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The Impact of Increases in Female Education on Fertility in Niger



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Cover photo: "Young girls of the desert" by Kristin Smith.

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I. Introduction

The goal of most developing countries is to achieve a rate of development that will enable prosperous lives for its population. While development is a complex process, research and the experience of countries that have undergone development indicate certain fundamental factors that enhance or prohibit development. Among these factors are the population growth rate, mainly determined by fertility levels in developing countries.

Niger has a high annual population growth rate of 3.2 percent, which corresponds to a population doubling every 22 years. With an average of 7.4 children per woman (Alichina, Garba, and Barrère, 1993), fertility is at one of the highest levels in the world. This rapid rate of population growth coupled with economic stagnation and contraction in recent years has negatively affected the quality of life for Niger's people. The country's rapid population growth greatly inhibits the nation's ability to attain an economic growth rate that translates into greater well-being for all Nigeriens. Education is one factor linked to lower fertility levels, as well as increased development due to greater economic efficiency and higher productivity. This paper examines the linkages between education and fertility.

Previous research findings are analyzed to explore these linkages. The situation of education in Niger will be reviewed. Hypothetical changes in education levels are examined to determine their impact on the country's fertility level. Finally, strategies to increase education are discussed along with recommended actions for Niger. Because this analysis does not stem from primary data collection, but rather depends on other research and secondary analysis, it cannot determine causation. However, the benefit of such an analysis is that it surveys the situation of Niger and proposes policy action; in addition, issues that require further study are identified.

II. Education and its Value

A. Definition and thresholds

Given the differences between countries in terms of curriculum, as well as the quality of instruction, consensus among researchers worldwide has not been gained regarding the definition of basic education. Most researchers have adopted an abstract definition consisting of literacy, numeracy and cognitive ability, while others also include a minimum knowledge of environment, health and family planning as part of basic education (Wilkey Merritt, 1994).

A World Bank study, "Social Gains from Female Education" (Subbarano and Raney, 1993), defines effective basic education as providing "the literacy and numeric skills that are necessary for all further education and training." For the purpose of this paper, we concur with the World Bank definition of basic education.

Another issue to consider when defining basic education is the amount of schooling necessary to attain the skills associated with a basic education. This length of time is often

called the "threshold" level because noticeable differences in behavior and economic potential are measurable after this point. Research on the relationship between fertility and education indicates that until a certain number of years of schooling has been achieved the relationship between the two is not consistent. After this threshold point, reductions in fertility typically result as education length and level attained increase, with greater impacts being seen at the higher education levels. While four years is typically necessary to reach the threshold *with a conducive environment*, i.e. one where reading and numeracy can be practiced often, and which reinforces the benefits associated with educational attainment, six years of schooling is a more realistic estimate for Nigerien students to obtain a basic education. This expanded time frame stems from the requirement that children spend the initial school years learning French before they can begin to obtain an "education" (literacy, numeracy, and cognitive thought process). Further, in rural areas, children have limited exposure to written materials outside the classroom, meaning that this skill is not continually reinforced or practiced (Wilkey Merritt, 1994).

B. Benefits of increases in education levels

In a highly-agrarian society such as Niger, where the immediate opportunity costs of educating children deter parents from enrolling their children in school, the comprehensive benefits of education are not generally recognized. However, worldwide research indicates that increases in educational attainment are associated with improvements in health and productivity. This section explores the long- and short-term social and economic advantages attributed to increases in primary and secondary school enrollment rates.

Education has been recognized as a foundation of social and economic development. In this increasingly technical world, education has become crucial to the social and economic development process of a nation. Education serves to open the door of opportunity for developed and developing nations alike, by providing the necessary skills, knowledge and efficiency necessary to adapt to a changing environment.

Investment in formal education contributes to increases in the health status of the population. Countries that have invested in their education sector and thus increased enrollment rates and improved the quality of education have also reaped the following benefits: lower infant mortality rates, longer life expectancies and lower fertility rates. In addition, these countries have experienced economic growth and higher productivity; research indicates that lower income countries received the highest overall rates of return on their investment in education (Haddad, Carnoy, Rinaldi and Regel, 1990).

Another linkage is apparent between the percentage of the population educated and the level of foreign investment. This link stems from a perception of greater political stability and reduced business risks, as well as a large pool of skilled workers to fuel economic growth. A spiraling effect occurs, since foreign investment will in turn spur private sector development and further expand the economic growth of the country. Historical data suggest that consistent

and widespread economic growth will not occur until primary school enrollment reaches 50 percent and secondary enrollments total 25 percent of the population (USAID, Mali, 1994).

1) Health benefits

While educating all members of the population is fundamental to development and increases in well-being, the benefits from increases in female education are even greater when the contribution to social and economic progress is considered. Data from research worldwide demonstrate a clear relationship between increasing female education levels and improvements in various health indicators. Across the board, women with higher educational attainment have healthier and fewer children, longer life expectancies and a lower likelihood of death or illness from childbirth. Evidence of this relationship comes from the BRIDGES and ABEL Projects, two USAID-funded projects sponsored by the Office of Education and Office of Women in Development. Data collected quantified the expected global impacts of increasing female primary enrollment rates from 20 percent to 70 percent over a 20-year period (the time necessary for these educated girls to become women with their own families). The data reveal that a society could anticipate the following social benefits:

- a 38 percent decrease in the infant mortality rate;
- a six-year increase in life expectancy at birth;
- a 7.3 percentage point rise in labor force participation; and
- a decline of 0.5 births per woman (BRIDGES and ABEL Projects, 1990).

