselves to sexual harassment that may occur during the

journey or at the school itself. However, sanitary pads ranked lower in safety because although the provision of pads will aid with a girl’s personal hygiene, many schools do not have proper bathroom facilities in which girls can privately change and dispose of her pads and there are dangers associated with the taboo of menstruation. The conditions in the columns below were evaluated as follows:

- *School Attendance*: How does this solution impact an individuals’ ability to attend school?
- *Family Expense*: What amount of expense does this solution place on the family?
- *Political Feasibility*: What is the likelihood that the government of Mozambique and/or donors will support this solution?
- *Infrastructure Support*: Does the country have the necessary physical and organizational structures in place to operate this solution?
- *Socially Acceptable*: Will this solution be generally accepted among the citizens of Mozambique, particularly in regard to the masculinity culture?
- *Safety*: What impact does this solution have on the safety and health of the citizens of Mozambique?

Qualitative CBA Summary for Female Literacy Initiatives in Mozambique

	School Attendance	Family Expense	Political Feasibility	Infrastructure Support	Socially Acceptable	Safety/ Health	Total Score
Adult Education	2	3	4	1	2	3	15
Sanitary Pads	4	4	2	2	2	2	16
Uniforms	4	4	2	4	4	3	21
Mobile Learning	5	3	2	1	3	5	19

Although it must be remembered that the above rankings are subjective, it is interesting to note not only that the provision of uniforms was again determined to be the most desirable approach and current adult education initiatives to be the least desirable, but also that mobile learning is still a viable contestant in looking at alternative approaches to increasing literacy rates among females in Mozambique, ranking second out of the four.

Strategic Recommendations

The recommendation for this memorandum is that the government of Mozambique and the donors seriously consider providing uniforms free of charge to the children and youth of Mozambique, female and male, whose families are not able to afford such a cost of school attendance. This recommendation is based strictly off of the fully monetized cost-benefit analysis, as it is evident that this alternative would yield the greatest net benefit for all stakeholders. Following through with this undertaking would save the families of Mozambique, the government of Mozambique and donors an estimated \$123 billion compared to current efforts by shifting about \$19 million to this initiative.

It is important to note that although the provision of uniforms would assuredly assist in dramatically improving literacy rates among females in Mozambique, the implementation of this recommendation would not “solve” the illiteracy problem in this country. Considering that providing a student with a uniform increased her/his chances of attending school by 43.7 percent, there is still an additional 56 percent of factors unaccounted for as to why these children would not be attending school. As has been previously discussed, these factors include the many systemic, cultural and developmental barriers that continue to prevent girls and women from participating in the formal education system. It is evident that this is a problem that will require a multi-dimensional solution that addresses all of these issues in some form in order to be most effective and reach the optimal outcome for the country. And as with any undertaking in developing countries with limited resources, one of the greatest challenges will also be making the initiative

sustainable and ensuring that proper time, money and attention continue to be allocated and accountability mechanisms are put in place.

Additionally, I believe that the mobile learning approach should still be viewed as a credible solution to anyone devoted to this issue. Although the infrastructural support is not yet in place in Mozambique due to limited cellular phone coverage and internet access, “penetration of mobile cellular Internet is rising rapidly in Africa and other developing countries because of the availability and relatively low cost of Internet access, text and voice through cellular networks, especially compared to broadband Internet” (Olson, J et al 2011). It is obviously difficult to ascertain when such technology will be made accessible to the citizens of Mozambique, but in looking at the technological progress that has been made in just the past short while, this alternative may become increasingly practical in the not-to-distant future. It is an exciting and hopeful endeavor considering that mobile learning approaches have the ability to use technology to leapfrog many of these challenges that have been previously discussed to provide a more equitable and sustainable solution.

Weaknesses and Limitations

There are several issues that stem from using literacy rates as an indicator of educational achievement and development. First, when used on their own, these rates do not tell us if they are a result of an inadequate educational system or if children had to leave school to go home and work. Second, there is danger in viewing literacy as a dichotomous variable and ignoring the complexity that extends beyond an individual merely being “literate” or “illiterate.” Third, it pays no attention to other skills than an individual has than may be just as valuable. And fourth, official literacy rates are based off of one of three assessments:

1. *Self-declaration*: respondents report literacy levels as part of a census questionnaire;
2. *Third-party opinion*: the head of household reports on level of household numbers;

3. *Education proxy*: number of years of schooling is used to determine the level of literacy (UNESCO, 2006).

These assessment methods vary from region to region and may not be accurate reflections of the reality of illiteracy. Because of these validity concerns, literacy rates may not be sufficient justification for political interventions.

