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Adolescent Girls, Cornerstone of Society: Building Evidence and Policies for Inclusive Societies

Conference Background Paper

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Introduction

The conference for which this literature review has been prepared makes a bold assertion: that adolescent girls, who are navigating the second decade of their lives, are the cornerstone of society. It is an assertion that has gained considerable momentum in the past year. The United Nations Interagency Task Force on Adolescent Girls, CARE International, Plan International, and the UN Foundation and Nike's Coalition for Adolescent Girls are just some of the international organizations and partnerships that have launched campaigns to promote investment in girls and fulfill their rights. International organizations are recognizing that whereas development policies have failed girls in the past, inequality is not an intractable problem. Rather, they argue that global partnerships and targeted investment in the developing world's 600 million girls can lift them out of poverty and protect their rights – and in so doing can meet the Millennium Development Goals. As evolving young women who already significantly contribute to their families, and as future adults who will contribute to their communities, adolescent girls are now recognized as having a strategic role to play in promoting social justice and building inclusive societies.

How, then, have adolescent girls been represented in development literature? The World Health Organization (2008) defines adolescents as aged 10 to 19 years, an age span that overlaps with UN definitions of children (0 to 18 years) and youth (15 to 24 years). As will be discussed later, adolescence itself includes several stages of physical, emotional, social and cognitive development which differ for each child and according to each expert. (UNAIDS 2004; UNFPA et al. 2006) It also differs by gender. In terms of development programming and policies, however, girls' adolescence is usually defined in terms of sexual and reproductive health. With the exception of literature produced in the past year, the bulk of the literature focusing specifically on adolescent girls during this decade is concerned with issues such as early marriage, early pregnancy, female genital cutting, HIV/AIDS, sex trafficking, child prostitution, and sexual exploitation. Adolescent girls' rights, such as the right to education, are often linked back to sexual and reproductive health, such as the argument that educated girls are more likely to have smaller families and safer sex. Without question, each of these issues is critical. Yet the lives and experiences of adolescent girls encompass so much more.

Adolescence is not only a time of bodily changes, it is a time of social, emotional and cognitive change as girls and boys transition to adulthood. In the developing world, many adolescents are pushed into adult roles before they are ready: work, marriage, parenting either younger siblings or their own children, heading households, and even soldiering. While some of these roles may be taken on by boys or girls, the transition into adulthood differs greatly based on gender. As boys grow and learn, their world widens and they take on more public roles and inherit greater social, economic and political rights. Girls enter adolescence earlier and mature faster than boys, but their entrance into adulthood is a retreat into the domestic sphere. They

take on more family roles and their mobility, public participation and economic, social and political rights are increasingly restricted. (Lloyd et al. 2005) In fact, adolescent girls never reach full adulthood under laws in many countries to the extent that even as women they may become defined as dependents of their husbands, having to request his permission to travel or unable to fully own property and independently transact business. A sexual and reproductive health and rights approach also does not account for the world in which adolescents in the 21st century live. They are among the first generations to come of age in a world that has always known HIV/AIDS, but they are also growing up in a world made smaller by information and communication technologies (ICTs) such as mobile phones and the Internet. (Lloyd et al. 2005)

By focusing through the lens of sexual and reproductive health and rights, we are missing these and other aspects of adolescent girls' lives. If we are truly invested in promoting and protecting girls' rights, then we need a conceptual framework that seeks to understand development issues from their perspective: how girls experience these issues, how their lives are lived. From this new perspective, other emerging issues take on new importance for girls' programs and policies, as we begin to understand how shocks such as climate change or the economic crisis can result in a radical shift in a 14-year old girl's life. As Judith Bruce has observed, what happens during adolescence shapes a girl's (or boy's) adulthood. (Bruce 2003) Choices made by adults about a girl's education, healthcare, employment and so forth will determine her future place not only in her family but in the economy and civil society. They may even empower or hinder her from making informed choices of her own. Adolescence for girls is therefore a transition into new realms of discrimination, vulnerability and risks but also, with the appropriate support, new opportunities.

This literature review seeks to broaden our perspective of the lives and experiences of adolescent girls by exploring four major development challenges and how they impact girls' present and future lives. These are: demographic transitions, the global economic crisis, climate change, and technology. Youth populations have risen dramatically in many developing countries partly as the result of improved maternal and child health. These "youth bulges" pose immediate and future challenges to countries' social and economic development but, with targeted investments in education and employment, can produce economic growth. The global economic crisis and climate change both drag households further into poverty and threatens to reverse development gains. Yet policies and reforms aimed at preventing crises and mitigating risk can fuel gender equality as well as protect households. Climate change has, in addition, inspired some innovative youth programming that builds youth leadership. Information and communication technologies offer an array of economic, educational and other opportunities to young people who have access, but have served to widen social and economic disparities for those who do not. Each of these development challenges present risks as well as opportunities for adolescent girls in developing countries.

Three observations with respect to studying adolescent girls in the context of these four development challenges have emerged from the literature review. The first is that adolescent girls are not generally represented as a specific category in any of these issue areas. Instead, they are subsumed under the rubric of either children (ages 0 to 18 years), youth (ages 15 to 24 years), or mentioned in tandem with or absorbed within the heading of women – all of which are broad categories themselves. That adolescent girls can fit into such vastly different age categories highlights the need for programs and policies to consider girls throughout the different stages of adolescence: there is a world of contrast between the economic and social realities of a girl of 12 years and a young woman of 17 years. Adolescent girls must be recognized as a cohort with its own subsets. Approximate age categories include pre-adolescence (9 to 12 years), early adolescence (12 to 14 years), middle adolescence (14 to 16 years), and late adolescence (16 to 18 years). (UNFPA and Population Council 2006) Other relevant subsets for analysis are rural or urban residence, marital status, education, socio-economic status, and marginalization (such as disability, migration status, living in a vulnerable area, or belonging to an ethnic or religious minority). (Bruce 2003)

The second observation is that most of the evidence supporting what we know about adolescent girls in connection with the issue areas explored in this review is anecdotal rather than empirical, or is generalized rather than context specific. We know, for example, that land degradation and crop failures due to climate change place girls at greater risk of early marriage (WEDO 2008; Government of Uganda 2007), but there have been no studies to assess the scope of the problem or to monitor it. This suggests that there is either a lack of relevant data which can be compared regionally, nationally or globally; or that available data has been underutilized. Such gaps in data and knowledge must be filled in order to support strong, evidence-based programming and policy making. In another example, advocates and policymakers in Indonesia warned that girls' education, health and other human development factors would suffer as a result of the 1997 Asian financial crisis. Later, an analysis of national data disaggregated by gender and age found that trends favoring girls that preceded the crisis generally protected them from risks such as early school leaving. (Levine and Ames 2003) Such counterintuitive findings beg additional research to understand what existing policies, trends or practices enabled girls to continue with school, and how governments and development partners can support or strengthen them. Clearly, a stronger relationship between researchers and policymakers is important for designing policies and programs that are responsive to realities on the ground.

