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**Female Education and Economic Growth: theoretical
overview and two country cases**

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Abstract

This bachelor thesis examines if female education affects economic growth through human capital and fertility rate. To illustrate this aim, two country cases have been presented: India and Niger. The motive behind choosing India was because of the country's recent shift from developing to developed country. With its steady economic growth and large population, yet still some cultural and social barriers to overcome, India made an interesting case. Niger made a stimulating case because of the country's unstable economic growth and high illiteracy rates. To facilitate the reading of the paper as well to approach the topic not just from illustrative but also theoretical point of view, female education has been examined on a general level as well. Ultimately, we came to the conclusion that female education does affect economic growth, both directly and indirectly, through human capital and fertility rate.

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Source (for all figures): World Bank, World Development Indicators and Global Development Finance (World Bank Database, 2012).

1. Introduction

"We know from study after study that there is no tool for development more effective than the education of girls and women. No other policy is as likely to raise economic productivity, lower infant and maternal mortality, improve nutrition, promote health -- including the prevention of HIV/AIDS -- and increase the chances of education for the next generation. Let us invest in women and girls." — UN General Secretary Kofi Annan.

Economists and other scholars in the field of gender studies agree that gender equal education system has positive effect on our society. However, there are discussions about the amount of the effect that female education has on economic growth and the returns to it. Former research suggest that female education has direct and indirect positive effects on economic growth, especially per capita growth through reducing fertility rate and increasing labor participation, and thus creates better setting for economic growth to occur (*Hill & King 1995, Knowles and others 2005 in Klasen 2002; Psacharopoulos 1994; Barro, 1996*).

Our aim in this paper is to present if female education affects fertility rate and human capital, and therefore economic growth in developing countries. To accomplish our aim we will answer the following questions:

- Does female education affect economic growth through suggested mechanisms in India and Niger?
- Are there any existing barriers to female education and what are they?
- Are there any similarities or differences between the results found in India and Niger?

This bachelor thesis firstly explains the method and data used for research and then passes onto theoretical background that we based our paper on. Background covers definitions, facts and findings that we are going to use throughout the thesis. Chapters that come after it present results of our research divided into two parts. First part of the results focuses on female education in general and its affect on economic growth with emphasis on developing countries, while the second part of the results contains two illustrative case studies, India and Niger, with a short comparative discussion. Last part is devoted to conclusions made of our own suggestions and thoughts.

2. Method and data

This chapter will summarize method and data used to determine whether female education is affecting economic growth and the case studies used to illustrate issues about this topic.

2.1 Method

To address the aim of this thesis, a qualitative literature study will be made through reviewing theoretical background in the field of development economy. Due to vast existing literature in the area of female education and economic growth, it was appropriate to make qualitative literature study instead of quantitative.

The first section in this paper goes through a basic theoretical background regarding education and its possible relationship to fertility rate and human capital. The reason for inclusion of an elementary theoretical overview is to ease the reading and understanding of common concepts in development economy.

In the first part of the results section, an overview of female education is presented. The purpose was to assemble theoretical background of female education before moving on to the two country cases. We believe that it will simplify further reading and increase usage of the paper so that it can be used for better understanding of female education not only in India and Niger but in general.

The decision behind making a literature study, and investigating the relationship of female education's effect on economic growth through two mechanisms: fertility rate and human capital, is based on Klasen (2002). Regression analysis made by Klasen (2002) shows a statistically significant correlation between a lower fertility rate and an increase in human capital to economic growth. Robert Solow's neoclassical growth model and the human capital theory also contributed to strengthen the incentives to look into fertility rate and human capital's relationship to economic growth via female education.

India has had a steady economic growth in recent years, together with an increasing population. Before India was labeled "developed" by the World Bank in 2011, it had the largest academic system in the developing world. However, historically, there have been social and cultural barriers to female education. All this makes India an interesting case study. The motive behind choosing Niger as the second case study lies in our aspiration to explore if the low female enrollment is correlated with the inconsistent economic growth. It is interesting to compare these countries because of the similarity in increasing population, but differences in economic growth.

2.2 Data

While researching for the paper, difficulties were encountered in terms of accuracy and lack of data. Due to lack of data regarding Niger, we used some of the empirical findings and research from the Sub-Saharan region. The expectation was that it might be usable for explanation of some issues regarding female education in Niger. However, some distortion can occur. Thus, when data from other countries in Sub-Saharan Africa has been used in the text, context and country is clearly specified.

One of the weaknesses of the data might be the lack of argumentation when it comes to causality. Higher female enrollment might lead to economic growth, however higher economic growth might also lead to higher female enrollment. There is an awareness of this weakness. We decided not to dedicate a section to the causality issues but only answer our research questions instead. The aim for this particular qualitative literature study was to keep it concise.

Majority of the statistical data comes from the World Bank Database because of the organization's consistency and objectivity. Other scholars in the field of development economy also acknowledge the World Bank Database as a reliable source for collecting data. Our goal is to use a time period between 1990 and 2010. However, there are gaps in collecting data for both countries, and therefore ambitions have not sometimes been met.

The benefits and costs of female education are viewed from both private and social aspect. This is important because female education generates benefits and cost on both micro and macro level. Therefore, both microeconomic and macroeconomic aspects of female education will be addressed.

The foundations for our thesis are papers written by scholars in the field of development economy, as well as gender studies. The reasoning behind using papers from the field of gender studies has been to capture social and cultural barriers which affect female education. Various reports from organizations such as UNICEF¹, UN², IRIN³ and World Bank have been used throughout the thesis.

1 The United Nations

2 The United Nations Children's Fund

3 Integrated Regional Information Networks

3. Theoretical Background

The first part presents theoretical background which provide a foundation and background for later parts in the paper. Some basic concepts regarding education will be defined, as well as relationship between human capital and fertility rate on one side and economic growth on the other side.

3.1. Three levels of education: primary, secondary and tertiary

Primary education represents the first stage at the educational ladder and it is compulsory in majority of countries. In this stage, basic skills in the area of literacy and calculus are learned and foundations for further schooling in fields of science, mathematics, history et cetera are established. In developing countries, as we will grasp later in this paper, high opportunity cost influences parents' decision on whether to enroll their child into school or not. 121 million primary-school-age children are not attending school (*UNICEF, 2005*). One of the many reasons for such high number is that parents, mostly in developing countries, calculate that economic benefits of not attending primary schooling offset the opportunity cost of it (*Card, 2001*).

Secondary education refers to the next stage following primary education and can be viewed as an entry to tertiary education. At this level, students consolidate basic education from the primary level and acquire knowledge about the world, environment and common culture. Secondary schooling became universal in the developed countries but it is still a scarce luxury in the developing world (*Lewin & Caillods, 2001*).

Tertiary education refers to all degrees of post – secondary education. In recent decades tertiary education is more expanded, diversified, heterogeneous and more internationalized. In the new age, networking among institutions, students, scholars and diverse industries is increasing immensely. In the developed countries women outnumber men in tertiary education, while in developing countries females are underrepresented (*Tjomsland, 2009*).

3.2. Private vs. Social benefits and costs

Costs of education are fairly simple to calculate, but to calculate benefits of education is a bit more difficult. Social, cultural, private or economic educational benefits are vital for the whole society and some of them will be examined further below.

Private benefits are those that people have direct advantage of, for example, better job opportunities

which could lead to a higher income. Private cost, on the other hand, represents the cost that an individual pays in order to receive education. This includes direct private costs such as fees, materials for schooling such as textbooks and uniforms, et cetera but it also includes the opportunity cost such as forgone income and potential knowledge of household management.

Social benefits are seen mostly as positive externalities that education offers. If a person is highly educated, he or she will not only increase their own output but also society's output. Return to education of only one person could raise production of many more and create so called "spill-over" effect (*Weil, 2009*). It might be hard to put a value on positive externalities which have positive effect on the society. They are one of the reasons why governments subsidize and support schooling. The social cost of education includes the financial assets invested in education for the whole society. Thus, the social cost is much higher than the private cost because education is often greatly subsidized. Therefore, social benefits are not as high as private ones (*Psacharopoulos, 1994*).

3.3. Rate of return to education

The rate of return to education can be defined as an increase in wages that a worker would receive if he or she had one more year of schooling (*Weil, 2009*). To calculate the return to education, as stated above, can be difficult because human capital is inseparable from other "capitals" that a person possesses and it cannot be expropriated. Having that in mind, economists found a way to calculate human capital by measuring people's wages at different educational levels. *Weil (2009)*, for example, shows in his findings, a positive relationship between wages and years of schooling, in both developed and developing countries.

The internal rate of return is based on the benefits and costs produced or lost due to education, hence it represents the net benefits of an investment. In contrast to the rate of return, the internal rate of return is used to measure the desirability of an investment. The internal rate of return is an indicator of the efficiency and/or quality of an investment. An investment is seen as acceptable when the minimum return on is the cost of the investment (*Magni, 2010*).⁴

Weil (2009) came to the conclusion that the rate of return on education is diminishing. There are studies that suggest that the rate at which human capital is being accumulated in rich countries is going to slow down over time, after optimal level has been reached. In many countries in the developing world, there is a long way until the optimal level of education is reached, and therefore education should have an increasing marginal rate of return on education, especially for females

⁴ Criticized for being complicated and giving multiple answers (*Magni, 2010*).

because of lower female enrollment rates (*Weil, 2009*).

3.4. Human capital

3.4.1. Definition of human capital

The term was first developed by Theodore Schultz in the 1960s who wanted to put a value on human abilities and pointed out that human capital should be perceived as any other capital that could be enhanced and invested into through education, experience or training. Human capital builds on the assumption that not all labor is equal and that the quality can be improved through investments. Education is one of the best examples of investing in human capital which generates returns in forms of wages or other types of compensations. These returns are mostly private but can be seen as social ones as well. In conclusion, according to *Wiel (2009)*, human capital can be defined as a measure of the economic worth of an employee's skill set.

