The Effect of Female Education on Human Development and Economic Growth: A Study of Human Capital Formation in developing countries.

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Abstract

According to the different studies, there is a strong correlation between (GDP) per capita as the index of economic growth and indicators of human development such as life expectancy, infant mortality, adult literacy, political and civil rights. Based on Millennium Development Goals, which is a program made by UN to reduce extreme poverty and improve human development in developing countries, we can find the indicator of which has key role and affect the other goals of human development directly and clearly. Considering the concept of education accurately we also would be faced with subject of literacy for both genders in a society. Recent empirical research reveals the benefit of women's education and describes the importance of this subject for the economic development.

Therefore the main object of this paper is the relation between human development and economic growth and the effect of education on human capital accumulation and thereby on the economic growth, especially the case of female literacy rate and its consequences for human development. This paper will analyze the effect of the human development on the economic growth and well being with special attention to the female education concept related to the MDG in developing countries generally. It will consider mainly the sub Saharan countries as developing countries. For this purpose we will verify the theoretical literature via comparing statistic and charts for the region under consideration.

Key Words: Human Development, Female Education, MDG, Economic growth.
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INTRODUCTION

Today, global wealth is concentrated less and less in factories, land, tools and machinery. The knowledge, skills, resourcefulness of people, what generally is called human capital, is increasingly critical to the world economy. According to the Schultz (1993), the term “human capital” has been defined as key element in improving a firm in order to increase productive as well as sustain competitive advantage. Human capital refers to processes that related to the training, education and other professional initiatives in order to increase the levels of knowledge, skills, abilities, values and social assets of employee which eventually will lead to improving a firm performance. OECD (2001: 18) defines human capital as “the knowledge, skills competencies, and attributes embodied in individuals that facilitate the creation of personal, social and economic well-being”.

Human development has been defined as enlarging people’s choices in a way which enable them to lead longer, healthier and fuller lives. This matter has recently been advanced as the ultimate objective of human activity in place of economic growth. Clearly there is a strong connection between economic growth (EG) and human development (HD). On the one hand, EG provides the resources to permit sustained improvement in HD. On the other hand improvement in the quality of the labor force can count as an important contributor to EG. So in this case it seems we have a two-way relationship between HD and EG. Turning our attention to the chain from HD to the EG we will have an obvious presumption, supported by abundant evidence, that shows as people become more healthy, well-nourished and educated they contribute more to economic growth.

Considering the concept of human capital, Adam Smith (1776) defines that as

“the acquired and useful abilities of all the inhabitants or members of the society. The acquisition of such knowledge, by the maintenance of the acquirer during his education, study, or apprenticeship, always costs a real expense, which is a capital fixed and realized, as it were, in his person. Those talents, as they make a part of his fortune, so do them likewise that of the society to which he belongs. The improved dexterity of a workman may be considered in the
same light as a machine or instrument of trade which facilitates and abridges labor, and which, though it costs a certain expense, repays that expense with a profit.”

Knowledge and personality matter by affecting labor performance, thus producing economic value. The greatest improvement in the productive powers of labor, and the greater part of the skill, dexterity, and judgment with which it is anywhere directed, or applied, seem to have been the effects of the division of labor and distinctly these attributes gained by a worker through education and experience. This is the view that education gives knowledge and thereby human capital.

Recent evidence suggests that, however, the higher education can produce both public and private benefits. The private benefits for individuals are well established, and include better employment prospects, higher salaries, and a great ability to save and invest. These benefits also may result in better health and improved the quality of life. In fact, education is associated by better skill, higher productivity and enhanced human capacity to improve the quality of life. Education at all levels is needed if economies are to climb from subsistence farming, through an economy based on manufacturing to participation in the global knowledge economy. In this case we can say that, economic development for developing countries can be effectively stimulated by building the technical capacity of their workforce, through quantity and quality of education program.

On the other hand, based on the eight Millennium Development Goals (MDGs), education is a major catalyst for human development (UN, 2010). The MDGs are:

1. Eradicating extreme poverty and hunger
2. Achieving universal primary education
3. Promoting gender equality and empowering women
4. Reducing child mortality rates
5. Improving maternal health
6. Combating HIV/AIDS, malaria and other diseases
7. Ensuring environmental sustainability
8. Developing a global partnership for development
UNESCO demonstrates how rapid advances in education can help to achieve all of the MDGs\(^1\). The second goal of the program indicates that: “education is development. Education creates choices and opportunities for people, reduces the twin burdens of poverty and diseases, and gives a stronger voice in society. For nations it creates a dynamic workforce and well-informed citizens able to compete and cooperate globally – opening doors to economic and social prosperity.” In fact we can say that education provides knowledge and skills, encourages new behavior and increases individual and collective empowerment and in this way can be counted as the center of social and economic development.

**1.1 Overview and Research Question**

During the twentieth century, education, skills and the acquisition of knowledge have become crucial determinants of a person’s and a nation’s productivity. One even can call the twentieth century the time of awareness of human capital in the sense that primary determinant of a country’s standard of living is how well it succeeds in developing utilizing the skills and knowledge and furthering the health and reducing poverty of its.

There are several studies which show the way that, how education generally can effects development and economic growth by increasing among of human capital which also leads to innovation and technology progressing (Lucas 1988, Romer 1991). However, does it matter who will get the education in a society? Does it matter whether investments are made in female or male education? The answer is yes, it probably does. Among the MDGs, which can be counted as main program for improving the general condition of developing countries, we will find the female education as main component. Regarding United Nations Millennium Development Goals, Gartner (2010) states that:

“Without achieving universal education we are not going to achieve the other Millennium Development Goals ...“We’re not going to reduce child hunger, because education is the key to reducing child hunger in terms of educating mothers. We’re not going to reduce child mortality,

as giving mothers just five years of education ... can lead to a reduction in child mortality of 40 per cent."

This paper will try to show whether there is any special advantages for increasing the female literacy rate and its effect on the human development and consequently economic growth.

This paper is organized by following way. First, the relationship between human development and the way by which increased human capital will lead to economic growth will be outlined briefly, incorporating the Millennium Development Goals as the main concept for improving the level of human capital and thereby human development. Second, education and its relationship with development and economic growth will be analyzed, using systems theory (Boulding 1956, Bertalanffy 1968, Jacob 1988), human capital theory (Schultz 1960, Becker 1964, Lewin 1997) as well as endogenous growth theory (Lucas 1988, Romer 1990) and clarify the effect of education on human capital formation and consequently on economic growth generally in developing countries for both gender as theoretical framework. Third, we will ponder the effect of raising education in two categories of market and non-market impacts for the region have in mind by different gender. Concerning the poor women's situation in developing countries (especially in sub-Saharan countries), it will be considered by assessing special non-market consequences of increasing the level of female education, as studied by Elson (1997) for developing countries; the pathways through which women's schooling leads to social gains and consequently human development, as compared to the male's schooling. This is substantiated by considering the result of different studies (such as; Boserup 1970, Moock 1976, Caldwell 1979, Martin et.al 1983, Elson 1987, Benavot 1989, Strauss 1990, Goldin 1995, Strauss and Thomas 1995, Vandemoortale and Delamonica 2000, Esteve and Volart 2004) in the case of productivity, health, HIV combating, fertility and child mortality (as components of MDG) as well as using some statistic comparison table and chart to present the theoretical part in developing countries. The results and statistic consideration reveals the direct and strong effects of increasing the level of female education on human development as well as economic growth. However because of the lack of data it wasn’t possible to evaluate the direct effect of female literacy rate on economic growth in developing countries.
2 Human Development, Economic Growth, and Female Education

2.1 The relation between Human Development (HD) and Economic Growth (EG)

According to the UNDP's Human Development Reports, human development has recently been advanced as the ultimate objective of human activity in place of economic growth. First published in 1990 under Pakistani economist Mahbub ul Haq and Indian Nobel Laureate Amartya Sen, the goal of the Human Development Report and the Human Development Index (HDI) was to accurately measure whether people are better off in terms of health, freedom, education, and other aspects of life not measured by gross GDP. The originators stated: “People are the real wealth of a nation. The basic objective of development is to create an enabling environment for people to enjoy long, healthy and creative lives. This may appear to be a simple truth. But it is often forgotten in the immediate concern with the accumulation of commodities and financial wealth (UNDP, 1990).

According to the composite human development index, the HDI, a new way would be introduced for measuring economic development by combining indicators of life expectancy, educational attainment and income. The HDI sets a minimum and a maximum for each dimension, called goalposts, and then shows where each country stands in relation to these goalposts, expressed as a value between 0 and 1. The life expectancy at birth component of the HDI is calculated using a minimum value of 20 years and maximum value of 83.4 years. This is the observed maximum value of the indicators from the countries in the time series, 1980–2010. The decent standard of living component is measured by GNI per capita (PPP$) instead of GDP per capita (PPP$). Since GDP per capita is not a measure of personal income and this item is one of the factors of standard of living so The HDI uses the logarithm of income, to reflect the diminishing importance of income with increasing GNI. The education component of the HDI is now measured by mean of years of schooling for adults aged 25 years and expected years of schooling for children of school entering age\(^2\). Education contributes directly to the growth of national income by improving the productive capacities of the labor force. Based on United Nations Educational, Scientific, 

\(^2\) Mean years of schooling is estimated based on educational attainment data from censuses and surveys available in the UNESCO Institute for Statistics database and Barro and Lee (2010) methodology
and Cultural Organization (UNESCO), a recent study of 19 developing countries, including Egypt, Jordan, and Tunisia, concluded that a country’s long-term economic growth increases by 3.7 percent for every year the adult population’s average level of schooling rises\footnote{UNESCO Institute for Statistics, Financing Education — Investments and Returns, Analysis of the World Education Indicators, 2002 Edition}. The UNDP, Human Development Report divides countries of the world into three groups: high, medium, and low human development.