A third observation is that how girls from poor households are impacted by economic or food crises, or whether they are able to benefit from new technologies, often has to do with preexisting issues of social exclusion and discrimination. A debate continues as to how best define poverty. It is widely understood that poverty is multi-dimensional, and yet many institutions and economists still use income poverty measures to determine its threshold. One example is cited later in this review: The World Bank's estimate that by 2010 an additional 89 million people will be living below $1.25 per day as a result of the current global financial crisis.

(World Bank 2009A) Yet income poverty measures do not give a good indication of how poverty is experienced by the poor, particularly by girls. Nor do they capture social exclusion experienced by those who are discriminated against because of their gender, age, ethnicity, caste, religious identity, migration status, or other culturally devalued difference.

UNICEF has defined children living in poverty as those who "experience deprivation of the material, spiritual and emotional resources needed to survive, develop and thrive, leaving them unable to enjoy their rights, achieve their full potential or participate as full and equal members of society." (UNICEF 2005)[1] As this definition suggests, poverty has a social dimension; children may be excluded because of gender and other social identities that are subject to social, political or economic discrimination. Kabeer (2006) describes exclusion as a durable form of disadvantage "revolv[ing] around social identity and reflect[ing] the cultural devaluation of people based on *who they are* (or rather *who they are perceived to be*)." (Kabeer 2006) In addition to gender, girls may therefore be socially excluded on the basis of several overlapping claimed or ascribed identities such as belonging to an indigenous people, living in a female-headed household, or having parents who are seasonal migrant workers. The durable nature of social exclusion makes it that much more difficult to access the opportunities that enable groups to escape poverty or benefit from economic or disaster recovery. Excluded groups are all the more vulnerable to shocks. Many of the policy and practice papers discussed in this review therefore recommend actions to ensure that opportunities are genuinely accessible to girls, especially those that are marginalized. Societies that are inclusive for adolescent girls, accordingly, are those which provide social protection but which also seek to address the root causes of poverty and inequality by promoting girls' rights and empowerment.

Methods

This paper is the result of a review of literature from the period 2000 to 2009 on the impact of 1) demographic transitions; 2) economic crises; 3) climate change; and 4) the expansion of technology and innovations on adolescent girls in developing countries. "Impact" was characterized in terms of measurable development outcomes, such as a decline or increase in girls' school attendance, as well as predicted or observed risks and opportunities, such as opportunities for girls' empowerment through participation in youth-led community education activities about climate change and adaptation. To facilitate analysis, a matrix was constructed that lists risks, opportunities and knowledge gaps found in the literature for each topic.

[1] Child poverty is measured according to seven types of severe deprivation: nutrition, access to safe drinking water, access to sanitation facilities, health, shelter, education, and access to information. Gordon et. al. (2003) include an eighth measure, not readily captured in current national data, access to basic social services.

Literature was identified through online search engines and academic databases such as those provided by Eldis (www.eldis.org), CIAO (Columbia University's International Affairs online database), the World Bank as well as through personal communication with experts at international organizations and research institutions. Literature was classified according to whether it presented a) general trends, b) empirical evidence, c) policy and practice, and d) implicit or explicit research questions. The attached annotated bibliography summarizes and provides the classification for select papers that were reviewed. In most cases, literature that specifically explores the themes specifically in the context of adolescent girls was not available. Instead, the review frequently relied upon literature that addressed the selected themes from an approach focused either on gender, children or youth, and extrapolated information that was relevant to adolescent girls.

Themes

Demographic Transitions

General Trends. The term "demographic transition" has been described in a number of ways, but generally it refers to a period of accelerated population growth generated by declining mortality rates while the number of births remains high. Eventually fertility rates drop in response to improved child survival and life expectancy, and population growth stabilizes at a much lower rate.[2] (United Nations Population Division 2005; Lam 2006) The mismatch between declining mortality and fertility rates produces a population "bulge" that works its way over time through the population's age structure. During the first stage of the demographic transition, birth rates are high and children comprise a large proportion of the population. During the second stage, fertility rates begin to fall, producing less children, and the working age population – including youth – increases. The proportion of youth and working age adults eventually peaks and declines, giving way to a large elderly population during the third and final stage of the transition. (United Nation Population Division 2005)

As the description of the three stages of a demographic transition implies, the changing size and age structure of a country's population has considerable implications for its economic growth and, some would argue, its social and political development. The large child and elderly populations found at the beginning and end of a transition are mostly dependent on a smaller working population, requiring more government social spending but reducing the taxable base to support it. On the other hand, economies can receive an enormous boost during the transition's second stage, when the largest proportion of the population reaches working age. Assuming that young people have smaller families and are fully employed, the dependency ratio declines and savings, investment and GDP rise. (AARP International 2008; United Nations Population

[2] According to Lam (2006), the decline in infant mortality rates has been the greatest driver of demographic transition in the developing world.

Division 2005; Dhillon and Yousef 2007) This "demographic dividend" has been widely credited as contributing to the growth of the East Asian economies. However, many developing countries do not have the economic and education policies, labor markets or social investments in place to leverage their sizeable youth populations. In the Middle East and North Africa (MENA) region, for example, weak education policies have attempted to keep pace with the rapidly growing youth population by expanding educational access, but have done so at the expense of quality. As a result, university graduates do not have the skills needed by a changing economy. (Dhillon and Yousef 2007) The injection of a surplus of young, inexperienced workers into a weak labor market thus drives wages down and push unemployment up. (Lam 2006) Under such circumstances, young adults continue a prolonged adolescence or "waithood" given their economic dependence on the state or household support. Finally, given that the youth cohort will age after 20 to 30 years, the window of opportunity for a demographic dividend is actually quite small. It then ages and becomes a disproportionately large elder population that reduced subsequent generations of workers are unable to support. (AARP 2008; Dhillon and Yousef 2007; McNay 2005) Youth bulges therefore present a considerable challenge to developing countries if the appropriate policies and investments are not already in place to accommodate their numbers.

Empirical Evidence. While most youth populations in the developing world have either peaked or will do so by 2010, countries have experienced demographic transitions at different times and at varying rates. David Lam (2006) divides developing countries into four categories depending on the timing of their youth bulges (defined as ages 12 to 24). Countries that peaked before 2000 (such as China and Thailand); countries peaking between 2000 and 2010 (e.g., Indonesia, Brazil, Mexico and Vietnam); countries which will peak between 2010 and 2030 (e.g., the Philippines, India, Malaysia, Egypt and Peru); and those which will peak after the 2030 (e.g., Pakistan, Iraq, Nigeria and Senegal). The largest number of countries – mostly in Sub-Saharan Africa but also including Afghanistan and several Central Asian countries – will peak well after 2030. (Ibid.) While countries in this last group are not the most populous, they are among those facing the greatest challenges to meeting the Millennium Development Goals.

