Education and Population Dynamics:
Mobilizing Minds for a Sustainable Future
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Preface by the Director-General of UNESCO

Almost five years after the International Conference on Population and Development (ICPD, Cairo, 1994), UNESCO has produced this monograph, exploring the multiple interactions between education and population. It is a contribution to the ICPD+5 review process, aimed at assessing the extent to which the challenges identified in Cairo are now being met. Far from being an isolated event, the ICPD was one of a series of world conferences convened or supported by the United Nations during the 1990s to examine the challenges facing the world community on the eve of a new millennium.

Appropriately, the subject and goal of the first in the series of world conferences of the 1990s, Education for All (Jomtien, 1990), was to become – as this monograph demonstrates in the case of the ICPD - an essential means of action for pursuing the objectives of all subsequent conferences. This is hardly surprising. Development, above all else, requires new ways of thinking and acting. Education is the principal means for responding to new situations, requirements and possibilities with fresh thinking and effective action. Thus, the promotion of education became a recurrent theme in all the world conferences. Whether the issue be the reduction of poverty, the preservation of the environment, the improvement of urban life or the promotion of the rights of women, education is a part of the answer, often a very sizeable part. It is a vital force in the struggle to shape a happier future for humanity.

Education, as the monograph demonstrates, has a powerful and pervasive impact in reducing mortality and fertility rates and, in tandem with communication, accelerating the demographic transition. Even for those ardently convinced of the power of education to improve the human condition, the impact of relatively small amounts of schooling is impressive. Imagine what might be achieved if every child – boy and girl alike – were to receive eight years of quality education: education that teaches the art of critical thinking, the skills of knowledge-seeking and the duty to act ethically and responsibly towards others. The impact of this could change the world. We are, alas, still very far from providing education of such quality to the vast majority of the world's children. As concerns their parents, the available educational opportunities are even more meagre. One of the major failings of past decades has been the serious under-investment in education - not only of money, but also of imagination. If society expects education to help pull millions out of poverty, then in the poorest countries education itself must first be rescued from the poverty that besets and enfeebles it.

The relationship between education and population cannot be understood in isolation, but only in the context of the struggle for development and sustainability. What ultimately counts is the quality of life people enjoy and the communities they form and foster. A world in which the richest fifth of humanity consumes 150 times more than the poorest fifth - and recent studies suggest this is the current state of affairs - is rendered fragile both by the excesses of the rich and the desperation of the poor. To restore a sustainable balance we must begin by forging a new sense of community based on mutual responsibility and what I have termed an ethics of the future; a far-sighted acceptance of our shared interdependence and the long-term action that it implies.
The type of education that can contribute to this ambitious yet essential goal is, evidently, an education of both breadth and quality. It is an education that not only activates the mind and imagination, but also touches the conscience, constantly reminding us of our obligations to one another. While the world desperately needs new knowledge and technologies, we must pursue them with the awareness that there are no purely technical solutions to the major problems of the present or the future. Indeed, most problems are due to human factors and failings. There is much wisdom in the saying: “we have met the enemy and he is us”. Thus, the battle we must win is not so much against external forces as over ourselves and our failure to have created a world in which all have a chance and a share. An education of quality must provide a critical reflection on the human situation, especially its failures and injustices. But, in addition to telling us what is, it must also help us to imagine what might be and how we might set about achieving it.

One of the most useful outcomes of the development conferences of the 1990s is an almost tangible awareness that development is holistic. Through this perspective education emerges – both in the work programmes and evaluations of the conferences – as an essential means to a wide diversity of ends. It is with an acute awareness of this fact that UNESCO, the United Nations Organization charged with responsibility for education, has sought to cooperate fully and effectively with all its partners, working with them at all levels: international, regional and especially national. This specific responsibility of UNESCO’s does not imply a claim of our Organization upon the work of others. On the contrary, it fosters a close complementarity and productive synergy. Our working relations with the UNFPA, I might note here, have been especially close and fruitful.