3.4.2. Human capital theory

Human capital theory suggests that education, or training, raises the productivity of workers by imparting useful knowledge and skills, hence raising workers' future income by increasing their lifetime earnings (*Becker, 1975*). This theory postulates that education is costly, it takes time which can be used doing something else and when successfully completed earns us a return and therefore should be seen as an investment. As education should be seen as an investment the workers should be seen as 'capitalists' (*Galor & Moav, 2000*). The workers are earning the return to their own investment in form of higher wages and increased life standard.

Human capital theory is more suitable in countries with high population growth, because of the vast human resource which might become human capital. The human resource can be transformed into human capital through inputs such as education and health care. Therefore, the government has the largest responsibility to facilitate the accumulation of human capital, and has both private and social benefits in terms of better life standard and economic growth. For human resources to translate into human capital, the supply of good quality schooling is crucial (*UNDP, 2011*). This is harder in countries with high population growth, where good quality schooling sometimes is scarce luxury.

3.5 Fertility rate and economic growth

3.5.1. Definition of fertility rate

The fertility rate and population growth can be defined and measured by the Total Fertility Rate (TFR). The TFR measures how many children woman would have if she reaches her childbearing

age (*World Bank Database, 2012*). A TFR of two means a zero change in population growth while a number less or over two will translate into a decrease or increase in population growth (*Weil, 2009*). Mortality rate has been decreasing faster than fertility rate in the developing world. Therefore, input in the form of labor has been increasing. This, however, does not have to translate into a higher productivity because other inputs such as capital and land might be a scarce resource which creates capital dilution. Therefore, a high fertility rate might translate into a low income per capita (*Weil, 2009*).

3.5.2. Robert Solow's neoclassical growth model

According to Robert Solow's model, developing countries with slow population growth have had the strongest economic growth per capita in recent years. There is more physical capital available for each worker. This increases output for each unit of capital and it is higher in the developed countries. He explains this by saying that if capital is constant, and population grows, then less capital is available per worker, and a capital dilution will occur. Robert Solow's model describing fertility rates effect on economic growth is described in the equation below (*Weil, 2009*).

$$\Delta k = \gamma f(k) - (n + \delta) k$$

Δk represents the change in capital per worker, γ is the fraction of output invested, $f(k)$ is the production function, n growth rate of the labor force, δ is the depreciation rate and k is capital. The condition for steady-state is no change in capital per worker, and is reached when fraction of output invested times the production function is equal to the growth rate of the labor force added to the depreciation rate times the capital. In a country with no population growth compared to a country with four percent population growth, for example, the difference in income per worker will be 34 percent according to calculations made based on Robert Solow's models. This translates into large difference in income per capita between countries with a slow population growth, contrary to a large population growth (*Weil, 2009*).⁵

⁵ Assuming the production function in the Robert Solow model has a Cobb-Douglas form. For further readings and calculations read Weil (2009) pp. 94-99.

Results – Part 1

This is the first part of the two-part results analysis which goes through basic aspects of female education, barriers to female education in the developing world, as well as effects of female education on fertility rate and human capital. First part of the results is the foundation on which the second part is built.

4.1 Female education

In general, there is higher female enrollment rate in the developed world and in urban areas than in the developing world and rural areas. Socioeconomic factors may create different social and private benefits and costs for female education (*Dollar & Gatti, 1999*). This, in turn, might create different private and social rates of return on female education in the world, and therefore different incentives to invest in female education.

Dollar and Gatti (*1999*) have only been able to find significant correlation between female education and economic growth in middle-income countries. Barro (*1996*) somewhat agrees on their point of view, but argues that Dollar and Gatti (*1996*) have not included positive externalities which comes from female education. Even if women are not part of the paid labor force spill-over effects are still generated. On the other hand, Klasen (*2002*) argues that female education is indeed significantly correlated with economic growth even in developing countries. This is based on the fact that innate ability is equal for both men and women. If more women are educated, the total level of innate ability is higher. Therefore female education has increasing marginal returns in the developing world.

4.2 Barriers to female education

There are many barriers to female education in the developing countries hence the low female enrollment rates (*Barro, 1996; Hill & King, 1995; Klasen, 2002*). Poverty is one of the reasons fewer women enroll and attend school. In many developing countries, women from poorer families have to give up education before men do. Female education has a higher opportunity cost due to greater responsibility in the household and social norms. Girls might spend 20 percent more time taking care of the household and siblings than boys outside school (*World Bank, 1997*). In some parts of the developing world, early marriages as a social norm might unable women to pursue higher education.

In many labor markets in the developing world the labor participation of women is perceived inferior to men (Barro, 1996; Klasen, 2002; World Bank, 1997). Men find work sooner than women, autonomous of the level of education (Tembon & Fort, 2008). Therefore there is less incentives to send women to school. In many parts of the world women receive lower salaries than men, for the same workload and effort (Hill & King, 1995; Horton 1999, Tzannatos 1999, World Bank 2001 in Klasen) which might decrease motivation for further schooling.

4.3 Female education's effect on fertility rate

“... ‘unless passion between sexes could be suppressed’, the human race was doomed to breed itself into poverty” (Malthus 1766-1834).

There is a higher child mortality rate for children under the age of 5 in the developing world, compared to developed world (World Bank, 1997). Therefore, parents have a tendency to insure themselves from the risk of higher child mortality by having more children than desired (Weil, 2009). Literacy is known to be negatively correlated to mortality rate (Tilak, 2006). Schultz (1993 in Tembon & Fort, 2008) wrote that one year of female education reduces infant mortality by 5-10 percent. There are other factors affecting fertility rate as well, some of them will be addressed later in the paper.

Female education, especially secondary levels, have negative effect on fertility rate (Barro 1995, 1996; Dollar & Gatti 1996; Hill & King 1995; Klasen 1999, 2002; Lagerlöf 1999, Murthi, Guio & Drèze 1995, Schultz 1994, World Bank, 2001 in Tembon 2008). Subbarao & Raney (1995 in Tembon 2008) mean that if secondary female enrollment doubles, fertility rate drops from 5.3 to 3.9 percent. Klasen (2002) addresses three ways in which female education effects fertility rate reported below:

- Fertility rate reduces population growth (Barro 1995, 1996, Dollar & Gatti 1999, Hill & King 1999, Klasen 1999, 2002, Lagerlöf 1999, Murthi, Guio & Drèze 1995, Schultz 1994, Sen 1990, Tembon & Fort, 2008; World Bank, 2001), hence increases ratio of capital per worker. Therefore economic growth per capita increases, as mentioned in Robert Solow's model earlier in the paper.
- A lower fertility rate lowers burden of dependency, hence increases savings and investments (Barro 1996, Klasen 2002). This occurs in two ways: either by the substitution or income effect. Substitution effect is generated when female wages increases while the

opportunity cost of having more children increases as well. As female wages increase, income effect occurs and women tend to consume more of other goods as well (Weil, 2009).

- A lower fertility rate will increase the amount of workers on the labor market in the short run, due to the fact that more women will join the labor market, instead of raising children. This might increase the demand for housing and also a country's tax revenues, and therefore investments in infrastructure, education and health. This might in turn also increase incentives for foreign investors and boost the economy (Weil, 2009).

4.4 Female education's effect on human capital

"Education is an investment in building human capital" (Weil, 2009)

If male and female education is seen as imperfect substitutes, fewer educated women reduce human capital and therefore economic growth in the society (Knowles, Lorgelly & Owen 2002 in Klasen 2002; Weil, 2009). Poor quality of human capital lowers productivity and economic growth. Health issues, lack or poor quality of education can be the factors affecting human capital negatively (Barro, 1996; Dollar & Gatti, 1999; Hill & King, 1995; Klasen, 2006).

A gender equal schooling system has positive correlation to investment rate indirectly through a higher human capital (ADB 1997, Barro 1991, Bloom & Williamson 1998 in Klasen 2002). A higher human capital might result in increased return on physical investments, which makes it more appealing for domestic and foreign investors (Klasen, 2002).

In conclusion, social and private benefits and costs are not the same for female education around the world. This might be due to barriers such as poverty, social and cultural norms and discrimination in the labor market (Barro, 1996; Hill & King, 1995; Klasen, 2002). Female education affects fertility rate in three ways according to Klasen (2002); by reducing population growth, lowering burden of dependency and increasing amount of workers in the labor market. Female education also reduces fertility rate through increasing literacy and therefore reducing mortality rate. As female education improves quality and the amount of human capital alters as well (Barro, 1996; Dollar & Gatti, 1999; Hill & King, 1995; Klasen, 2006).

Results – Part 2

Case studies India and Niger

This part of the results section is dedicated to female education in India and Niger. If not stated otherwise, everything mentioned in chapter five is related to female education in India. The same logic applies to Niger as well.

5. Case study 1: India

5.1 Economic growth in India

India is classified as a lower middle income country, and since 2011 is no longer regarded as a developing country (*World Bank Database, 2012*) due to recent high economic growth (*Kohli, 2006*). In 2010, the country had a real GDP growth of 8.8 percent and a nominal GDP per capita of 1410.3 dollars (*World Bank Database, 2012*). According to AT Kearney, an International consulting group (*Rao & Varghese, 2009*), India is ranked as one of the best countries to start a new business in. The foreign investment rate, might be a proof of that. The ministry of finance in India believes it will reach almost 40 percent of the GDP by 2013. Not only the foreign investments have increased but the domestic savings and investments has also gone up and were about 30 percent of the GDP in 2009 (*Rao & Varghese, 2009*). The ratio of poor people⁶ has decreased from 45.3 percent to 29.8 percent between year 2000 and 2010 (*World Bank Database, 2012*).