On the other hand no country has achieved sustained economic development without substantial investment in human capital. Several studies has evolved to analyze the channels through which human capital can affect growth (surveys include Barro and Sala-i-Martin, 1995; and Temple, 1999). Much of these studies have emphasized the complementary relationship between human and physical capital, noting how imbalances in these two stocks, as well as human capital externalities, can affect economic growth. For instance, the highly educated, such as scientists and technicians, appear to have a comparative advantage in understanding and adapting new or existing ideas into production processes. So distinctly, there exists a strong connection between economic growth (EG) and human development (HD). Actually there is a strong correlation between gross domestic product (GDP) per capita and indicators of development such as life expectancy, infant mortality, adult literacy, political and civil rights, and some indicators of environmental quality which actually, they are implied in the HDI.

Also Expenditure on HD related items is strongly affected by the rate of poverty reduction. For instance, if poor householders receive extra income, they will increase their food expenditure and calorie consumption significantly. Of thirty eight studies in different countries one-third indicate that at least one half one-half of additional income is spent in this way (Strauss and Thomas, 1995). Another empirical evidence regarding developing countries – for example for Bolivia, Brazil, Chile, Ghana, India, Indonesia, Pakistan, Philippines, Malaysia, Nicaragua and Peru – also indicates a positive effect of family income changes on child schooling (Alderman et.al., 1996a, Behrman and Wolfe, 1987a,b; Birdsall, 1985; Deolalikar, 1993; King and Lillard, 1987).

So, to be more accurate, we can consider a two-way relationship between HD and EG in this way which EG provides the resources to permit sustained improvements in HD and on the other hand improvements in the quality of the labor force are an important contributor to EG. So we can count the HD as the central objective of human activity and economic growth as potentially a very important instrument for advancing it.
To consider precise and turning our attention to the chain, from HD to EG, there is an obvious presumption, supported by different ample evidences which shows that as people become more healthy, well nourished and educated they contribute more to economic growth.

2.2 Women, development and Economic growth

The Millennium Development Goals (MDGs) produced by the United Nations and at least 23 international organizations, is a program which aims to promote inclusive and sustainable human development and works to reduce poverty in all its dimensions, reducing child mortality rates, fighting disease epidemics such as AIDS, and developing a global partnership for development. As a matter of fact it focuses on three major components of human development including improving infrastructure, increasing social, economic, political rights, also basic standards of living and well-being with majority of focus on improving nutrition, healthcare and education. Actually according this agreement, economic growth is an important factor in reducing poverty and generating the resources necessary for human development and environmental protection. Hick’s (1980) study regarding economic growth and human resources indicates that, although reducing poverty has been wildly recognized as the primary goal in the developing countries, it soon became clear that a “basic needs” approach would also improve the quality of labor force through the effects of improved health and education. Thus, the emphasis shifted away from meeting “needs” toward improving the productivity of human resources, by improving human capital. So, the link between economic growth and the achievement of the Millennium Development Goals (MDGs) lies in how the opportunities and benefits created by growth support the human development of the poorest people. In fact higher level of economy affects the economy via enhancing people’s capabilities and consequently their creativity and productivity.

To be more accurate, in order to fulfill certain the eight MDGs we can find a key factor, women’s education which can affect the other goals much more than men’s education. Increasing the level of education for instance, can contribute a lot to reduce the high level of maternal mortality, efforts to achieve the MDGs for children’s health and education as well, and for poverty and hunger reduction, on an ongoing basis. Similarly, providing girls with better and more education can help reduce child mortality; improve child nutrition and health; and enhance overall development progress.
In fact increasing the level of female education in addition of general advantages of rising education like, increasing productivity, skills and innovation also will bring other special gains (compare to the male’s education), which directly affects growth of human capital and consequently economic growth specially in developing countries.

High human development countries has the adult literacy rate of 99%, these countries have almost universal adult literacy while For low human development countries, adult literacy rate is generally lower, ranging from 67.4% to 24.0%. However, what distinguishes among high, medium and low human development countries is not just the level of adult literacy rate which is equally but more striking is the disparity between male and female adult literacy rates among these countries. The disparity between the sexes in adult literacy is almost non-existent in high human development countries. In contrast, the disparity is large and significant in medium and low human development countries. For example, in Morocco, which is one of the countries in the medium HDI group, adult literacy rate for males is 65.7% and that for females is 39.6%. And in Sierra Leone, which is ranked lowest in the HDI ranking, adult literacy rate for males is 46.7% and that for females is 24.2%. It can be inferred from this matter that the disparity between male and female education is one of the crucial factors in determining the degree of country’s accomplishment in human development.

Also according to the United Nations Population Fund, countries that have made social investments in health, family planning, and education have slower population growth and faster economic growth than countries that have not made such investments. Obviously, the health and education of a population represent one of the main determinants of the composition and growth of output and exports and constitute an important ingredient in a system’s capacity to borrow foreign technology effectively. Improved health and nutrition have been shown to have direct effects on labor productivity, especially among poorer individuals (Behrman, 1993, 1996). Education is also an important contributor to technological capability and technical change in industry. For example, Statistical analysis of the clothing

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and engineering industries in Sri Lanka showed that the skill and education levels of workers and entrepreneurs were positively related to the rate of technical change of the firm.

3 Theories

3.1 Education and Human Capital Theory

In *The Wealth of Nations*, Adam Smith (1776) formulated the basis of what was later to become a science of human capital. According to the school of thought (over the next two centuries), human beings themselves were capital. The neoclassical perspective of investment in capital was extended to the context of decision making regarding the enhancement of skills and abilities. In this way education and training are the most important investments in human capital (Becker 1964). Since the payoff to spending on education or training lies in a future it makes sense to regard this spending as capital investment specially an investment in human capital (Lewin 1997).

As a matter of fact the economic prosperity and functioning of a nation depend on its physical and human capital stock. Whereas physical capital stock has traditionally been the focus of economic research, factors affecting the enhancement of human skills and talent are increasingly figuring in the research in social and behavioral science. In general term, human capital represents the investment people make for themselves that enhance their economic productivity. Human capital analysis assumes that schooling raises earnings and productivity mainly by providing knowledge, skills and a way of analyzing problems (Becker 1964). On the other hand, a key strategy in determining economic performance has been to use a conception of individuals as human capital and various economic metaphors such as productivity, technological changes, innovation, research, education and competitiveness.

Based upon the works of Schultz (1971), and Sakamota and Powers (1995), human capital theory, rests on the assumption that formal education is highly instrumental and even necessary to improve the production capacity of a population. In fact human capital theory emphasizes how education will

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6 Deraniyagala, 1995.
increase the productivity and efficiency workers (as human capital) by raising the level of cognitive stock of economically productive human capability which is a product of innate abilities and investment in human beings. A prominent explanation for that move is provided by a recent reformulation of Human Capital theory which has stressed the significance of education and training as the key to participation in the new global economy. On the other hand according to the Lewin (1997) by increasing the level of cognitive skills and technological progresses consequently the phenomenon of ever present change will place a premium on the ability to adopt to change, on being able to recognize opportunities in the capital structure. Thus preparing our children for the twenty first century will mean equipping them with more than the basic skills. It means the rapidly changing capital structure is related to and is , indeed predicted on, rapid changes in human capital structure (via education). Also education plays a great and significant role in the economy of a nation, thus educational expenditures are found to constitute a form of investment. This augments individual’s human capital and leads to greater output for the society. It increases their chances of employment in the new labor markets, and allows them to reap pecuniary and non-pecuniary returns and gives them opportunities for job mobility.

Obviously, it is much easier to quantify the monitory gains from education, but, nevertheless, progress has been made on the other aspects. Many studies shows that education promotes general health as well as family structure reduce smoking, raise the propensity to vote and improve birth control knowledge (Becker 1964). In an ingenious study that relies heavily on economic theory, Michael (1972) quantifies some non-monetary benefits of education. His results and others indicate that such benefits of schooling are quit large, although for most people they are apparently smaller than monetary benefits. In fact, since the possible external benefits of education that don’t apply directly to the production process, are not reflected in factor payment so they are often less amenable to empirical research. Such external benefits might arise because education reduces criminal behavior (Lochner and Moretti, 2004) because education enables individuals to participate more efficiently in the political process (Friedman, 1963) or because education carries direct consumption externalities. According to the Fagerlind and Saha (1997) human capital theory provides a basic justification for large public expenditure on education both in developing and developed nations. The theory was consistent with the ideologies of democracy and liberal progressing found in most Western societies.
There are many studies of economic growth and development which consider the importance of education and human capital. Robert (1991) extended a human capital model which shows that the creation of human capital and education was responsible for both the differences in labor productivity and differences in overall levels of technology that we observe in the world. More than anything else it has been spectacular growth in East Asia that has given education and human capital their current popularity in the field of economic growth and development. Countries such as Hong Kong, Korea, Singapore and Taiwan have achieved unprecedented rates of economic growth while making large investment in education. In the statistical analysis that accompanied his study, the World Bank 1993 found that the improvement in education is a very significant explanatory variable for East Asian

Also here are several ways of modeling which shows how the huge expansion of education accelerated economic growth and development. Schultz (1960) identified human capital narrowly with investment in education and put forward the proposition that “important increases in national income are a consequence of additions to the stock of this form of (human) capital. In the one point of view the role of education in the growth and development process is to count human capital as a critical input for innovations, research and development activities. In fact in this perspective education is seen as intentional effort to increase the resources needed for creating new ideas, thus any increase in education will directly accelerate technological progresses. This modeling approach usually adopts the Schumpeter assumption (1942) of imperfectly competitive product markets and competitive innovation. In this way education is seen as an input into the intentional and entrepreneurial efforts to create new technology and new products. Proponent of this view, point out the close correlation between new product development and levels of education. The countries that are at the forefront of technology also have the most educated population (Van den Berg 2001).