These family health improvements may be due to several behavioral factors shared by educated women, including an increased utilization of health services among family members (perhaps due to their exposure to institutions such as school), more informed and respected decision-making ability within the household regarding health and other family matters, and higher income generation through skills acquired at school. In addition, children whose mothers are educated are more likely to attend school. Thus, a positive cycle of the benefits gained from schooling is promoted and passed on to future generations ("Educate a boy, and you educate an individual, educate a girl and you educate a family."; attributed to various individuals, including Mahatma Gandhi). In sum, the health of the entire family improves with increased female education.

The positive effects of education on health are even more striking when females continue their schooling beyond the primary levels. With each additional year of education achieved, a 7-9 percent decline in the child mortality rate can be expected (IPPF, UNFPA and IUCN, 1993).

A similar phenomenon can be seen regarding other development indicators, including the total fertility rate (TFR). Data from the Demographic and Health Surveys (DHS) demonstrate that those countries with higher levels of female secondary enrollment in school also have lower total fertility rates (Macro International, Inc., 1994). The impact of secondary

education is evident when one compares the TFR by education level attained. Women who attain secondary or higher levels of education have substantially fewer children than those with primary or lower education levels. This relationship may be due in part to greater accessibility to and increased knowledge and utilization of modern methods of contraception among educated women.

Supporting the additional benefits accruing from secondary education, a World Bank study on education found that a female secondary enrollment rate of 40 percent results in women's actual and desired fertility rates converging (Subbarano *et al*, 1993). When a society reaches this level of educational achievement, couples gain control over the number of children they bear. The study also found that doubling the female secondary enrollment rate (from any level) results in a 10 to 20 percent decrease in the infant mortality rate, a significantly higher impact on infant mortality than ensues from doubling the Gross Domestic Product. The report concludes that where female secondary enrollment rates are low (as in Niger), increases in secondary enrollment may be the single best way to reduce fertility and mortality levels.

2) *Economic benefits*

The benefits of female education are not confined solely to health. Economic benefits emerge disproportionately with gains in female education levels. Educated women are more likely to contribute to the formal and informal productivity of the country than uneducated women; through education they gain employment skills and have greater access to credit and vocational programs. The increased resources available to the family, in turn, have positive ramifications on the well-being of the entire family: children, husbands and wives. For example, as women engage in productive activities and gain access to better employment opportunities, their families benefit through improved consumption and better nutrition.

Female education offers girls the opportunity to pursue alternatives to marriage and childbearing at an early age. Data from the World Fertility Study found that women who had attained more years of schooling also had a higher age at first marriage; in fact, when compared to women with no schooling, an increase of seven years of schooling corresponded to an increase in a woman's age at marriage by four years (IPPF *et al*, 1993). Research worldwide suggests that a later age at marriage is associated with enhanced access to resources and is linked to greater economic independence.

III. Situation in Niger

A. The current situation of girls' school enrollment

Given the previous findings, data for Niger will now be examined to determine the linkages. The rate of primary school enrollment in Niger is one of the lowest in Africa (23 percent in 1988¹); however, the rate is higher for boys (28 percent) than for girls (18 percent). The resulting gender gap means that for every 100 boys in primary school, there are only 65 girls. Table 1 displays the gross enrollment rate by level of education. This Table depicts a common phenomenon in Africa, the sharp decline in enrollment at the higher levels of education; although 24 percent are enrolled at the primary level, only 0.3 percent attain higher levels of education.

Table 1. Gross rate of enrollment by level in 1988 (percentage)

Level	Overall	Male	Female
Primary	23.6	28.3	18.4
Secondary, 1st cycle	9.2	12.5	5.9
Secondary, 2nd cycle	2.1	3.7	0.8
Higher	0.3	0.5	0.1
Total	11.3	15.1	7.7

Source: General Population Census, Niger, 1988.

This low enrollment rate persists despite the considerable effort made by the Government of Niger (GON) over the past 35 years. In this period, the number of classes multiplied by a factor of six; this is lower than the increase of 20 times of the number of pupils and teachers. The budget allocated for education equals 19 percent, much of which comes from outside assistance. The result is by and large below general expectation. *Rather than being a source of discouragement, the state of the country's education situation should raise awareness among all actors to focus on a plan of synergistic development among the public, private and community sectors for the financing and implementation of a consistent and integrated educational policy in line with the country's socio-cultural values.*

¹ Source: Final report of the seminar workshop on school enrollment of girls in Niger: Kollo 15-18 November 1994.

In addition to the gender gap, it must be pointed out that there is also a geographical and residential disparity. The rate of school enrollment of girls by region is presented in Table 2 below.

Table 2. Rate of enrollment of girls by region (percentage)

Region	Agadez	Diffa	Dosso	Maradi	Tahoua	Tillaberi	Zinder	Niger
Rate of enrollment	30	19	13	11	12	29	17	18

Source: Final report of seminar/workshop on enrollment of girls in Niger, Kollo 15-18, November 1994.

Table 2 shows that the regions of Agadez and Tillaberi have the highest rate of enrollment of girls with 30 percent and 29 percent, respectively. The case of Tillaberi can be explained by the presence of the capital. One potential reason for the higher enrollment levels stems from the length of time that educational institutions have been in existence. Long-time co-existence of and interaction between the school and the community have increased the awareness and acceptance of schooling among the population. As concerns Agadez, the higher female enrollment rates derive from the high rate of urbanization in this region.