Even if poverty has decreased one third of the population is still thought to be poor (*World Bank Database, 2012*). Poverty negatively affects the opportunity for many to be able to enroll in school negatively. The state has a major role to mass educate the population and increase human capital (*Duraisamy, 2001*). One of the most important ways to do that is to reduce the fertility rate. It is one of the major components to long-term economic growth in India (*Drèze & Murthi, 2001; Tilak, 2006; World Bank, 1997; Yadava & Chadney, 1994*). A lower fertility rate means a higher GDP per capita (*Weil, 2009*), and more money to invest in the country and its inhabitants (*World Bank, 1997*).

6 Poor as in people living below the national poverty line which was 1.25 dollar in 1995 (World Bank, 2011). For further readings visit:
<http://www.worldbank.org.in/WBSITE/EXTERNAL/COUNTRIES/SOUTHASIAEXT/INDIAEXTN/0,,contentMDK:21880725~pagePK:141137~piPK:141127~theSitePK:295584,00.html>

5.2 Education in India

The 1.2 billion people (*World Bank Database, 2012*) of India's 28 states, together with its seven union territories, do not speak the same language, do not share the same culture and do not have the same religious beliefs. Educational system differs in the respective states due to the fact that it is partly regulated by the state and partly by the local government (*Kajisa & Palanichamy, 2009; World Bank, 1997; World Bank, 2004*). In 1999 India spent 4.5 percent of its total GDP on education, but spending on education has declined since then. In 2006, spending dropped to 3.1 percent (*World Bank Database, 2012*).

Article 45 in the Indian Constitution states: "... for free and compulsory education for all children until they reach the age of 14" (*in Andréosso-O'Callaghan, 2003*).⁷ As can be seen in article 45, ambitions have been high since 1960s. In year 2000 approximately 18.5 million children were out of school. In 2007 the number was 4.9 million. Primary completion rate also increased and in 2008 it was around 95 percent, for both males and females⁸ (*World Bank, 2012*).

The quality of governmental schools has been questioned in India (*Duraisamy, 2001*). Even if the completion rate in primary schooling is high, literacy rate is not reflecting that. Between year 2000 and 2006 there has been little change in the literacy rates, which was just under 50 percent for females and approximately 75 percent for males (2006) (*World Bank, 2012*). Some argue that good quality schooling is only available for the rich and higher middle class in private schools, especially for boys (*Andréosso-O'Callaghan, 2003*). According to Easterly (*Andréosso-O'Callaghan, 2003*) elite education does not lead to economic growth. If ability is seen as innate, it means that the majority of the people who are not included in the elite will not be able to use their full potential. This is a great social loss, and might slow down India's future long-term economic growth (*Esteve-Volart, 2004; Klasen, 2002; Rao & Varghese, 2009*). For example, in China, mass education has been the key to a fast growing economy (*Andréosso-O'Callaghan, 2003*).

Chatterji (2008) claims that primary education has the highest correlation with economic growth in India, secondary education have some effect and tertiary education being insignificant to economic growth. The reason Chatterji (2008) came to that conclusion might be the debated "surplus of education" in the media. India supplied domestic labor market with 22 million graduates (2009) and faced high youth unemployment rates (*Rao & Varghese, 2009*). However, Tilak (2007) disagrees.

7 Only eight states had implemented compulsory schooling in 1997/98 (*Andréosso-O'Callaghan, 2003*).

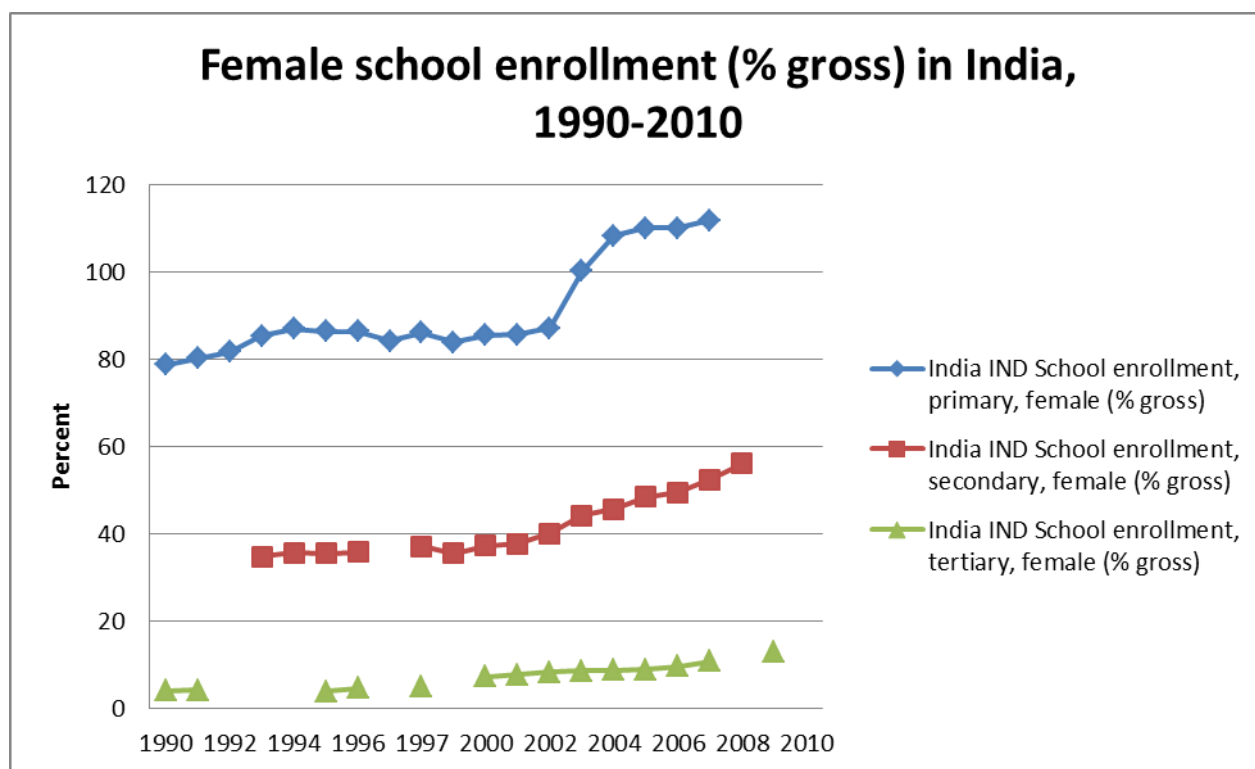
8 In year 2000 the primary completion rate was 63 percent for females and 79 percent for males.

According to him higher education has a significant effect on economic growth, but it is not as strong as the effects of primary and secondary education on economic growth in India.

5.3. Female education in India

As mentioned above approximately 18.5 million were out of school in the year of 2000, almost 75 percent of these children were girls⁹. Out of 5 million children out of school in 2007, 3.5 million were girls. The data indicates that ratio is still approximately the same. In year 2007 the expected years of education for women and men respectively was 10.9 for males and 9.8 for females. However, this was not reflected on the average years of schooling in 2010. The mean years of schooling for girls over the age of 15 were approximately 4.5 years and about 7 years for boys (World Bank, 2012).¹⁰

Figure 1:



Source: World Bank, World Development Indicators and Global Development Finance (World Bank Database, 2012).

As can be seen in figure 1, gross female school enrollment¹¹ rate has increased for all levels in India between 1990 and 2010. The highest increase has been in primary education after the millenium and forward. The high percentage rate of female enrollment rate in primary schooling might be an

⁹ 13.5 million girls were out of school.

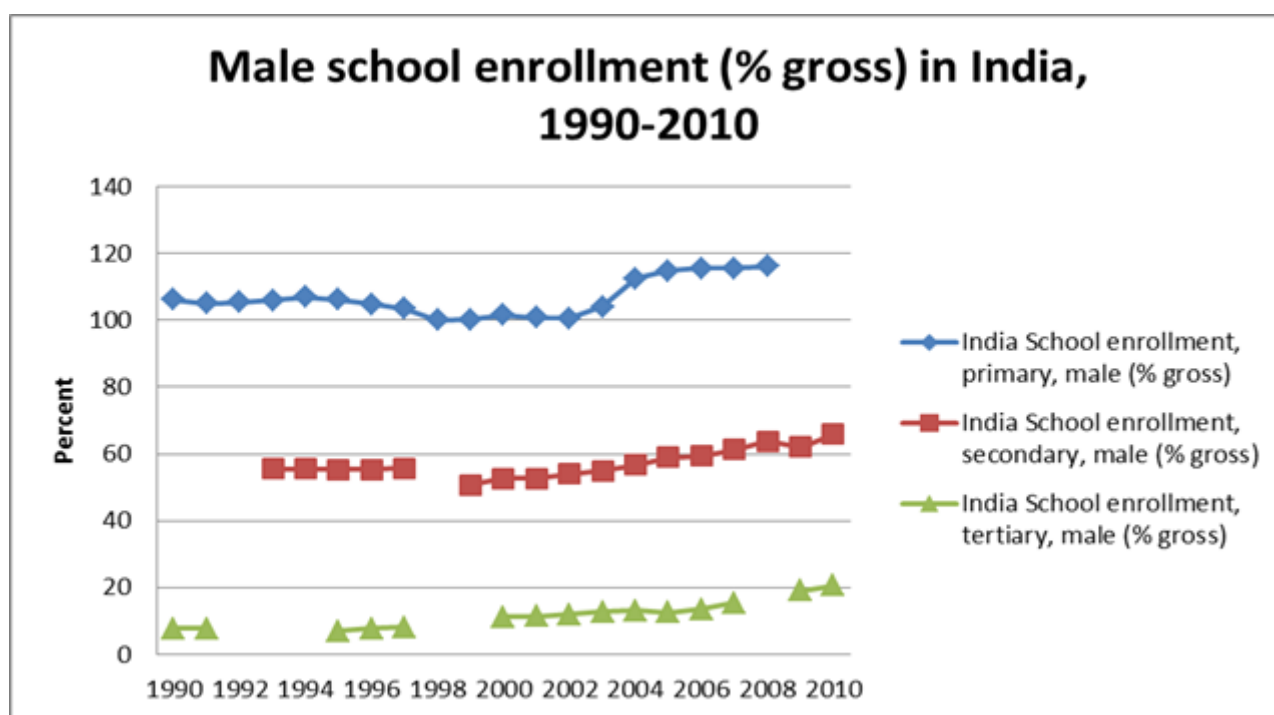
¹⁰ International Institute for Applied Systems Analysis/ Vienna Institute of Demography (IIASA/VID) Projection

¹¹ The United Nations Educational, Scientific and Cultural Organization(UNESCO), describes 'Gross Enrollment Rate' as the total enrollment within a country "in a specific level of education, regardless of age, expressed as a percentage of the population in the official age group corresponding to this level of education.

indication that women in all ages are enrolling in school, independent from appropriate primary schooling age in

the country. This might be due to an increase in informal schooling, which will be reviewed later in the paper. Secondary schooling is spiriling up as well, which might be due to an increase of the middle class in India. However, tertiary education does not have as high increase in enrollment as primary and secondary schooling. This might as well be due to an increase of the middle class. Females staying at home is a sign of financial stability (*Duraisamy, 2001*), therefore the incentives to enroll in tertiary education might decrease.