It is also very difficult to obtain detailed information in developing countries regarding current literacy and adult education initiatives and literacy rates. This is where the majority of the weaknesses stem for this memorandum and its cost-benefit analysis. This is mainly due to the fact that Mozambique's National Directorate for Literacy and Adult Education does not have capability to determine the number, location, coverage, and capacity of institutions and personnel, lacks information on the sources and scale of funding for adult education, and has no evaluation and monitoring mechanism in place to see if methods are fulfilling their objectives and are cost-effective. Although I was able to access most of my desired data, it was often inconsistent when cross-checked with other sources and oftentimes current data was not available (this was not a problem for monetary data as I was able to just adjust for inflation, but for non-monetary data such as enrollment rates, it was much more problematic). Therefore, I was required to patch together data from many different sources. This being said, I feel as though suitable effort was put in to ensure that the most accurate data could be found from the most dependable sources. As with any development project, there will inevitably be an issue with reliability.

Considering that most of my calculations were determined in some part by how many children, youth or adults were enrolled in the education system, it is critical to address the three major problems that I came across with enrollment data:

1. There is obviously a major difference between "enrollment rates" and "attendance rates" and the data most often reported the former. Although I attempted to address the issue of retention in my

analysis, these numbers do not accurately represent the number of students *actually* attending school.

2. When reporting enrollment rates, there was no delineation made between gross enrollment (total number of students, including “repeaters” and net enrollment (total number of students of the official school age). The latter more accurately captures the education systems coverage and internal efficiency (The World Bank, 2014). If the data I used was gross enrollment (which is highly likely), then this will slightly skew the data.
3. As previously discussed, there is minimal data for current enrollment rates so the most recent I found was between the years 2005 and 2010. I did not adjust these numbers because I had no data to indicate the rate of increased participation, but these numbers have assuredly risen by 2013 because enrolment has been on a continued upward trend.

Additional Research

This analysis was to initially be an evaluation of educational strategies to ensure that females in Mozambique were participating in the best learning environment for their needs. Research suggests that female education needs to be coupled with either instruction on rights-awareness or a hands-on utilization learning techniques to ensure that these women will feel as though they are deserving and capable of leveraging their skills and understanding how it will be relevant to their everyday lives (Kabeer, 2010). Although more advanced levels of literacy are currently overly-ambitious for a population of individuals who are barely meeting even the most basic requirements, the more comprehensive definition of literacy that includes actual utilization of these skills is the obvious next step. But as the Open Society Initiative for Southern Africa states the problem remains that “although the official Ministry of Education and Culture definition of adult education as being essential for social, political and economic development, evidence suggests that the current system is unable to link adult education to community participation in local development, and that its main focus remains reading, writing and numeracy as ends themselves” (Luis).

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Appendix I: Implications of Proposed Solutions

Status Quo

The Open Society Initiative for Southern Africa (OPSISA) reports that 46 percent of the adult (15+) population is illiterate (Luis). When looking at the population by age, there is an adult population of 12,503,430 (African Development Bank Group). I used this data to calculate the number of illiterate adults in Mozambique to be 5,751,577.

In 2005, 662,416 adults were enrolled in the formal program of literacy and adult education in Mozambique (Luis). However, only 340,953 completed the programs with satisfactory learning results, making a passing rate of only 51 percent (with only a little over half of these individuals being women.) This means that the adult education programs currently in place in Mozambique account for a 5.9 percent increase in literacy rates. Therefore, I made the assumption that the status quo would create a 5.9 percent reduction in relevant costs and benefits.

Alternative A: Sanitary Pads

A study by the University of Oxford (2010) showed that by providing free sanitary protection at secondary schools in Ghana, girls missed ‘significantly less’ school. On average, the rate of absenteeism over six months was cut by slightly more than half, from about 21 percent of school days to about 9 percent of school days. This means that there was a 57.1 percent increase in attendance due to the provision of sanitary pads.

However, this proposed solution is unique from the others in that it would only affect the attendance rates of females who have begun menstruation, which starts at the average age of 12 for most girls (Hitti, 2006). Based on data from OSISA (Luis), this amounts to 34 percent of the out-of-school aged children. Therefore, by the 57.1 percent by this percentage of the population, I made the assumption that the status quo would create a 17.7 percent reduction in absenteeism and adjusted each relevant cost and benefit accordingly.

Alternative B: Uniforms

A study undertaken by Innovation for Poverty Action in Kenya concluded that there is a strong correlation between receiving a school uniform and student school participation - the provision of a uniform reduced school absenteeism by 6.4 percentage points from a base of 15 percent school absenteeism (Kremer, 2004). This means that there was a 43.7 percent increase in attendance due to the provision of uniforms. Given that my measure of success is school attendance, I assumed that the reduction of absenteeism translated into an increase in the number of literate individuals and adjusted each relevant cell accordingly with the 43.7 percent decrease in costs or increase in benefits.