UNESCO’s contribution to the objectives set out in the ICPD Programme of Action is in line with the objectives of its Medium-Term Strategy for 1996-2001. Special emphasis was placed on increasing knowledge, public awareness, understanding and commitment concerning population and sustainable development issues. In this context, the Transdisciplinary Project “Educating for a Sustainable Future” (EPD) was conceived as the tool UNESCO should use to implement this task. The Project was envisaged as a major innovation, intended to promote interdisciplinary and intersectoral work within the Organization and to improve inter-agency co-operation in this field.

Education plays a vital role in the quest to ensure the basic needs and well-being of all the world’s people and this is the ultimate goal of the population policies that UNFPA is pursuing. We also share the same sense of priorities. The success of the ICPD Programme of Action hinges on the empowerment of women through education and other means of action. This is a goal of UNESCO as well, one which we are pursuing in the closest cooperation with UNFPA and other partners.

11 March 1999

Federico Mayor
Executive Summary

The International Conference on Population and Development (ICPD, Cairo, 1994) addressed the inter-related issues of population, economic development and sustainability. This monograph examines these issues, especially the first, in relation to education.

Education – a force for shaping the future: Education, of course, is more than schooling. It includes all efforts aimed at conveying knowledge and know-how, shaping attitudes, values and behaviours, and teaching skills, techniques and procedures, both in school and out-of-school. It was education in this broad sense that the ICPD recognized – as did all the major development conferences of the 1990s – as a powerful means for building an understanding of and commitment to development goals. The ICPD assigned particular importance to the education of women and girls both because of their previous neglect and the special relevance of female education to population issues, given the well-established relationship between rising levels of female education and declining levels of fertility, mortality and morbidity. Education is also a critical factor in promoting economic growth and contributing to sustainability.

World population situation: During 1999, the population of the planet will pass the 6 billion mark. By the middle of the next century, the world’s population is projected to number between 7.3 and 10.7 billion with 8.9 considered the most likely estimate. While fertility has declined in all major regions – from a global total of over 5 births per woman in 1950 to an estimated 2.7 births at present – the youthful age-structure of the world’s population means that it will continue to grow by an estimated 78 million people per year.

Over 95 per cent of population growth is taking place in the developing regions, especially in poorer countries with weak and vulnerable economies and, in many cases, fragile social systems. Increasingly, the population of the developing world dwells in cities: the proportion of population living in urban areas is projected to reach 40 per cent in 2000 and 57 per cent in 2025. In absolute numbers, this means that the number of city dwellers in the developing world will increase from 1.5 billion at present to a projected 4 billion in about 2025. Latin America will lead the way, having 85 per cent of its population living in urban areas by the year 2025. The HIV/AIDS epidemic has reached a scale where it is having an impact on population statistics: reducing the average life expectancy by up to seven years in the hardest-hit African countries.

The demographic challenge to education: While in the longer run, education tends to reduce population growth rates, the developing countries are currently confronting the challenge of accommodating a rapidly growing school-age population. Between 1970 and 1995, primary school enrolments in the developing countries increased from 305 million to 561 million. Yet, even this expansion has been insufficient: there are still an estimated 83 million out-of-school children between the ages of 6 and 11 years. The inadequate learning conditions and seriously overcrowded schools of many developing countries contribute to high drop out and repetition rates and low levels of scholastic achievement. Inadequate – often, miserable – learning conditions are an especially acute problem in the least developed countries.
Viewed in an historical perspective, however, the developing countries have made remarkable progress in enrolling their growing populations in schools. This progress is illustrated by the growth of female literacy over the past half century, the effects of which are now being seen in the decline of fertility rates. If even small doses of education have so powerful and beneficial an impact, imagine what might be achieved if every child – girl and boy alike – received six or eight years of quality education. The lesson drawn is that education has an enormous potential to rescue developing societies from poverty. But for this to happen, it will first be necessary for the countries concerned – with the active support of the international community – to rescue education from its poverty.

The impact of education on population – a complex, multifaceted and evolving relationship: For nearly two centuries, demographers have debated the notion of a demographic transition, a hypothesized movement from a situation in which high birth rates are offset by high death rates towards one in which low birth rates, combined with low death rates, re-establish population stability. The “trigger” that sets off the transition is usually a sudden drop in mortality rates resulting from public health measures and the rapid growth in population that ensues.

