IPRAD

COST OF GENDER DISPARITIES IN ACCESS TO SOCIO-ECONOMIC SERVICES IN MALAWI

Research Report # 0302

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Abstract

Cost benefit analyses of increasing men's and women's literacy and access to agriculture services as planned in the Malawi Poverty Reduction Strategy Paper show that there are substantial net economic benefits in implementing the plans. *But the analyses also show that there are significant incremental net economic benefits of doing this while closing the gender disparities in access to these services.* It is also shown to be economically worthwhile to implement activities of the National Strategic Plan to end Gender Based Violence. With these benefits, GDP can grow at a rate that is at least twice the average annual growth rate of the past five years.

1. Introduction

This is a report of the findings of Cost Benefit Analyses (CBA) of the gender disparities in literacy and access to agriculture services in Malawi, and the interventions to redress it and also of activities to reduce Gender Based Violence (GBV). The purpose of the study is to provide information to assist in advocating for and planning programs that are gender responsive, and thereby contribute to overall national economic growth and poverty reduction. The objective of the study is to estimate the incremental financial benefits of addressing the gender disparities. A review of the Malawi Poverty Reduction Strategy Paper (MPRSP) process showed that there was no gender rationalization of the allocation of resources and the setting of targets (Gender Studies and Outreach Unit, 2001). This study aims to show the economic gains of gender targeting of expenditures and reducing gender inequalities.

Gender inequalities persist in participation in or access to benefits of development all over the world (Tinker 1990; UNIFEM 2000). In Malawi women are disadvantaged in terms of access to health, education, and agriculture services (Semu et al 2003; Ngwira et al 2000; Bernbaum, 1999; Castro-Leal 1996; Ngalande Banda 1995). The debate on the importance of the gender variable in economic and social policy analysis revolves around two issues. The first one is whether women and girls or female-headed households should be the special targets of programs like credit, education etc, that do not provide for biologically determined roles (Buvinic and Gupta 1995; Kabber 1997). The second issue is whether gender inequalities impede economic growth, which is considered a condition for poverty reduction.

The implementation of gender sensitive programs usually requires that there be gender targeting in service delivery, and specifically that women should be given priority or quotas in access to the benefits or resources of development programs. This is a contentious issue. Although much of the recent literature does indicate that women are disadvantaged in terms of access to social and economic services, it is not always easy to show that women or female headed households deserve to be a special target of programs. The evidence is at best mixed (Lampietti and Stalker 2000). For example, Appleton (1995b:5) reports, and to appearances as if contradicting himself:

> In Uganda, woman headed households as a whole do not appear to be poorer when assessed by consumption and income. Although women do work longer hours, there is no evidence that woman headed households' parity in incomes and consumption is brought at the expense of a further burden on women's time. Women headed households have less

> land, but ownership of this asset is not associated with higher welfare. They also have fewer other assets but this is to some degree offset by higher food consumption. All this suggests that women should not be designated as a targeted group on which poverty alleviation economic intervention should be focused. In Uganda gender of head of households provides no information on the economic status of the household. However the same is not true of a number of social indicators: compared to man-headed households, in woman-headed households girls are less likely to be enrolled in school, the sick are less likely to be sent for treatment, and mortality rates are higher.

Chant (1997) reporting on research in Mexico, Costa Rica and the Philippines, summarized her findings in the following way:

> 'the poorest of the poor' is a misleading stereotype for female headed households…. A central tenet of the argument is that aggregate household incomes tell us relatively little about poverty and that the examination of intrahousehold characteristics is vital for understanding economic vulnerability. Moreover, while stress on poverty of female headed households highlights the fact that women are disadvantaged by gender inequality, undue emphasis on material privation negates other elements (for example ideological, psychological, and legal- institutional factors) which are important in the formation and survival of women headed households, and which may mean more in terms of personal perceptions and experience of hardship than economic factors per se (p27).

Some of these conclusions depend on the research design. For example, unlike Appleton 1995 cited above, Tabaijuka (1994) found that:

> In Tanzania, reducing the time burdens of women could increase the household cash incomes for smallholder coffee and banana growers by 10%, labor productivity by 15%, and capital productivity by 44%.

However, for Malawi, the results of the Integrated Household Survey conducted by the National Statistical office show that the sex of head of household is a statistically significant explanatory variable for poverty, even when poverty is measured using consumption expenditure.

Other studies and literature still indicate the benefits of giving special attention to female headed households and women. This is mostly in the new areas of public expenditure management and gender budgeting (Budlender and Ngwira 1999; Tanzania Gender Networking Program 1999). It is argued and demonstrated that gender targeting of public expenditures increases the efficiency and effectiveness of the expenditures.

Gender relations tend to result in distortions leading to created by biased and absent markets. Cut backs in public expenditures that are characteristic features of the policy prescriptions of the IMF and World Bank often worsen these distortions and crowd out women's contribution to economic growth. New approaches to macroeconomics that stress the complementarities of public and private investment (e.g. Bacha 1994) and production activities open the way for examining taxation and public expenditure through a gender lens to reveal how spreading the burden of the reproductive tax[1] can promote the development of well functioning labour markets and contribute to equitable and sustainable growth (Palmer 1995:1981).

[1] The time and resources extorted from (mostly) women as they try to fill in the gap left by the withdrawal of the government from the social sectors, due to expenditure cuts of the SAPs.

Redistributing the reproductive tax can take the form of public spending to reduce the workload of women. For example public expenditures can be used to reduce the cost to households of sending girls to school through for example child day care programs to take up a chore done by girls, or through reducing the distance travelled to fetch water and firewood. Sometimes the actual financial cost of sending girls to school can be subsidised directly (Rose and Al-Samarrai 1997). These kinds of public expenditures can accelerate the attainment of universal enrolment. The result is higher productivity of the women and girls later in their life, with consequent gains in economic growth.

The World Bank used available survey data on enrolment rates by gender and income quintiles, price elasticities of demand for girls' and boys' primary schooling, and published data on the share of private expenditures in total education expenditures in developing countries, to estimate the cost increment of gender targeting the expenditures. The findings were that a cut in cost recovery that got every school age child to school, and was gender targeted would cost 20.35% more in public resources and 33.33% if no gender targeting was followed. Cutting cost of primary education for both poor boys and girls, and increasing enrolment without necessarily targeting girls would need 16.16% more resources, and if gender targeting is followed, the increase in public resources required would be 7.93% (World Bank 2000:33).

The debate thus continues on whether to target women headed households. What is clear is that where as woman headed households may not have significantly lower average incomes, they fare badly in terms of indicators of human capabilities like health, education and employment (labor allocation) that are the important determinants of productivity and economic growth.

This leads to the second issue of whether gender inequalities impact the growth rate of an economy, and the speed of poverty reduction. Studies show evidence of a relationship between gender inequality and growth (Tinker 1989; Forestrythe et al 2000; World Bank 2000). Klasen (1999) estimated that if Sub-Saharan Africa had the growth in the gendered ratio of educational attainments of East Asia, economic growth would have been 0.5% points higher, and that the differential in education and employment opportunities between men and women served to reduce annual per capita growth by 0.8 % points. This is significant given that average annual growth in SSA stood at only 0.7% between 1960 and 1992.The magnitudes of effects give credence to the argument that one important element in Africa's slow growth may be its high gender inequality in education and employment (Blackden and Bhanu 1999).

There are similar findings relating to poverty reduction. Using simulations based on a semi-log function for consumption expenditures, the data from the IHS lead to the conclusion that 'the most effective and sustainable way of reducing poverty is higher levels of educational attainment, especially for girls and women'. The report suggests that increasing by one the number of women with high school education in households with women without high school, would lead to a 10% point drop in the head count of the poor (Poverty Monitoring System Policy Brief No.5). One channel through which this works is that educated women want less children so that per capita consumption of their families goes up. The other channel is that women are able to move into jobs in the service sector and get higher incomes.