B. Reasons for the low rate of girls' school enrollment in Niger

Enrollment of girls has always been a concern of the GON since independence in 1960. Nonetheless, despite declarations of good intention, the percentage of girls in educational establishments is low and seems to be declining. Reasons for the low enrollment of girls can be classified under the topics of psycho-social, cultural, economic, pedagogical, religious and geographical.

1) Psycho-social reasons

These reasons originate from the earliest Nigerien educational institutions and the way education was introduced by the colonial rulers. For example, many recall or have heard of children being abducted to attend school without parental consent. In addition, school is regarded by most Nigeriens as something foreign in nature, which challenges the pre-established, heavily caste traditional order; in Niger, the school is perceived to challenge the supremacy and authority of the elders.

When girls are involved, the situation becomes more serious and complicated. Indeed, in Nigerien society, a girl is considered a "bridge" linking two families and two communities. Hence, a girl represents a destiny for the family. The honor code demands that the girl be married a virgin, and to ensure this she is married at a very early age. Any deviation to the social mores by the girl is attributed to her family, and especially to her mother. Often the mother maintains strict oversight of her daughter's behavior and insists that the place of the daughter is beside her mother.

In such conditions, the ensuing question is how to increase girls' enrollment in schools that are often located far from the village where she was born.

With respect to fertility, the adolescent is torn between a traditional society that taught her the cultural rites and customs, and a modern society characterized by uncertainty. The social consequences of this hybrid situation are often terrible for the girl and her parents. Pre-marital pregnancies are not uncommon and constitute a sign of dishonor for the family. For those in school, pregnancy is punished. Until 1975, pupils who were pregnant were dismissed from school irrespective of their level of education and the state of their pregnancy. In 1975, a decision by the Ministry of Education authorized "pregnant young girls in form four or in the second cycle institutions to resume their studies after delivery, provided they did not contract marriage as day pupils." In 1978, another decision modified the 1975 decision in these terms: "young girls in form four or in second cycle institutions may, in case of their first pregnancy, resume their studies after delivery provided they did not contract marriage as day pupils. In case of a second pregnancy, they shall be dismissed." What is not generally known in Niger is that those women with higher educational attainment tend to marry later, begin childbearing at a later age and have fewer, healthier children.

As can be seen, these decisions are at odds with each other. On the one hand, the authorities are discouraging pregnancy among school-going adolescents. On the other hand, the arbitrariness of these rules (which do not in any way protect the young girls in form four or higher) and the type of punishment given, such as dismissal from the boarding house, could contribute to a decrease in the number of school-going girls.

Indeed, the act of separating a girl from her peers in the boarding house could be very frustrating, first for the girl in question and also for her family. Such a consequence could discourage the family and the entire community from sending their daughters to school. Dismissal of young girls from school for pregnancy does not only discourage the community, which sees the school as a place for the economic and social advancement of the woman, but also can increase the marginalization of the woman since after such an experience it may be difficult for the girl to find a spouse.

Given the possibility of such an occurrence, there is great reluctance among rural communities to send their daughters to school on a massive scale.

2) Cultural reasons

Culture is intricately linked with habits, life-styles and behavioral patterns. One unique feature of the Niger culture is the importance placed upon and the strict guidance of pre-established social roles, historically passed through generations -- the blacksmith works at his smithy, the weavers weave, and so forth.

With this in mind, it is understandable that the school represents a threat to the established means of social status as it teaches other values and enables social mobility through non-traditional

means, for boys as well as girls. This is an important aspect of the reasons explaining why parents seem hostile toward schooling of girls; in Niger, the social mores that dictate appropriate roles for girls are very embedded in the culture. Each girl (apart from observing the code of conduct of her social class, which she is supposed to regard as sacred) undergoes training compatible to her family's social status. This is why, for example, the daughter of a blacksmith learns pottery and that of a weaver learns spinning. In such a society, Western-style schools can upset the balance of roles assigned to villagers and make girls unsuitable for marriage. Despite the empowerment a girl might experience at school, she is expected to abide by the heritage and the social values transmitted by her social class.

It must be noted that for most Nigerien women getting married and having children is the most essential thing in life. Generally, women bear many children because that is what the society expects of them. In addition, women marry at a very early age. Hence in 1992, 48 percent of the women were married at the age of 15 years, and 90 percent of them at the age of 18 years, according to the results of the Niger Demographic and Health Survey (NDHS).

3) *Economic reasons*

In Niger the girl, especially in the villages, is considered as an "economic asset." The economic activity performed by the girl constitutes a source of income for the mother. Nigerien markets, truck stops and street corners are the locations where young girls seek their daily source of income. In villages, it is the young girls who go out to look for firewood and also fetch water for the household. Girls help their mothers with the household chores, including the cultivation and the sale of cash crops like cotton and okra. Women tend to resist schooling their daughters due to the perceived opportunity costs²; they feel the immediate economic loss when a daughter is away at school and not helping with household chores or earning income in the market.

4) *Pedagogical reasons*

A study conducted by *Project Education II*, World Bank, in Nigerien middle and secondary schools found that girls prefer to attend schools more than boys, they attach great importance to school, and they tend to excel in the humanities and languages. However, even if the girls happen to be more gifted in languages and the humanities, it is difficult for them to obtain employment in the job market with skills in these areas. This, in turn, has a negative impact on the rate of girls' enrollment in school. Despite their motivation to learn, teachers tend to pay more attention to boys than girls. Generally, the girl is called upon less frequently in the classroom compared to the boy and many teachers feel that it is more important to teach boys. Additionally, it is common to hear male Nigerien teachers say that they are less interested in their female pupils for fear of being suspected of courting them. An additional institutional problem is the persistent government strikes in which four academic years were lost within a period of six years between 1990-1995 (Wynd,

²Opportunity cost is the true cost of any action measured by the value of the best alternative that must be foregone when the action is taken.