### 3.2 Education and Growth theories

According to the previous section we assume that education plays a central role in growth. So in this part we are going to consider can the possible role of education be given a source foundation in terms of economic theory? Can the growth effects of education capture, as it generally defined and understood?
Economic growth theories focus on physical and human capital as key determinants of economic growth and development. In fact, early models of economic growth assumed the rate of growth of the labour force as determined by rate of population growth and no attention was paid to factors that determine the efficiency of labour. The neoclassical (exogenous) growth model was based on the assumption that economic advancement was driven by labour, physical capital and technology and that technological change that was critical to growth process occurred by chance and hence was exogenously determined. Accordingly, for this traditional growth model, these factors affect growth only in the short run as the economy converges to the new steady state output level. But the more recent alternative, endogenous growth theory emphasizes more on the role of human capital accumulation (through education and training as well as through investment on health) in economic development and technological change. On the other words, endogenous growth theories introduced the idea that Investment in human capital was seen as a key means by which a given stock of labour could be make more productive at any point of time. Economic growth thus became a function of investments in education (Kabeer 2003). Within the framework of endogenous growth model, the question raises about the nature of education production returns. Thus, the question of the real role that education plays in the process growth can be answered and so the endogenous character of growth can be verified. An endogenous growth theory argues that economic growth is generated from within a system as a direct result of internal processes. More specifically, the theory notes that the enhancement of a nation’s human capital will lead to economic growth by means of the development of new forms of technology and efficient and effective means of production. The contribution of new growth theory is to explain productivity growth, which is growth in production as resulting from innovations. One of the most prominent and influential contribution is that of Lucas (1988) which was related to the previous work by Uzawa (1965).

In these models the level of output is the function of the stock of human capital. In the long run, sustained growth is only possible if human capital can grow without bound. The market outcomes of education in the Lucas (1988) production function are shown below:

\[ Y = A \left[ (\mu_1 h N)^{1-\alpha} \ K^\alpha h_a^\gamma \right] \]

\( Y = \) output, usually measured in the aggregate as GDP,
\( \mu_1 = \) the fraction of time the typical worker devotes to production,
\[ \mu_1h = \text{human capital inputs within the firm. This is the average education or skill level, } h, \text{ times the fraction of time devoted to production, } \mu_1, \]

\[ N = \text{the number of persons employed,} \]

\[ K = \text{physical capital,} \]

\[ h_0 = \text{the average level of education in the community, and } A \text{ the level of technology.} \]

\[ A = \text{the level of technology} \]

A growth equation relating changes or growth of GDP over time, to flows of investment is implied by this Lucas function. This is made apparent by taking the logs, totally differentiating with respect to time, and dividing through by real output. This is then converted to per capita terms by subtracting the rate of growth in the number of persons from both sides. It shows that the rate of growth of per capita GDP depends primarily on growth of human capital per capita as a percentage of GDP, and on investment in physical capital per capita as a percentage of GDP.

The second wave of endogenous growth theory consists of so-called “innovation-based” growth models, which themselves belong to two parallel branches. One branch is the model of Romer (1990) according to which aggregate productivity is a function of the degree of product variety. Romer proposed four elements of growth theory, namely, neoclassical economics in the capital and labour (unskilled labour), the further addition of human capital (as measured by the number of years of education), and new ideas (using patents to measure, emphasizing innovation). The landmark contribution of him, endogenous growth models based on the analysis of research and development, yield the result that steady-state growth partly depends on the level of human capital. The underlying assumption is that human capital is a key input in R&D and the production of new ideas. In most endogenous growth models based on research and development, the stock of human capital is taken to be exogenously determined.

Based on endogenous growth theory, economic growth is the elemental result of endogenous and not external force. It means technological progress is made endogenous also some human capital is assumed. Labor learns by using capital. In fact, economic growth is enabled by increases in productivity, which means the inputs (labor, capital, material, energy, etc.) will increase for a given amount of output. In fact we achieve higher productivity by instituting new processes, producers and organizations that invariably displace old ones.
The displacement produces real losses to those whose jobs or investments were tied to old ways of doing things, but absent this creative destruction, there is no technological improvement. More specifically, each of the various components of human development is likely to have a distinct impact on economic growth. On the other side, education is an essential, obvious and contentious ingredient of prosperity. Obvious because any person able to read this text knows what difference schooling makes in their lives and contentious because when social scientists try to prove that the education is a cause of economic growth it turns out to be quite difficult to decide which came first the chicken or the egg. Education alone is obviously not enough to solve the world’s problems, but it remains an essential factor in any development activity. So, in general, based on the models of new growth theory, we can see human capital as an important input in the creation of new ideas, and this mechanism provides a relatively appealing justification for viewing education as a central determinant of growth rates, even over long times intervals.

But however, this kind of macroeconomic analysis did not consider the human dimensions of economic growth except at a very general and abstract level. It is therefore not surprising that it had almost no concern with gender. Elson (1997) in his arguments regarding gender-neutrality indicates that “the gender-neutrality of macroeconomic analysis was an illusion. Human resources were treated as ‘non-produced factors of production’ like natural resources. The implication was that they could be transferred between activities without cost in the same way that land could be used for growing different crops at different times. Yet this is clearly not the case. Alongside the stream of activities that are labeled ‘production’ by economists, there is a parallel stream of activities that constitute ‘reproduction’”. He continued ‘Production’ traditionally refers to all the activities that contribute to a country’s GNP – in other words, that are bought and sold in the market place. ‘Reproduction’, on the other hand, refers to those activities that add to, and take care of, society’s human resources. These include bearing and rearing of children, reproduction of people on a daily basis and caring for the old, the sick, the disabled and others who find it difficult to take care of themselves. Human beings have to be born, brought up, cared for and taught a variety of norms, values and skills before they become the ‘factors of production’ that are taken for granted in macroeconomic growth models. In poorer countries, however, much of it is carried out on an unpaid basis in the household in response to the combination of social norms, habit, custom, affection and obligation that make up family life.
In most cultures, women have the main responsibility for the reproduction of ‘labour’ on a daily and generational basis. By using male economic activity as its standpoint, economic analysis has become skewed and failed to appreciate what is distinctive about women’s work patterns. Considering the case of productivity it has thus had an ‘iceberg’ view of the economy, seeing only the tip of what actually goes on by way of productive work. The activities that entered the System of National Accounts (SNA) and help to calculate the GNP are only those that represent market transactions (See Fig 1). So in this way we can imagine an “iceberg” view of the economy which we see only the tip of what actually goes on by way of productive work but all these activities, in turn, rest on the unpaid work of reproduction and care in the household that ensures the production and productivity of the labour power that keeps the entire economy working.

**Figure 1 The Iceberg View of the Economy**

![Figure 1 The Iceberg View of the Economy](source: web.idrc.ca/en/ev-42963-201-1-DO_TOPIC.html)
3.2.1 Education and Growth Theory: Evidence

Based on above models, we find that investment in human capital, innovation and knowledge are significant contributors to economic growth according to endogenous growth theory. Hultén (2001) says that the endogenous theories have the new assumption that the marginal product of capital is constant rather than in diminishing as in the endogenous growth theory. Capital often models includes investments in knowledge, research and development of products, and human capital. The centerpiece of endogenous growth theory is the role knowledge plays in making growth possible. Knowledge is a subject to increase the returns because it is a non-rival good (note all goods and services are rival and excludable).

Modern growth theory suggests that human capital has positive impact on economic growth. Although there are expectations, empirical evidence generally shows that human capital has a positive and statistically significant impact on the growth rate of per capita income (Temple 1999). For example, Artadi and Sala-i-Martin (2003) argue that if primary school enrolment rates an independent in African countries had been as high as those in OECD countries, the average annual growth rate of per capita income in Africa would have been 2.37 percent instead of 0.9 percent recorded in the last four decades; a growth rate that would have more than doubled per capita GDP over the 40 years period. On the other hand, if African countries had the same rate of investment in physical capital as OECD countries during same period, GDP per capita would have grown by 0.44 percent higher. This additional contribution to the growth rate of per capita income is only 30 percent of the additional contribution that education would have made to economic growth in Africa. This suggests that education has a much larger impact on economic growth in Africa countries than physical capital.

Empirical evidence at both micro and macro levels further illuminates these relationships. At a micro level, numerous studies indicate that increases in earnings are associated with additional years of education, with the rate of return varying with high level of education (Behrman 1990, Psacharopoulos 1994). The returns to primary schooling tend to be greater than returns to secondary and tertiary education (Psacharopoulos 1994).
3.3 System Theory

A system can be described as a complex of interacting components together with the relationship among them that permit the identification of a boundary identification and entity or process. Systems theory is the interdisciplinary study of systems in general, with the goal of elucidating principles that can be applied to all types of systems. The advantage of system theory is its potential to provide a trans-disciplinary framework for a simultaneously critical and normative exploration of the relationship between perception and conceptions and the worlds they purport to represent. Studies of cognitive development and human perception are beginnings to rely more and more on the system approach. System theory does much to render the complex dynamics of human bio-psycho-socio-cultural change comprehensible (Laszlo and Krippner 1997).

General systems theory, termed by Boulding (1956) as the skeleton of since provided a foundation for the integrations of scientific knowledge across a wide variety of disciplines. Systems theory was initially developed by biologist Ludwig von Bertalanffy (1968). Thought grow out of organism biology; general system theory soon branched into most of the humanities. In recognition as platform for the study of human behavior has led to recent applications in areas of social work, mental health, and political and behavioral science. Bertalanffy, indicates in his book the general systems theory is not a search for vague and superficial analogies” (p. 35) He also indicates a discussion of some of the holistic movements in various fields, such as physics (thermodynamics), psychology (Gestalt), and economics (planned economies). So the same in a social science, social phenomena must be considered as “system” difficult and at present unsettled as the definition of socio cultural entities may be. There is a revolutionary scientific perspective stemming from the General System Research movement and with a wealth of principles, ideas and insights that have already brought a higher degree of scientific order and understanding to many areas of biology, psychology and some physical science s.). He continues, is in need of generalists, but not people who simply know a little about a lot of things. Instead, what is needed are people who are well trained in a discipline that allows them to think in higher-level (more abstract) terms than is allowed for in most specialties. These people would be trained in models, principles, and laws that apply to generalized systems or their subclasses, irrespective of their particular kind, the nature of their component elements, and the relations or ‘forces’ between them a theory, not
of systems of a more or less special kind, but of universal principles applying to systems in general (p. 32).