Figure 2:



When figure 1, is compared to figure 2, which shows the trends for male schooling in India between 1990-2010, it is possible to see that the gap between male and female enrollment is closing. In the beginning of 1990 almost 110 percent of males were enrolled in primary schooling, whilst only 80 percent of females were enrolled in the same level. In 2010 the enrollment for males and females is almost the same. This might be because of subsidies for girls, but also that informal schooling which first of all targets females and the poor has showed results. The enrollment for male secondary schooling has slightly increased during the last two decades, while the female secondary enrollment significantly has increased. This might be due to the facts mentioned for primary schooling, as well as completion of primary schooling and therefore the ability to move on to the next level of schooling. The increase of the middle class might also be a reason for this. Tertiary

schooling is moving in the same pace more or less both for males and females, slightly more males than females join higher education. Which might be an indicator that the most bright ones, or with the most money have the ability to join, independent of gender. It is also important to mention the states hard work since the 1960's to make its inhabitants see the positive sides with education, working hard for families to see the benefits of schooling for girls.

A woman's socioeconomic background might affect the level of completion rate. If a family is poor, one rather invests in sons than daughters (*Chaudhri & Jha, 2011; World Bank, 1997*). Women from the middle class in the majority of cases finish at least primary education, irrespectively if they live in rural or urban area. Women from the upper class in the urban areas, usually have at least secondary education, and more often can chose if they want to become a part of the labor force or not. There are few or no social barriers prohibiting them from joining the labor market (*World Bank, 1997*).

Duraisamy (2001) came to the conclusion that female education has a positive rate of return for all levels of education in India. World Bank (1997) came to the same conclusion, but only when participation in the labor market was not accounted. One reason for this might be that majority of women do not work after finishing school but become stay at home mothers. Therefore education for women might not give the same economic return on the investment compared to men who join the labor force and therefore contribute to increased income per capita. This finding might be questioned due to exclusions of positive externalities mentioned earlier in the paper.

Before continuing on and reviewing the impacts of female education on economic growth through a decline in fertility rate and increase in human capital, it is important to clarify the diversity in India. In the 1990s some states had almost universal education, such as the southern state of Kerala. In Kerala, both men and women can choose whether to join the labor force or not. In other parts of the country, such as states of Bihar and Rajasthan, overall female enrollment was about 50 percent. In Punjab on the other hand, an agricultural state in the north, overall female enrollment was almost 80 percent, but labor participation for women was extremely low (*World Bank, 1997; World Bank, 2004*).

5.4 Barriers to female education in India

Female education has a higher social rate of return on education than male education have. Therefore if decisions about female education are made on perceptions of private benefits the social optimal level will not be reached (*Duraisamy, 2011; Tilak, 2006; World Bank, 1997*). This has a negative effect on the majority of working sectors in India except in agriculture (*World Bank,*

1997).

According to Indian traditional beliefs, a woman is not born into her real family, but only “resides” there until she gets married. In some cases a woman’s parents also have to pay dowry¹² (*Mutharayappa, Choe, Arnold & Roy, 1997*). The returns on investment on a daughter’s education fall on her husband’s family (*World Bank, 1997*). That might be one of the reasons why parents perceive private returns on a daughter’s education as less than a son’s education, in some parts of the country. It is important that a daughter hopefully marries into a good family. Which might be the reason why it is essential for women to have an unharmed chastity. Therefore opportunity cost to educate women increases during their teens. The chance for a girl's virtue to be damaged will increase if she spends more time outside her home. This can occur if she continues with secondary or higher education, especially in rural areas where there are not many appropriate schools nearby (*Mutharayappa, Choe, Arnold & Roy, 1997*). When a girl is in school she is also losing valuable lessons about household work. To keep a woman at home also represents financial stability and prosperity (*Esteve-Volart, 2004*). As mentioned earlier, in poor families both boys and girls receive less education. However, if a family has limited financial resources it is more often girls who give up their education (*Chaudhri & Jha, 2011; World Bank, 1997*).

There are small differences regarding overall achievement in school between males and females. However, girls receive lower grades in language, in contrary to other parts of the world where girls are more successful in the subject of language. One explanation for this might be that girls are not encouraged to speak in class. They might not only be discouraged by teachers, but also by textbooks used in schools, where women are given a submissive role. Girls might therefore be discouraged to attend and finish school by the schooling system itself (*Tembon & Fort, 2008*). This shows once again that the sole status of a woman in the society can be a barrier as well.

Women also have a harder time to enter the labor market. Many employers rather hire a man than a woman even if that means paying a higher salary because men are perceived as the ones with financial responsibility (*Esteve-Volart, 2004; World Bank, 1997*). Women present a small part of the paid labor force. In 2010, approximately 25 percent of the total labor participation was women. Women receive in average 70 percent (*World Bank Database, 2012*) of the wage of a man which might decrease incentives to work because of low benefits (*Esteve-Volart, 2004; World Bank, 1997*).

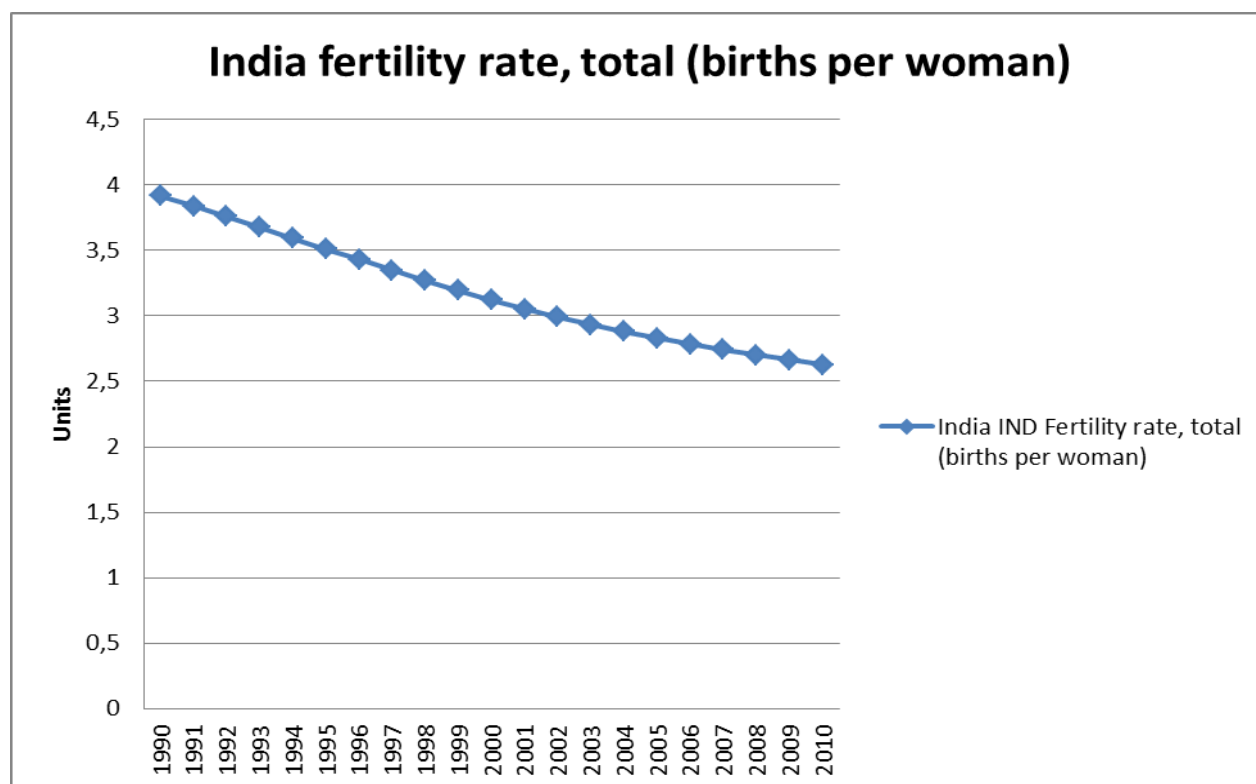
12 Asking for dowry is illegal, but still exists as a Hindu custom in many parts in the country.

5.5 Female education's effect on fertility rate in India

Drèze and Murthi (2001) argue that female education together with low mortality rate and low son-preference are the only significant factors reducing fertility rate in India. They add that modernization and urbanization, poverty reduction and male literacy have no significant association with reduced fertility rate. On a national level, a drop in fertility rate reduces population growth and therefore increases income per capita.