1995). The impact of this on school attendance has been far reaching; it is characterized by a substantial proportion of drop-outs, class repetition and the lowering of academic standards. All these factors combine to result in a loss of interest among parents.

5) Religious reasons

Although Islam is not against education per se, its interpretation can be an obstacle, especially with respect to the education of girls. For example, it is not surprising to hear Moslems in Niger condemn the co-educational character of schools. It is also common to hear people say that the school creates financial needs that cannot always be met. In such an environment, the school is generally seen as being incompatible with the Islamic culture. Furthermore, young girls emerge with ideas and skills not adapted to the circumstances in which they live. Hence, in the Moslem environment, where pre-marital sexual relationships are disapproved, families promote very early marriages aimed to prevent pre-marital pregnancies. Therefore, girls are not encouraged to attend school as it is not considered useful for their role as wife and mother.

6) Geographical reasons: remoteness of schools

Another reason explaining the non-schooling of girls comes from the location of schools (especially, the secondary schools). Until quite recently, the overwhelming majority of higher-level schools were located in the principal towns of Regions and/or Administrative Districts. This situation has dire consequences, especially when it is known that the children who are admitted into secondary school are obliged to leave their villages for the urban centers in order to attend schools. This can be unsettling, especially for parents of girls who have never allowed them to escape their "watchful eyes." How, for example, can one accept to allow his daughter to go to the town that is considered the opposite of the peaceful and interdependent life of the village? Again, how can one not worry about such an adventure undertaken by a girl without resources? (The parents are generally poor and the allowances given by the State are not only inadequate but are paid piecemeal). The girls are without their parents in the towns where life is very expensive. All these reasons contribute to certain parents encouraging their daughters to fail so they will not be admitted into secondary schools.

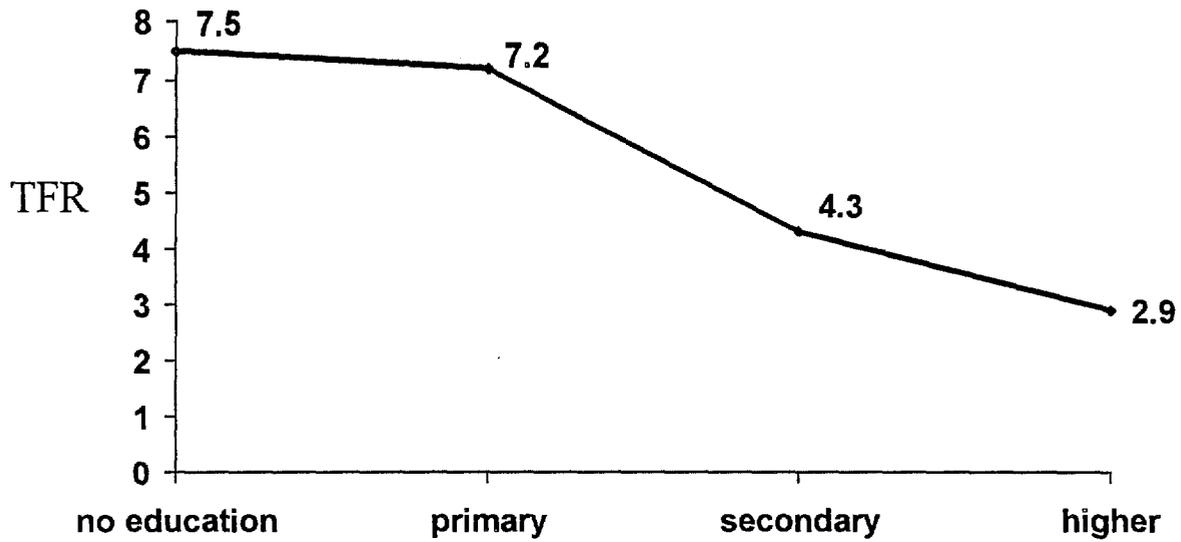
C. The impact of education on fertility in Niger

Given the worldwide linkages among education, the cultural setting in Niger and various health and economic outcomes, we now turn to an investigation of the situation in Niger with respect to fertility levels using existing data. The main source of available information comes from the 1992 NDHS, and many predicted associations are substantiated by this data.

The TFR (the number of children the average Nigerien woman would have based on existing fertility patterns and levels) in Niger is among the highest in Africa (7.4 children per woman). Niger also has the lowest rate of school enrollment (more than 89 percent of the men and women have not received any form of education) on the continent. There is a relationship between level of education attained and number of children born. Continued education appears to delay age

at marriage and subsequent childbearing, as exemplified by Figure 1 below. The TFR is high among non-educated women and those who attended the primary level (7.5 and 7.2 children per woman, respectively), while those at a secondary and higher level have a TFR that is considerably lower (4.3 and 2.9, respectively).

Figure 1 Total Fertility Rate by Education Level



Niger DHS, 1992

The following Table describes how education is associated with the fertility rate of adolescent girls from 15 to 19 years old in Niger. Indeed, statistics show that only 25 percent of the educated adolescents between the ages of 15 and 19 have already begun childbearing as compared to 39 percent of uneducated adolescents.

Table 3. Percentage of adolescent girls from 15 to 19 years old with one child already or pregnant with first child in terms of her level of education.