At the sectoral level, studies in Malawi and Zambia (Due and Gladwin 1991) show that efficiency is lost when women have less access to productive resources. Women's labor tends to be under-utilized in formal production processes, and over-utilized in informal activities. As women's and men's labor has the same productivity, the equimarginal principles of optimization are violated, and the result is allocative inefficiency (Quisumbing 1996). This justifies raising the level of resources given to women.

In Burkina Faso, Udry et al 1995 found that if existing resources are shifted between men's and women's plots within the same household, output could be increased by 10-20%.

Chant (1997) cautions that although the intention of pointing to the deprivation in female headed households and the economic consequences of gender inequalities is welcome so as to legitimate reallocation of resources to them, it has the unintended effect of feeding

> into negative images of, and attitudes towards, women headed households. This can act to depress the social and civil legitimacy of female headed households and, arguably to reinforce the idea that women's proper place is in the home of a husband, father or other male custodian (p27).

The results of these studies, stimulating and to appearances contradictory, indicate the information gaps existing on gender and development, and provide the justification for exploring the quantitative benefits and costs of reducing gender disparities in Malawi. There are no studies known that have been done on Malawi of this nature.

This report next outlines the CBA methodology that is used, it then sets out the absolute financial benefits, costs, and the net financial benefits of two scenarios: the MPRSP scenario of increasing literacy while maintaining gender disparity, and the alternative scenario of increasing literacy while closing gender disparities in literacy. It then shows the net incremental benefits of reducing the gender disparity in literacy over the MRPSP Scenario. The conclusions drawn from the study and the policy implications form the final part of the report.

2. The Cost Benefit Analysis Methodology and Data Sources

The methodology of doing CBAs is only summarized here as follows.

(a) The first stage is to identify the project or the intervention, that is to delineate its major characteristics and parameters. Among other things this involves defining the goals and goal targets of the intervention, finding the current levels of the goal(s) and the relationship between inputs and goals. Other issues are establishing the institutional or managerial and commercial aspects of the intervention. This information helps to identify costs and benefits and to mitigate data problems. The intervention being investigated here is reducing gender disparities in literacy, access to agricultural services and reducing GBV.

(b) The second stage is to identify the costs and benefits of the intervention. The costs are mostly inputs required to achieve the outputs, but can also include losses or foregone benefits due to implementing the intervention.

The benefits could be increases in outputs or reduction in input use or cuts in output losses. An example of increase in output is increased agricultural productivity due to literacy. This study does not deal with gender differences in efficiency that are suggested by some studies (Quisumbing 1996). An example of benefits that arise from reduced cost of inputs is the saved inputs into the public health system say maternal and child health program due to reduced fertility.

(c) The third stage is valuing the costs and benefits. For financial analysis this is done using market prices. At the economic analysis stage, that aims to correct for distortion in market prices, some costs are revalued e.g prices of traded goods are adjusted to reflect parity prices and using adjustment factors like for example for exchange rate distortions, and freight and insurance costs. This study has not yet proceeded beyond financial analysis.

(d) The stream of benefits and costs is then discounted to take care of society's rate of time preference and the opportunity cost of investments. The results are summarized using either the NPV, cost/benefit ratios or the internal rate of return.

(e) The last stage is to do sensitivity analysis. This stage varies those parameters whose probability of changing is known. Or it can be done to search for the levels in variables for which the project is viable or not (break even analysis). The variables that can be changed are costs and benefits, their prices, or the discount rates, and delays in realizing the benefits of the projects.

CBAs can be done as part of management accounting; for assisting in making decisions internal to an organization; or for financial accounting, to provide information to parties external to an organization (Drury 1998:4). CBA is based on the theory of welfare maximization and efficiency of economic agents. However when this is done for governments or by government some of the assumptions of these theories may not hold. CBA also has the disadvantage of being partial analysis, in that it is assumed that not everything changes as the project is being implemented. When the changes suspected contribute negatively to welfare the benefits of the intervention could be overstated. This problem is handled through 'extra' analyses like environmental audit or revaluation of benefits using social goals. Although doing CBAs on a project basis actually helps to contain data problems, CBAs nevertheless still require the amount and quality of data that is not easily available in some countries.

The main data sources for the various components of the CBA are the integrated household survey 1998, the Demographic and Health Survey 2000; the Malawi Poverty Reduction Strategy Paper especially the budget; the Economic Report, and other studies done by the World Bank as indicated in the references.

3. Case Study I: CBA of Reducing the Gender Disparity in Literacy

3.1 Benefits of Reducing the Gender Disparity in Literacy

The MPRSP reports that as of 2002, 58%[2] and 44% of adult men and women respectively were literate. The MPRSP has a program to increase literacy to 70% for men and 60% for women between 2003 and 2005. This is labeled Scenario 1. This paper aims to illustrate the benefits of implementing a program to increase literacy to 65% for both men and women over the same period. This is Scenario 2.

The following main assumptions about the benefits of literacy are used here: reduced fertility rate, reduced child and maternal mortality rate; and increased agricultural output. Other advantages of increasing the literacy of women in particular are not assessed. These are for example the incremental gains in expenditures on food and health expenditures that women tend to make viz a viz men, and that are the stronger proximate determinants of poverty reduction. Additionally it is assumed that the benefits of increasing literacy (schooling) translates into increases in the economic growth rate (Bills and Klenow 2000; Hanushek and Kimko 2000; Blackden and Bhanu 1999; Klasen 1999, Forestrythe et al 2000; World Bank 2000). There are not many studies done to understand the quantitative link between literacy and socio-economic development, world wide, and none that are known for Malawi. But it is reasonable to believe that the results found elsewhere would apply to Malawi.

Studies from Kenya and Burkina Faso indicate that giving women more education and inputs can increase agriculture output [Table 1] (Saito and Spurling 1992; Udry et al 1995). Similar evidence comes from Zambia and Malawi (Ngwira 1987; Gladwin 1991). The findings of these studies are used to make assumptions on which are based calculations of the agriculture output benefits of increasing literacy in both the MPRSP Scenario (1), and the alternative Scenario (2).

It is thus assumed that, both women and men farmers experience 15% increase in production when they become literate. The mechanisms through which this might work is that literacy increases access to and effectiveness in use of technology and credit (Taylor 1986). This assumption is operationalized as follows. First, using a simplifying conservative assumption, every adult has on average 0.5ha for cultivation (Khaila 1998), and grows only maize on the farm. The MPSRP projects an increase in mean yields of maize from 1137Kilograms (Kg) to 2000Kg in year 3 (GOM 2000). Adding 15% this would yield 1307Kg in 2003, 1803Kg in 2004 and 2300Kg in 2005 for literate farmers.

The following ancillary assumptions are also made: that literacy will increase in a linear fashion during the project period. Thus men's literacy will go up from 58% to 70% in average annual increments of 4% in the MPSRP scenario and from 58% to 65%, by 2.33% every year in Scenario 2. Similarly women's literacy will increase from 44% to 60% by 5.33% on average every year in the MPRSP scenario, and from 44% to 65% by 7% every year in Scenario 2.

[2] This is the proportion of adult men and women able to read and write. Government sources put out varying rates of literacy. But these are for different age groups, and using different definitions.