More careful examination of historical experiences reveals a wide variation in the manner and speed with which societies have progressed through the demographic transition which can take from 50 years to a century or more. During this period the population usually doubles and often doubles again. Rising levels of education play an important role in accelerating the pace of the transition. Indeed, to some extent, education and communication appear capable of bringing down birth rates in societies that would, by historical standards, still be at stages in the transition process at which population growth would be expected to remain high. This is especially the case in economically diverse but linguistically homogenous societies where birth rates tend to fall not only in advanced areas, where this would be expected, but also in less developed areas, where such a drop would not be predicted. Accelerating the process is critical given that at a 3 per cent annual rate of growth, a population doubles in approximately 24 years.

The education of women has a particularly important impact on maternal and child mortality and morbidity. In certain rural regions of the developing world, one birth in every 100 costs the life of the mother. Infant mortality is far higher, representing nearly a quarter of all deaths in some areas of Africa. Education reduces maternal and child mortality and morbidity in a variety of ways: through improved living standards, better access to health care, better information and a more active and less fatalistic approach to matters of health. Moreover, as educated women have fewer children and longer intervals between their births, their pregnancies present reduced risks to both mother and child. In the South-central Asia and China, where traditional attitudes strongly favour boys over girls, demographic studies show that girls, especially in the early months and years of life, have a considerably higher death rate than boys. These “missing girls” are the victims of prejudice and poverty.

Education is among the most effective means for eroding traditional attitudes and creating more egalitarian values. Education – especially of women – is also consistently linked to lower fertility. Education influences the number of children parents desire, the measures they take to achieve the objective they set themselves and the manner in which they care for and protect the children they have. The cumulative impact of education is illustrated by a comparison of population projections for Tanzania. Under the first assumption, the present parameters are unchanged; under the second assumption, education levels rise steadily, accelerating the demographic transition and sharply reducing the average number of children that women bear. Without these changes, the population almost quadruples, increasing from
31 million in 1996 to 115 million fifty years later, in 2046. With higher levels of education, the population approximately doubles, reaching 61 million in 2046.

A closer look at half of humanity – the nine high-population developing countries: This chapter examines the relationship between education, as measured by female literacy, and fertility in nine countries (China, Bangladesh, Brazil, Egypt, India, Indonesia, Mexico, Nigeria and Pakistan) that are working with one another and with UNESCO, UNFPA, UNICEF and UNDP to extend the reach and improve the quality of their education systems. With the exceptions of Nigeria and Pakistan, all of these countries appear to be progressing rapidly through the demographic transition. In general, despite variations in cultural, social and economic conditions, those countries that have widely extended educational opportunities to women have lower fertility rates than countries that have been less successful in doing so. The chapter also examines the proportion of women and men – the femininity ratio – in the populations of China and India. In the case of India, it is shown that disparities are greatest – that is, the number of women per 1,000 men lowest – in states with low levels of female literacy.

Targeting selected population goals through education: Earlier sections of this monograph concern the overall impact of all forms and levels of education on population dynamics. This section examines conscious efforts to use education to achieve particular population and health objectives. Population education projects pursuing such aims have been conducted in over 100 countries during the past three decades. Such activities take many forms. Often population content is incorporated into a variety of school and university courses: biology, social science, history. In other cases, population content is included in out-of-school education. A common aim of population education courses is the teaching of life skills that enable participants, especially young women, to plan their reproductive lives and avoid dangers to themselves and their future children.

A review of evaluation findings reveals that these programmes can have a significant impact on both attitudes and subsequent reproductive behaviours. While there is overwhelming evidence showing the impact of general education on population variables, substantial investments over a period of decades are required to develop education systems and raise education levels to a point that achieves a significant impact on reproductive behaviours. Population education is intended to be a “sharper instrument”, aimed at rapidly achieving well-defined goals, such as reducing adolescent pregnancies, preventing HIV/AIDS or spacing the birth of children. It should, of course, be regarded as a complement to – not a substitute for – the development of general education needed to serve the overall needs of society.