Level of education	Adolescents (%) who are:		Adolescents at child-bearing age	Number of Adolescents
	Mothers	Pregnant with first child		
None	33.3	5.5	38.9	1117
Primary or higher	21.5	3.4	24.8	262
Overall	31.1	5.1	36.2	1379

Source: DHS, Niger 1992

Although education can improve women's knowledge of maternal and child health, it also helps them to space the births of their children. This may be due to the regular visits to the family planning offices by educated women. Table 4 depicts knowledge and utilization of family planning services according to the level of education of women. This Table shows clearly that a relationship exists between education and use of contraceptives: educated women have a greater awareness of contraceptive methods (especially modern ones) and sources, and are more likely to use modern methods.

Table 4. Percentage of women who are married and currently using a Family Planning Method and who know of another method (as a source of information to the services) according their level of education.

Level of education	Knows one method	Knows one modern method	Knows one source for a modern method	Use of contraception		Number
				Modern method	Traditional method	
None	79.5	56.5	30.5	1.5	1.9	5136
Primary or higher	87.1	76.7	61.8	11.0	5.1	425
Overall	77.3	58.0	32.9	2.3	2.2	5561

Source: DHS Niger, 1992

Although studies conducted so far (Alichina *et al*, 1993) show that education can reduce the number of children a woman would like to have, her ability to put it into practice can be undermined by her limited decision-making responsibility. The strong traditional roles, family lineage and Islamic religion encourage the Nigerien woman to be obedient and submissive to her husband. In general, women do not practice family planning without permission from their husband regardless of whether they would like to space their next birth.

IV. Potential impacts on fertility through changes in female primary school enrollment

To demonstrate the relationship between female education and fertility and to illustrate possible fertility outcomes when female education is increased, three scenarios of female education levels are presented. Table 5 presents the current fertility rates by education level attained in relation to the national proportion of female scholarization by education level and shows the actual situation in Niger.

Table 5.**Education Level by Fertility Rates and Female Scholarization**

Education Level	Total Fertility Rates, 1992 DHS	Female Scholarization, 1988 Census	Ratio to Primary Enrollment
No education	7.5	74.8	NA
Primary	7.2	18.4	1:1
Secondary	4.3	6.7	1:2.75
Higher	2.99	0.1	1:184
Total	7.4	100.0	NA

To simulate potential impacts of raising female education in Niger, the following assumptions were made: First, the current fertility rates by education level attained measured by the 1992 NDHS are used to calculate the simulated TFR for the three education scenarios; these scenarios assume no change in fertility behavior by educational level. This does not take into consideration any other factors that influence fertility (such as the strength of the family planning program, availability of services, urbanization, etc.), but rather holds all factors constant at their current contribution to fertility. Second, the first two scenarios maintain the current ratio among primary, secondary and higher education rates; as previously noted, while primary enrollment in Niger is low, secondary and higher enrollment rates are substantially lower. The ratios described in Table 5, column 4, remain constant in Scenario 1 and 2, although the rates rise. However, as enrollment increases, the proportion of non-educated women decreases.

Scenario 1. Government of Niger targets for basic education

By the year 1999, the Government of Niger (GON) intends to raise primary education enrollment from the current 23 percent to 35 percent. For this scenario, we are assuming that girls' enrollment rates will rise to 35 percent. Maintaining the ratio now in effect between female primary education and the other levels means that secondary and higher levels would increase to 12.7 percent and 0.2 percent, respectively.

Applying the current fertility rates to the new education level proportions would decrease the TFR by 5.4 percent, from 7.4 children per woman to approximately 7.0 children.

Table 6. Scenario 1, Education Level by Fertility Rates, Female Scholarization and the Potential Impact on Fertility

Education Level	Total Fertility Rate Schedule, 1992 DHS	Scenario 1: Female Scholarization	Scenario 1: Simulated Contribution to Fertility
No education	7.5	52.1	3.91
Primary	7.2	35.0	2.52
Secondary	4.3	12.7	0.55
Higher	2.99	0.2	0.006
Total	7.4	100.0	6.98

Scenario 2. Primary education level reaches 50 percent

In the second scenario, female primary education increases to 50 percent (or half of all females would receive primary education), secondary to 18.2 percent and higher to 0.3 percent. With this new level of education, the TFR would decrease to 6.7 children per woman, a decrease of 9.5 percent.

Table 7. Scenario 2, Education Level by Fertility Rates, Female Scholarization and the Potential Impact on Fertility

Education Level	Total Fertility Rates, 1992 DHS	Scenario 2: Female Scholarization	Scenario 2: Simulated Contribution to Fertility
No education	7.5	31.5	2.36
Primary	7.2	50.0	3.6
Secondary	4.3	18.2	0.78
Higher	2.99	0.3	0.009
Total	7.4	100.0	6.75

Scenario 3. Levels required to initiate steady economic growth

As discussed in section II, historical data suggest that consistent and widespread economic growth will not occur until primary school enrollment reaches 50 percent and secondary enrollments totals 25 percent of the population. In this third scenario, education levels required to initiate and maintain steady economic growth are presented. Assuming there is no gender gap, this education schedule would also represent the enrollment rate of boys. Therefore, the needed national levels would be obtained. Given Nigerien enrollment rates, to

reach a secondary enrollment rate of 25 percent would require at least 70 percent enrollment in primary school. Higher education would rise to 0.4 percent, and virtually all of the population would attain at least a basic education.

It is important to note that this simulation does not consider the other influences that would impact fertility in a country with a highly-educated population as is described (urbanization, increased age at first marriage, higher employment, lower mortality, longer life expectancy, etc.); neither does it consider the important social changes that coincide with a population educated to this extent. Nonetheless, keeping all these factors constant at the current levels, the TFR would decrease to 6.5 children per woman, a 12.2 percent decrease.