Table 1: Payoffs to Investing in Women in Agriculture

Policy Experiments	Increase in Yields (%)
Maize farmers, Kenya, 1976	
Effects of giving female farmers sample mean characteristics and input levels	**7**
Effects of giving female farmers men's age education and input levels**	**9**
Effects of giving women primary schooling	**24**
Food crop farmers, Kenya, 1990	
Effects of giving female farmers men's age education and input levels**	**22**
Effects of increasing land area levels to male farmers' levels	**10.5**
Effects of increasing fertilizer to male farmers levels.	**1.6**
Farmers, Burkina Faso, 1995	
Effects of reallocating factors of production between men's and women's plots in the same household	**10-20**
Farmers , Zambia, 1994	
Effects of giving women same overall degree of capital investment in agricultural inputs including land as men	**15**
Source: Saito and Spurling 1992, Udry et al 1995 *** women farmers are usually younger*	

The value of the benefits of literacy in terms of increased agriculture production are assessed using the increase in the output of literate farmers multiplied by the price of maize and the incremental number (cumulative) of men and women who become literate in each of the three project years. (In reality these benefits will continue to accrue over the life of those who become literate, so that the benefits should be larger than estimated here). The results are posted in Annex 1. The two scenarios have roughly the same agricultural output benefits. For year 1 these benefits are estimated at K3.50bn for Scenario 1 and K5.53bn for Scenario 2. The net cumulative agricultural output impact of making more people literate are estimated at K37.79bn in Scenario 1 and K38.02bn in Scenario 2 in year 3. The small differences in the two Scenarios are due to the slightly higher number of people who become literate in Scenario 2. Note that these benefits accrue only from those who become literate because of the project. The relationship of literacy to benefits is apparently exponential.

The impact of women's education on fertility has been well studied. Better educated women tend to bear less children than less educated women due to many possible reasons. They marry later and have fewer years of child bearing; they have more access to knowledge on how to control fertility; they have more control over their fertility as they have greater decision making power in the household. They also have greater aspirations for their children and understand the tradeoffs between numbers and quality of children etc. However, the relationship between women's education and fertility is not necessarily linear (Gatti 1999).

Cross-country studies indicate that for every average year of schooling completed by women, the number of births per woman fall by 0.32. In other words, a three-year increase in average education of women is associated with one less child per woman (Gatti 1999). Additionally while the absolute levels of women's education affect fertility, the gender gap in education has an extra negative impact on fertility (Klasen 1999). The Malawi Demographic and Health Survey (DHS) 2000 corroborates this

finding by showing that an increase in the average schooling for women of child bearing age from 2/3 years to 5/6 years reduces TFR by 1.3.

These findings are used in this study. To attain the literacy rates goals in the MPRSP (Scenario 1) it is assumed that the average level of schooling has to increase by one year for both men and women, in each project period. It takes about 33 months for all child bearing women who have had one child to have another one (NSO, DHS 2000). Thus every year on average 0.33 births per each child-bearing woman will be prevented. We assume that the fall in fertility will happen during the project period. In Scenario 2 it is assumed that the average year of schooling of women is 33% higher, so the TFR falls by an additional 33% per woman, from 0.33 to 0.44. The absolute number of saved births is 44% of the number of child-bearing age women in each of the project years in Scenario 2.

The benefits of reduced fertility are a) the reduced cost of maternity care; the reduced cost of maternal mortality, the reduced cost of household provisioning for preschoolers, and also the reduction in government expenditures on public health of preschoolers.

The total cost of maternity care goes down by the number of saved pregnancies times the unit cost of maternity care. The main difference between Scenario 1 and 2 is that in Scenario 2, more women will become literate, leading to a lower absolute number of maternity cases, and hence there is greater reduction in maternity costs. The unit cost of maternity is assumed to be on average K2500, as hospital costs are estimated at K4000, and nearly half of the births are attended to by TBAs, (National statistical Office 2000: 109) costing about K1000 per unit. Based on these assumptions and calculations, for example in the year 2003, the nation (households and government) could save at least K2.14bn in costs of maternity care in Scenario 1 and K2.85bn in Scenario 2.

Increased literacy can lead to savings on the costs/losses due to maternal mortality. This value is derived as follows. The absolute cumulative numbers of prevented maternal deaths are estimated as the product of the number of births that would occur in the scenarios and the MMR, taking into account the dampening impact of increased literacy rates on TFR, and also on the MMR. The reduction in MMR is more for scenario 2 because more women would become literate. Due to lack of data connecting literacy rates to MMR, we assume that the MMR goes down by the rate of the increase in literacy among women. So in scenario 1 the MMR goes down by 5% every year. Thus the rate is MMR–MMR (5.33%) in year one for scenario 1, MMR – MMR (10.67%) in year two, and MMR-MMR (16%) in year 3. The same logic is used in Scenario 2, except that the respective yearly adjustment factors are 7%, 14% and 21%.

The absolute maternal mortality figures for every year are then multiplied by the number of days a woman could reasonably be expected to work in a year, estimated at 9 months (of which 6 months is for productive work and 3 months for reproductive work), and then times the minimum wage rate. The benefits are calculated only for the 3-year period of the project. And so the benefits are for three years for those women living whose deaths were prevented in the first year, and 2 years and 1 year for those deaths prevented in years 2 and 3 respectively. The estimates of the saved cost of

maternal mortality are K9.32m in Scenario 1 and K10.23m in Scenario 2 in year 1; and K9.67m in Scenario 1 and K10.61m in Scenario 2 in year 3.

Another benefit of reduced fertility is the saved cost of bringing up the preschoolers not born, but who would still be living, thus taking out the effect of infant mortality rate (IMR). The IMR would fall over the years due to increased literacy of both men and women, albeit differentially in the two Scenarios due to the difference in the literacy rates of women. This cost of bringing up preschoolers is divided into home care costs and then the reduced cost of public health. It is assumed for our purposes that this saved cost is only for 3 years, during the project life[3]. The benefit is calculated as follows. The number of days that care is required is assumed to be 365 in a year, multiplied by the per capita consumption expenditure of the Integrated Household Survey (1998) of K10.47, times the number of children not born who would still be living. The saved cost of at home care is at least K3.15bn in Scenario 1 and K.4.23bn in Scenario 2, in year 1. The values increase to K9.63bn and K12.91bn respectively in year 3.

The reduced cost of public health used is that of immunization, that every child is assumed to receive, as the EPI has achieved close to universal immunization coverage (Chilowa 2000). The unit cost of immunization is estimated to be K2000. So for example, in the year 2003 the saved cost of immunization of children is estimated to be K1.71bn in Scenario 1 and K2.28bn in Scenario 2.

Based on these figures, it is clear that increasing literacy has large potential benefit for households and the government. The gross benefits of increasing literacy in scenario 1 add up for the three years to K86.88bn, and K97.67bn in scenario 2.

3.2 Financing Gender Equality in Literacy

There is very little information about the financing of gender equality. It is known that to increase the chances of girls' participation, persistence and performance in primary school the government has to reduce the household financial cost of schooling especially, and also reduce the opportunity cost of sending girls to school (Rose and Samarrai 1997; Hyde and Kadzamira 1994; Ngwira et al 2001). There is also need to increase primary education expenditures in general to increase the number of education physical facilities (Kadzamira et al 1999). Using available survey data on enrollment rates by gender and income quintiles, price elasticities of demand for girls' and boys' primary schooling, and published data on the share of private expenditures in total education expenditures in developing countries, the World Bank (2000) made simulations of various scenarios of closing gender disparities in access to primary education. The findings were that:

> While pursuing gender equality in primary education would require additional resource commitments, for most regions (of the world) the budgetary costs of attaining universal primary education levels for girls would be relatively modest - in the order of several percentage points increases, the exception is Sub-Saharan Africa (World Bank 2000: 33).

[3] The children would later on be valuable to their families and society and this value is lost to society, but in the first three years, only the costs of raising them are evaluated

For example a cut in cost recovery that got every school age child to school, and was gender targeted would cost 20.35% more in public resources and 33.33% if no gender targeting was followed. Cutting cost of primary education for both poor boys and girls, and increasing enrolment without necessarily targeting girls would need 16.16% more resources, and if gender targeting was followed, the increase would be 7.93%.