Appendix II: Line Items and Modifications Explained

Uniform Provision

Although mandatory school fees were abolished from the Mozambican public school system in 2005, it is still required that all students wear uniforms to attend school, which can be cost prohibitive for many families considering that over half of the population lives below the income poverty line of \$1 per day. Innovations for Poverty Actions who conducted a study on the link between uniforms and absenteeism in Kenya reported that average cost for uniforms is \$6.09 (Kremer, 2004). In looking at African Development Bank Group's data regarding population by age in Mozambique (2013), there are currently 8,820,150 citizens who are part of the school-aged population (ages 6-19). Taking the data from OPSISA (Luis) regarding the number of school-aged children and youth out of school (1,993,000 and 1,140,000, respectively) in 2010, I calculated the number of individuals actually attending school, multiplied by the cost per unit of uniforms, amounting to \$34,634,743.

It is most often through donors (NGOs and humanitarian organizations) that uniforms are provided to children in need in Mozambique. Therefore, the cost of supplying uniforms was shifted to this stakeholder and away from the families in alternative B. However, this calculation was based on the assumption that a uniform would be provided to every illiterate child, which is not necessarily a realistic pursuit.

Status Quo: No changes to Families of Mozambique or Donors

Alternative A: 17.7 percent increase in number of children and youth needing uniforms

Alternative B: Cost remained same for Families of Mozambique already paying for uniforms; cost shifted to Donors for remaining out-of-school aged children whose families are unable to provide uniforms

Earnings

According to Department for International Development (2007), the average annual income (GNI) per person in Mozambique is \$250 USD. Given that illiterate individuals earn 30-42 percent less than their literate counterparts (Martinez & Fernandez 2010), I took the average of 36 percent and found that this was a difference of \$90 USD per year. OPSISA reports that 46 percent of the adult (15+) population is illiterate. When again looking at the population by age, there is an adult population of 12,503,430. Therefore, I calculated the number of illiterate adults multiplied by a loss of \$90 in earnings per year, amounting to \$517,641,930.

Status Quo: 5.9 percent reduction

Alternative A: 17.7 percent reduction

Alternative B: 43.7 percent reduction

Child Mortality

According to UNESCO (2010), in developing countries, a child born to a mother who can read is 50 percent more likely to survive past the age of 5. I used Bowland & Beghin's estimate of value of a statistical life for developing countries to find that willingness-to-pay estimates were in the ranges of \$519,000 to \$670,000 per life based on 1992 Purchasing Power Parity USD (2001). I took the average of these two estimates (\$597,000) and adjusted for inflation in 2013 USD (\$996,343.21). Currently, there is an under-five mortality rate of 168 per 1000 live births (Republic of Mozambique Ministry of Health 2009). With 3,876,420 live births in Mozambique in 2009 (The African Development Bank Group, 2013), this amounts

to 651,238 deaths per year. Figure 8 shows the main causes of death for children under 5 in Mozambique. I made the assumption that all of these categories of causes of death would be more easily prevented with an increase in literacy rates (given literacy's inextricable link with poverty and health problems). I split the number of deaths in half (as that would be the number of deaths that could be prevented by increasing literacy rates) and then calculated the cost per life, amounting to \$324,428,279,697.

Figure 8: Cause-Specific Mortality Fractions by Main Categories of Causes of Death, for Various Age Groups; Mozambique, Overall

Cause of death	Percentage of deaths*				
	neonatal	post-neonatal	infant	child (1-4y)	under five
<i>n</i>	718	1425	2143	1718	3861
Gastro-intestinal infectious diseases	N/A*	9.1	5.9	7.9	6.7
HIV/AIDS	1.4	10.5	7.2	13.1	9.8
Malaria	4.8	33.3	23.1	46.2	33.2
Meningitis	N/A	3.4	2.2	2.4	2.3
Acute lower respiratory infections	2.2	19.2	13.1	6.3	10.1
Other infectious diseases	3.9	10.0	7.8	2.0	5.3
Malnutrition	N/A	2.8	1.8	6.4	3.8
Prematurity	34.9	1.6	13.6	0	7.6
Birth asphyxia	24.3	N/A	8.8	0	4.9
Sepsis of newborn	16.7	N/A	6.0	0	3.4
Other causes	11.9	10.0	10.7	15.7	12.9