Table 8. Scenario 3, Education Level by Fertility Rates, Female Scholarization and the Potential Impact on Fertility

Education Level	Total Fertility Rates, 1992 DHS	Scenario 3: Female Scholarization	Scenario 3: Simulated Contribution to Fertility
No education	7.5	4.6	0.345
Primary	7.2	70.0	5.04
Secondary	4.3	25.0	1.08
Higher	2.99	0.4	0.01
Total	7.4	100.0	6.48

As discussed earlier in this paper, increasing education levels has many positive effects on the health and welfare of the population, and these effects are more evident when female education levels increase, as well as when schooling is continued beyond primary levels. However, the overall decline in fertility depicted by these scenarios is small but can be explained by several factors. First, the current TFR among non-educated women and those women with a primary education are both very high (7.5 and 7.2, respectively). As the simulations primarily move non-educated women to primary education levels, the change in fertility is not dramatic. It should be noted that the TFRs given in the DHS are for women with *any* primary education and would include women who have not completed the threshold level discussed earlier, likely upward biasing the fertility rate. Second, increases in female education levels typically would be accompanied with social changes that in turn would also affect the fertility rate. For the purpose of this exercise, we held these variables constant to single out the impact of female education on fertility. However, in reality there would be a synergistic effect among the variables and the decrease in the TFR would be greater.

In fact, to acquire the education levels proposed in the third scenario, substantial economic and social development would need to either precede or occur simultaneously with the increases in education. Therefore, the decline in fertility of one child per woman shown in

Table 8 does not represent the likely fertility rate that would ultimately ensue from a society at this level of enrollment rates due to other inherent modernization variables (socioeconomic status, urbanization, strengthened family planning program with increased availability) that would affect fertility.

Another variable that impacts fertility is the use and availability of family planning. A worldwide study on the structure and effectiveness of family planning programs by Mauldin and Ross (1991) considers the association between the strength of the family planning program effort and fertility declines (this study was analogous to those conducted over the past 30 years). Mauldin and Ross also created an index to measure socioeconomic status (or social setting) to decompose the association with fertility level of both program effort and social setting. By and large those countries with family planning programs rated as having a greater effort also have lower fertility rates, thus affirming the correlation not just between family planning use and lower fertility, but also between family planning program effectiveness and lower fertility. In fact, declines in fertility for the period 1975-1990 were greater among those countries with stronger programs: TFRs declined approximately six percent among countries with weak or very weak/nonexistent programs, by 24 percent among countries with moderate programs, and by 33 percent among countries with strong programs (Mauldin and Ross, 1991). In sum, this study demonstrates that countries with a stronger family planning program and greater availability of reproductive health services tend to experience greater declines in fertility.

However, the study also considers the impact of social development variables on fertility through the construction of the socioeconomic index. According to the researchers' analysis, program effort has a stronger direct effect on the decline in TFR than do the socioeconomic variables (.64 and .29, respectively); yet, the combined effect is greater than the individual impact. The study concludes that "good programs typically also have strong components of education, legitimization, and endorsement; both the programs and the change in the social setting modify the climate of reproductive decision-making" (*ibid*). In sum, the effects of one variable (education or family planning) are small in isolation, but when combined impact fertility synergistically. There is reason to assume that similar results would occur in Niger, meaning that increased family planning program effort along with other social developments would likely enhance falls in fertility levels.

V. Situation in West and Central Africa

The need to raise educational enrollment is widely accepted in West and Central Africa, where many countries have concluded that a more educated population (especially women) will accelerate the chance and pace of economic and social development. The main issues surrounding education in Africa fall into three general areas: how to boost enrollment and improve access; how to increase survival in the system; and how to improve the quality of the learning environment and the appropriateness of the curriculum.

Enrollment rates vary widely in West and Central Africa, as shown in Tables 9 and 10 for primary and secondary levels. The figures vary from a very high enrollment rate in Cameroon³ to the lowest levels found in Niger and Mali, where only 24 percent of eligible children are enrolled.⁴ In all countries, the enrollment rate of boys is higher than that of girls, a phenomenon known as the gender gap. The final column of Table 9 presents the ratio of enrolled girls to boys. While Niger has very low levels of enrollment of both boys and girls, the disparity between the enrollment of the sexes is less pronounced than in some of the other West and Central African countries. The larger proportion of boys enrolled as compared to girls indicates that while Niger needs to concentrate on increasing enrollment of all children, even greater emphasis must be given to the enrollment and continuation of girls in school.

Table 9. Primary School Enrollment In West and Central Africa, 1990

Country	Total	Male	Female	Ratio F/M
Mali	24	30	17	56.7
Niger*	24	29	19	65.0
Burkina Faso	37	45	28	62.2
Mauritania	51	58	43	74.3
Chad	57	79	35	44.3
Senegal	58	68	49	72.1
Benin	67	89	45	50.6
Cameroon	103	111	95	85.6

Source: World Education Report, 1993 UNESCO; *Niger General Population Census, 1988.

At the secondary level, Niger remains one of the countries with the lowest secondary enrollment level, which is 7 percent overall. This compares to 28 percent in Cameroon and 16 percent in Mauritania. Even more disturbing is the gender gap: only one in 25 girls is enrolled in secondary school, as compared to one in every 10 boys. Thus, the gender gap worsens at the secondary level with girls' enrollment reaching only 44 percent of boys' enrollment levels.

³This rate exceeds 100 percent due to children who are older than the typical primary school age child.