The estimates of costs of increasing literacy used in this study are based on these insights and bearing in mind that increasing literacy does not require the full 8 years of primary schooling. It is assumed that primary education programs will be organized so that full enrolment is achieved, although there will be dropouts, and that there would be gender targeting of public expenditures. The costs are derived based on the MPRSP costings. The basic education component of the education expenditures of the MPRSP are used for Scenario 1. Scenario 2 of accelerated closure of gender disparities is believed to be possible if some of the items of expenditures in scenario 1 are doubled. This leads to a 21% increase in the primary budget component which is within the World Bank (2000) range of results. The doubled expenditure items are the line items of special education needs and those of girls; literacy and numeracy, and attending to the impacts of HIV/AIDS. The literacy component is likely to reach more women than men due to the social dynamics of attending literacy classes. The HIV/AIDs component is more likely to assist girls and women because they are the most negatively affected by HIV/AIDS. The costs are based on resource envelopes and may not be realistically adequate to generate the outputs planned.

Discount rates of 15% and 25% have been used. A year one as opposed to year zero format is used for calculating the discounted values. Thus investments are done at the beginning of each year, and most of the benefits accrue in the same year. This is largely true for investments in literacy programmes, as literacy can be gained within 6 months.

3.3 Results

Based on these data and assumptions the following results are reported. Both scenarios have positive NPV at a 15% discount rate, in all the three years that increase from K4.18bn to K29.33bn in Scenario 1, and from K5.25bn to K31.65bn in Scenario 2. The large gain over the years in both Scenarios is due mainly to the impacts of the cumulative number of literate adults. The cumulative NPV is K47.72bn for Scenario 1 and K52.86bn for Scenario 2. The cumulative net incremental benefit over the three years is estimated at K5.13bn. This gives an annual average of K1.71bn. This is the benefit that would be lost to society annually if literacy rates are not increased to 65% for both men and women by 2005. It represents 1.23% of the K138bn GDP of the year 2002.

The GDP of Malawi has been growing on average by about 1.26% between 1998 and 2002. This case study excludes many of the possible benefits of reducing gender disparities in literacy, and truncates them at 3 years when in fact they accrue over the whole productive and reproductive years of an individual. It also concentrates on the primary and not secondary benefits. Thus a major conclusion from this CBA analysis is that *ceteris paribus*, the GDP growth rate would be about 100% higher (1.23%/1.26%) if literacy rates were increased from 58% for men and 44% for women to 65% for both men and women, rather than to 70% for men and 60% for women.

The arithmetic of compounding growth rates attests that neglecting gender disparities leads to big losses in national income.

These findings are similar to those of Klasen 1999a. He showed that if between 1962 and 1992 the countries of sub-Saharan Africa had the initial female male years of schooling of East Asian countries and had closed their gender gaps at the rate achieved by those countries, average per capita growth rate would have been 0.5 percentage points higher than the average of 0.7. This means that growth rates would have been 71% higher than has been the case. In the particular cases of Botswana and Ghana, he found that controlling for differences in initial income levels, investment rates, economic openness and population and labour force growth, between 1.3 to 1.6 percentage points of the 5.2 percent difference between the growth rates of these two countries can be attributed to differences in gender inequalities in education (quoted in World Bank 2000:40).

Sensitivity analysis was done for the case study, using the discount rate of 25%, and increasing the value of agriculture output by 20%, and increasing project costs by 20%. All the cases still showed a positive net incremental benefit of increasing literacy while reducing gender disparities.

3.4 Conclusions and Policy Implications

A major policy implication of the findings of this CBA is to make the literacy of persons of child bearing age or the economically active group compulsory by law. The near universal literacy should generate economic and social benefits that far outweigh the cost of implementing such a scheme through supplying the services, incentives to local leaders and social mobilization, and ensuring compliance. A specification of this kind of program has been made elsewhere (Semu et al 2003). At the very least any adult less than 30 years old ought to be required to be literate and the design of such a literacy program should give priority to this group to enroll in the first 2-3 years of implementing it. Those that are still illiterate after that duration should be subject to some penalty like community service doing public works. The age group for which literacy is compulsory should then be increased to 40 years after 2 years, and to 50 years after another 2 years. In this way literacy can be near universal in 10 years time. The successful implementation of this program requires that the foreign aid and public budgets should give special attention to the level and effectiveness of expenditures on basic education, and should be gender targeted.

4. Case Study II: Cost Benefit Analysis of Gender Based violence

This problem is set up based on data in the Strategic Plan for Reducing Gender Based Violence (GBV) of the Ministry of Gender and Community Services (MGCS), and those data available from the Center for Social Research on reported GBV in a sample of public institutions. These data are used to make extrapolations of the total GBV cases: sex and non-sex crimes, reported and non-reported. Unlike the literacy case study, this one has no "without" project scenario. This is due to the fact that this scenario is null in that with no expenditures there would be no reduction (that can be logically forecast) in GBV cases. Thus the cost and benefits would be zero. This means that the net benefits of the with project scenario are also the net incremental

benefits. It is quite likely for GBV cases to fall with increase in per capita GDP and increasing economic empowerment, but that is a long run impact.

The number of GBV cases are estimated based on the following assumptions:

a) reported crimes are 30% of all crimes
b) sex crimes are 25% of reported and non reported cases of GBV

These estimates are based on a sample of 6 police stations, 5 magistrate courts and 7 hospitals. On that basis the national incidence of the various categories of these crimes was estimated using the national figures for these institutions.

The benefit of reducing GBV is calculated as the reduction in the cost to households and government of processing and dealing with the cases in public institutions, as well as the productivity loss due to the time the offenders, victims and relatives spend on the cases. These costs were calculated for the various categories of sex crimes: whether they are reported to the police, taken to court or hospital and whether they were not reported.

The national incidence of sex crimes reported to the police was estimated to be 7552.

- 🕮 The cost of handling a case at the police was estimated at K10557. This was based on cost of police labor, transport costs from home to the police station, by the police staff and also the victim and offender, as well as their relatives; custody costs that may include food, sundry costs for those who come to the police, loss of productivity of the labor of the offender and victim and 2 relatives. Productivity loss was estimated using the minimum wage for 3 days.

- 🕮 It is assumed that 80% of the cases sent to the courts are convicted.

- 🕮 The cost of processing one case at the courts is estimated at K12632 based on cost of transport to the court, cost of police labor (estimated) of K3000 for the average five days it takes to finish hearing a case, and the cost of court labor estimated at K7000. The loss of productivity of one offender, one victim and 2 witness and two guardians was calculated using the minimum wage. For convicted offenders, on top of these costs, it is also assumed that they serve on average 3 years in jail and hence the productivity loss is calculated. A similar procedure is followed for calculating the unit costs of hospital cases.

- 🕮 The cost or lost benefit of non-reported crimes was estimated using the number of days that are lost due to the crime. It was assumed that the value of output of about three months is lost in a year for each case. The corresponding value was derived using the minimum wage.

For reported non-sex crimes, the same costs as for sex crimes were assumed. The costs of implementing the project are taken to be those in the National Strategic Plan to end GBV.

- 🕮 Based on these assumptions and calculations the total cost of reported crimes was estimated to be K10.5bn, and K303.5m for unreported crimes, giving a total of K10.8bn for all crimes (see Annex II). The assumption is made that due to the project, the estimated cost to society of GBV falls by an average of 10% every year over the project life.