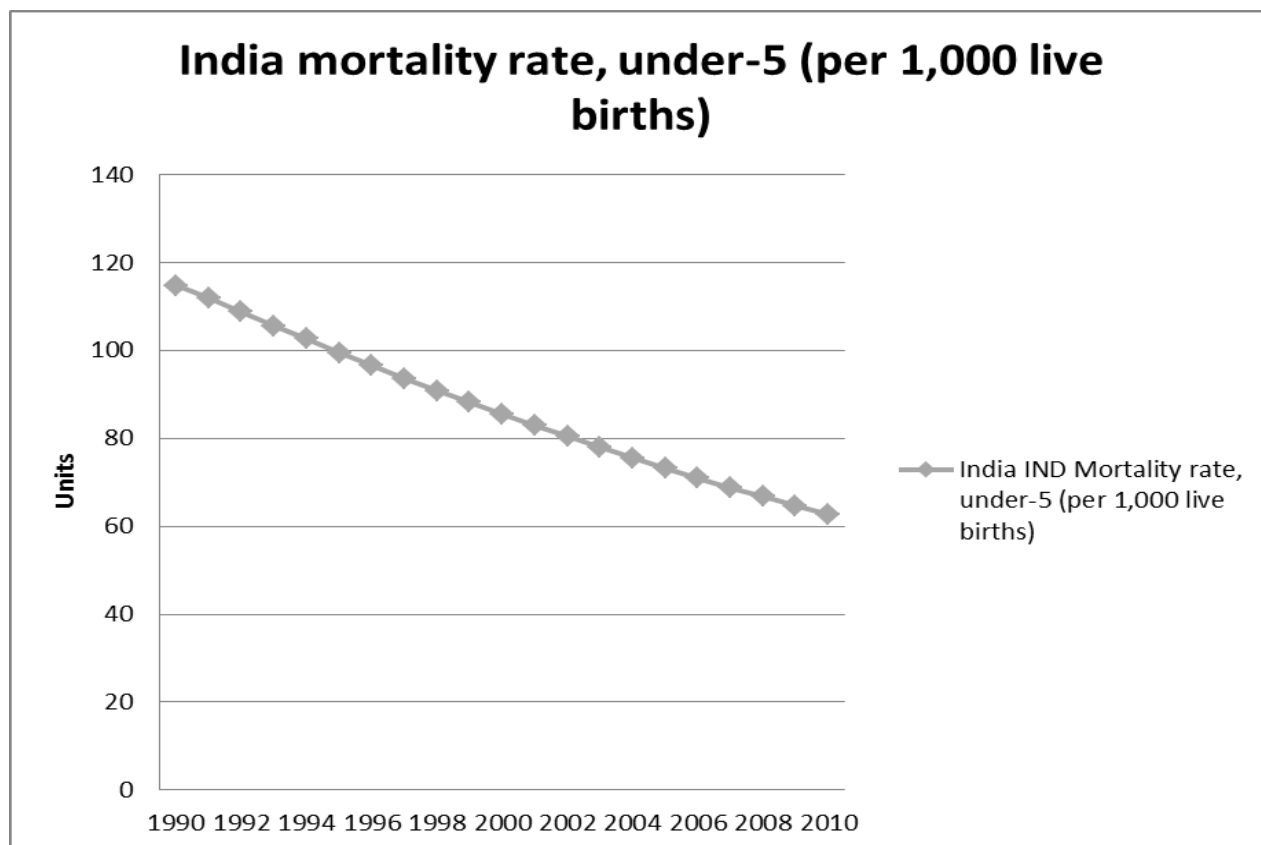
A lower mortality rate is indirectly affected by female education. According to the World Bank (1997; 2004) literate women have more knowledge about how to feed their children; they grasp the importance of hygiene and clean water, and know more about a child's basic health. This decreases child mortality, and therefore women does not have to plan for as many children (Drèze and Murthi, 2001; Yadava & Chadney, 1994).

Figure 3:



Source: World Bank, World Development Indicators and Global Development Finance (World Bank Database, 2012).

Figure 4:



Source: World Bank, World Development Indicators and Global Development Finance (World Bank Database, 2012).

In figure three and four one can view that fertility rate and mortality rate have decreased significantly in the last 20 years. Majority of the scholars such as Klasen (2002) claim that only secondary female education has a direct effect on reducing fertility rate while primary education has an indirect effect in reducing fertility rate through reducing mortality rate for children under the age of five. Comparing figures one, two and three one can comprehend that it might be true. Mortality rate has had a higher percentage decrease than fertility rate and primary female enrollment is higher than secondary.

There is a strong son-preference in India. Parents might continue to have children until they get a son. A weaker son-preference could decrease the fertility rate by eight percent (Drèze and Murthi, 2001; Chaudhri & Jha, 2011; Esteve-Volart, 2004; Mutharayappa, Choe, Arnold & Roy, 1997; Yadava & Chadney, 1994). Some argue that modernization did not show to have any direct effect on fertility rate in India but might lower son-preference indirectly through female education. However, this might not only be true for female education

solely, but for education in general as well (*Drèze & Murthi, 2001; Yadava & Chadney, 1994*).¹³

In India, female secondary education has a stronger direct effect in reducing fertility rate, than primary education. An educated woman might not desire as many children as an uneducated one. They also have a higher probability to give birth to as many children as desired. Thus, the actual family size has a higher chance to be close to the desired. This indicates to an increased knowledge of contraception use and that educated women marry later than uneducated ones. The income and substitution effect both occur in India, as explained above (*Drèze & Murthi, 2004*).

In 1994 in Gujarat, women with no education had 3.6 children, mothers with primary education had 3.3 children, and women who had completed secondary school had 2.4 children. In Rajasthan the fertility rate in 1991 was 6, and in Kerala the fertility rate the same year was 2.6. The rate of female enrollment in these states was very different, from almost universal in Kerala to less than 50 percent in Rajasthan (*Mutharayappa, Choe, Arnold & Roy, 1997; World Bank 1997; 2004*).¹⁴

It is commonly believed that poverty has a significant positive effect on fertility rate. As mentioned earlier, Drèze and Murthi (*2001*) have not found any association between poverty and fertility rate in India. Studies have shown that parents do not view children as financial assets. Instead they are seen as a financial burden in short-term, with a possibility that sons will take care of them in old age. This perception in India seems to be independent of income.

5.6 Female education's effect on human capital in India

After China, India has the second largest labor force in the world, of approximately 500 million people (*Rao & Varghese, 2009; Sahoo & Kumar Dash, 2009*). This is a possible foundation for high productivity and therefore economic growth. However, if the population is unhealthy, illiterate and uneducated then the large population might not translate into a high human capital.

In India, where majority of the mothers stay at home, they are the ones taking care of children's health needs (*Esteve-Volart, 2004*). There has been shown, not only in India, but in the whole world, that mothers who are literate have more nurtured and healthier children, than their illiterate counterpart (*Tembon & Fort, 2008*). Therefore female education has shown to be both directly (through women joining the labor force) and indirectly related to a higher human capital, hence higher economic growth. Good health and nutrition received in early age is an important condition

13 Some say a high son-preference lowers population growth due to parity-specific gender bias which leads to higher abortion rates when expecting a girl (Das Gupta & Bhat, 1987 in Drèze & Murthi, 2001). This effect is insignificant and very small compared to the positive association, according to Drèze and Murthi (2001).

14 Can also mention that son-preference is much higher in Rajasthan than in Kerala (Mutharayappa, Choe, Arnold & Roy, 1997)

for good health as an adult. For example, in India, vaccination against polio and malaria increases when a mother is educated to some extent (*World Bank 1997*). However the causality between female education and better health and attainment in school can be questioned. The poorest women have the least access to education in India, and therefore do not have access to financial assets as educated women might have.

Healthy children facilitate mother's ability to go back to paid or un-paid work much faster than women who have unhealthy children (*World Bank, 1997; 2004*). This means that the opportunity cost of female education for girls decrease, if mothers and siblings are healthier. This might increase female enrollment, and decrease drop-out rate among girls. Therefore, an increase in knowledge of basic health due to female education increases human capital in more than one way (*Esteve-Volart, 2004; Rao & Varghese, 2009*).

In the majority of cases, fathers join the labor market while mothers stay at home, especially in rural areas. In India there is a positive relation between educated mothers and their children's achievements in school. Studies have shown that a mother's education increases not only the health and therefore concentration level of a child in school, but also the motivation and grades. Once again we can see that educated mothers have positive effects on their daughters. Educated mothers, especially in urban areas, encourage their daughters more often to strive for a higher education, than uneducated ones (*World Bank, 2004*).

5.7 Policies that promote female education in India

The Indian government has been working hard since the late 1960s to be able to give universal education to its population (*Duraisamy, 2001; Tilak, 2006*). It is not the easiest task in India where the population grew from approximately 890 million in 1991 to over 1.2 billion in 2010. The hardest ones to reach are the Dalit¹⁵ girls. Indian government has tried to increase the demand for education for them through subventioning the direct costs of their education, for example text books and uniforms (*Ferry, 2008; Munshi & Rosenzweig, 2006*).¹⁶

A project that started in the 1980s in India was informal schooling. The purpose was and is mass education for those who had the least possibilities to enter formal schooling and provide basic knowledge in subjects that students can use in their everyday life. These schools reduce opportunity cost of female education through having schools closer to communities in rural areas and during the day when girls do not have to be involved in household work. There are many positive effects of

¹⁵ Formal way of saying casteless.

¹⁶ For all former casteless children, Dalits.

informal schooling, which are similar to those of primary education. However, the national institute of educational planning and administration reported that the informal education had several weaknesses, especially in the poorest areas in the country like Bihar. It was said to be underfunded, curriculum was thought by unmotivated teachers and few children continued with formal education (*World Bank, 1997*).