⁴These are among the lowest in the world (World Bank, 1993).

Table 10. Secondary School Enrollment in West and Central Africa, 1990

Country	Total	Male	Female	Ratio F/M
Mali	7	9	4	44.4
Niger *	7	9	4	44.4
Burkina Faso	8	10	5	50.0
Mauritania	16	22	10	45.5
Chad	7	12	3	25.0
Senegal	16	21	11	52.4
Benin	11	16	17	43.8
Cameroon	28	32	23	71.9

Source: World Education Report, 1993 UNESCO; * Niger General Population Census, 1988.

Experts in education differentiate the barriers to higher enrollment levels into demand and supply factors. However, because these factors often interact there is a need to understand the major barriers and to simultaneously address them. The underlying barriers can be thought of as “pressure points,” areas where interventions can alter household decision-making processes and outcomes (USAID, 1995). Research is needed to identify the specific pressure points in each country, although an analysis of other programs provides insight as to where to concentrate research efforts.

On the supply side, barriers are viewed as linked to the school, including geographical issues as discussed in section III. The first attribution is whether schools are available. Table 11 presents information on access to primary and secondary schools in Niger and other West African countries. In Niger, the low levels of enrollment prevail despite primary schools existing within five kilometers of 78 percent of Niger’s population and even 74 percent of the rural population. While even five kilometers may be a distance too great for rural girls to travel to attend school, it appears that the current low enrollment levels in Niger stem from other school-related problems and low demand for and value associated with education, rather than school location. However, should enrollment begin to increase rapidly, the supply of classes and teachers could become a problem (as is currently true in urban areas).

Table 11. Availability of Primary Schools in West and Central Africa

Country	Primary schools within 5 kilometers			Secondary schools within 5 kilometers		
	Total	Rural	Urban	Total	Rural	Urban
Niger, 1992	77.6	74.1	98.6	20.3	8.3	92.5
Burkina Faso, 1993	85.8	83.1	100.0	26.8	13.8	95.8
Cameroon, 1991	88.1	82.3	97.5	40.7	14.1	83.6
Senegal, 1992/93	79.0	69.0	100.0	34.2	3.8	98.2

Source: Demographic and Health Surveys

Attempts are being made to increase the availability of schools. Interventions to increase school availability tried in other countries include flexible scheduling (having school during times when children are relatively free); satellite schools; multi-grade teaching (which allows many children of different ages and levels to be accommodated); and double shifts (two groups of children being taught a day). Although availability does not appear to be a large issue in Niger, it is a dominant concern in many African urban areas due to inadequate space to meet the current demand for school. While double shifts have been adopted in many countries, including Niger, this system is not popular among parents and teachers. A trend that has begun to accelerate in Mali, Senegal, Benin and Chad is an increase in the number of private schools in urban areas. Research in Mali found that children in private schools performed 40 percent better than their peers in public school. Researchers attributed this finding to greater parental involvement and reinforcement of skills (Miller-Grandvaux, 1995).

However, the proximity of the school is only one supply element. Other concerns include characteristics of the school and the way education is provided. For example, another element is the cultural appropriateness and security in schools. This addresses families' concerns about the welfare and honor of their daughters. One means to address this issue has been the recruitment of rural female teachers (Yemen, Gambia, Mali). There are some difficulties in actually implementing this strategy, given the placement issue of women and often their need to move when they marry. However, if rural girls who have completed six years of schooling are trained to become teachers, they will likely stay in the area. Moreover, these women also become positive female role models for rural girls and their parents. Construction of latrines for girls has occurred in Zambia to increase the privacy and reduce the vulnerability of girls in school. However, a study in Mali did not find that private latrines were significantly associated with greater enrollment of girls. Single-sex schools are also an intervention used in Asia, although this is not yet widely adopted in Africa. At the secondary level, more female teachers and appropriate places for girls to live are possible ways to address these barriers.

Improving quality and effectiveness of teaching is an additional area encompassing certain obstacles to education and girls' education in particular. Elements of improving quality include improving teacher training, such as how best to teach girls and boys (Zambia, Malawi), in-service training and improvements in the curriculum. Some countries have adopted a family life curriculum (Gambia, Mali) incorporating facets of village life instead of presenting a curriculum that seems completely removed from the village. This approach can also build support among parents and the community since it is typically formulated with input from the community and extends to include literacy for adults. Schools in Senegal and Malawi are also working to use textbooks and other materials that eliminate gender bias and do not perpetuate stereotypical roles. Mali has instituted a competition among schools with awards to those schools with the largest decrease in repetition rates and drop-out rates and the largest increase in enrollment rates. Pilot projects adopting many of the above strategies have been tried in Mali and Uganda with indications of success.

Often these supply issues cannot be addressed without policy reform. In Senegal, great emphasis has been given to identifying barriers to be addressed through changes in policy. Potential policy changes adopted in other countries include reduction of school enrollment age to six years (from seven or eight), which can give girls more time to complete their primary education before they are expected to marry. A second cited reform is to void all restrictions and penalties associated with the schooling of pregnant girls to enable pregnant girls to continue in school during the pregnancy or to return to school after giving birth.

On the demand side, activities are typically aimed at communities and parents in an attempt to change attitudes and alleviate burdens that prohibit girls from attending school. With respect to the home, some strategies have targeted reducing the cost of schooling for families. Often the tuition fee is waived or families receive tax breaks. Incentives and subsidies are other means of addressing economic resistance of the family. In Malawi, scholarships are available to girls who do not repeat a class. Other possible incentives include meals at school and the provision of school supplies. Other means of reducing family costs include the use of flexible schedules to allow students to attend when convenient, a reduction in the number of hours of school, and the provision of child care at the school to allow girls responsible for their siblings to attend class. Penalties for families concerning children's schooling are rare; however, in one state in Nigeria authorities have decided to prosecute parents for withdrawing a child from school.