Demographic transitions have mostly occurred as the result of falling mortality rates and are resolved when matched by comparable rates of fertility. A number of studies suggest that the paradigm has been quite different in countries hardest hit by the HIV/AIDS pandemic. Using modeling and projections from UNAIDS, Lam projected that Botswana's youth population would peak in 2005, several decades before it would have in the absence of AIDS. Similarly, he projected that AIDS would curb the growth of Zambia's youth population by about 15 percent by 2015. (Lam 2006) Other studies of the impact of AIDS on demographic transitions in southern African countries suggest higher dependency ratios as the working age population (ages 15 to 64) decreases, but do not disaggregate data by small enough age brackets to specify adolescents or youth as distinct cohorts in their studies. (Udjo 2006; Kalemli-Ozcan 2006; Matanyaire 2005)

A few empirical studies linking youth bulges, domestic armed conflict and economic stagnation have received greater acceptance in U.S. foreign policy circles since 9/11. (Urdal 2004; Leahy et al. 2007; Urdal 2008) These studies claim that "societies with rapidly growing young populations often end up with rampant unemployment and large pools of disaffected youths who are more susceptible to recruitment into rebel or terrorist groups." (Beehner 2007) How youth actually influence conflict or vice versa appears to remain conjectural and relies on assumptions that adolescents and youth – mostly male – have an inherent propensity towards aggression. (Boyden 2006; Hartmann and Hendrixson 2005) Hartmann and Hendrixson point out that these studies rely on a paradigm in which adolescent boys and young men are equated with criminal behavior whereas adolescent girls and young women are viewed as mothers whose fertility must be controlled, a paradigm used to rationalize crime among poor youth of color in developed countries.

As is suggested by Hartman and Hendrixson's critique, adolescent girls and young women are largely missing from empirical studies of youth bulges. Kirsty McNay (2005) has produced to date the only review of empirical evidence on how girls and women are impacted by demographic transitions, and most of the studies she references were published in the 1990s. The majority of them argue that declining fertility has benefits for women and girls of reproductive age, since lower birth rates and fewer children to care for translates into more time to pursue economic opportunities outside the home. The growth of women's employment in East Asia is frequently cited as an example. (Ibid.) McNay counters that the reality is more complex and context specific. Declining fertility may in some settings reflect a decision by poor households unable to support an extra dependent and therefore yield no other advantage. Moreover, the jobs available to women in East Asia "[leave] much to be desired": they have been in low-wage, labor-intensive, export industries and where women have little job security. Even with fewer children to care for, women and girls who work are not able to relinquish their household duties in order to do so and therefore their work load is doubled. (Ibid.) McNay observes that women among the elderly population at the end of the demographic transition are vulnerable given that they outlive men and will have fewer resources to draw upon for support as the working age population declines. McNay might also have noted that a significant share of caregiving for dependents falls to adolescent girls, so that the several generations of girls following the transition's end might continue to face additional work at home if the appropriate supports are not in place.

McNay points to another counterintuitive trend that has recently received more attention in the international media, which Amartya Sen referred to as "missing women" and which has since been called "the daughter deficit." (Sen 2003; Rosenberg 2009) In 1992, Sen published his estimate that 100 million women were "missing" from parts of Asia and North Africa, based on sex ratios that uncharacteristically favored males, due to gender discrimination in healthcare and sex selective abortions. (Sen 2003) Other researchers have since carried out studies that support Sen's finding, although Stephan Klasen estimates that the number of missing women is

closer to 89 million. (Klasen 2008; Srinivasen and Bedi 2006; Das Gupta et al. 2003) Contrary to expectations that gender discrimination disappears with affluence, Monica Das Gupta found that son preference in parts of Asia persist even among educated women. Sex selective discrimination takes place before conception (parents wanting only sons stop conceiving when the preferred number is reached); during pregnancy (through sex selective abortion); at birth (sex selective infanticide); and during childhood (through neglect such as failure to provide healthcare for a sick daughter). (Das Gupta et al. 2003) Birth order has proven another factor. In her study of well-off families in Punjab, Das Gupta found that a first daughter might receive good care, but that a subsequent daughter born to an educated mother was 2.36 times more likely to die before her fifth birthday. Ultrasound has been advertised to couples who can afford it as a way of preventing large dowry costs down the road, implying that sex selected abortion saves couples the burden of raising a girl. (Rosenberg 2009) Such findings raise additional questions about demographic trends for adolescent girls, particularly in a context where gender equality has empowered women to discriminate against their girls.

Policy & Practice. Just as adolescent girls have been missing as a cohort from empirical studies, they are not adequately represented in policy discussions of youth bulges and demographic transitions. "Youth" is typically characterized as male and an object of concern. When girls and young women are mentioned, it is as vectors of population growth. Population Action International's 2007 report, *The Shape of Things to Come: Why Age Structure Matters to a Safer, More Equitable World*, epitomizes this view. It promotes girls' education, later marriage and women's employment not as ends desirable in themselves but as means to lower fertility and slower population growth in the developing world. (Leahy et al. 2007)

One series of policy papers has begun to include young women in its discussion of youth inclusion in the Middle East and North Africa (MENA) region. The Middle East Youth Initiative, a joint project of the Wolfensohn Center for Development at Brookings and the Dubai School of Government, views youth in the region as "involved in a different fight – a fight to build their economic future and contribute to society." (Dhillon and Yousef 2007) It defines youth inclusion as "the provision of opportunities that enable youth to fully participate in normatively prescribed roles and activities", including "receiving *quality* education, *decent* employment, *affordable* housing and the power to shape their communities." (Ibid.; emphasis mine.) The initiative therefore proposes not only the basic needs of young women and men to enter an inclusive adulthood but that they should be acceptable to them and allow them to engage meaningfully in community life. It also recognizes that, for both young women and young men in the region, marriage and parenthood are important markers of adulthood which are delayed when they are unable to find work or earn enough to support a family. More young women and men are accessing higher education, but the skills and expectations with which they graduate are often misaligned with the needs and realities of the labor market. Labor markets are therefore unable to absorb the high number of graduates. Young women are particularly disadvantaged as they are usually given lower paid jobs. Young women and men therefore often enter a prolonged

period of economic dependence and "waithood", extending adolescence well into their 30s. (Ibid.) While the Middle East Youth Initiative offers a starting point for a gendered analysis of youth inclusion, more research is needed to understand the specific experiences and expectations of young women and how policies and investments can better support their entrance into adulthood.