Any given system may be further subdivided into subsystems of a lower order and also a system is a part of a super system so in this way we can say that there is a hierarchy of systems. On the other side is comprised of a set of elements together with the relationship between the objects (elements) and between their attributes (Hall and Fagen 1968) or it may be viewed as asset of parts coordinate to accomplish a set of goals (Churchman 1968). Based on Ackoff’s suggestion (1981) that a system is a set of interrelated elements, following properties can be derived:

1. Each element has an effect on the functioning of the whole
2. Each element is effected by at least one other element on the system
3. All possible subgroups of elements also have the two first properties

On the other part, system thinking comes from the shift in attention from the part to the whole (Checkland 1997, weingber 2001). On the other hands the relationships between the parts themselves and the event they produce through their interaction become much more important, with the result that “system elements are rationally connected” (Luhmann 1990) toward a shared purpose (Gollinelli 2009). So we can say that a complete understanding of a system required holistic study of not only the individual integrant of the system but also their inter-linkage and the relationships with the wider system. System theory links fields and disciplines together through the use of common principles in solving problems. System theory suggests that although problems may differ in their specific content they are essentially the same in their basic structure. Further, problems within system have definable causes. The causes may have multiple sources, which in turn can be linked to the original indicators. Those indicators then can be linked to the actions that could be taken to remove the indicators and thus solve the problem. System theorists assume therefore the problems are not isolated or random events, but are the result of a set of antecedent conditions that can be predicted and controlled (Jacobs 1988).

Considering the case of MDG as a system in developing countries, there are find eight subdivided with interaction effects on each other. Among these subdivided we will find one common element, women, in all of them an also as direct element of at least in three of them (promoting gender equality and empowering women, reducing child mortality and improving maternal health.
In addition based on hierarchy of systems in this case as it was discussed in previous part we can consider increasing education specially female education as a elementary subsystem of MDG system which in turn is a subsystem of a national economy here defined as the super system of interest. So this approach will lead us to find those females are more related to this system compare to the men. Using the same pattern in human capital system, as it will be discussed in details, considering the subgroups of learning system, population, health, freedom we find the elemental role of female in this regard and subsequently in the super system of super system of growth system.

4 Education's External Benefits; considering the case of developing countries

Eight out of ten of the world’s children live in developing countries. It shows the important of policy questions stem from the potential role of education in improving the welfare of the 5 billion people living in developing countries. As we consider before many macroeconomists have emphasized the impact of education on economic growth. Among micro economists, both an older literature using OLS regression and a new literature using natural experiment and instrumental variable techniques estimate the both private and social rates of return to education are higher in developing countries. Actually, developing countries have massively expanded their education system in the last 40 years but also focus on education as two of the eight MDGs would be on two part: first for all children to complete primary school by 2015, and second to achieve gender quality at all levels of education by 2015. Such a contribution shows us it also would be important that who will get the education in these countries this is the point that we will start next section regarding the female literacy and its consequents on the economic growth. So in this section we are going to consider the externality of education and review some experience and survey done across the developing countries.

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7 World Bank (2003)

8 See Psacharopoulos (1985, 1994)

9 See Duflo (2001)

10 World Bank (2010)
Education externalities are social or public benefits from the education of each individual that benefits others in the society in both current and future generations. In fact, they include education impacts on economic development goals that are part of the quality of life but that also benefit future generations. Based on Lucas (1988) findings, education externalities operating through these development goals affect GDP per capita, as well as earnings, to a limited extent in the short run but much more substantially as times passes. At a micro-level, numerous studies indicate that increases in earnings are associated with additional years of education, with the rate of return varying with the level of education. The main contribution of education to economic growth is to increase the level of cognitive skills possessed by work force and consequently to improve their marginal productivity (Lockheed, Jamison, and Lau 1980).

Standard estimates of social rates of return include only a portion of the total social effects of education, they are limited to the monetary returns and do not include non-market private or non-market externality benefits of education. The externality effects from human capital, $h_a$ in the Lucas (1988) model, can be analyzed into education impacts on more specific development goals, which in turn affect economic growth and future development. Also McMahon (2002) implies a model of endogenous theory which estimates the marginal short term and longer term impacts of increased education on the main economic growth and development goals. The market measured impacts are on per capita economic growth, including earning and jobs and the other aspect of non-market impacts on development such as: Better health, as reflected in lower infant mortality and increased longevity, lower fertility and population growth rate, democratization and human right, as education improves civic institutions, reduced inequality but only as each level of education is made universal. Thus in aggregate, the greater the provision of schooling, will lead to the greater the stock of human capital in society, and the greater the increase in national productivity as well as economic growth.

So in this way we can consider two different aspects of education’s role in development process, once in market measured value points of view and the other in non-market measured concept. Generally according to the above mentioned contribution of the education on economic growth we will try to consider these contribution summary in following cases with evidence on developing countries.
4.1 Market Outcomes

4.1.1 In case of General Increasing of productivity

Economists have long debated the best way to explain the sources of productivity growth. Exogenous and endogenous growth theory both regard investment—broadly defined to include purchases of tangible assets, human capital expenditures, and research and development efforts—as a critical source of productivity growth, but they differ in fundamental ways. The focus on productivity is understandable because countries with high labor productivity tend to be rich societies. Since in this way, each worker is responsible for a large share of goods and services therefore real wages tend to be high. There has been much discussion on the subject that how education increase the productivity and efficiency of workers by increasing the level of cognitive stock of economically productive human capability which is a product of innate abilities and investment in human beings (Olaniyan and Okemakinde, 2008). Whether the most able workers are those who can complete higher levels of education, education may be a way to signal higher ability. If this were an important part of the story, enlargement in education would not certainly cause to more productivity. Theoretically, higher education allows workers to use existing physical capital more efficiently, to drive the development and distribution of new technologies and to improve the capacity of imitation and adopting of the new techniques previously developed by more advanced countries. Higher education has also positive external effects on productivity (Sarquis and Arbache, 2002). Consequently, it plays a positive role in efficiency improvement and technical change, so productivity growth. However, recent research 'higher earnings do indeed demonstrate that education imparts knowledge and skills which increase worker’s productivity.

Also according to another study by Lucas (1988) we will find that, the higher the level of education of workforce the higher the overall productivity of capital. The main reason of such a phenomenon is that the more educated are more likely to innovate and thus affect everyone’s productivity. It means that increasing the education of individuals raises not only their own productivity but also that of others with whom they interact so the total productivity will increase as the average level of education rises. A general view regarding R&D will show that technical progress depends on the R&D level in an economy so education again plays a key role here (Canton et al.2005) Considering from macro perspective, endogenous growth theory emphasizes education, learning as well as R&D. The theory argues that innovation and new technologies don't occur simply by random chance.
It means that, it depends of the number of people seeking out new innovations or technologies and how hard they are looking for them. In addition, people also have control over their knowledge capital. In fact the new growth theory argues that real GDP per person will perpetually increase because of people's pursuit of profits. As competition lowers the profit in one area, people have to constantly seek better ways to do things or invent new products in order to garner a higher profit. This main idea is one of the central tenets of the theory.

Typically, returns on educational investment are higher at lower levels of schooling and also higher for countries at lower levels of economic development. The scarcity of human capital in low-income countries provides a significant premium to investing in education. The high returns on primary education provide an added justification for making education a priority in developing countries. Psacharopouls (1985) has summarized the many rate of return to education studies around the world. He found that the estimated rates of return to education are typically above, and sometimes considerably above, ten percent per annum in real terms, which is generally considered a very respectable rates of return. They are also higher in countries where educated manpower is scarcer.

Nelson (1964 and 1981) recognized that there are important interactions between capital formation, labour allocation, technical progress and productivity. This calls into question whether the growth due to physical capital can be separated from growth attributed to other inputs. Unless a production technology is a fixed Leontief process, there is always some degree of substitutability among categories of inputs. Moreover, according to the experiment from different countries regarding education, we will find that having physical and financial capital as well as access to the technology is not enough; there must be skilled manpower to make use of these resources. For example, the success of South Korea and Taiwan their respective economies and failure of Thailand, until recently, to develop hers, may be partially attributed to relatively lower level of educational development in Thailand in 1960s and 1970’s. By the late 1980s however Thailand has caught up with the level of educational development achieved by South Korea and Taiwan in the early 1960s and it is now well on her way to becoming fifth New Industrialized Economy (Lau, Jamison, and Louat, 1991).

So, mainly improving the level of education for entire population will increase the productivity. So in this way we can say that, generally by increasing the level of female’s education the tendency of them to job participate will increase and they will be better equipped for the new job of 21 century. On the other part women which have higher education will have the chance to act selectively among different job
vacancy and such a matter will encourage them more to work participation. Overall labor force participation rates will continue to rise among women and edge down among men between 1998 and 2008. As a result, women’s labor force growth should be faster than men’s—about half again as fast, in fact. For example, for the developing countries, according to the World Bank The Labor participation rate; female (% of female population ages 15+) in Sub Saharan Africa was 61.00 in 2009, according to a World Bank report, published in 2010. The Labor participation rate; female (% of female population ages 15+) in Sub Saharan Africa was reported at 60.54 in 2008.

![Figure 2 The Labor participation rate; female (% of female population ages 15+) in Sub Saharan Africa](source)

Boserup (1970) presents a comprehensive and pioneering effort to provide an overview of women’s role in the development process. Normally Women’s participation in economic activity brings benefits at both micro and macro levels.

- Women’s participation in labor force is beneficial for the welfare of the family containing income, health, children education, reducing the mortality and fertility rate.
• We will find the positive correlation between female labor force participation rates and economic growth.