Education and population in the quest for development: This chapter places the issues of education and population in the broader context of development and explores a number of key issues. What is the relationship between population growth and economic development? Is population regulation a prerequisite for development or, to the contrary, is development itself “the best contraceptive”? How do the more recent notions of sustainable development and equitable development affect population policies? What role does education play in relation to population, development and sustainability? To what extent can it contribute to achieving equal rights and opportunities for women? These are questions and issues that have been hotly debated during the last three decades. The ICPD did not put an end to this spirited debate, but it placed it in a broader societal context and, at the same time, focused it more clearly on the role and rights of individuals. The aim of population policies, the ICPD Programme of Action asserts, is to establish a sustainable balance between demographic
rates and social, economic and environmental goals in order to improve the quality of life of present and future generations.

Education plays a critical and multifaceted role in development. In the knowledge economies of the 21st century, education — and invention, innovation and research based on education — will be powerful forces for growth. Education also contributes to the goals of sustainability and equity through scientific research and better public understanding of environmental and social issues. Finally, education is an important factor in reducing fertility, mortality and morbidity rates.

Conclusions: On the eve of a new millennium, the world is confronting unprecedented problems, but with unprecedented means for coping with them. The world of the 21st century will be both smaller and more crowded, yet linked as never before by communication networks and a world economic system. It will be inhabited by 6 billion people at the dawn of the century and a projected 9 billion by 2050. This monograph argues that education is humanity’s best hope to survive and prevail in such challenging circumstances. Education’s impact in reducing population growth is of particular importance. It may be only one of several factors affecting fertility, but its influence is strong, consistent and responsive to public policy. Moreover, an approach to fertility regulation based on the provision of education and information respects human rights, putting decisions in the hands of individuals, not public authorities.

A critical failing in current development policy is the serious underinvestment in education. While more resources are essential, education also needs a new sense of purpose and inspiration, new structures and methods, and openness to innovation and reform. In particular, education needs to make far wider use of the information and communication technologies. The challenges of the new millennium will require an energetic mobilization of minds and wills. Education is the principal means of action to this end. In sum, education holds the potential to shape a better future for humanity, if humanity has the wisdom to place its faith and resources in education.
The International Conference on Population and Development (IPCD, Cairo, 1994) dealt with a cluster of critical and complexly interrelated issues: population, economic development and sustainability. Its Programme of Action (POA) stresses the need to "promote social justice and to eradicate poverty through sustained economic growth in the context of sustainable development". The pursuit of these objectives raises a number of key questions:

- How should the world respond to continuing population growth, a projected increase of 78 million per year that will increase the planet's population from 6 billion in 1999 to a projected 9 billion in the year 2050?

- How can an adequate rate of economic growth be achieved in the developing world and for poor people everywhere: a rate of growth sufficient to relieve the poverty and distress of the more than 1.3 billion people - nearly a quarter of humanity - who live on less than one dollar per day and to create the 40 million new jobs that the developing world will require each year to accommodate those who will seek to enter the work force?

- How will the environment be enabled to bear the "wear and tear" that a growing population and increased economic activity will impose upon it?

This monograph examines these issues through the lens of education. What, it asks, can education do to provide a response to these critical questions of development? The focus of the monograph is on the nexus between education and population, but the discussion - of necessity - extends to issues of economic growth, equity and sustainability. Development is holistic. The interrelationships between education and population cannot be understood in isolation; they must be placed in the broader context of the struggle to overcome poverty, promote justice and equity and ensure respect of the environment and, thus, for the right of future generations to live healthy and fulfilling lives.

1. Education – a force for shaping the future

All of the major development conferences of the 1990s recognized and proclaimed the power of education to shape attitudes, values and behaviours and build an understanding of and commitment to development goals. Education, to be sure, is not a panacea for all the ills that afflict the earth. It is not the whole answer to every problem, but it is an
indispensable means for mobilizing minds and enlisting them in the service of development. To the extent that development involves the acquisition of new ways of thinking and acting, education is its motive force.