Economic Crises

General Trends. At this writing, the global economy is showing "tentative" signs of recovery from the 2008-2009 financial crisis. For low income countries whose economies had already been devastated by skyrocketing fuel and food prices in 2007 and 2008, the World Bank (2009A) has forecasted a slower, "muted" recovery with an additional 89 million people living below $1.25 per day by 2010. Although the current crisis is by all accounts the most severe since the Great Depression, it is important to note the frequency with which developed and developing countries alike have been subject to banking crises. The 1990s alone saw crises in Mexico, which resonated in the Southern Cone and Brazil (1994-1995); East Asia (1997); and Argentina (1999-2002). Reinhart and Rogoff (2008) have identified 18 economic crises in the postwar period in advanced economies alone, of which the five largest have occurred in the last three decades before the current crisis. When emerging economies are included, they find that "on average there are no significant differences in either the incidence or frequency of banking crises between advanced and emerging economies – banking crises are an equal opportunity menace." (Ibid.) Clearly, we can expect economic crises with regional and international repercussions to become more common in the decades ahead. (Ibid.; Mendoza 2009)

What is different is how a single crisis can affect different countries, based on local socio-economic conditions preceding the crisis and "the relative significance of channels of impact." (World Bank 2009A) Generally, low income countries in the current crisis have experienced balance of payment difficulties and declines in commodity prices, demand for manufactured and commodity exports, tourism, foreign direct investment and private capital flows, particularly remittances. (World Bank 2009A; Seguino 2009; Fukuda-Parr 2009) Economic crises have a decidedly gendered impact in low income countries because women often dominate the sectors most affected. Women comprise 85 percent of the 95 million poorest borrowers in the microcredit sector, and, without collateral, will likely face difficulty if banks tighten their micro-lending requirements. (World Bank 2009A; Buvinic 2009) Women also predominate in agriculture and export manufacturing, sectors that have been hit hard by the current financial and food crises, usually in lower wage jobs than men. Consequences are especially hard for female headed households. (Sequino 2009; Fukuda-Parr 2009) The loss of women's employment and business is important because women earners are more likely than men to spend on children, including girls. (Buvinic 2009; Mendoza 2009)

In addition to the economic impact on women, Jahan (2009) identifies three other areas in which economic crises are gendered: human development, the care economy, and gender-

specific impacts such as increased domestic violence, prostitution and trafficking. Human development suffers both because of reduced household income, including lost remittances, and contracted government social spending in response to declining revenues and economic reforms. As Fukuda-Parr (2009) poignantly expresses it, "macroeconomic policy reforms aiming at balancing budgets and at stabilizing the economy end up unbalancing human lives." Economically distressed households are, in turn, pressured to make painful choices about how to spend their meager resources such as who is able to continue school, who must seek work, who eats less, and who can receive healthcare. Ultimately, adolescent girls are among those with the most to lose. Where such a choice must be made, girls are often more likely to be pulled out of school, particularly in countries with existing low enrolment rates for girls. (Janan 2009; Buvinic 2009; Seguino 2009; Bjorkman 2007) Similarly, distressed households often prioritize men and boys over girls and women when it comes to food distribution and healthcare. (Jahan 2009; Neumayer and Plumper 2007) Adolescent girls may also be impacted by negative shocks to the care economy, as reduced government spending on healthcare and other social services requires girls and women to spend more time caring for household members. (Jahan 2009; Mendoza 2009) Care work, which frees up other household members to work outside the home, is not counted in GDP. If a monetary value were assigned to care work, it is estimated that it would comprise close to two-thirds of the market economy. (Fukuda-Parr 2009) Regardless, households in which girls or boys forego education in order to work risk becoming trapped in poverty, and the countries in which they live risk lose potential human capital accumulation and productivity. (Mendoza 2009)

Empirical Evidence. Although a gender impact assessment is needed, the current crisis is still too recent for there to be published empirical studies and the literature on the gender effects of past economic crises remains small. (Jahan 2009) Of note to this review, risks specific to adolescent girls from poor households, such as early marriage, trafficking or food for sex, have been reported only anecdotally in the context of depressed local economies, food crises and climate change-related household shocks. (Nyumbu and Poulson, 2009; WEDO 2008; Government of Uganda 2007) For example, an ILO article on child labor in Zambia's mining communities reported anecdotally that economic hardship is pushing families to marry their adolescent daughters and sons to much older adults, and adolescent girls are selling sex for food or entering into local prostitution. (Nyumbu and Poulson, 2009) Data collection and analysis that might help assess the scope of such hazards for girls or document risky coping strategies is lacking.

Gender disaggregated data on education, healthcare, and other indicators of development outcomes are available and offer some insight on how adolescent girls have fared during past crises. The general assumption is that girls in low income countries are pulled out of school more often than boys when poor households struggle financially. This is certainly the case in Bjorkman's (2007) study of the effect of household income shocks on schooling in rural Uganda. Using rainfall as an indicator of agricultural income, Bjorkman found that when rainfall

declined, so did adolescent girls' enrolment, far more so than boys'. School drop-out rates were even higher for older girls. In the years following low rainfall, girls who had left school did not return. Another lingering effect was that girls who had been impacted by previous shocks to household income performed worse than boys on tests, suggesting that shocks negatively affect not only the amount of time girls spent in school but the quality of their education. (Ibid.)

Other studies have found evidence to the contrary, suggesting that preference for boys' or girls' schooling depends on local social and economic contexts. For example, Gubert and Robilliard (2006) found that in Madagascar, agricultural households coping with declining incomes were more likely to pull older children out of school to work, but that it was boys', not girls', enrolment that was negatively affected. They point out that their finding that parents favor girls' education is consistent with other current research on the "negative" gender gap in Madagascar's schools. (Ibid.) Levine and Ames (2003) compared gender disaggregated data not only on school enrolment but also child labor, immunizations and mortality to determine the impact of the East Asian financial crisis on adolescents in Indonesia. Despite predictions to the contrary, Indonesian girls overall did not fare worse than boys even though their share of housework increased. Instead, girls appeared to benefit from long-term trends in their favor such as increasing secondary school enrolment rates. These three studies suggest that whether girls are negatively impacted by household income shocks depends largely on existing social policies that support adolescent girls' education and other outcomes as well as measures that support struggling households that are facing difficult decisions.

Policy & Practice. Because adolescent girls have not been the focus of the literature on the current and past economic crises, good practices and policy recommendations that target their needs have not been specified. Nevertheless, recommendations supporting human development outcomes for children and women provide a starting point for discussion.