On the other hand, Goldin (1995) shows that the rise in female labor force participation that characterized the United States in the twentieth century was due to the growth of “white-collar” jobs, largely in the clerical sector, that were acceptable forms of employment for women. In fact gains in a female education, both in absolute terms and relative to men education level, made these white collar jobs attainable for women and increased the incentives of women to work away from home. In addition participation may be accompanied by other economic, social, and political transformations, such as the increased availability of market substitutes for home-produced goods, changes in family formation and the level and timing of fertility, and shifts in the power dynamics between men and women. In continue he will discuss that there may be a U-shaped relationship between women’s labor force participation and economic development. For very poor countries, female force participation is high, and woman work mainly in farm or non-farm family enterprises. Development initially moves women out of the labor force, partly because of rise in men’s market opportunities and partly because of social barriers against women entering the paid labor force. However as countries continue to develop, women’s education levels rise, and women move back into the labor force as paid employees holding mainly white-collar jobs.

Despite of such a general increasing in labour force participation, considering the case of developing countries, however we will still find unequal situation between women and men especially regarding the chance to attend in schools as well as work participation. According to the recent World Bank’s report\textsuperscript{11}, closing these gender gaps matters for development and policymaking, greater gender equality can enhance economic productivity, improve development outcomes for the next generation, and make institutions and policies more representative. Women, especially those in the low-income countries, traditionally have contributed to productive activities such as agriculture (mostly small-scale), agro-processing crafts and home industries, trade and commerce. Also In almost all societies, particularly in developing countries, there remain essential but usually unpaid activities (such as household and child care) which are seen as responsibility of women of the household. But however, as Elson (1987) has

\textsuperscript{11} \textit{World Development Report: Gender Equality and Development, 2012}
pointed out it is wrong to assume that unpaid tasks by women would continue regardless of the way resources are allocated. In this case the subject of women work participation will be a more complex matter than is often recognized. Since most women are actually employed in some kind of productive/reproductive work whether or not this is recognized and quantified by statistics. So in this way may be the importance of female education can be consider in non-market impacts of education more clear than this part although this matter definitely will act also as substructure of increasing the general productivity.

4.1.2 In case of agriculture

Based on the eight Millennium Development Goals, the first goal is the one whose attainment most clearly involves the agricultural sector: The poor around the globe are disproportionately farmers and herders, and, perversely, the hungry also most commonly find their livelihoods through agriculture. About 70 percent of the target groups live in rural areas, particularly in Asia and Africa, and for most of the rural poor agriculture is a critical component in the successful attainment of the MDGs. Even though structural transformations are important in the longer term, more immediate gains in poor households’ welfare can be achieved through agriculture, which can help the poor overcome some of the critical obligations they now face in meeting their basic needs. Thus, a necessary component in meeting the MDGs in many parts of the world is a more productive and profitable agricultural sector.

So what would be the role of education regarding augment of this matter? In agriculture, evidence suggest positive effects of education on productivity among farmers using modern technologies compare with among those using traditional methods (Behrman 1995, Rosenzwige 1995). In fact education will enable them to contribute to the protection of the environment and preservation of water and energy will increase economic growth markedly. According to the Jamison and Lau (1982) survey, which focus on studies using data from individual farms in low income regions, report that mastering the result of Thailand, Korea and Malaysia that related schooling to agricultural productivity. They also created histograms (based on the 31 studies that were not omitted for technical or comparison reasons) by percentage decrease or increase in output attributable to a farmer’s having 4
years of education rather than none; they use 4 years because it is an often state minimum for the basic
education cycle. They concluded that, the main gain in production for 4 years of education was about
8.7 percent with standard deviation of 9.0%. The importance of such a finding indicates these fact that
1) productivity measurements in agriculture are in real (physical) output terms and 2) the usual
objections raised when using wages as proxies for productivity in other studies have no relevance in a
farm setting. They also report that in Thailand the marginal effects of education on output is greater in
rural than in urban areas. To the extent of this matter to the other countries we will find it true, as one
might reasonably suspect, past growth accounting exercises using urban wage differentials must have
underestimated the contribution of education to economic growth, especially in developing countries.

Also Sub-Saharan Africa relies heavily on agriculture. The sector accounts, on average for close to 20% of
total GDP and 60% for region total labor force.\textsuperscript{12} Documentation in Africa's framework for agriculture,
NEPAD's Comprehensive Africa Agriculture Development Program (CAADP) (NEPAD, 2003) indicates that
28% of Africa's population is chronically hungry. Thus, agriculture-led development is fundamental to
cutting hunger, reducing poverty, generating economic growth and promoting sustainable use of natural
resources. The rural areas, where the agriculture is the mainstay of all people, support some 70-80
percent of the total population including 70 percent of the continents extreme poor and
undernourished. So improvement in agricultural performance has potential to increase rural incomes
and purchasing power of large number of people. Thus more than any other sectors, agriculture can
uplift people on a mass scale. With greater prosperity, the consequent higher effective demand for
African industrial and other goods would include dynamics and would be a significant source of
economic growth (NEPAD, 2002). Indeed, a World Bank perspective study on Africa sates categorically
that “raising educational levels enhances agricultural productivity” (1989:64). The evidence of this
statement comes primarily from Jamison and Lau (1982), who compile and analyze 37 earlier studies
relating education to agricultural productivity. They conclude that, on average, four years of education
increase output by 7.2% and that this percentage is higher in rapidly changing agricultural environments.
More recent studies have confirmed a positive relationship between education and productivity
(Pudasaini 1983, Jamison and Moock 1984, Azhar 1991) or education and adoption of new technologies
(Lin 1991). Also a few studies in Africa have focused on estimating external benefits of education in
agriculture using the education of neighboring farmers. A one-year rise in the average primary schooling

\textsuperscript{12} FAO 2003, World bank 2003
of neighboring farmers is associated with a 4.3 percent rise in output, compared to a 2.8 percent effect of one’s own primary education in Uganda (Appleton and Balihuta 1996). Another study found that neighboring farmers’ education raises productivity by 56 percent, while one’s own education raises productivity by only 2 percent in Ethiopia; however, the 56 percent figure seems rather high (Weir 1999). Overall, the results are inconclusive.

Considering the case of women, In Sub-Saharan Africa women contribute between 60 and 80 percent of labour for food production, both for household consumption and for sale. Moreover agriculture is becoming predominantly female sector as a consequent of faster male out-migration. A recent study shows that women’s labour is becoming increasingly significant in production also. Men still play central roles in land preparation and ploughing but women provide the bulk of the labour for weeding, harvesting, transporting and processing. The later stages of transportation, processing and marketing are also handled mainly by women. Also a number of studies have examined the relative productivity of female and male in farming in Sub-Saharan Africa. Often find indicates many factor explaining women farmers have lower productivity in agriculture. Women farmers have quantitatively and qualitatively less access to information, technology, inputs and even credit. For a sample of Kenyan farmers, it was found that the gross value of output per hectare from male-managed plots was 8 percent above than female manage plots (Saito, Mekkonen and Spurling 1994). It was estimated if women were used the same resources as men their productivity would increase by about 22 percent. The study also concluded that educating women is more likely to increase the use of new technologies than educating men. Other research in Kenya also showed the same result before. It indicates that increasing in level of physical and human capital of women (to that of the men’s in sample) would increase yield by between 7 and 9 percent (Moock 1976). The effect of schooling on farm output was also found to be greater for women than for men because men with more schooling tend to seek off-farm employment and are more likely to be successful in finding and keeping the job compared to the women. Thus evidence clarified the importance of increasing the level of education for the women in developing countries to certain the MDG goals as it was explained before.

FAO 1994
FAO 1998
The collaborative study of Cassava in Africa (COSCA) undertaken by Institute of Tropical Agriculture from 1989 till 1997 based on 281 villages in six African countries.
4.2 Non-Market Outcomes

4.2.1 In case of public sector and life expectancy

The effect of education on nonmarket outcomes or behavior, were not explored by economists until the early 1960s. The traditional form of evaluation focused on market returns particularly labour market returns and in this way a large number of benefits lying beyond labor market returns were neglected.

In fact, social changes and long term prospects for economic growth rely considerably on the expansion of quality learning opportunities for all. Greater equity in both education enrolments and school quality across all population groups will result in a more equal income distribution and reduce socioeconomic inequalities in general\textsuperscript{16}.

Berhman and Stacey (1997), McMahon (1997), Wolf and Zuvekis (1997) and Wolf and Haveman (2001) provide recent surveys of the literature that attempts to quantify the social and non-market effects of education. The empirical results for their surveys generally shows considerable impacts of education on a wide variety of non-market and social benefits including: The effect of education on health individually and family, the effect on parents education on child outcomes, the effect of education on fertility rate, the effect of schooling on social cohesion and social inequalities. Becker and Mulligan (1997) in his study indicates that determinants and consequents of time preference and other variables typically called as tastes can be approach by standard economic models of rational behavior, with important implications for the role of schooling in decision pertaining to, for instance, the rate of growth in consumption with age, saving, and investment in children.

Also, over the past decade the Demographic and Health Survey (DHS) and other major population and health studies have consistently shown that educational attainment has a substantial effect on behavior and attitudes towards health, evidence of the mutual benefits between education and health.

Hence the global population outlook depends greatly on further progress in education, particularly of young women. Schultz (1993) explains “One of the most important discoveries in research in nonmarket returns to women’s education. A majority of the studies indicate larger effects from mother’s schooling

\textsuperscript{16} UNESCO, 2010
than from father’s schooling. This finding is consistent with a division in labour within the household in which the mother is the family member most involved with the child care.

According to Behrman and Wolf (1987), we will find that education has ever important role because of its impact also on health and especially in the case of women which according this report we will notice that the impact of women’s education on family health and nutrition. As education and health improve and become more broadly based, low income people are better able to seek out economic opportunities. In fact, once human capital is created through education or training it has to be preserved therefore it provides a stream of benefits via its theoretical lifetime (which in this case is of the order of fifty years). According to the Cochrane (1980) there were significant partial effects of literacy rate of life expectancy in some countries, after standardizing for the level of income.