Definitions

The term “education”, as used in this monograph, should not be equated with schooling or formal education alone. It includes all efforts aimed at conveying knowledge and know-how, shaping attitudes, values and behaviours, and teaching skills, techniques and procedures whether through formal, non-formal or informal modes of instruction. It covers not only the learning that takes place in schools, but also the critical acquisition of knowledge, values and attitudes that occurs in homes, workplaces and communities as well as through the mass media. Education, of course, is more than the collection of information or even the accumulation of knowledge. It is an attitude of mind and an openness of spirit. It is the capacity that education – in all its many forms – engenders to think of oneself and the world in new ways that makes it a powerful force for social and economic adaptation and progress.

Education is directed to meeting learning needs which, even at the basic level, are numerous and diverse (see box 1). By widening the definition of education, one also widens the community of “educators” to include, in addition to those working in the formal education system, large numbers of people engaged in diverse activities often not classified as “education”. These include industrial trainers, agricultural extension staff, public health workers, visiting nurses, staff in family planning clinics, forest rangers and other environmental workers, leaders and trainers of NGOs, officers of unions and cooperatives, community educators, youth leaders, parent-teacher association members, representatives of the mass media and many others as well. What makes such people a part of the “education force” is the fact that their work involves conveying knowledge and know-how and shaping values, attitudes and behaviours.

It will be observed that while the definition of education proposed above is extremely broad, much of the data presented in this monograph is limited to formal education systems. There are two reasons for this. The simpler one is the dearth of information concerning non-formal education. The more complicated explanation involves the critical role that basic education – usually in the form of primary schooling – plays in development, particularly in the development of education itself. While invention, innovation and creativity may flow from universities and research institutions, the first steps in forming future leaders and scientists occurs in primary school. It has been said that every village has its genius. But those geniuses must be identified and prepared to play their role in society. That journey to service and – for a few – to fame is likely to start in a primary school. In the end, education is vastly more than a sorting and selection mechanism. A productive society may benefit handsomely from the genius of a few, but it depends upon the competence of the many.
Any large-scale undertaking requires people with a great variety of different levels of knowledge and training in order to succeed. The invention of modern contraception, for example, depended upon basic biological research carried out by highly trained scientists in major research laboratories. Without their discoveries and inventions, it is difficult to imagine that family planning would be nearly as widely practised as it is today. But that success also depended upon an enormous effort to diffuse information and awareness, namely, on education and communication aimed at alerting millions of women and men to new developments and the possibilities that they opened.

In a more general sense, an informed citizenry and educated workforce are prerequisites for the success of modern societies. Constructing such societies, thus, calls for education at all levels, but the necessary mobilization of minds and spirits begins with basic education. Thus, the first step in the development of education – and, accordingly, the first concern of this monograph – is the quest to ensure a basic education of quality to all: every woman and every man, every girl and every boy. The provision of such an education is not only an important end in itself, but also an essential step in the development of higher levels of education and the emergence of a learning society.

Box No. 1

MEETING BASIC LEARNING NEEDS

Every person – child, youth and adult – shall be able to benefit from educational opportunities designed to meet their basic learning needs. These needs comprise both essential learning tools (such as literacy, oral expression, numeracy, and problem solving) and the basic learning content (such as knowledge, skills, values, and attitudes required by human beings to be able to survive, to develop their full capacities, to live and work in dignity, to participate fully in development, to improve the quality of their lives, to make informed decisions, and to continue learning. The scope of basic learning needs and how they should be met varies with individual countries and cultures, and inevitably, changes with the passage of time.

Source: Article 1. World Declaration on Education for All

Education: a right and a “tool”

The Programme of Action (POA) of the International Conference on Population and Development emphasizes the importance of education both as an inalienable human right and as a critical factor in promoting social and demographic change. “Everyone”, the POA asserts, “has the right to education, which shall be directed to the full development of human resources and human dignity and potential, with particular attention to women and the girl child ...” Education is also identified as a “key factor in sustainable development” and “as a component of well-being and a factor in the development of well-being through its links with demographic as well as economic and social factors”.

"Everyone has the right to education, which shall be directed to the full development of human resources and human dignity ..."
Education enables individuals to gain access to knowledge, a "precondition" for coping with the complexities of the modern world. Education also shapes the attitudes, expectations and self-images of individuals as well as the manner in which they are perceived and regarded by others. It influences many fundamental aspects of one's life experience: the kind of work, place of residence, network of friends and acquaintances, level of aspirations and expectations.