Top among these recommendations is introducing or strengthening social protection measures: school feeding programs, public works and employment guarantee programs, subsidized healthcare, and so forth. (Jahan 2009; Mendoza 2009; UNICEF 2009) Mosel and Sarkar (2009) recommend combining measures to lower educational costs with incentives to poor households to keep children in school, such as conditional cash transfer programs that require children's school attendance, school feeding programs, lower school fees, and free or subsidized textbooks, uniforms and childcare. Such programs would particularly benefit adolescent girls whose families are otherwise unable to send them school. Supporting social and healthcare services lessens the burden of unpaid care work on girls and women (Mendoza 2009; Fukuda-Parr 2009). As the studies on girls' schooling demonstrate, governments should also improve domestic policies that strengthen social and economic stability (Mendoza 2009) and that address underlying gender and social inequality. This theme will be taken up again in gendered policy responses to climate change-related disasters, which carry negative economic consequences as well.

Social protection programs that guarantee women's employment and expand their economic opportunities are important because women typically invest their earnings in their girls and boys. Buvinic (2009) provides examples of women-friendly public works in India, Peru, Chile and Argentina. These programs target women and provide work close to home, flexible hours and childcare options, and include a variety of employment options, some of them home-based.

Finally, Jahan (2009) calls for research partnerships that can assess the gender impact of the current economic crisis. In the absence of data, many of the predictions of the crisis' impact on poor and vulnerable households are hypothetical even if based on the documented experience of past crises. Again, many of the risks and hazards specific to adolescent girls – early marriage and thus early pregnancy, gender-based violence, hazardous forms of work such as prostitution – are not analyzed empirically in the context of aggregate shocks or crises and therefore it is difficult to accurately gage the scope of these risks. Jahan proposes regular knowledge sharing between NGOs, academics and governments so that the situation can be accurately assessed and targeted, shared strategies can be formulated. (Ibid.) The conference for which this literature review is being prepared could provide a forum for such knowledge sharing.

Climate Change

General Trends. In 2007, the Intergovernmental Panel on Climate Change (IPCC) announced that "unequivocal" evidence confirmed that human activities were causing global warming. The resulting higher surface temperatures have unleashed a chain of climate events such as rising sea levels, increasing numbers of heat waves and hot extremes, and tropical storms that are less frequent but far more severe. (UN News Center 2007) While there has long been a significant amount of writing about the impact of natural disasters and environmental degradation on human security and development, it is mostly in the last decade that a literature has emerged which connects them as part of a multi-faceted, global phenomenon known as climate change. A small segment of this growing body of literature calls attention to the impact of climate change on women or children and youth and points to opportunities for their active participation in climate change adaptation, disaster risk reduction, and policy negotiations. This new body of work contributes policy recommendations and documents good practices but is far from exhaustive in scope. It acknowledges the scarcity of empirical evidence that would strengthen and support concrete policy analysis and recommendations, and frequently cites the need for further research. As with other emerging issues covered in this paper, adolescent girls are mentioned only anecdotally and in passing reference. Gender analyses focus on adult women, while children and youth are constructed mostly as gender neutral. Adolescent girls are therefore largely absent as a specific category with their own concerns, experiences and potential for contribution.

Climate change encompasses both sudden "extreme weather events", such as hurricanes or severe heat waves, and gradual changes yielding long term effects such as higher temperatures

or rising sea levels. Whether felt as an immediate disaster or a slow encroachment, the impact of climate change can jeopardize health, destroy livelihoods and displace communities. These impacts are analyzed in terms of "hazards" and "vulnerability". Hazards are physical impacts that threaten the safety of human life, property and the environment as well as uproot communities and disrupt local and national economies. Vulnerability refers to how susceptible communities are to the physical impacts of climate change, not only in terms of destruction but economically, politically or socially. (WEDO 2008; UNICEF UK 2008)

Gender analyses of climate change use as their starting point the role of adult women as food producers, household managers and caregivers and the types of vulnerability carried within these roles. For example, both hotter, drier seasons in some regions and more intense rainfall in others can lead to crop failures and shortages of safe drinking water. Where women play a major role in agricultural production and household water provision, they are challenged not only with maintaining household economic and food security, but face "time poverty" as they must invest more time and energy into farming and seeking potable water. Similarly, shortages of firewood exact an opportunity cost as women spend more of their productive time gathering firewood further from home. Walking longer distances to collect water and firewood pose other risks as well, exposing women to sexual harassment and sexual assault. (WEDO 2008; BRIDGE 2009) Given that adolescent girls participate in many of these activities –working in agriculture, collecting fuel and water – they are often mentioned in tandem with women as similarly vulnerable. What is missing, however, is an exploration of how adolescent girls experience such hazards and any differences in the ways in which they may be vulnerable. For example, married girls are entering new households where they lack decision making power and yet are expected to take on certain adult work and caregiver roles. How are they impacted differently by challenges to food and fuel provision? How are they able to participate in household decisions around adaptation strategies such as changing diets or switching to other crops or farming methods? How do their experiences differ from those of unmarried girls?

One vulnerability specific to adolescent girls living in economically distressed households is early marriage. Families confronted with extreme economic hardship will sometimes marry off their daughters at an earlier age to reduce household demand and, among communities where marriage involves the transfer of money from the groom's family to the bride's, for the short term gain of bridewealth. (WEDO 2008) Typically, the younger the girl at time of marriage, the greater the distance in age from her husband. (Haberland 2004). The unequal relations inherent in such marriages expose adolescent brides to a host of other risks including HIV and other sexually transmitted diseases, unwanted sex and early pregnancy, exclusion and the loss of social networks, and school drop out. (Ibid.) The Government of Uganda identifies these "famine marriages" in its National Adaptation Programme of Action as a negative coping strategy but does not provide information as to their prevalence. (Government of Uganda 2007) In its briefing report on the impact of the 2004 tsunami on women in India, Sri Lanka and Indonesia, Oxfam International (2005) found that young women were also being

pressed into marriage at an earlier age to much older husbands in response to the enormous family losses wrought by the disaster. However, these reports are mostly anecdotal; there is no data available that indicates the scope or patterns of early marriage as a coping strategy for distressed households in response to climate change.

The coping strategies of distressed households potentially affect adolescent girls in other ways as well. As crops are damaged by drought or heavy precipitation, food shortages drive households to ration food and place children at risk of malnutrition. (UNICEF UK 2008; WEDO 2008) Previous studies have reported that households often prefer boys and men over girls and women when rationing food. (Neumayer and Plumper 2007) While malnutrition is primarily viewed as a developmental risk for children under the age of five, adolescent girls are also undergoing an important growth stage as their bodies mature. Other coping strategies for struggling households include pulling children out of school and sending them to work. (UNICEF UK 2008) (The trade off between school and child labor has already been discussed above in the context of economic crises.)