For African and Latin American countries, Benavot (1989), using data on 96 countries from 1960 to 1985, finds that increases in female primary enrolment ratios have larger effects than male ratios on economic growth especially. Moreover Education heightens women’s awareness of the important role they can play in the community and society to find solutions to problems that impede development and social stability. With the awareness of her role as citizen, an educated woman can play a more dynamic role in addressing the economic challenges faced by her country. One of the other points of social benefits of the female education can be considered as the subject of Contributes to democratization. In fact, countries with higher primary schooling and a smaller gap between rates of boys’ and girls’ schooling tend to enjoy greater democracy. Democratic political institutions (such as power-sharing and clean elections) are more likely to exist in countries with higher literacy rates and education levels. Also, educated women are more politically active and better informed about their legal rights and how to exercise them. 17

Considering the women’s situation, although over the years, they have entered various traditionally male-dominated occupations. But however, they are still rarely employed in jobs with status, power and authority or in traditionally male blue-collar occupations. So despite changes that have occurred in women’s participation in the labour market, women continue to bear most of the responsibilities for the

home: caring for children and other dependent household members, preparing meals and doing other housework. In all regions, women spend at least twice as much time as men on unpaid domestic work.  

According to many reports in the developing countries a majority of women reside in rural area, supporting their household with subsistence farming, rising children, and maintaining t their properties. They are usually the most exploited and least privileged members of households, overburdened with work for their families but marginalized in regard to the distribution of resources, (Ngimwa, Ocholla & Ojiambo, 1997). But however, their lack of support and privileges isolates them from information resources they would need to make their lives better. So this matter clarify the importance of consideration the role women in reproduction process of development as well as the effect of schooling in the subject of nonmarket outcomes in the case of developing countries to certain the MDG goals and economic growth consequently. On the other hand, that is noteworthy to mention that returns on investment in education translate to economic growth and of course extend to improvement in the quality of the society because education can affect children’s attitudes and assist them to grow up with social values that are more beneficial to themselves and the nation at large. Considering in case of fertility, it needs to be kept in mind that the effect of better education on population growth will take a long time, It means that the consequents of such a phenomena is not explicit for the first generation.

5 Women’s Education and Development in Developing Countries

As it was discussed in previous part, Human capital theory suggests that just as physical capital (machines) augments people's economic productivity, so human capital acquired through education improves the productivity of individuals. Studies of the sources of economic growth demonstrate persuasively that education plays a major role as a factor in the rise of output per worker. The endogenous growth theories initially set forth by Romer (1986), in economics place education and human resource development at the centre of their explanation for long-term economic growth. To be

18 UN Data, The World’s of Women 2010

19 Population Crisis committee 1988 and World Conference of Women 1995
more accurate the point that we can note it here is that does it matter who will get the education in a society? Would be any special relation between gender education association and development in an economy? The answer is yes it probably does.

In fact, if female schooling raises human capital, productivity, and economic growth as much as male schooling does, then women's disadvantage in education is economically inefficient. Research worldwide shows that, in general, the economic benefits from women's education - calculated as the economic rate of return to education - are comparable to those from men's education (Schultz 1993). Thus, from the point of view of economic efficiency, the gender gap in education is undesirable. So in this part we will consider the returns to the women education compared with the men as well as the effect of this matter on the development especially in the developing countries.

5.1 The gender inequality rate

Based on Human Development Report\textsuperscript{20}, Gender inequality remains a major barrier to human development. This report introduced Gender Inequality Index, which is a composite measure reflecting inequality in achievements between women and men in three dimensions: reproductive health, empowerment and the labor market. In this way, the health dimension is measured by two indicators: maternal mortality ratio and the adolescent fertility rate and the empowerment dimension and also labor dimension are measured by two indicators: the share of parliamentary seats held by each sex and by secondary and higher education attainment levels as well as women’s participation in the work force respectively.

On the other hand, the growth theory suggest that economic growth depends on capital accumulation (including human capital), on the yield of such capital, on the efficiency of their use and on the institutional framework of production. By affecting all these determinants, gender inequalities have an impact on economic growth. Indeed gender inequalities influence both the accumulation of economic resources (both physical and human), the return of these assets, the technical progress and the

\textsuperscript{20} United Nation Development Program, Research Paper 2010/46
efficiency with which capital is used to produce income and institutional framework.\textsuperscript{21} On the other side gender inequalities also generate distortion in employment and income in this way that more productive women than men are excluded from the labor market and hinder economic growth (Esteve and Volart 2004). But however the importance of gender issues may not be as directly visible as some other issues affecting growth, due to the fact that a considerable share of the economic contribution of women is not included in national income aggregates and income-based poverty measures.\textsuperscript{22}

In particular if we want to highlight inequality gap in education, we can say that one most enduring types of educational inequality is that of gender. At a global level, the gender gap in education has been reduced significantly in many of the countries of the North although it remains extreme in parts of the South, particularly in South Asia and of the Sub-Saharan Africa (SSA). South Asia has the largest gender gap at both the primary and secondary levels followed by SSA. Also evidence across the world reveals patterns in school enrolment rate and literacy that are divided along gender lines. During to the past thirty years, educational progress has been enjoyed by both sexes but according to the estimation on enrolment rate for both sexes, result showed that the enrolment ratio for women is lower than especially in higher education and this gender gap remained largest in the poorest countries. These kinds of choices, at least in primary level and early years, are made by parents. The differences in what a family is prepared to invest in a son’s and a daughter’s education may be perpetuated by regulations and incentives in public education system. Clearly even when schooling is publicly provided much of the cost of education such as school fee, textbook, uniforms and stationery as well as opportunity cost of the child’s time in school, which can be quite large in developing countries, should be provided privately. Based on different cultural patterns, especially in poor and under developing countries, adult sons are expected to be financially responsible about their parents and family so in this way parents receive greater return from a son’s education than a daughter’s. Therefore they may invest too little in their daughter’s education from a social perspective. In fact such a distribution can lead to gender inequality.

According to the Lucas (1988) the accumulation of human capital is an increased function of its stock and its quality. The higher the level of human capital leads to the higher the rate of accumulation. Therefore we can say that gender inequality in education reduce the stock of human capital as well as its

\textsuperscript{21} Development Economics and Public Policy, working paper No.16, Gender and growth in Sub-Saharan 2005

\textsuperscript{22} UNDP 1995
quality and its accumulation. Hence, gender inequalities in education reduce the average quality of human capital and therefore the productivity of workers and economic growth. By now, there is a considerable theoretical literature that gender differences in asset accumulation and use can have significant growth effect. In particular, a number of theoretical and empirical studies find gender inequality in education and employment reduce economic growth (Klasen 1999, 2002). With respect to the gender inequality in education, the theoretical literature suggests that such gender inequality reduce the average amount of human capital in a society and thus harms economic performance. It does so by artificially restricting the pool of talent from which to draw for education, thereby excluding highly qualified girls and take less qualified boys instead. In addition, if there are declining marginal returns to education and imperfect substitutability between males and females restricting the education of girls to lower levels while educating boys at higher levels mean that the marginal return to educating girls is higher than that of boys and thus would boost overall economic performance.\textsuperscript{23}

5.2 Gender literacy rate comparison; Evidence

While the economic benefits of educating girls are similar in size to the economic benefits of educating boys, recent findings suggest that the social benefits from investing in female education are far greater than those from investing in male education. Statistical analyses show that male schooling has relatively much smaller effects on these important social outcomes (Strauss and D. Thomas, 1995).

Based on Subbarao and Raney (1995) using national aggregate data from 72 countries regressed the total fertility rate of 1985 on the male and female secondary school enrolment rates lagged by 10 years, i.e. on the enrolment rates of 1975. The objective was to examine the effect of education on fertility, controlling for a number of other factors such as family planning service provision and per capita income. The results show that female secondary school enrolment (lagged by 10 years) is inversely correlated with the total fertility rate but that male secondary school enrolment shows no strong correlation. Similarly, a regression of the 1985 infant mortality rate on 10 year lagged male and female secondary school enrolment rates shows that while female education is associated with lower infant mortality, male education has no statistically significant effect.

\textsuperscript{23} Knowles et al 2002, World Bank 2001
Numerous studies have been carried out using household-level data that confirm the findings from studies using aggregate data. To cite one example, an examination of the determinants of fertility in fourteen countries of sub-Saharan Africa by Ainsworth, Beegle, and Nyamete (1996) using household survey data shows an inverse correlation between female schooling and fertility in virtually all of the countries, though the relationship is non-linear: female primary schooling has an inverse relation with fertility in about half of the countries only but female secondary schooling is universally associated with lower fertility, and the strength of the correlation increases with increasing years of schooling. Among ever-married women, husband's schooling has no significant relation with fertility in about one-third of the countries. Moreover, in cases where both women's and men's schooling matter, women's schooling exerts a much larger negative effect on fertility than men's schooling. Also, A similar exercise by Murthi, Guio, and Drèze for India using district level aggregated data shows that whereas the district female literacy rate had a strong inverse correlation on the district average total fertility rate, on under-five child mortality rate, and on the female disadvantage in child survival, the district male literacy rate had no significant effect on each of these outcomes. Moreover, district per capita income, urbanization, and the spread of medical facilities were not statistically significant determinants of total fertility rate. While these latter three variables do have positive effects on child survival levels, their effects were relatively small compared with the powerful effect of female literacy.

5.3 Returns for women's Education

As it was mentioned before, investing in education provides the foundation for accelerating social and economic development of nations because of its pervasive influence on economically relevant variables such as productivity, health, earnings. Considering the case of female education, increasing women’s education not only increases their productivity but also result in greater child health and nutrition. More educated mothers lead to multiplier effect on the quality of nation’s human resources for many generations to come. As women carry a disproportionate burden of the poverty which disturbs developing societies, significant improvement in their role and status of the education can have an important impact on breaking vicious circle of poverty and inadequate education.
In addition to the monetary benefits of education for women like increasing the productivity and income, there are also various studies for measuring the non-monetary benefits of education in a family and consequently in a society, such as the intergeneration effect of a mother's education on the future achievement of her children, or the non-pecuniary benefits of employment for women in the labour force and generally improvement the quality of life. In the following part we will consider two subjects of health externality and population growth as two aspects of these matters as non-monetary returns to education and their effects on economic growth with a glance to the case of developing countries.