The benefit to society of the project will start at 10% of the estimated total cost of GBV, and will double, triple and quadruple over the project life. The respective figures are K1.08bn; K2.16bn; K3.25bn, and K4.33bn. The discounted net benefits start at K911.92m in 2003, increasing to K2.46bn in 2006, with a total NPV of K7.07bn. When sensitivity analysis is done using annual increases of 25% in project costs over the project period, the net benefits rise to K2.42bn in the last year, with a total NPV of K6.99bn. If GBV cases are assumed to fall at a rate of 20% per year, and project costs increase by 25% the discounted net benefits start at K1.85bn in 2003 and rise to K4.91bn. The total cumulative NPV is K14.18bn.

We can surmise from these figures that we can expect an average annual financial benefit of K1.4bn to society if a total of about K300m is spent annually (base Scenario) over the next five years to reduce GBV by 40%. This represents 1% of GDP of the year 2002. If the GDP has been growing at 1.26% on average, this means the growth rate of GDP will be 79% higher if the project is implemented to reduce the negative effects of GBV by an average of 10%, over the next 4 years. It is also clear that reporting and punishing cases of GBV exacts their financial costs to society. It may thus be important to find ways of adjudicating cases of GBV in a cost effective manner.

5. Case Study III: Cost Benefit Analysis of Closing Gender Disparities in Access to Agricultural Services

This is a CBA of closing the gender gap in access to agricultural services. Such services include agricultural extension, crop production, land resource conservation, irrigation services, animal husbandry, agricultural research, and administration and support services. The project period is three years coinciding with the MPRSP. Two scenarios have been set up in this analysis. In the first scenario, which coincides with the MPRSP's plan of activities, it is assumed that the proportion of men and women who have access to agricultural services by the end of the project period is different. In the other scenario (scenario 2), it is assumed that the same proportion of male and female headed households will access agricultural services by the end of the project period.

The total number of farm families has been calculated by diving the total population for each year by 5 (the average household size) less 15% - those living in the urban areas. Of the total farm families, 65% are male-headed households (MHH) and the rest 35% are female-headed households (FHH).

Currently 7% and 24% of FHH and MHH have access to agricultural services. In scenario 1, it is assumed that the proportion of households accessing services increases from 24% and 7% in year 2001 to 50% and 40% in 2004 for MHH and FHH households respectively. This means that the access for MHH increases by 8.7% per year and that of FHH increases by 11% per year. For scenario 2, the proportion of households accessing services increases from 24% and 7% in year 2001 to 50% for both MHH and FHH in 2004. This is an 8.7% and 14.3% yearly increase for MHH and FHH respectively (see table below).

Access of men and women to agricultural services in Thyolo and Chiradzulu Rural Development Programmes (RDPs) in 2001

		2000/01[1]	2001/02	2002/03	2003/04
Scenario 1	Men (%)	24	32.7	41.4	50
	Women (%)	7	18	29	40
Scenario 2	Men (%)	24	32.7	41.4	50
	Women (%)	7	21.3	35.6	50

[1]source: Nyamai, J. 2002

The Malawi Poverty Reduction Strategy Paper (MPRSP) reports that the 2001 maize production per hectare is 1137kg and that the target maize production for the 2005 is 2000kg per hectare. The analysis assumes that if farmers have access to agricultural services, maize production per hectare would increase by 15% in both scenarios. This means that yields will be 1308kg, 1804kg and 2300kg in the three consecutive years. The landholding size per household used is 1.5 hectares based on Khaila 2000. The price of maize used in the analysis is MK17.00 per kilogram.

Incomes/production of MHH and FHH have been adjusted to 60% and 80% respectively. This is based on research findings that FHH have a higher proportion of food consumption expenditures out of total income (Lampietti and Stalker, 2000; and Appleton 1995b). It is thus assumed that FHH sell 20% of maize to raise money for non-food purchases and that this proportion is 40% for MHH.

The benefit for each year has been calculated by adding the value of output of MHH and that of FHH. The value of the production of MHH is 60% of the product of production per hectare, landholding size per household, the price of maize and the number of MHH with access to agricultural services. The value of the production of FHH is similarly calculated but scaled by 80%. Summing up all the benefits for the three years gives the total benefits.

The costs used in the analysis are those in the government "Budget Document" No. 4A. for the financial year 2001/2002 (output based). The total cost for scenario 1 is the sum of all agricultural programmes costs as reported in the budget document. It is assumed that scenario 2 will accelerate FHH access to agricultural services so that by the end of the project period both MHH and FHH have equal access. Thus in scenario 2, individual programmes costs have been increased by 20% so as to take into account the extra costs for increasing the access of FHH to agricultural services. This increase is due to additional training of extension people and programming that would be needed. The total cost for each year is found by adding all the individual programme's cost. Total project cost is equal to the sum of all the costs in the project period.

The Net Present Values (NPVs) are positive at the 15% discount rate for both the scenarios (see Annex III). The NPV for scenario 1 is MK43.9 billion and for scenario 2, it is MK47.0 billion. Thus the NPV is higher in scenario 2 than in scenario 1. The net incremental benefits (NIB) are positive for all the project years. When the discount rate is assumed to be 25%, the NPVs are MK36.3 billion and MK38.9 billion for scenario 1 and 2 respectively. The higher the discount rate, the lower the NPV.

The NIBs are MK3.1 billion for the 15% discount rate and MK2.5 billion for the 25% discount rate. At the 15% discount rate the average annual financial benefit is MK1.03bn. This is the loss to society in terms of foregone food security (food consumption expenditure), if access to agricultural services is not increased to 50% for both MHH and FHH. It represents 0.7% of the MK138bn GDP of the 2002.

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ANNEX I: CALCULATION OF THE FINANCIAL ANALYSIS AND SENSITIVITY ANALYSIS

SCENARIO 1: INCREASING LITERACY FROM 58/44 TO 70/60

SCENARIO 2: INCREASING LITERACY FROM 58/44 TO 65/65

		year				
		2002	**2003**	**2004**	**2005**	**Total**
Benefits						
agricultural production	**Scenario 1 (fxgxh)**		**3,507,941,803.84**	**14,666,890,287.67**	**37,789,892,878.40**	
	total population	10,600,000	10,800,000	11,000,000	11,200,000	
	a. productive (15-64yrs) population	5,512,000	5,616,000	5,720,000	5,824,000	
	b. population (men)	2,700,880	2,751,840	2,802,800	2,853,760	
	c. population (women)	2,811,120	2,864,160	2,917,200	2,970,240	
	d. literate men (cumulative)	1,566,510	139,630	422,968	854,090	
	e. literate women (cumulative)	1,236,893	175,997	533,646	1,078,897	
	f. total literacy (d+e)		315,628	956,614	1,932,987	
	g. production/ha (kg)		653.78	901.89	1150	
	h. price of maize (MK)		17	17	17	
	Scenario 2 (fxgxh)		**3,528,789,150.92**	**14,754,232,651.85**	**38,015,122,641.60**	
	total population	10,600,000	10,800,000	11,000,000	11,200,000	
	a. productive (15-64yrs) population	5,512,000	5,616,000	5,720,000	5,824,000	
	b. population (men)	2,700,880	2,751,840	2,802,800	2,853,760	
	c. population (women)	2,811,120	2,864,160	2,917,200	2,970,240	
	d. literate men (cumulative)	1,566,510	93,675	283,399	571,832	
	e. literate women (cumulative)	1,236,893	223,829	678,912	1,372,675	
	f. total literacy (d+e)		317,503	962,311	1,944,508	
	g. production/ha (kg)		653.78	901.89	1150	
	h. price of maize (MK)		17	17	17	
saved cost of preschoolers						
a) at home	**Scenario 1 (axbxcxh)**		**3,150,972,335.91**	**6,360,296,011.36**	**9,627,971,026.38**	
	a. days in a year care required		365	365	365	
	b. per capita consumption expenditure		10.47	10.47	10.47	
	c. number of years care is required		1	1	1	
	d. childbearing women		2,588,760	2,636,700	2,684,640	
	e. births prevented per mother		0.33	0.33	0.33	
	f. prevented births (d x e)		854,291	870,111	885,931	
	g. infant mortality [f x 52/1000]		29,763	30,315	30,866	
	h. total prevented births (cumulative)		824,527	1,664,324	2,519,389	
	Scenario 2 (axbxcxh)		**4,226,195,340.99**	**8,530,653,558.67**	**12,913,374,653.03**	
	a. days in a year care required		365	365	365	
	b. per capita consumption expenditure		10.47	10.47	10.47	
	c. number of years care is required		1	1	1	
	d. childbearing women		2,588,760	2,636,700	2,684,640	
	e. births prevented per mother		0.44	0.44	0.44	