Finally, education plays an important role in both the transmission and renewal of cultural values and beliefs, including those relating to family preferences and practices. In all of these ways – as well as in many others – education exercises an important influence in forming individual attitudes and behaviours and shaping social values and policies that, cumulatively, have a powerful impact on the course of demographic and social change.

What is it about education that accounts for its power to transform individual behaviours and social realities? Is it the cognitive changes that count, the new and different ways of thinking and understanding, including the development of awareness concerning the critical issues of one’s life and society? Is it the institutional impact, the break with tradition that school attendance represents? Or, is it the “seepage” of more reasoned and less traditional attitudes into the minds of individuals that occurs as the education levels of the society rise and media exposure increases?

Certainly, all of these factors – and many more – are involved. The mix of ingredients is probably very different from one society to another, depending on a wide range of cultural and contextual factors. Educators will ask: “To what extent do duration and quality matter?” There is clear evidence that the duration of enrolment has an effect upon fertility. While almost any amount of schooling of girls appears to nudge fertility rates downward, women with seven years or more of schooling have significantly fewer children than those with fewer years of education.

Quality is harder to define and measure, but common sense would suggest that it is related to fertility behaviours just as it is known to be related to income, employment and socio-economic status? Indeed, education is essentially a qualitative pursuit. A small dose of inspiring learning is probably more effective in nearly every respect than many years of dull routine. What is surprising is the power and impact of even limited amounts of education of very questionable quality upon reproductive and social behaviours. Imagine what might happen if every boy and – more especially, every girl – received, say, eight years of quality education: i.e., education that teaches the arts of critical thinking, the skills of knowledge seeking, and the duty to act ethically and responsibly towards others. Would not the whole world be changed?

Even if in the longer run education – especially of women and girls – is a decisive factor in reducing fertility, mortality and morbidity, in the short run the pressure of population growth on education systems is the dominant issue in the developing countries. Much of the developing world is still at a phase in the demographic transition in which rapidly growing numbers of students and would-be students severely strain available resources.
educational resources. Teachers, facilities, teaching and learning materials, even chalk, paper and pencils are all in short supply. Thus, if education is to provide the answer to population growth and other societal problems — or, more realistically, an important part of the answer — it will first be necessary to develop education systems capable of bearing the burden of hopes and expectations that are being placed upon them. The ICPD recognized this need and appealed to the governments of developing nations to make greater efforts to achieve quality education for all and to the international community to demonstrate its solidarity by providing needed external assistance to countries struggling to educate rapidly expanding populations.

2. World population situation

In 1804, as Thomas Robert Malthus was revising his famous essay on population, the planet counted about 1 billion people, having required roughly half a million years to reach that number from the time Homo sapiens first evolved on earth. Malthus’ “dismal” thesis, of course, was that population would increase more rapidly than the means to sustain it, resulting ultimately in strife, suffering and starvation that would cruelly restore the balance between population and sustenance. In this year, 1999, according to the most recent estimates of world population issued by the United Nations, the population of the planet will surpass six billion, the addition of the last billion having required only 12 years. Looking to the future, it is projected that the world’s population will continue to increase, even if at a slower rate, growing to between 7.3 billion and 10.7 billion by the year 2050, with a figure of 8.9 billion considered to be most likely.

FIGURE 1: World Population Size, 1750 to 2050: past estimates and medium, high and low fertility variants (in billions)

Impact on developing countries

Even more significant than the rate of growth – which is estimated to have declined to 1.33 per cent per year – or the impressive magnitude of the numbers involved, is the fact that over 95 per cent of population growth is taking place in the developing regions of the world. Put quite simply, this means that the impact of population growth falls almost exclusively on those countries that are least prepared to meet the challenge. The poorest countries with the weakest and most vulnerable economies and, in many cases, fragile social systems will be required to feed, clothe, shelter, educate, care for and employ hundreds of millions of additional people.