Source: Republic of Mozambique Ministry of Health, 2009

Status Quo: 5.9 percent reduction

Alternative A: 17.7 percent reduction

Alternative B: 43.7 percent reduction

Opportunity Cost

In 1999, Uganda's Ministry of Gender, Labour and Social Development, in collaboration with the World Bank, conducted an evaluation of the Functional Adult Literacy (FAL) programs in Uganda, which proved to be fairly effective at decreasing literacy rates among the populations it served. The researchers in this study calculated the opportunity cost for the adults to attend to FAL program when they could be at their places of employment – a very important factor to take into account considering that many of these illiterate individuals are in poverty to begin with. Current per capita income in Uganda was \$180. Therefore, if they were to participate in the program, it would cost 4 hours per week at \$1.08 (estimating \$.27 per hour based on a 40 hour work week over 50 weeks), or over the year at \$54 (Okech, et al). Adjusted for inflation, this amounts to \$75.89. Multiplying this by the number of illiterate adults, amounting to \$436,942,518.

Status Quo: No changes

Alternative A: 17.7 percent reduction

Alternative B: 43.7 percent reduction

GDP (Welfare, Health & Justice)

According to the World Literacy Foundation, illiteracy costs a developing country about 0.5 percent of GDP (Cree, Kay & Steward 2012). These figures are based on a sample study of countries in each category based upon UNESCO's mathematical formula for calculating the economic impact of illiteracy. These estimates reflect the level of spending on social services such as welfare, health and the justice system. Given that Mozambique's GDP is \$14.59 billion (official exchange rate), the cost of illiteracy in these terms is \$72,950,000.

Status Quo: 5.9 percent reduction

Alternative A: 17.7 percent reduction

Alternative B: 43.7 percent reduction

Education Spending (Primary, Secondary & Adult)

The most recent data on Mozambique's spending on education as a percent of GDP is 5.01 percent in 2006. Given that Mozambique's GDP is 14.59 billion, education spending amounts to \$730,959,000.

To account for increased attendance at school in alternatives 1 and 2, I utilized data from The World Bank (Fox, et al, 2012) that estimated per student costs in Mozambique at around 1,780 MZN for primary and 3,700 MZN for secondary. Because there was no way to calculate which level of education the increased attendance would affect, I averaged these two numbers and converted to USD, which amounted to \$87.68 per student. Having previously calculated the number of school-aged children and youth out of school to be 3,133,000 (Luis), I decreased this number by the percent reduction assumed by the alternatives and multiplied that increased number of students by \$87.68 to determine how much more the Government of Mozambique would have to spend to account for this influx of students.

In that alternatives 1 and 2 would reduce the demand for adult education in subsequent years, an added benefit is the reduction of cost for adult education. I could not find data on cost-per-pupil for adults so I made the assumption that it was the same as it was for children and youth used this in conjunction with the total number of adults enrolled in adult education in Mozambique (662,416) to account for this decrease in spending.

Status Quo: No changes

Alternative A: 17.7 percent increase in Primary and Secondary attendance; 17.7 percent decrease in Adult attendance

Alternative B: 43.7 percent increase in Primary and Secondary attendance; 43.7 percent decrease in Adult attendance

HIV/AIDS Treatment

I decided to put the cost of treating individuals who have HIV/AIDS under this stakeholder because the main funders of this treatment are donors, such as international humanitarian organizations. Individuals with little or no education may be 2.2 times more likely to contract HIV as those who have completed primary education (De Walque 2004). And according to Menzies, Berruti & Blandford (2012), the average annual per-patient costs are \$177 for pre-Antiretroviral (ART) therapy, \$353 for patients in the first 6 months of ART and \$222 for patients on ART for over 6 months. The average of all three of these costs is \$250. Taking the number of illiterate adults (15+) previously calculated (5,751,577) and considering that

16.2 percent of the adult population has HIV (UNFPA 2005), I calculated the cost of treatment for the illiterate adult population, amounting to \$105,881,250

Status Quo: 5.9 percent reduction

Alternative A: 17.7 percent reduction

Alternative B: 43.7 percent reduction

Sanitary Product Provision

I obtained the data for the pricing of the provision of sanitary pads from AFRIPads, a social business that curbs the rates of menstruation-related absenteeism among primary and secondary schoolgirls in Uganda. (AFRIPads, 2013). They provide washable, cloth sanitary pads that provide complete menstrual protection for up to one year (12 cycles) for 11,000 UGX, or \$4.31. Considering that there are currently 680,000 out-of-school aged females over the age of twelve in Mozambique (Luis) and making the assumption that none of them have access to sufficient sanitary pads, I multiplied these numbers to get a total of \$2,930,800

Status Quo: N/A

Alternative A: Cost of \$2,930,800 to donors

Alternative B: N/A