f. orevented births (d x e)	1,139,054	1,160,148	1,181,242
g. infant mortality [f x 52/1000]	33,169	33,784	34,398
h. total prevented births (cumulative)	1,105,885	2,232,250	3,379,093

b) public health	**Scenario 1 (axb)**	**1,708,581,600.00**	**1,740,222,000.00**	**1,771,862,400.00**	
	a. cost of public health	2000	2000	2000	
	b. prevented births in each year	854,291	870,111	885,931	
	Scenario 2 (axb)	**2,278,108,800.00**	**2,320,296,000.00**	**2,362,483,200.00**	
	a. cost of public health	2000	2000	2000	
	b. prevented births in each year	1,139,054	1,160,148	1,181,242	
saved cost of maternity care	**Scenario 1 (axb)**	**2,135,727,000.00**	**2,175,277,500.00**	**2,214,828,000.00**	
	a. cost of maternal care (MK)	2500	2500	2500	
	b. prevented births in each year	854,291	870,111	885,931	
	Scenario 2 (axb)	**2,847,636,000.00**	**2,900,370,000.00**	**2,953,104,000.00**	
	a. cost of maternal care (MK)	2500	2500	2500	
	b. prevented births in each year	1,139,054	1,160,148	1,181,242	
saved cost of maternal mortality	**Scenario 1 (bxcxdxe)**	**9,318,678.60**	**12,666,867.11**	**9,669,858.51**	
	a. childbearing women (CBW)in each year	2,588,760	2,636,700	2,684,640	
	b.prevented maternal mortality cases	518	1,056	1,612	
	c. days employed in a year	120	120	120	
	d. wage rate (MK)	50	50	50	
	e. years lost if a woman dies	3	2	1	
	Scenario 2 (bxcxdxe)	**10,229,122.71**	**13,891,401.22**	**10,607,979.11**	
	a. childbearing women (CBW) in each year	2,588,760	2,636,700	2,684,640	
	b.prevented maternal mortality cases	568	1,158	1,768	
	c. days employed in a year	120	120	120	
	d. wage rate (MK)	50	50	50	
	e. years lost if a woman dies	3	2	1	
Total Benefits	**Scenario 1**	**10,512,541,418.35**	**24,955,352,666.14**	**51,414,224,163.29**	**86,882,118,247.78**
	Scenario 2	**12,890,958,414.62**	**28,519,443,611.74**	**56,254,692,473.74**	**97,665,094,500.10**
Costs					
cost of basic education	**Scenario 1 (a+b+c+d+e+f)**	**5,700,590,000.00**	**6,166,130,000.00**	**6,801,920,000.00**	
	a. improve the quality and relevance of primary education	4,264,930,000.00	4,630,350,000.00	5,124,110,000.00	
	b. improve access and equity, focussing on special needs education and girls	1,004,290,000.00	1,006,020,000.00	1,035,310,000.00	
	c. improve and increase adult literacy and numeracy	98,340,000.00	177,990,000.00	266,740,000.00	
	d. provide special education for out of school youth	31,970,000.00	47,010,000.00	63,580,000.00	
	e. respond urgently to the problems created by the HIV/AIDS epindemic	45,270,000.00	45,270,000.00	45,270,000.00	
	f. strengthen and decentralise adminisrative and planning responsibilities	255,790,000.00	259,490,000.00	266,910,000.00	
	Scenario 2 (a+b+c+d+e+f)	**6,848,490,000.00**	**7,395,410,000.00**	**8,149,240,000.00**	
	a. improve the quality and relevance of primary education	4,264,930,000.00	4,630,350,000.00	5,124,110,000.00	
	b. improve access and equity, focussing on special needs education and girls *2	2,008,580,000.00	2,012,040,000.00	2,070,620,000.00	

	c. improve and increase adult literacy and numeracy *2	196,680,000.00	355,980,000.00	533,480,000.00	
	d. provide special education for out of school youth	31,970,000.00	47,010,000.00	63,580,000.00	
	e. respond urgently to the problems created by the HIV/AIDS epindemic *2	90,540,000.00	90,540,000.00	90,540,000.00	
	f. strengthen and decentralise adminisrative and planning responsibilities	255,790,000.00	259,490,000.00	266,910,000.00	
Total Cost	**Scenario 1**	**5,700,590,000.00**	**6,166,130,000.00**	**6,801,920,000.00**	**18,668,640,000.00**
	Scenario 2	**6,848,490,000.00**	**7,395,410,000.00**	**8,149,240,000.00**	**22,393,140,000.00**
Net Benefits:					
Total Benefits less Total Costs (B-C)	Scenario 1	**4,811,951,418.35**	**18,789,222,666.14**	**44,612,304,163.29**	**68,213,478,247.78**
	Scenario 2	**6,042,468,414.62**	**21,124,033,611.74**	**48,105,452,473.74**	**75,271,954,500.10**
Discount Factor (15%)		0.8696	0.7561	0.6575	
Net Present Value (NPV)	**Scenario 1**	**4,184,305,581.18**	**14,207,351,732.43**	**29,333,314,153.55**	**47,724,971,467.16**
	Scenario 2	**5,254,320,360.54**	**15,972,804,243.28**	**31,630,115,869.97**	**52,857,240,473.79**
Net Incremental Benefit Stream:					
NPV Scenario 2 less NPV Scenario 1		**1,070,014,779.36**	**1,765,452,510.85**	**2,296,801,716.42**	**5,132,269,006.63**
Discount Factor (25%)		0.8000	0.6400	0.5120	
Net Present Value (NPV)	**Scenario 1**	**3,849,561,134.68**	**12,025,102,506.33**	**22,841,499,731.60**	**38,716,163,372.61**
	Scenario 2	**4,833,974,731.70**	**13,519,381,511.51**	**24,629,991,666.56**	**42,983,347,909.76**
Net Incremental Benefit Stream:					
NPV Scenario 2 less NPV Scenario 1		**984,413,597.01**	**1,494,279,005.18**	**1,788,491,934.95**	**4,267,184,537.15**

SENSITIVITY ANALYSIS OF INCREASING MAIZE PRICE BY 20%

Total Benefits	**Scenario 1**	**12,893,752,699.33**	**28,486,883,491.80**	**57,298,825,141.42**	**98,679,461,332.55**
	Scenario 2	**14,938,461,992.60**	**31,717,400,627.71**	**61,813,593,277.19**	**108,469,455,897.50**
Total Cost	**Scenario 1**	**5,700,590,000.00**	**6,166,130,000.00**	**6,801,920,000.00**	**18,668,640,000.00**
	Scenario 2	**6,848,490,000.00**	**7,395,410,000.00**	**8,149,240,000.00**	**22,393,140,000.00**
Net Benefits:					
Total Benefits less Total Costs (B-C)	Scenario 1	**7,193,162,699.33**	**22,320,753,491.80**	**50,496,905,141.42**	**80,010,821,332.55**
	Scenario 2	**8,089,971,992.60**	**24,321,990,627.71**	**53,664,353,277.19**	**86,076,315,897.50**
Discount Factor (15%)		0.8696	0.7561	0.6575	
Net Present Value (NPV)	**Scenario 1**	**6,254,924,086.38**	**16,877,696,402.11**	**33,202,534,818.06**	**56,335,155,306.55**
	Scenario 2	**7,034,758,254.43**	**18,390,919,189.19**	**35,285,183,382.72**	**60,710,860,826.34**
Net Incremental Benefit Stream:					
NPV Scenario 2 less NPV Scenario 1		**779,834,168.06**	**1,513,222,787.08**	**2,082,648,564.66**	**4,375,705,519.79**