Climate change affects children in other ways. Children's health is a major concern as tropical storms and heavy rains cause floods that contaminate drinking water supplies, threaten sanitation, and spread water-borne diseases such as cholera. Climate adaptation strategies have in some cases posed new public health risks. For example, changing irrigation patterns and land degradation in West Africa appear to be providing new vectors for the spread of malaria and meningitis respectively. (UNICEF UK 2008) Air pollution, worsened by record high temperatures and ozone levels, contribute to higher rates of asthma and other respiratory illnesses.

Another concern is the injury, death and displacement wreaked by heavy rains and flooding. In 2007 alone, an estimated 1.5 million people were left homeless due to rains and flooding in 18 African countries. Typically women and children represent more than three quarters of those displaced by natural disasters (UNICEF UK 2008; Oxfam International 2005); the gender imbalance in disaster-related deaths is discussed in the next section. Not only rural areas face weather-related disaster; urban slums often concentrate near coastal areas or are relegated to hazardous areas such as floodplains and industrial waste sites. The impact of habitation can change drainage patterns or destabilize slopes, resulting in floods and landslides that destroy the precarious shelters and infrastructure of informal urban settlements. Children and their caregivers are easily injured or killed by collapsing structures and the large amount of debris often found at such sites and left without shelter. (Bartlett 2008) The aftermath of disaster exposes adolescent girls to other hazards. In emergency shelters, families living together in crowded conditions lack privacy for bathing or changing clothes, and areas surrounding outdoor toilets are often poorly lit after dark. Not surprisingly, adolescent girls in IDP camps and emergency shelters have reported high levels of sexual harassment. (Bartlett 2008)

The search for wage labor as well as shelter has increased distress migration and migration of internally displaced families to urban centers. As a consequence, children and young people who migrate or are left behind are at greater risk of exploitation and abuse. (UNICEF UK 2008; Bartlett 2008) The most widely cited figure estimates that up to 200 million people will have migrated due to environmental factors by 2050, although estimates range from 25 million to one billion. (IOM 2009) Ten million people are already said to have migrated in Africa in the last two decades alone mainly because of environmental degradation and desertification. (Ibid.) Terms that have begun to be used by activists to describe this new wave of migrants, such as "environmental refugee" or "climate change refugee" have no legal basis in international refugee law (ibid.), and suggests new dimensions of vulnerability around legal status in receiving countries the for migrants uprooted by environmental degradation. Children of undocumented immigrants are deprived of rights in many receiving countries such as public schooling and access to healthcare. Children of seasonal distress and other internal migrants face discrimination and structural barriers to their rights and entitlements in their own countries, partly owing to the limited efforts of governments to facilitate their access to education, healthcare and protection. Adolescent girls, like their siblings, instead become part of the household workforce, either staying home from school to care for small children while parents work, or working alongside their parents in manual or agricultural labor. (Smita 2008)

Empirical Evidence. Many of the trends discussed above are based on anecdotal reports or small-scale surveys that necessarily conclude with calls for further research. Several studies have analyzed the affects of drought, famine and other climate-related hazards on girls' growth and development, but focus on children under the age of five because of their extreme vulnerability.[3] These studies find that malnutrition in very young children long term effects that extend into adulthood. Adolescence is a critical growth phase for children as well, but does not appear to be a category that is studied in this context, either for boys or girls.

One study that uses a vulnerability approach to analyze the impact of natural disaster on women's life expectancy does have implications for adolescent girls. Using up to 141 countries during the period 1981 to 2002, Neumayer and Plumper (2007) found that the strength of a natural disaster has a systematic effect on the gender gap in life expectancy in countries where women have lower socioeconomic status. In other words, disasters kill more women than men or kill women at an earlier age than men where women have low socioeconomic status. The

[3] See, for example Mansuri, Ghazala, "Migration,sex bias, and child growth in rural Pakistan," Policy Research Working Paper Series 3946, The World Bank; Omitsu, Makiko & Yamano, Takashi, 2006. "The Impacts of Hurricane Mitch on Child Health: Evidence from Nicaragua," 2006 Annual Meeting, August 12-18, 2006, Queensland, Australia 25700, International Association of Agricultural Economists; Mu, Ren & Zhang, Xiaobo, 2008. "Gender difference in the long-term impact of famine," IFPRI discussion papers 760, International Food Policy Research Institute (IFPRI); and Wang, Limin & Kanji, Shireen & Bandyopadhyay, Sushenjit, 2009. "The health impact of extreme weather events in Sub-Saharan Africa," Policy Research Working Paper Series 4979, The World Bank.

greater the disaster's death toll relative to the country's population, the narrower the gender gap in life expectancy, indicating more higher mortality rates among women than men. (Typically women have a longer life expectancy than men.) However, in countries where women enjoyed a higher socioeconomic status, disasters had less of an effect on gender differences in life expectancy. "Natural disasters do not affect people equally as if by an arbitrary stroke of nature," concluded Neumayer and Plumper. "Instead, the disaster impact is contingent on the vulnerability of affected people, which can and often does systematically differ across economic class, ethnicity, gender, and other factors." (Ibid.) Citing other disaster literature (including Oxfam International 2005), they listed a number of ways in which socially constructed gender roles and the socioeconomic status of women and girls place them at higher risk of mortality during disasters. These include vulnerability owing to where women and girls are when disasters hit (for example, in the poorly built homes in which they live, compared to men often being at work in the open or in more sturdily built structures); cultural biases that discourage women from learning to swim or climb and thus acquire self-rescue skills; elderly and impoverished female household heads living in poorly built areas; and gender biases that reserve scarce food or medical supplies for boys rather than girls. (Ibid.)

For Oxfam International (2005), the demographic change in Tsunami-struck villages where up to three quarters of those killed were women and girls begs questions about new risks for female survivors. Will men and boys share in household and other tasks traditionally assigned to women and girls, or will women and girls shoulder a greater work burden and increased time poverty? What will the gender imbalance mean for marriage and family formation – will it encourage early marriage and earlier, larger families? What effect will the increased presence of men and boys have on women's and girls' mobility and safety? Again, these questions do not appear to have been followed up with research in the years following the Tsunami.