Studies made in urban Mumbai shows that some girls from former casteless groups, the Dalits, have been the biggest winners. These women used free education offered to them and became active members of the labor market and have taken themselves out of the poverty trap. In contrast to women from the middle class who might not have been able to do so because of the social norms (*Ferry, 2008*).

In summation, the key factor for long-term economic growth in India is a decrease in fertility rate. The proof that female education affects economic growth through fertility rate reflects findings of Drèze and Murthi (*2001*) who argue that the only factors which decrease fertility rate in India are female education, low mortality rate and low son-preference. It is also proven that female education has both direct and indirect effect on human capital which creates effect on economic growth as well. Obstacles for female education in India are mainly related to social and cultural norms, as well as a high population.

6. Case study 2: Niger

6.1 The economy of Niger

The Republic of Niger, situated at the edge of the Sahara desert and part of the Sahel belt, is rated by the UN as one of the least developed countries in the world. The country has one of the lowest ranks on the United Nations' Human Development Index (HDI) taking 186th place out of 187 countries (UN, 2011). It is populated by nearly 16 million people with nominal GDP per capita at circa 399 dollars (IMF, 2011). Niger is the largest country in the West Africa but nearly 80 percent of it is covered by Sahara desert which immensely affects the country (Bureau of African Affairs, 2012).

Niger's economic growth varies greatly and the reason behind it lies in amount of rainfall per year. Country is often stricken by droughts which leaves its citizens without food. But when the amount of rainfall is satisfactory, it generates decent agricultural output which affects economic growth positively. According to World Bank's data, annual GDP per capita growth was -4, 6 percent in 2009 but increased sharply to +5, 0 percent in 2010. Numbers in 2009 reflected drought period in Niger at that time (Bureau of African Affairs, 2012; World Bank, 2010)

Current government sees foreign private investment as a solution in restoring and stabilizing economic growth. There are plans for private sector recovery with assistance of the UNDP¹⁷ and international financial institutions. The factum is that Niger attracted foreign investment before but poor condition of legal and physical infrastructure hindered the country from further development (Bureau of African Affairs, 2012)

6.2 Education in Niger

Two biggest challenges in today's Niger are food security and education (Heward & Bunwaree, 1999). Due to people's daily struggle to survive, education is not always a priority. This is the reason why many boys and girls are dropping out of school and engaging in other economic activities such as working at young age.

Niger has one of the lowest gross school enrollment levels in the world. In 2007, it stood at 31.8 percent, taking all levels of education together (African Economic Outlook, 2011). Even when children do enroll in school majority of them are boys, 60 percent enroll at primary level, to be

17 United Nations Development Program

exact (*World Bank, 2011*). Nigeriens who live in rural areas, mostly located in the north of the country, have little or no access to schools.

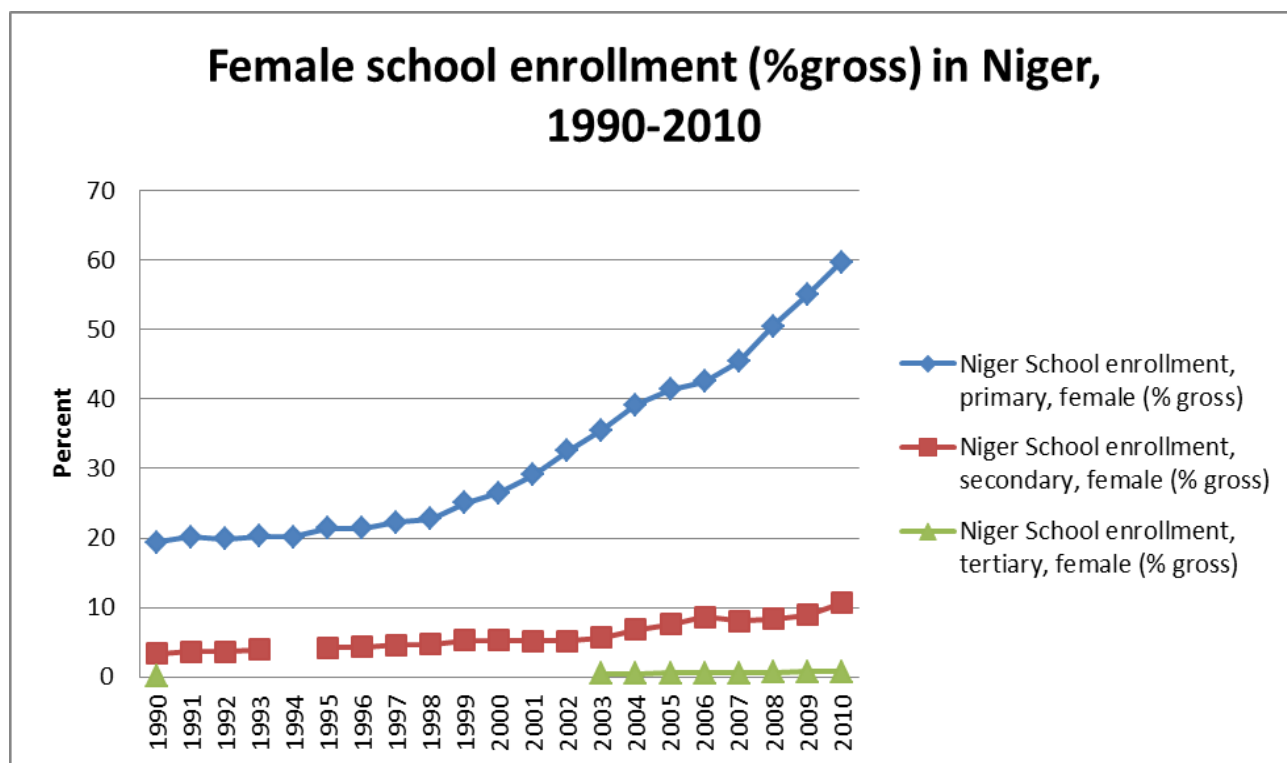
6.3 Female education in Niger

“One of the silent killers attacking the developing world is the lack of quality basic education for large numbers of the poorest children in the world's poorest countries – particularly girls.”

(*Sperling, 2005*)

As figure four shows female education in Niger certainly improved in the last twenty years. In 1992, percentage of girls who enrolled in primary schooling was 19.8 percent. Whereas in 2010 that number almost tripled or, to be exact jumped to 59.7 percent (*World Bank, 2012*). According to these numbers one would assume that Niger is moving forward to achieving universal primary education but there are still obstacles along the way.

Figure 5:

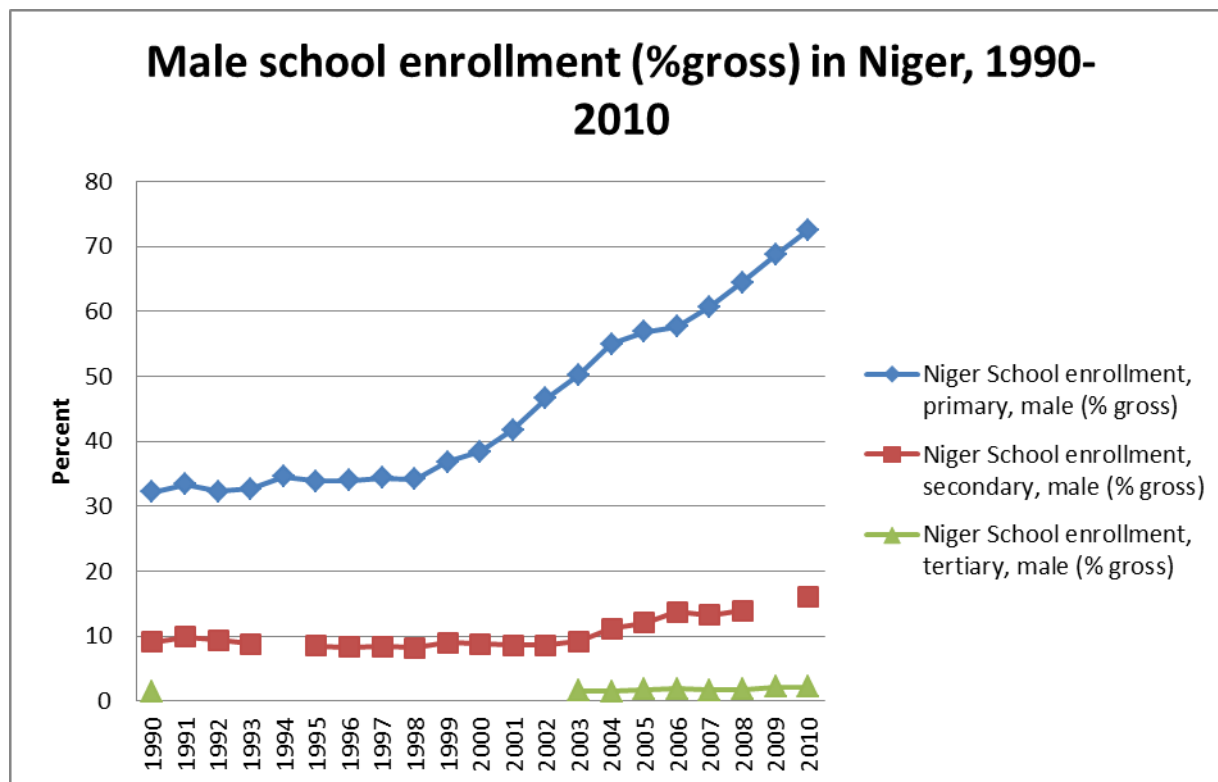


Source: World Bank, World Development Indicators and Global Development Finance (World Bank Database, 2012)

The completion rate of primary schooling for girls in Niger is very low. According to the World Bank, 39.6 percent of the girls finish primary schooling (*World Bank, 2010*), which means that about 30 percent of girls decide not to continue with their education, and they either get married and have children or work to support their families. Women enrolling in tertiary education are few and, there is a lack of data between the years of 1991-2003. Women in Niger are neglected in

educational sense through low enrollment rates, especially in higher education (*Browne & Barrett, 1991*).