Discount Factor (25%)		0.8000	0.6400	0.5120	
Net Present Value (NPV)	**Scenario 1**	**5,754,530,159.47**	**14,285,282,234.75**	**25,854,415,432.41**	**45,894,227,826.62**
	Scenario 2	**6,471,977,594.08**	**15,566,074,001.73**	**27,476,148,877.92**	**49,514,200,473.73**
Net Incremental Benefit Stream:					
NPV Scenario 2 less NPV Scenario 1		**717,447,434.61**	**1,280,791,766.98**	**1,621,733,445.52**	**3,619,972,647.11**

SENSITIVITY ANALYSIS OF INCREASING PROJECT COSTS BY 20%

Total Benefits	**Scenario 1**	**10,512,541,418.35**	**24,955,352,666.14**	**51,414,224,163.29**	**86,882,118,247.78**
	Scenario 2	**12,890,958,414.62**	**28,519,443,611.74**	**56,254,692,473.74**	**97,665,094,500.10**
Total Cost	**Scenario 1**	**6,840,708,000.00**	**7,399,356,000.00**	**8,162,304,000.00**	**22,402,368,000.00**
	Scenario 2	**8,218,188,000.00**	**8,874,492,000.00**	**9,779,088,000.00**	**26,871,768,000.00**
Net Benefits:					
Total Benefits less Total Costs (B-C)	Scenario 1	**3,671,833,418.35**	**17,555,996,666.14**	**43,251,920,163.29**	**64,479,750,247.78**
	Scenario 2	**4,672,770,414.62**	**19,644,951,611.74**	**46,475,604,473.74**	**70,793,326,500.10**
Discount Factor (15%)		0.8696	0.7561	0.6575	
Net Present Value (NPV)	**Scenario 1**	**3,192,898,624.65**	**13,274,855,702.19**	**28,438,839,591.21**	**44,906,593,918.05**
	Scenario 2	**4,063,278,621.41**	**14,854,405,755.57**	**30,558,464,353.57**	**49,476,148,730.55**
Net Incremental Benefit Stream:					
NPV Scenario 2 less NPV Scenario 1		**870,379,996.76**	**1,579,550,053.38**	**2,119,624,762.36**	**4,569,554,812.50**
Discount Factor (25%)		0.8000	0.6400	0.5120	
Net Present Value (NPV)	**Scenario 1**	**2,937,466,734.68**	**11,235,837,866.33**	**22,144,983,123.60**	**36,318,287,724.61**
	Scenario 2	**3,738,216,331.70**	**12,572,769,031.51**	**23,795,509,490.56**	**40,106,494,853.76**
Net Incremental Benefit Stream:					
NPV Scenario 2 less NPV Scenario 1		**800,749,597.01**	**1,336,931,165.18**	**1,650,526,366.95**	**3,788,207,129.15**

ANNEX II: CBA OF GENDER BASED VIOLENCE

CALCULATION OF BENEFITS	
1.Reported Sex Crimes	
A. Police (a.1xa.2)	**79,726,464.00**
a.1 number of cases	7552
a.2 unit cost (a.2.1+….+a.2.5)	10557
a.2.1 allowance of police officers	4500
a.2.2 productivity loss of victim, offender and 2 relatives	957
a.2.3 transport costs to police station	3000
a.2.4 custody costs	100
a.2.5 sundry costs	2000
B. Magistrate cases ((b.1.1Xb.2)+(b.1.2X(b.2+b.3))) (80% of the	**2,157,768,012.80**
b.1.1 number of cases heard less those convicted	1208
b.1.2. Number of cases convicted	4833
b.2 unit cost of heard cases (b.2.1+b.2.2+b.2.3+b.2.4)	12631.75
b.2.1 transport cost (coming to court)	3000
b.2.2 allowance for police	7000
b.2.3 cost of court personnel	1196.25
b.2.4 lost productivity of victim, offender, 2 witnesses, 2 relatives	1435.5
b.3 unit cost of convicted cases (b.3.1Xb.3.2xb.3.3)	430650
b.3.1 minimum wage	1196.25
b.3.2 average years in prison (3 years)	3
b.3.3 days employed in a year	120
C Hospital costs (c.1xc.2)	**19,101,305.10**
c.1 number of cases referred to hospital	6654
c.2 unit cost (c.2.1+…..+c.2.5)	2870.65
c.2.1 drugs	540
c.2.2 food	600
c.2.3 sundries	300
c.2.4 transport	1000
c.2.5 loss in productivity per case (c.2.5.1xc.2.5.2xc.2.5.3)	430.65
c.2.5.1 number of days in hospital	3
c.2.5.2 minimum wage	47.85
c.2.5.3 1 patient, 2 guardians	3
Total costs of reported sex crimes	**2,256,595,781.90**
2. Non-reported and non-sex crimes (2.1x2.2)	**227,658,816.00**
2.1 number of non-reported and non-sex crimes	52,864
2.2 unit cost (2.2.1x2.2.2)	4306.5
2.2.1 minimum wage	47.85
2.2.2 90 days lost per case	90
3. Non reported sex crimes	**75,884,836.50**
3.1 number of non-reported and sex crimes	17,621
3.2 unit cost (2.2.1x2.2.2)	4,306.50
3.2.1 minimum wage	47.85
3.2.2 90 days lost per case	90.00
4. Reported non sex cases	**8,274,127,225.15**
4.1 number of police cases	22,656
4.2 police costs	10,557.00

4.3 number of magistrate cases		18,126
4.4 magistrate costs		443,281.75
4.5 number of hospital cases		19,962
4.6 hospital costs		2,870.65
total cost of reported GBV		**10,530,723,007.05**
total cost of unreported GBV		**303,543,652.50**
total cost of GBV		**10,834,266,659.55**

		year 0	year 1	year 2	year 3	year 4	
			Base Senario CAPTURING A 10% AVERAGE ANNUAL FALL IN GBV CASES				
total cost		34,716,000.00	34,716,000.00	30,241,000.00	30,241,000.00	30,241,000.00	
total benefit		-	1,083,426,665.96	2,166,853,331.91	3,250,279,997.87	4,333,706,663.82	
net benefit	-	34,716,000.00	1,048,710,665.96	2,136,612,331.91	3,220,038,997.87	4,303,465,663.82	
discount rate (15%)		1	0.8696	0.7561	0.6575	0.5718	
NPV	**-**	**34,716,000.00**	**911,922,318.22**	**1,615,585,884.24**	**2,117,227,910.16**	**2,460,520,460.59**	**7,070,540,573.21**
			SENSITIVITY ANALYSIS CAPTURING A 10% FALL IN GBV CASES PER ANNUM WITH A 25% INCREASE IN PROJECT COST				
total cost		34,716,000.00	43,395,000.00	54,243,750.00	67,804,687.50	84,755,859.38	
total benefit		-	1,083,426,665.96	2,166,853,331.91	3,250,279,997.87	4,333,706,663.82	
net benefit	-	34,716,000.00	1,040,031,665.96	2,112,609,581.91	3,182,475,310.37	4,248,950,804.44	
discount rate (15%)		1	0.8696	0.7561	0.6575	0.5718	
NPV	**-**	**34,716,000.00**	**904,375,361.70**	**1,597,436,356.83**	**2,092,529,175.88**	**2,429,351,412.80**	**6,988,976,307.21**
			SENSITIVITY ANALYSIS CAPTURING A 25% INCREASE IN PROJECT COST WITH 20% FALL IN COST OF GBV CASES PER ANNUM				
total cost		34,716,000.00	43,395,000.00	54,243,750.00	67,804,687.50	84,755,859.38	
total benefit		-	2,166,853,331.91	4,333,706,663.82	6,500,559,995.73	8,667,413,327.64	
net benefit	-	34,716,000.00	2,123,458,331.91	4,279,462,913.82	6,432,755,308.23	8,582,657,468.26	
discount rate (15%)		1	0.8696	0.7561	0.6575	0.5718	
NPV	**-**	**34,716,000.00**	**1,846,485,506.01**	**3,235,888,781.72**	**4,229,641,034.42**	**4,907,162,263.29**	**14,184,461,585.44**