5.3.1 Health externalities for the women education

In addition to the income obtaining, several studies has stressed the role of education in augmenting an individual's stock of health knowledge (Willis 1973). Glewwe (1999) indicated that the most important mechanism for knowledge gain is not directly via curricula rather the skills obtained in school facilitate the acquisition of health knowledge. Grossman (1979) formalized these ideas by viewing education as productivity shifter in household production function for health. In a simplified version of Grossman model, Individuals don’t purchase health from the market but instead produce it spending time on health improving activities as well as purchasing medical inputs. Medical care serves as an input to produce health. Therefore, health is produced in the household sector with a production function in which the individual’s stock of human capital (education) is an element that enhances the efficiency of production of health. In this approach, human capital is traditionally operated in terms of measures of years of schooling or educational qualifications.

Several in all around the world have shown that higher education for mothers in associated with healthier children. For instance, John Strauss (1990) found that mother’s education is strongly related to children’s nutritional status as measured by weight for height and height for age. In fact, a more educated mother may be more informed about appropriate personal hygiene and a healthy diet, may have a greater notice for health care and may be more willing to make the investment of her time and resources. In addition she will have greater access to information about health services and simply will be better able to put her knowledge into practice. A determinant study of chronic malnutrition among children in Philippines by Albino Barrera in 1990 indicates that mother’s schooling and the availability of
safe drinking water explain health differences among children whereas household income did not. It means were services were absent; better-educated mothers were able to protect even very young children against an unhealthy environment. An interesting case in Ghana (Duncan Thomas 1991), mother’s education has significant effect only on daughter’s height not the son’s and also by holding constant mother’s education there was negative effect for father’s education.

There is also evidence of a casual effect of maternal education on infant health. Currie and Moretti (2003) look at the effect of increase in availability of colleges (which lowers the cost of attending School) on women’s educational attainment and their infants’ health. They found that women in countries where college opened were more likely to attend college and had healthier babies. These health improvements resulted in part because these women engaged in healthier practices during pregnancy (they were less likely to smoke and drink and obtained more parental care). Also because education altered their reproductive behavior: more educated women were more likely to be married at the time of birth and have fewer children. So it means that there would be less premature pregnancy (which can be dangerous for both infant and mother) as well as fewer children will get more attention regarding their hygiene’s and nutrition’s.

Infant mortality rate is one of the best single indicators of a nation’s overall health status, particularly among the poor countries, and it is also a very good indicator of life more generally which focuses on internal factor associated with modernization, economic growth, education, fertility and income inequality. Educated women with high social status in the family and the society usually have more autonomy in declining in the number of children to have and in seeking medical treatment for themselves and their children. Numerous studies show that mother’s education is one of the most important predictors to infant mortality (Caldwell, 1979; Martin et al., 1983).

Generally, educated women bring social benefits by growing up fewer, healthier and educated children. According to the 2000 DHS, Egyptian women with less education were less likely to receive antenatal care: Only 34 percent of Egyptian mothers with no education received antenatal care, compared with 75 percent of those with a high school or college degree (El-Zanaty and Way, Egypt DHS, 2000).
If women specialize in the care of their families we won’t observe any labor market earnings for them, yet the benefit to their education can be significant. While the importance of female education has been wildly recognized, numerous publications from donor agencies have extensively documented these beneficial effects of female education (Floro and Wolf 1990, King and Hill 1993, King 1990, Herz et al 1991, Subbarao and Raney 1992, Hartnett and Heneveld 1993, Ogubo and Heneveld 1995). Women who had completed basic education were able to make use of health facilities and service for their children and had a higher interest in sending their children to school (Dighe 1998). In fact increasing the level of education improve women’s productivity in the home which in turn can rise family health, child survival and the investment in the children’s human capital.

Based on the Millennium Development goals one of the goals trying to improve and control is combating HIV/AIDS, Malaria and other disease. According to the historical points, the HIV-AIDS pandemic is very much in African Area and female bear the greatest burden. UNAIDS has estimated by the end of 2003, there would be 40 million people in the world with HIV/AIDS and 26.5 million of them live in Sub-Saharan. Also African women were 1.2 time more likely to be infected than men. In fact HIV/Aids spreading among young women (15-24) faster, not only because their physiology put them in risk, but also because they have little access to the knowledge economic resource and decision-making power. Education change this situation, by giving women information and learning the way that they can keep themselves safe.( Herz and Sperling 2004). According to the 32 countries UN study, literate women are 3 times more likely than illiterate ones to know that healthy looking person can have HIV and also 4 times more likely to know the main ways how to avoid AIDS ( Vandemoortale and Delamonica 2000). According to the following chart data Analyzing from UNICEF’s Multi- Indicators Cluster Survey for 12 countries (2000), shows that although knowledge levels among women are predictably greet for ones who have secondary or higher education but however primary education in itself makes a very significant effect. Women with primary education were 2.5 times more likely to identify the correct way to prevent HIV transmission compared to women with no schooling. The chart shows generally women with secondary or high level of education are more likely to know the way to control the spreading the HIV compare to the low level education’s women. The clear case is in Angola and Vietnam which indicates that the women with no education are almost five times more likely to transmit the diseases.
5.3.2 Population growth and female education

The other important benefits of women’s education for health is via reducing fertility which in turn can raise the family resources devoted to each child. Among better educated women the use of contraceptive methods is higher and fertility rates are lower. Education enables them to have access information on modern contraception and their proper use and to appreciate their role in fertility regulation and even the use of effective contraceptives enables them to avoid unplanned pregnancy that may compel them to enter into marriage earlier than desired.

Generally according to the economist’s standard explanation, women’s foregone earnings are the leading cost of children. If you raise women’s education, you raise their potential income; and as you raise their potential income, you raise the cost of fertility. In fact, the tradeoff between investment in
children and their number are central to the most economic theories of fertility. In neoclassical theory, positive income shocks. The reduction of fertility in favor of higher educational investment is crucial in human capital models. Following charts shows an inserting relationship between female literacy rate and population growth among under-developing countries. Here is a notable graph showing the increasing effect of female education on population growth line. More educated female less population growth rate.

**Figure 4 Percentage of educated women and population growth**


There are several arguments about the relationship between the case of population growth and economic growth. But is there any special link which can affect this relationship?
Simon (1996) challenges, the notion of an impending Malthusian catastrophe, according to which population is a drain on natural resources; and that we stand at risk of running out of resources through over-consumption. He argues that population is the solution to resource scarcities and environmental problems, since people and markets innovate Simon points out that another birth means another mind that can help think up ways of using resources more efficiently. Viewed economically, he argues, increasing wealth and technology make more resources available; although supplies may be limited physically they may be viewed as economically indefinite as old resources are recycled and new alternatives are assumed to be developed by the market. He also emphasizes that population is the solution to resource scarcities and environmental problems, since people and markets innovate. For example in case of agriculture land has become less important as productivity has been boosted by other inputs, including labor, fertilizer, pesticides, insecticides, new seed varieties, irrigation, mechanical or animal draft power, and education. So the classical economists’ emphasis on land as the critical limiting factor can be undermined by the ability of technical progress and capital accumulation to expand output. But how this kind of progress and productivity would be possible? In continue he emphasizes on the role of education by referencing to the populous countries China and India. He argues that, why are not populous china and India the most advanced countries of all? Quite obviously, China and India don’t produce as much as new knowledge as the US or other development countries because in such poor countries relatively fewer people are able to educate. So if more people become educated we can say that in this case; a large population implies a large amount of knowledge and new idea being created and consequently increasing the productivity. So even in this points of view for the developing countries which are in early phases of their demographic transmission education and the gender person is considered as fundamental characteristic because of its essential role, as it was discussed in previous parts, in progress of reproduction and care of human capital accumulation.

Also the education of wife has been found to have almost three times more effect in reducing fertility than the husband’s education (Susan Cochrane 1993). For this reason, universal secondary female education in addition to its many other positive implication has been suggested as an effective way to lower the world’s population growth. In fact, education will effect per capita income growth through its impact on the population growth.
For example a study of fourteen African countries for the mid-eighties showed a negative correlation between female schooling and fertility in almost all countries, with primary education having a negative impact in about half the countries and no significant effects in the other half. While secondary education visibly declined fertility (Birdsall 1995; Jayaraman 1995; Strauss and Thomas 1995; Thomas, Strauss and Henriques 1991; Behrman and Wolf 1987).

Research reported in two World Development reports (IBRD 1989 and 1992) confirms that women education reduces fertility, especially where family planning services are available. Women education is linked with later marriage, lower fertility, desire for smaller families, and increased practice of contraception. The relationship is stronger as women’s education increases (Herz et al, 1991). On the other part based on World Bank gender studies, the benefits of women’s education go beyond higher productivity for 50 percent of the population. More educated women also tend to be healthier, participate more in the formal labor market, and earn more income. These benefits also transmit across generations, as well as to their communities at large.

One of the other factors which can be considered regarding the female’s education is the age of marriage which will increase generally. Delayed age at marriage directly affects completed fertility by reducing the number of years available for childbearing. Later marriage permits women to build labor force skills, and develop career interest that compete with childbearing within marriage. Such career interest may in turn motivate women to limit family size too. For instance, estimation from the 1998 in Kenya indicates that the median age at first marriage among the ever married women age 25-49 with at least secondary education was 22 years compared with 17 years among those with no education (NCPD et al., 1999).

However we should notice that – as it discussed before- the effect of better education on population growth will take a long time. Because even in the case that more girls are entering primary education tomorrow, the main effect on fertility will only be some 15 or more years later, when these young women are in their prime child-bearing ages; even when fertility rates fall, this will not translate right away into declining absolute number of births because of the great momentum of more young women moving into reproductive ages as a consequent of pass high fertility. Even in the unlikely case of instant
replacement level fertility, young populations will continue to grow substantially for decades (Lutz et al. 2011).

### 5.4 The effects of women education on economic growth and social well-being

As it was discussed in previous parts we find that based on human capital theory education is one of the main factors in human capital formation and consequently economic prosperity. Better education will increase the productivity by raising the level of cognitive skills, innovation, finding and using new technologies. It also matters for human development including health, reducing poverty and even democracy. In this way that, high level of education is associated with lower mortality and fertility, better health, reducing gender inequality and enhancing the analyzing power in order to solve the problems. Hence considering the case of developing countries, by noting to the poor women’s situation as an important part human capital, we will find that development outlook depends on further progress in education, particularly of young women.