At the community level, there is agreement that an increased understanding and acceptance of the benefits of education (especially for girls) is needed. Many African countries -- including Burkina Faso, Cameroon, Mali, Uganda and Tanzania -- have adopted a policy of holding seminars, workshops and village meetings to discuss the benefits of education. Mass media Information, Education, and Communication (IEC) campaigns are being implemented in many countries in an effort to educate children and to reduce the resistance to educating girls. Programs to increase village literacy also increase support for children's schooling.

Having discussed these elements and strategies, a review of Niger's efforts follows. The final section comprises critical recommendations for addressing the education of children and particularly of girls given the important impact of education on fertility levels and behavior.

VI. Strategies for raising educational levels in Niger

A. Current strategies to increase school enrollment being explored in Niger

Education in general, and girls' education in particular, are very timely issues in Niger. Recently, several major projects have been launched that will address issues concerning education. The largest project, *Projet Pour le Secteur de l'Enseignement Fondamental*, signed in March 1995, has a diverse mandate. Project components include: 1) improving school facilities (building, renovating, providing equipment and materials); 2) training primary school teachers and sensitizing them to the benefits of girls' education, and broadening the curriculum to include environment and nutrition; 3) promoting girls' education (developing and distributing non-discriminatory materials, recruiting female teachers and administrators, reducing age at entry into school, awareness-raising as to the benefits of educating girls as well as boys, creating infrastructure within the Ministry of Education to promote girls' education, and creating incentives to increase girls' enrollment, such as meals provided at school); and strengthening the managerial capacity of the Ministry of Education.

UNICEF has also recently begun a project (1995-1999) to support primary education for girls in 13 *arrondissements*. In addition, the nongovernmental organization *Aide et Action* is using innovative strategies to promote education in Loga, Doutchi, Filingue and Ouallam. Other interventions underway include training and support for secondary, vocational and higher-level education, resources for libraries and the provision of scholarships. Because many of these are newly-implemented projects, their contribution to raising education levels is unclear (although they are adopting many of the strategies that have been successful in other countries).

B. Strategies and recommendations for the Conseil National de la Population (CONAPO)

This paper has described the importance of education (especially for girls) in the development of countries. It is evident from the preceding sections that there are numerous benefits from increasing educational levels, including improved health and well-being, greater prosperity and increased social development. These benefits occur both at the individual/family level and at the societal level. Despite the clear indications of how education would improve the livelihood of Niger's people, there exist many obstacles to universal education in the country. Thus, strategies adopted throughout the world to raise educational enrollment were presented to indicate possible mechanisms for adoption in Niger. Clearly, given Niger's high fertility and mortality rates, interventions that would increase educational attainment and dramatically improve such conditions are worth pursuit by the government, nongovernmental organizations and the private sector.

Major findings of this paper include the following:

- education is recognized as being the base of economic and social development and that foreign and domestic investment depends on an educated, healthy and productive population;
- Niger's rate of demographic growth of 3.2 percent, its TFR of 7.4 children per woman, its maternal mortality rate of 700 per 100,000 and its infant mortality rate of 123 per 1,000 births are among the highest in the world;
- there exists a strong relationship between the percentage of the population that is educated and the level of foreign investments. Thus greater educational levels promote greater business growth and yield a greater pool of qualified workers; and
- girls' education has positive impacts on demographic variables, such as reducing fertility levels and maternal and infant mortality, and improving life expectancy and the quality of the labor market.

Based on these findings, it is recommended that the CONAPO advise and suggest measures to the GON to increase the enrollment rate of girls in primary school from 18.4 percent to 35 percent, in secondary school from 3.25 percent to 10 percent and in higher levels of school from 0.1 percent to 5 percent by the year 1999. Strategies for achieving these increases include:

- 1) increasing efforts to educate and inform the population about the benefits of girls' schooling;
- 2) enhancing the environment to facilitate the development of private schools;
- 3) reorienting the nation's schools to address the needs of the population by:
 - a) easing the current hiring requirements for teaching to allow the recruitment of more rural female instructors;
 - b) promoting adult literacy in the community; and
 - c) adopting curricula that provide needed skills for rural dwellers.
- 4) strengthening the family planning program because of the synergistic effects that can be expected to result; and

- 5) initiating research in this sector on topics including:
- a) the reasons why parents keep their children (especially girls) out of school. This study would identify the current barriers and potential economic incentives needed to increase school enrollment.
 - b) the causes of school withdrawal and grade repetition. While enrollment is a recognized issue, perhaps equally important is the high rate of withdrawal and grade repetition. This study should determine the major causes for withdrawal and repetition, such as, but not limited to, economic obstacles (define their nature), lack of perception of the value of continued education, lack of time for study, or irrelevance of the current curriculum. This study would elucidate potential strategies to keep students in school once they are enrolled, thus contributing to greater productivity and well-being of the population.
 - c) a thorough review of all legislation pertaining to school enrollment and continuation to identify potential barriers that are reducing enrollment rates. This study should determine and examine obstacles resulting from the necessary papers and other requirements of enrollment, reasons for expulsion of students from school (such as motherhood) and indirect disincentives based on legal precedent, taxation or commonly-held beliefs. The goal of this review should be to ensure that interactions between parents and schools are easy and painless, which will promote ease of enrollment.

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