Policy & Practice. Responses to climate change are discussed in terms of mitigation, adaptation and risk reduction. Climate mitigation refers to environmental management and other practices, such as conserving forests and or utilizing alternative energies, aimed at reducing greenhouse gas levels in the atmosphere. Adaptation covers a broad range of strategies intended to strengthen the resilience of communities impacted by climate change and reduce their vulnerability. Adaptation might include, for example, raising the plinth level of homes where flooding is an increasing occurrence, or teaching farmers to detect changing seasonal patterns and adjust planting timetables in response. Some adaptation strategies have a negative impact, such as food rationing, which is described above. Disaster risk reduction, by contrast, includes safety planning, constructing homes that can withstand severe storms, and other measures aimed at building communities' capacity to respond to the immediate dangers of extreme weather events and natural disasters. (UN/ISDR 2008; BRIDGE 2009; Mitchell 2008; Bartlett 2008; WEDO 2008)

One of the more exciting new fields of policy and practice that has emerged in the past decade is child-centered climate change adaptation and disaster risk reduction. Most disaster planning and preparedness education are led by adults and treat children as passive recipients of information. Child-centered approaches begin with the recognition that children and youth can play a dynamic role in community advocacy and education as communicators of climate change adaptation and risk reduction and agents of change. (Mitchell 2008; Bartlett 2008; Plan UK; Children in a Changing Climate 2008) Most of these projects are working with adolescents, although some work with children as young as seven years old. When space is opened for their participation, adolescents are even able to actively contribute to disaster risk reduction planning. Bartlett (2008) gives the example of early adolescents who persuaded women in the community to advocate for the construction of smaller houses with concrete roofs rather than larger homes with thatch covering, pointing out the need for an easily accessible high ground during flooding. Adolescents remember less visible, vulnerable groups such as neglected or abused children when safety planning and have a "clear and uncluttered understanding" of the links between environmental hazards and socio-economic threats, and vulnerability. (Mitchell 2008) They also have a strong sense of their own capability as communicators and advocates and will organize on their initiative as in the case of Salvadoran adolescents who were concerned about erosion caused by local quarrying. (Mitchell 2008; Children in a Changing Climate 2008)

Child-centered adaptation and disaster risk reduction hold enormous potential for adolescent girls' empowerment and civic participation, which a few projects have begun tapping. Plan UK asked child participants in Indonesia to map girls' and boys' potential contribution to disaster preparedness and climate change adaptation, raising awareness about gender roles in their community. (Plan UK) CARE Nepal promoted girls' leadership through school-based disaster risk reduction, and girls' participation in skills training and evacuation drills often outnumbered boys'. (ISDR 2008) Another project builds the leadership skills of marginalized adolescent girls in the South African township of Ikageng to reduce their social vulnerability as well as strengthen individual and community resilience to disaster. (Ibid.)

Technology and Innovation

General Trends. Information and communication technologies (ICT) "are the hardware, software, networks, and media used to collect, store, process, transmit, and present information in the form of voice, data, text, and images." They include not only computers and the Internet but radios, telephones, televisions and any number of other electronic devices. (World Bank 2009B) Without question, ICT has ushered in an era of global economic and social change, making it "one of the most potent forces shaping the 21st century" not only for its promised benefits but for the new ways in which it exacerbates existing social and economic disparities (Primo 2003; Hafkin and Taggart 2001). "Gender and ICT" experts have sought to harness the enormous potential that new technologies hold for women's and girls' empowerment while calling for policies aimed at narrowing the "gender digital divide." Research in the field of gender and ICT frequently balances these two concerns, as discussed in the next section.

Although ICT has numerous uses, such as e-government and digital medical records and information sharing among healthcare providers, this section will focus on the ways in which ICT are most commonly used by adolescent girls.

Policy & Practice. Over the past decade, ICT has been promoted as a tool for girls' empowerment: through improved education and skills acquisition, enabling girls to enter the digital economy as skilled labor; through greater access to information; and through access to online social networks and opportunities to link up with global advocacy movements. Of these areas, it is ICT skills training for girls that has generated the most investment, since computer skills learned in school and through vocational training can enhance girls' future potential for safer and higher paid forms of employment in emerging knowledge-based economies. The most successful example of this is in Asia, where young women have found new job opportunities in telecommunication or "call" centers, data entry and data processing. While it is still only a small segment that are able to exploit such opportunities – women still comprise less than a third of IT professionals in India and Malaysia – these women nevertheless serve as role models for girls and demonstrate to households and policymakers alike the practical value of investing in girls' education. (Curtain 2001; Hafkin and Taggart 2001)

Youth employment advocates have argued that ICT provides entrepreneurial opportunities for young people that do not require a high level of skills training and have relatively low start-up costs. "Mini telecenters" are a common fixture in developing countries and may simply consist of a kiosk equipped with a telephone, a fax machine and sometimes a photocopier. Others have a PC connected to a printer and Internet. (Curtain 2001) However, there is no evidence in the literature that young women are able to take advantage of these opportunities. More commonly, microcredit and in-kind loan programs have enabled young women to purchase a mobile phone and offer pay phone services in their communities. (Curtain 2001; Hafkin and Taggart 2001) Mobile phones do not require skills training to operate and the earnings generated by their use as village pay phones may be modest, but they have been shown by Grameen Phone to contribute as much as 30 percent to household income. (Hafkin and Taggart 2001)

Another way in which ICTs are anticipated to empower girls is by connecting them online to other social networks and advocacy groups, both locally and globally, as well as to information resources on the Web. Because of the perceived anonymity of Internet usage, ICT potentially offers adolescent girls access to information that is socially or culturally difficult to access. (Hafkin and Taggart 2001) The Web holds an abundance of information on reproductive and sexual health topics such as HIV/AIDS, safer sex, obstetric fistula, early marriage, and harmful traditional practices such as female genital cutting (FGC). It also serves as an open window on the world, providing different perspectives on social, economic and political issues. A study of the gender impact of computers in African schools found that, next to academic research, girls spent more of their time online researching "information that is banned or

constitutes taboo in their culture." These girls described the Internet as "'a safe partner' with whom one can communicate discreetly, a partner 'that can provide us with the information we need to adapt in this modern world.'" (Gadio 2001) In the same study, 70 percent of adolescent girls surveyed in Mauritanian schools emphasized the freedom that they felt the Internet afforded them, as they no longer needed to rely on the information filtered to them by their families and society. (Ibid.)

Ironically, the same mechanisms that provide girls with new opportunities for social networking, learning and job seeking also provide new venues for old forms of exploitation and abuse. Sex traffickers recruit girls and young women through online advertisements for nonexistent jobs as nannies, domestics or waitresses in Western Europe. Both commercial websites and online noncommercial newsgroups advertise sex tours and prostitution in cities around the world. (Primo 2003; Hafkin and Taggart 2001) In a disturbing twist, the anonymity of social networking sites has provided a new foray for sexual predators to solicit adolescents. (Primo 2003) Without adequate protection such as adult supervision, ICTs open new entry points for the sexual exploitation of girls.