As we discussed before Education is a key part of strategies to improve individuals' well-being and societies' economic and social development. Also access to education in developing countries has improved dramatically over the past few decades, and there have been a number of encouraging trends in girls’ and women’s education. The Fourth World Conference on Women, held in Beijing in 1995, recognized that women's literacy is the key to empowering women's participation in decision making in society and to improving families “well-being”. In fact we can say that, in the socio-cultural context conditions the relationship of women's individual-level characteristics to decision-making, and autonomy is a key intervening mediator between women's status and reproductive outcome (Jejeebhoy 2000).

In addition, based on Millennium Development Goals (MDGs), gender equality, and women's empowerment are also have been suggested. The MDGs emphasize education's essential role in building democratic societies and creating a foundation for sustained economic growth.

In fact, fostering, extending the average of life expectancy in the population and improving the functioning of political process can be counted as social benefit of women’s education. The focus on education for women continued during the 1990s and results of different researches showed that
investment in this area gave the highest “output” (compared to earlier development investments focusing primarily on production and industrial growth) both at socio-economic, cultural and political levels. Also, the relationship between democracy and economic growth has been a center of debate in the past fifty years. In fact, the relationship between democracy and wealth reflects the power of human capital - education - to make countries both rich and democratic. Supporter of democracy argue that the motivation of citizens to work and invest, the effective allocation of resources in the marketplace, and profit maximizing private activity can all be mentioned in a climate of liberty, free-flowing information and secured control of property (North 1990). Democracies can limit state intervention in the economy, are responsive to public’s demands on the areas such as education, health and justice and encourage stable and long run growth (Rodrik 1999, Lake and Baum 2001, Baum and Lake 2003).

Also, Skriberkk (2008) indicated that the relationship between education and fertility rate is always negative. Separate analyze for men and women shows that the fertility depressing effect of schooling is considerably stronger for women than men. In the period of 1990-2006 for the whole world, highly educated women have 29.9% fewer children than women with low level of education while highly educated men have 11.6% fewer children than low educated men. Also the effect of education on fertility is particularly in countries that still have high rate of fertility.

Under- five mortality expressed as the probability of dying between birth and the exact of five is an important indicator of development and well-being of children. Considering the case of developing countries, in the 1950s, Sub Saharan Africa and South Central Asia had similarly high levels of child mortality and both experienced significant reduction until 1980s. Following chart is based on united nation studies show the predicted pattern for these areas.
In fact based on demographic economic paradox what will happen is that, when country reaches a certain level of human development and economic prosperity the fertility rate stabilizes and then recovers slightly to replacement rates (Myrskyla, Kohler and Billari 2009). On the other hand, as reflected in the HDI, improved health care is an objective of development child mortality rate is one of the best single indicators of a nation’s overall health also reducing the child mortality is one of the aim of the MDG.

In the light of the effect of female schooling in above mentioned indicators, according to what was also done by Lutz and Family name co-author (2011). In the following table 1, 4.4 we see recent empirically measured less than five child mortality as well as total fatality rate differences, compiled from DHS (Demographic and Health Surveys), of developing countries. The fertility rate is measured by the number of live birth per women and less than five child mortality refers to the period of 10 years prior.
Table 1.4.4: <5-years mortality and total fertility rate for number of developing countries by the level of maternal schooling.

<table>
<thead>
<tr>
<th>Country</th>
<th>Survey</th>
<th>Total fertility rate and proportion of women pregnant</th>
<th>Infant and child mortality by background characteristics (10 year rates)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Total fertility rates: Total fertility rate</td>
<td>Mortality rate: Under-5 mortality (5q0)</td>
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<td></td>
<td></td>
<td>Highest educational level</td>
<td>Total</td>
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<td></td>
<td></td>
<td>No education</td>
<td>Primary</td>
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<td>Angola</td>
<td>MIS 2006-07</td>
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<td>7.8</td>
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<tr>
<td>Bangladesh</td>
<td>DHS 2007</td>
<td>2.7</td>
<td>3.0</td>
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<td>Benin</td>
<td>DHS 2006</td>
<td>5.7</td>
<td>6.4</td>
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<tr>
<td>Bolivia</td>
<td>DHS 2008</td>
<td>3.5</td>
<td>6.1</td>
</tr>
<tr>
<td>Cameroon</td>
<td>DHS 2004</td>
<td>5.0</td>
<td>6.3</td>
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<tr>
<td>Chad</td>
<td>DHS 2004</td>
<td>6.3</td>
<td>6.3</td>
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<tr>
<td>Colombia</td>
<td>DHS 2010</td>
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<td>4.3</td>
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<tr>
<td>Congo (Brazzaville)</td>
<td>DHS 2005</td>
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<tr>
<td>Congo Democratic Republic</td>
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<tr>
<td>Country</td>
<td>Source</td>
<td>Year</td>
<td>Mortality Rate</td>
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<td>2009</td>
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<td>DHS</td>
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<td>6.2</td>
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<tr>
<td>Zimbabwe</td>
<td>DHS</td>
<td>2010-11</td>
<td>4.1</td>
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</tbody>
</table>

Source: DHS Measurement Data [www.measuredhs.com](http://www.measuredhs.com)

Data clarify that the mortality rate is still high among African countries particularly among uneducated mothers. Generally we will find the clear effect of secondary and higher education in Ethiopia, Mali, Niger, Guinea and Cameroon in this case this amount is more than two times among mothers with no education compared with mothers with secondary or higher level of education. In the case of fertility rate we also find same pattern In the Bolivia, Ethiopia, Tanzania and Zambia there is sharply decrease of fertility among mothers with secondary and high level of education.

In most of the case the effect of primarily education is not the high one in reducing the fertility. But however the general pattern shows the positive effect of education on health and fertility rates of a country and it will confirm that in every society better educated women have lower fertility as well as child mortality rate compared to the less educated mothers.
So the effect of education on health and fertility rate as two indicators which has positive and strong effect on the human capital accumulation will be found in this regard. On the other hand as it was shown in the endogenous growth model of Lucas (1988) the rate of growth of per capita GDP depends primarily on the growth of human capital. Such a consideration shows also that increasing in female education can be counted as main element which can defiantly help to accelerate human development as well as economic growth especially in developing countries.

Briefly, based on widespread studies generally here are two main aspects of education; monetary and nonmonetary. Education for both gender, basically improve the cognitive labor force abilities and they know how to use new methods and technologies. Also, innovation wouldn’t be possible unless by increasing the level of education. Considering the pecuniary aspect of education in case of women, by increasing the level of female abilities their tendency for work participation as well as their productivity will increase. Note to the countries situation, for example in Sub Saharan and south west Asia as developing countries, women are much more involved in agriculture activities so rising their productivity lead to better result in producing process(which is the first goal of MDG). Despite mentioned above aspect, since gender gap is still a notable problem among developing countries. Therefore, in view of this gender inequality, it seems the non-market effect of female education is stronger than market effects. Educated women normally are most aware about social situation and more likely know how to handle the problems. In fact, by hiking the level of female literacy the family structure will change that it has a direct effect on human capital accumulation in a society. For instance an educated mother has a desire as well as possibility to control the population growth and have fewer children. In addition higher education is associated to access to the new information in many area (hygiene, using new medicine and methods, nutrition,...) and have healthier and educated children. Counting family as a main and first unit of a society such an enhancement will improve economic productivity and consequently development.

On the other side, based on the system theory points of view, pursuing the Millennium Development Goals in developing countries reveals systemic approaches to development are growing in popularity in health and also other contexts. In fact it is essential to be aware of how different development goals relate to one another, such as the effect raising levels of public health on economic growth and reverse.
In a similar way, a holistic approach is also essential for building the solid infrastructure and social systems needed to sustain scientific research and technological innovation in developing countries, as both activities cut across a wide range of different social and economic objectives. In fact all these indicators are acting as subsystems of development and generally economic growth which they also have internal and reinforcing effects on each others.

6 Conclusion

Considering the Millennium Development Goals as main plan for development and economic growth in developing countries, broad-based education is among the most powerful instruments known to reduce poverty and inequality. With proven benefits for personal health, it also strengthens nations’ economic health by laying the foundation for sustained economic growth. So for individuals and nations, it is the key to creating, applying, and spreading knowledge and it is fundamental for the construction of democratic societies. Moreover, education—especially girls’ education—has a direct and proven impact on the goals related to child and reproductive health and social and gender sustainability. Education also promotes economic growth, national productivity and innovation, and values of democracy and social cohesion.

In the view of the women’s situation in the developing countries as it was discussed in final part of this study it was tried to show the benefits of female education for certainty the goals in this way that; as female education rises, fertility, population growth, and infant and child mortality fall and family health and child nutrition improves. Education in addition associated with increases in women’s participation in the labor force and their contributions to household and national income.

Also, educated women are more politically active and better informed about their legal rights and how to exercise them. For this porous we considered several surveys as well as different data sources like UN and Demographic and Health Surveys by measuring the effect of education on health subject (child mortality as well as HIV/AIDS combating in developing countries) and fertility rate. We find clear positive effect of secondary and high level of female education on controlling the diseases, the child mortality as well as fertility rate which they affect improving the human capital and since based on endogenous
growth theory (based on Lucas’s (1988) model) human capital accumulation is one of the main indicators which affect the growth of GDP (as indicator of economic growth) such an improvement finally leads to progress of economic growth in a society.

However, externalities exist among the MDGs, warranting a systems theory approach to human development. Increasing the female schooling rate and skills will bring up several social gains and can be considered in different concepts more than what was pondered here. As all of these social factors are acting as a subsystem of a whole social system so definitely they are also have considerable affect on changing the system. For example considering the case of developing countries, such rising in female education can also affect the migration pattern as well as political points of view and bringing democracy in a society which can be considered by further researches.
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