Figure 6:



Source: World Bank, World Development Indicators and Global Development Finance (World Bank Database, 2012)

According to figures five and six, the difference between primary school enrollment for boys and girls has been more or less the same the last two decades. This means that the gap has not been decreasing. It actually seems like; male enrollment is increasing faster than female enrollment in primary schooling. Secondary enrollment is very low for both men and women; however male enrollment is almost 100 percent higher than female secondary enrollment. Tertiary education is almost non-existing in the country for both genders. This is a strong indicator for low private and governmental financial assets. These trends, for both females and males are a good mirror of the financial situation in the country, which is very instable. Therefore investments and encouragement of female education is crucial.

Niger raises one interesting aspect where increasing female education might be strongly beneficial. The occurrence of female farming is very common in Sub-Saharan Africa including Niger. One of the main economic activities in Niger is subsistence agriculture¹⁸ and women make sizable

¹⁸ Subsistence agriculture is “self-sufficiency” farming: the farmer produces just enough food to support themselves and his/her family

contribution to production. Thus, educating women would make a positive impact on food production and agricultural output and therefore yield significant return (*Browne & Barrett, 1991*).

In 2005, only 15.1 percent of women of the age of 15 and above could read or write, for men literacy rate the same year was 57.1 percent (*World Bank, 2012*). This is however no surprise. Literacy is determined by primary enrollment rates, life expectancy at birth and average years of schooling for adults (*Verner, 2005*). This is all low for women.

6.4 Barriers to female education in Niger

Research made by Hake (*1970*) in the Kano State, Nigeria, pointed out that some parents often have negative attitude towards daughters enrolling in school. Some of Hake's findings point out the fact that parents are fearful that girls will lose interest in home management once educated or that education will interfere with marriage of girls at the proper age. The average age for girls to get married in Nigeria is approximately 18.5 years. We will assume that reasons for parents in Niger not wanting to send their daughters to school might be similar¹⁹, where average age for girls to get married is approximately 15,7 years, and the fact that the country still did not ratify the Maputo Protocol²⁰ which outlaws early marriages (*Population Reference Bureau, 2011*).

Cultural and family dynamics in Niger represents male interests, so women do not have complete freedom to manage neither their child's education nor childbearing which also reflects in high fertility rates. Family planning, as one of the ways to decrease such high fertility rate, is not functioning properly in Niger. Research from 2011 showed that people in Niger actually do not want fewer children. It turned out that Nigeriens, as one of the few nations in the world, want family size to be bigger than it actually is. When asked in 2006, women and men in Niger answered that they would want between 8.8 and 12.6 children respectively (*Potts; Gidi; Campbell and Zureick, 2011*).

Another obstacle that female education faces in Niger is very high drop-out rates. By looking at figure 4, approximately 40 percent of females enrolled in primary schooling, but only 15 percent of those could read. Which either is an indicator of poor quality of schooling, or/and high drop-out rates as mentioned above. We can also suppose that the drop-out rates for men are much lower when looking at the fact that a vast majority of those enrolled in primary schooling learned to read

19 Niger and Nigeria have other similarities as well, for example in geographical and demographical sense

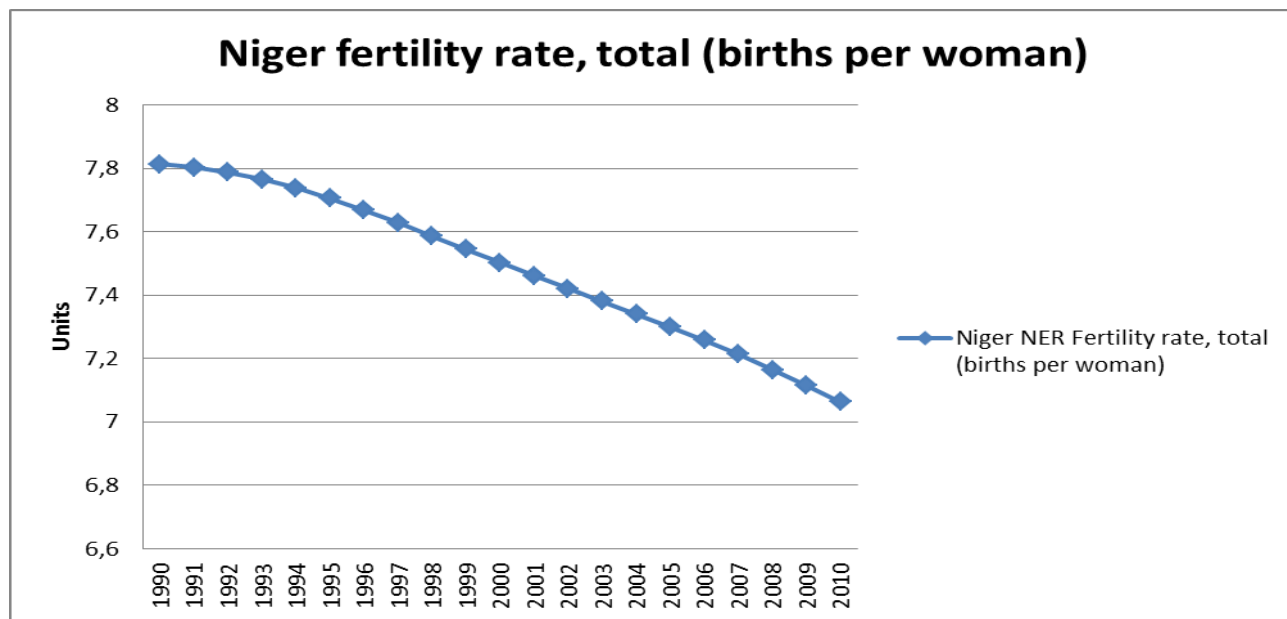
20 The Protocol to the African Charter on Human and Peoples' Rights on the Rights of Women in Africa

and write. By looking at figure 5 and 6, it is obvious that there is a vast gap between enrollments in primary and secondary school as well. This might be connected to social and cultural issues at hand. Parents' beliefs, educational level, religious orientation as well as the poverty issues could all influence decision of young girls dropping out of school.

6.5 Female education's effect on fertility rate in Niger

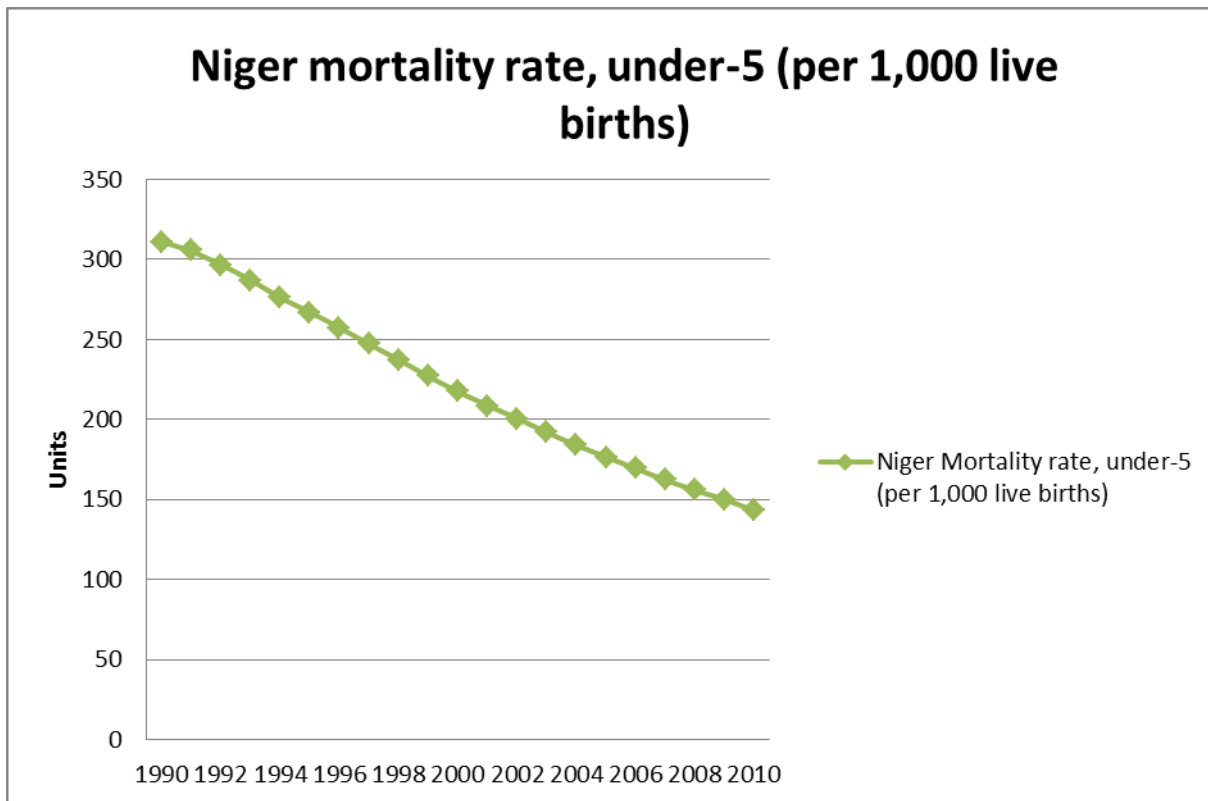
According to World Bank's data fertility rate in 1992 was 7.8 births per woman while, in 2010, fertility rate was 7.1 birth per women (*World Bank, 2012*). There is not much that has changed in the last 20 years. Niger's population is growing fast and there are estimations that the number could reach almost 50 million by 2050 compared to over 15 million in 2010 (*Potts; Gidi; Campbell and Zureick, 2011; World Bank, 2012*) which raises the question of the country's future economic growth. According to Robert Solow's neoclassical model a lower fertility rate increases income per capita. Therefore lowering fertility rate is essential for economic growth in Niger (*Weil, 2009*).