Whether girls are able to take advantage of the potential that ICT holds for girls depends largely on access. Indeed, access and use of ICT is highly gendered and rooted in existing socially and economically constructed gender roles. (Primo 2003; Hafkin and Taggart 2001; Isaacs 2002; Derbyshire 2003) Hafkin and Taggart (2001) identify a number of barriers that girls face, particularly in accessing computer training and technology. Education is a significant one; despite recent gains, girls continue to lag behind boys in terms of primary and secondary school enrolment and attendance. Social expectations around gender continue to discourage girls from enrolling in science and mathematics classes, cutting off many from educational opportunities that could prepare them for higher paid jobs later in life. Because of the prohibitive costs involved in purchasing and maintaining equipment and services, options for computer and Internet access is limited to Internet cafes or through office jobs for middle class women and girls, and through schools, if at all, for low income girls. Access in rural and peri-urban areas is even less likely. Internet cafes are an unlikely option for many girls not only because of the cost, but because they tend to be male dominated and are therefore seen as socially unacceptable and even unsafe environments for adolescent girls. Time poverty is another barrier as adolescent girls are usually relied upon for housework and childcare. (Ibid.)

The Centre for Women's Development and Research (CWDR), an NGO-based in Chennai, India, demonstrates how projects can engage with communities to lower some of these barriers and empower girls to access new technologies. CWDR designed a project that incorporated life skills and sexual and reproductive health and rights education into their computer classes for adolescent girls living in slums. While girls were eager to learn what they viewed as new vocational skills, household responsibilities and social expectations prevented them from consistently attending the workshops. Project staff therefore devoted a considerable

amount of time to building community support for the project while encouraging girls to transcend social conventions and go to the center to expand their knowledge. Power outages and low Internet connectivity were a problem as well, solved partly by transferring the workshop materials from an online website to a CD-ROM that could be copied and sent to other computer centers for offline use. (CWDR 2005)

Empirical Evidence. ICT programs for girls and computer use in schools have been around long enough now to warrant an assessment of their effectiveness as tools for learning and empowerment. Yet few comprehensive studies monitoring and evaluating the use of ICT in girls' education in developing countries have been produced, and the hypothetical link between ICT use in schools and educational outcomes is still not fully supported by empirical evidence.[4] What existing studies do show is that the availability of computers and Internet in schools does not automatically translate into access for girls; rather, schools must make efforts to support girls' computer use and learning. (Gadio 2001; Derbyshire 2003; Isaacs 2001) In Africa, for example, ICT in education has been introduced in an institutional context in which education budgets have been dramatically cut by structural adjustment programs in the 1990s, an HIV/AIDS pandemic continues to claim the lives of both teachers and learners, and where many schools do not have basic resources such as textbooks and toilets. (Isaacs 2002) Girls must therefore compete with boys for the few computers that are available in schools, as this girl describes:

> *Once the bell rings and it is time for computer classes, the boys run quickly to fill up the computer room. They reach the computer room before us and take up the machines. Usually, by the time the boys decide to get up, it's already time for the computer class to come to an end. (Gadio 2001, quoted in Derbyshire 2003)*

Gendered differences in learning and self-perceived learning ability greatly influence access as well. Studies in Europe, the U.S. and Africa have found that girls are affected by their teachers' expectations, underestimate their own technical competence and have less self confidence than boys when learning to use computers. Images and content found in educational software is typically geared more towards boys' interests and reinforces perceptions that ICT is male. (Derbyshire 2003) Teacher training is therefore critical not only in ICT but in gender awareness. Isaacs (2001) argues that girls learn best in noncompetitive settings where girls can learn together. Interestingly, girls and boys learn differently. A study of boys' and girls' computer learning in Mauritania, Ghana, Senegal and Uganda found that girls' communication and reasoning skills improved more than boys', and whereas boys acquired stronger technology

[4] See, for example, the skepticism expressed in one educator's critique of the One Laptop Per Child proposal for Nepal. Pat Hall, "Computers in Schools –What Should Be Done? The Pros and Cons of One Laptop Per Child." Working paper, November 16, 2007. ITC4D Collective website. http://www.gg.rhul.ac.uk/ict4d/workingpapers/Hall.pdf

skills. (Gadio 2001) Aside from school assignments, boys spent their extracurricular computer use for entertainment such as music and sports, whereas girls used their free time to email relatives and friends living outside their country or to research topics that were considered banned or culturally sensitive. As one girl in Mauritania stated:

> *We get our freedom from the Internet, since in our society girls are not allowed to go wherever we want… the Internet takes us out to other people, places and realities… it is our way of escaping from our closed society. It gives us liberty. (Gadio 2001)*

These few studies demonstrate that the introduction of ICT into schools does not automatically yield educational gains for adolescent girls and that, as Isaacs (2001) has argued, a comprehensive strategy is required to make them accessible, relevant and productive for girls. The same might be argued about the use of ICT for girls' empowerment generally. In the early part of this decade, ICT was promoted as the newest wave in development strategies, sporting acronyms such as "K4SD" (Knowledge for Sustainable Development) and "ICT4D" ("Information and Communication Technologies for Development). ICT was expected to strengthen economies, improve education, empower women and youth, foster civil society and connect local communities to a globalized world. A decade later, ICT has become more accessible to grassroots communities in low income countries, but its use remains limited and highly gendered. More research is needed not only to assess ICT projects for girls but to understand how adolescent girls themselves see ICT functioning in their lives, how they experience ICT access and use, and to hear what they would like to gain from new technologies.

Research Recommendations

This review set out to broaden development perspectives of adolescent girls through an analysis of literature discussing four current development challenges: demographic transition, economic crises, climate change and the spread of technology. Three clear gaps in the literature were evident: 1) the absence of adolescent girls as a specific category comprised of multiple subsets (by age, marital status, education, urban or rural residence, socio-economic status, etc.); 2) the lack of data and empirical studies of adolescent girls relevant to the development issues reviewed here; and 3) the need for studies that seek to understand forms of exclusion and discrimination experienced by adolescent girls at different stages in their lives as well as rigorous assessments of programs and policy strategies for their empowerment and inclusion. These are very basic gaps in knowledge that limit the possibility of meaningful debate and discussion. What follows, therefore, are suggested questions designed to initiate such debate and discussion and encourage further data collection and research.

1. Based on past crises, what models can be constructed to predict and anticipate the impact of economic or climate change-related shocks on adolescent girls? How can such models take into account changing experiences of girls based on life stage, early marriage and/or pregnancy, and so forth? How can they be used to develop interventions that reduce risks for adolescent girls?

2. How can rigorous systems for monitoring adolescent girls' rights and social inclusion be developed? In particular, how are existing data collection mechanisms such as MICS, DHS and other national surveys capturing adolescent girls' issues? What important information is missing in these surveys?

3. How can participatory and quantitative research methodologies be combined to effectively increase our understanding of discrimination and social exclusion as experienced by adolescent girls? How can such research inform social and fiscal policies aimed at addressing these inequalities?

4. What budgetary and policy guidelines are needed to ensure that national development strategies are genuinely inclusive and supportive of adolescent girls?

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