Type of cases	**Police**	**Hospital**	**Magistrate**	**total reported**	**total non reported cases**	**total GBV cases**
Sex cimes	7552	6654	6042	7552	17621	**25173**
non sex crimes	22656	19962	18126	22656	52864	**75520**
total gbv cases	**30208**	**26616**	**24168**	**30208**	**70485**	**100693**

ANNEX III: CALCULATION OF THE FINANCIAL ANALYSIS AND SENSITIVITY ANALYSIS OF FARMERS' ACCESS TO AGRICULTURAL SERVICES
SCENARIO 1: THE PROPORTION OF MALE AND FEMALE HEADED HOUSEHOLDS WITH DIFFERENT ACCESS TO AGRICULTURAL SERVICES
SCENARIO 2: THE PROPORTION OF MALE AND FEMALE HEADED HOUSEHOLDS WITH THE SAME ACCESS TO AGRICULTURAL SERVICES
numeraire used for production of MHH and FHH is Malawi kwacha equivalent in food consumption expenditure

		2001/02	2002/03	2003/04	Total
Benefits					
agricultural production	**Scenario 1 (j+k)**	**10,690,609,122.80**	**20,492,427,814.95**	**33,670,378,500.00**	
	a. total population	10,600,000	10,800,000	11,000,000	
	b. total farm families	1,802,000	1,836,000	1,870,000	
	c. farm families (MHH)	1,171,300	1,193,400	1,215,500	
	d. farm families (FHH)	630,700	642,600	654,500	
	e. farm families with access (MHH)	383,015	494,068	607,750	
	f. farm families with access (FHH)	113,526	186,354	261,800	
	g. production/ha (kg)	1,307.55	1,803.78	2,300.00	
	h. price of maize (MK)	17.00	17.00	17.00	
	i. land size (ha)	1.50	1.50	1.50	
	j. value of production of MHH	7,662,414,328.28	13,635,157,813.41	21,386,722,500.00	
	k. value of production of FHH	3,028,194,794.52	6,857,270,001.54	12,283,656,000.00	
	Scenario 2 (j+k)	**11,245,778,168.46**	**22,053,047,884.26**	**36,741,292,500.00**	
	a. total population	10,600,000	10,800,000	11,000,000	
	b. total farm families	1,802,000	1,836,000	1,870,000	
	c. farm families (MHH)	1,171,300	1,193,400	1,215,500	
	d. farm families (FHH)	630,700	642,600	654,500	
	e. farm families with access (MHH)	383,015	494,068	607,750	
	f. farm families with access (FHH)	134,339	228,766	327,250	
	g. production/ha (kg)	1,307.55	1,803.78	2,300.00	
	h. price of maize (MK)	17.00	17.00	17.00	
	i. land size (ha)	1.50	1.50	1.50	
	j. value of production of MHH	7,662,414,328.28	13,635,157,813.41	21,386,722,500.00	
	k. value of production of FHH	3,583,363,840.18	8,417,890,070.86	15,354,570,000.00	
Total Benefits	**Scenario 1**	**10,690,609,122.80**	**20,492,427,814.95**	**33,670,378,500.00**	**64,853,415,437.74**
	Scenario 2	**11,245,778,168.46**	**22,053,047,884.26**	**36,741,292,500.00**	**70,040,118,552.72**
Costs					
cost of agricultural services	**Scenario 1 (a+b+c+d+e+f+g)**	**1,128,420,000.00**	**1,282,420,000.00**	**1,543,360,000.00**	
	a. agricultural extension	217,290,000.00	267,880,000.00	326,280,000.00	
	b. animal husbandry	140,660,000.00	172,150,000.00	209,160,000.00	
	c. crop husbandry	10,040,000.00	85,760,000.00	104,990,000.00	
	d. land resources conservation	52,490,000.00	61,980,000.00	74,400,000.00	
	e. irrigation	37,720,000.00	48,440,000.00	57,860,000.00	
	f. administration and support services	532,990,000.00	466,170,000.00	561,980,000.00	
	g. agricultural research	137,230,000.00	180,040,000.00	208,690,000.00	
	Scenario 2 (a+b+c+d+e+f+g)	**1,354,104,000.00**	**1,538,904,000.00**	**1,852,032,000.00**	
	a. agricultural extension	260,748,000.00	321,456,000.00	391,536,000.00	
	b. animal husbandry	168,792,000.00	206,580,000.00	250,992,000.00	
	c. crop husbandry	12,048,000.00	102,912,000.00	125,988,000.00	
	d. land resources conservation	62,988,000.00	74,376,000.00	89,280,000.00	
	e. irrigation	45,264,000.00	58,128,000.00	69,432,000.00	
	f. administration and support services	639,588,000.00	559,404,000.00	674,376,000.00	

g. agricultural research	164,676,000.00	216,048,000.00	250,428,000.00

Total Cost	**Scenario 1**	**1,128,420,000.00**	**1,282,420,000.00**	**1,543,360,000.00**	**3,954,200,000.00**
	Scenario 2	**1,354,104,000.00**	**1,538,904,000.00**	**1,852,032,000.00**	**4,745,040,000.00**
Net Benefits:					
Total Benefits less Total Costs (B-C)	Scenario 1	**9,562,189,122.80**	**19,210,007,814.95**	**32,127,018,500.00**	**60,899,215,437.74**
	Scenario 2	**9,891,674,168.46**	**20,514,143,884.26**	**34,889,260,500.00**	**65,295,078,552.72**
Discount Factor (15%)		0.8696	0.7561	0.6575	
Net Present Value (NPV)	**Scenario 1**	**8,314,947,063.30**	**14,525,525,757.99**	**21,124,036,163.39**	**43,964,508,984.69**
	Scenario 2	**8,601,455,798.66**	**15,511,639,988.10**	**22,940,255,116.30**	**47,053,350,903.06**
Net Incremental Benefit Stream:					
NPV Scenario 2 less NPV Scenario 1		**286,508,735.36**	**986,114,230.11**	**1,816,218,952.91**	**3,088,841,918.37**
Discount Factor (25%)		0.8000	0.6400	0.5120	
Net Present Value (NPV)	Scenario 1	**7,649,751,298.24**	**12,294,405,001.57**	**16,449,033,472.00**	**36,393,189,771.80**
	Scenario 2	**7,913,339,334.77**	**13,129,052,085.93**	**17,863,301,376.00**	**38,905,692,796.70**
Net Incremental Benefit Stream:					
NPV Scenario 2 less NPV Scenario 1		**263,588,036.53**	**834,647,084.36**	**1,414,267,904.00**	**2,512,503,024.89**