Figure 7:



Source: World Bank, World Development Indicators and Global Development Finance (World Bank Database, 2012)

Figure 8:



Source: World Bank, World Development Indicators and Global Development Finance (World Bank Database, 2012)

In figures five and six it is possible to see the development of fertility rate and child mortality rate of children under the age of five over the last two decades. Fertility rate did not change much in the period of 1990-2010. However, the mortality rate, which can be seen in figure six, has had a larger decrease. As mentioned before, female literacy, which is attained from primary education, has the strongest negative effect on reducing child mortality. Therefore it might not be very surprising that mortality rate has decreased more than fertility rate. Female education is known to have a direct negative effect on fertility rate through secondary education and the low enrollment rate of secondary education might therefore explain the lower decrease in fertility rate in contrast to the mortality rate. It also makes it clear how important female education is.

As mentioned in the theoretical background, a higher education is positively correlated to an increase in wage. If more women in Niger attain some kind of education their income will increase and therefore fertility rate might decrease. This might especially be true in Niger due to importance of female farming because education might increase output. Therefore a higher income could increase the opportunity cost of having more children, or in other words, generate a substitution effect.

According to Potts, Gidi, Campbell and Zureick (2011) German Credit Bank is making an effort to keep young girls in school but fertility rate as high as Niger's could offset this investment because it is very unlikely that female education will increase at the same pace as population growth.

6.6 Female education's effect on human capital in Niger

Sub-Saharan Africa is well known as a region where population is endangered by illness like malaria or tuberculosis, but the condition that Niger has the most difficulties with is widespread malnutrition which affects about 50 percent of people every year (IRIN, 2006). Unhealthy population, with insufficient energy for daily activities, is negatively affecting human capital. High maternal and child mortality rates as well as overall basic health²¹ could be lower if the condition of girl's education in the country improves (IRIN, 2007). Once educated, mothers can decrease child mortality by being able to properly care and provide for their children. Being able to understand the condition her child is in, to react on time and prevent potential illness are the factors which are crucial for reducing child mortality. On the other hand, maternal mortality is connected to both the state of health system in need of improvement in Niger, and female education (IRIN, 2007)²².

On the other hand, people are still unaware of the importance of modern healthcare. Some families will not send pregnant mothers to hospital, but will turn to traditional healers or religious officials instead. Female education makes not only women but the whole society aware of the importance and benefits of modern healthcare. This does not only reduce child mortality, but should also decrease fertility rate, because parents do not need to insure themselves and have more children in case of infant mortality. It might also contribute to a healthier youth and adults, which contributes to increasing the human capital in Niger, which is crucial for economic growth.

In 2010, life expectancy at birth for females was 54.7 years while only 20 years ago life expectancy at birth was 42.8 years (World Bank, 2012). Life expectancy did increase but it is still very low compared to developed countries. For example, average life expectancy for females in the European Union was 82.6 years in 2010 (World Bank, 2012). Through such comparisons, we achieve better understanding of the fact that low life expectancy could also be one of the factors which affect human capital in Niger. If women live longer, a chance for acquiring education increases. Once educated, they would be able to take better care of their children, provide for their families and participate in the work force for a longer period of time. This will, in turn, increase human capital in

21 Examples of basic health; maternity and newborn care, chronic diseases, comfort care, fatal conditions – for further readings look at Saultz (2008).

22 There are 17 doctors who are able to perform Caesarean operations in Niger

the country and positively affect economic growth. Intuition behind this lies in foundations of human capital theory (Becker, 1975).

6.7 Policies that could improve female education in Niger

“Making change takes time. It means working to change laws and sometimes traditions”, Issa Sadou, gender program officer at UNFPA²³.

Family planning is a policy directed to decrease fertility rates with average results in Niger (Potts; Gidi; Campbell and Zureick, 2011). Advantages of such policy are enhanced health, reduced poverty and empowered women, but this policy alone will not reduce massive increase in Niger's population. Other strategic regulations such as broadly available contraception and access to health care would help. Policy that would increase the age at which young girls get married would not have immediate affects but substantial results would be seen in the future. This might increase female enrollment.

Traditional chiefs and religious leaders have immense influence on society in Niger (UNICEF, 2007). By spreading the message about importance of female education Nigeriens might eventually change some of the negative beliefs and customs still incorporated into their daily lives. Chiefs usually travel to villages and raise awareness about women empowerment, prevention and treatment of harmful diseases, early marriages and female education. This kind of influence that leaders in Niger provide is crucial especially for illiterate population who does not have the opportunity to be reached via more conventional methods of communication.

Recent research proved that when cutting the enrollment costs and pointing out the benefits of sending girls to schools, majority of parents will send their daughters to school. Strategy that worked best in some other countries in Sub-Saharan Africa was simply eliminating enrollment fees which are still charged in some developing countries. After introducing this strategy enrollments in countries like Uganda, Kenya and Tanzania increased immensely (Sperling, 2005).

In conclusion, Niger's future economic well-being depends, among other things, on decrease in fertility rate and increase and improvement in human capital. Poor quality of female education and high fertility rates that rapidly increases population growth are not beneficial to the country's economic growth. Female education can decrease fertility rate through income and substitution effects and increase and improve human capital by raising awareness about importance of health care or decreasing child and mortality rates. Policies represented here are just one part of the

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equation when it comes to improving female education and mechanisms used to influence economic growth. Niger could benefit out of better healthcare system and revision of cultural and social norms as well.

7. Comparison of the results retrieved in India and Niger

Both India and Niger have a tendency to fast population growth which might slow down future economic growth in both countries. Results of the two countries cases showed that both decrease in fertility rate and increase and improvement in human capital could work as mechanisms through which female education affects economic growth. Both countries have barriers in the form of cultural and social norms that might prevalent female education in India and Niger respectively.

Female enrollment rates differ at all levels in India compared to Niger. This might be the reason for the differences in fertility rate, foreign investments and economic growth. Secondary female education has the strongest direct effect on reducing fertility rate, while primary education has an indirect effect on reducing fertility rate by lowering mortality for children under the age of five. Therefore high drop-out rates and low secondary female enrollment, due to cultural and social barriers might make it hard to reduce fertility rate in Niger, and therefore be a hinder for economic growth.

8. Conclusion

Investments in female education have shown to be an important factor in reducing fertility rate and increasing human capital in both India and Niger. Therefore, female education has a positive effect on economic growth by increasing income per capita directly and indirectly. Robert Solow's neoclassical model shows the relationship between female education and economic growth, and the human capital theory shows the relationship between human capital and economic growth (*Weil, 2009*).

Female education in the world has shown positive private and social rate of returns. Research has also shown that female education has a higher rate of return in comparison to male education and increasing marginal returns, especially in the developing countries (*Klasen, 2002*). However, Dollar and Gatti (*1999*) argue that this is not the case. Investing in women who do not join the labor market creates a negative rate of return, especially on higher levels of female education (*Dollar & Gatti, 1999*). This might be because positive externalities and spill-over effects are not included when calculating the rate of return, and not because of negative returns to female education (*Barro, 1994, 1996; Klasen, 2002*).

Different female enrollment rates between the developed and developing world might be due to more social barriers in the second case. Social norms increase the opportunity cost of female education which make parents unwilling to let daughters attain higher education. In poorer families, girls are the ones giving up further education because private internal rate of return might be perceived as lower for girls than for boys even if the social optimal level might be higher (*Barro, 1996; Hill & King, 1995; Klasen, 2002; World Bank, 1997*).

Fertility rate has an indirect effect on economic growth. Klasen (*2002*) says that female education has a negative effect on fertility rate in three ways: by reducing population growth, by lowering the burden of dependency and by increasing the amount of workers on the labor market. In the reviewed literature, this has been found to be true for both India and Niger. Secondary female education decreases fertility rate by reducing the amount of desired children while primary education reduces mortality rate of children under 5 by increasing literacy (*Drèze & Murti, 2001*). Female education does lower burden of dependency in both countries, and the income and substitution effect therefore also exist, especially for women with higher education. A larger population has a negative effect on economic growth by lowering the income per capita. In Niger this has shown to be true, while in India it has been harder to prove this due to strong recent

economic growth.

A higher human capital might result in increased return on physical investments, which makes it more appealing for domestic and foreign investors (*Klasen, 2002*). Female education has a positive effect on increasing human capital both directly and indirectly in both India and Niger, and the effects are similar in both countries. The direct effects are improved health, enhanced knowledge and experience of educated women. Even if educated women do not participate in the labor market they have positive effect on the future human capital in the country. They are the ones having the strongest positive effect on their children's basic health, nutrition intake and attainments in school. However, there might be a causality problem when talking about effect of female education on human capital. Poverty represents a barrier preventing women from acquiring an education because of the higher opportunity cost of female education. Therefore, better basic health, nutrition intake and greater attainments in school for children with educated mothers might have to do with financial assets rather than their education.

In countries like India and Niger who have large population as well as high population growth, universal education is expensive. Therefore, female education becomes more important in these countries. Reducing fertility rate and population growth is important for economic growth in ways that increase income per capita, and enhance the chance for governments to offer better health care, education and infrastructure. These investments, together with a higher human capital, increase economic growth and create incentives for foreign investments.

Since the 1960s, India has had high ambitions regarding universal education and has made progress. The amount of children out of school has decreased; foreign investments have increased together with economic growth. Niger, which has had an inconsistent economic growth and has an ambition to try and attract foreign investors, can learn from India's example. The recommendation is to increase female education through informal schooling and continue in aspiration to empower women by revising social and cultural norms.

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