This reality is reflected in striking changes in the distribution of the world’s population. In 1950, for example, the population of Africa was substantially less than half that of Europe; in 2050, it is projected to be nearly three times as great. By the middle of the 21st century, Asia’s share of the world’s population is projected to stabilize at approximately 59 per cent. Africa’s portion, however, will have more than doubled, rising to 20 per cent, and Latin America’s nearly doubled, increasing to 9 per cent. Meanwhile, the share of Europe will have declined to 7 per cent, less than one-third its peak level. The distribution of the world’s vastly increased population will, thus, have dramatically changed. Over 85 per cent of the population living in the developing regions and less than 15 per cent in those regions presently referred to as “developed”.

Urbanization

What this may mean in terms of the quality of human life is difficult to foresee, but the prospects are hardly reassuring. Unless strenuous measures are taken to preserve and improve agricultural land, there could be serious food shortages. Rural poverty, already a serious problem, is likely to intensify. Probably the most startling change will be the growth of cities as the rural exodus continues and increases. In 1985, an estimated 32 per cent of the population in the developing regions lived in urban areas. This is expected to rise to 40 per cent in the year 2000 and to 57 per cent by about the year 2025.

As a significantly higher percentage of a vastly more numerous population moves off the land and into the cities, the urban population of the developing world is likely to increase from about 1.5 billion at present to over 4 billion in 2025. By that time, it is projected that Latin America will be the most urbanized region of the world with nearly 85 per cent of its population living in cities. In Africa, the figure will be around 58 per cent and in Asia 53 per cent. Already, there are twenty “megacities” with populations of over 11 million, 17 of them in the developing world. The population of both Mexico City and São Paulo presently exceeds 20 million and that of Calcutta, Bombay and Shanghai approaches or exceeds 15 million. Population densities in such cities tend to be extreme, in some cases more than ten times as high as in New York or London.

These developments will raise profound problems. How will these vast populations be provided with even the most essential requirements of life
and health – clean air and safe water – to say nothing of food, shelter and employment? What will be the political impact of a vast and impoverished urban proletariat? How will the delicate balance between countryside and city be affected by such dramatic changes in numbers and proportions? Will cities, once the “spots of light” to which people fled to seek opportunities and enjoy culture, become vast polluted seas of poverty and deprivation from which people will flee to save their health and sanity? The answers to these questions, of course, will be determined not by fate, but by the action – or inaction – taken to avoid a potential calamity.

**Declines in fertility and mortality**

While the seeds of future population increases are already sown, the 1998 Revision of World Population reports a decline in fertility in all regions of the world. The global average now stands at 2.7 births per woman. By contrast, during the early 1950s, the average number was 5 births per woman. In the last 25 years, the number of children per couple has fallen from 6.6 to 5.1 in Africa, from 5.1 to 2.6 in Asia and from 5.0 to 2.7 in Latin America and the Caribbean. While these trends suggest that a worldwide demographic transition is underway, the population of the planet, as noted above, is projected to continue increasing and to approach 9 billion by the middle of the 21st century. In part, this is because the world’s population is living longer. In fact, in the developed regions of the world, those over 60 years of age are the fastest growing segment of the population. In the developing countries, a marked decline in infant mortality brought about by a number of factors, including education, has been a significant accomplishment of recent decades as well as the major factor contributing to population growth.

**HIV/AIDS**

The tragic impact of HIV/AIDS was a factor taken into account in the 1998 revision of population estimates and projections. In the 29 hardest hit African countries, the average life expectancy is estimated at 47, seven years less than it would have been in the absence of AIDS. Many experts suspect that available statistics probably underestimate the impact of AIDS. In countries where testing services are limited, eight to ten years may pass before an infected person develops symptoms and is diagnosed with the disease. Official estimates, therefore, tend to be lower than those made by independent experts and more focused on the African region. By some estimates, the number of infected individuals may now be greater in Asia than in Africa. In even the most severely affected countries, however, population continues to increase, even as life expectancy falls.

The impact of AIDS is especially devastating to development in that it mainly affects the economically active – especially young adults – and this in countries where dependency ratios are already extremely high. The risk of infection, as the ICPD Programme of action emphasizes, is also greater for women than for men. This accounts for the fact that a growing percentage of recently reported cases involve women and their infant children.
To sum up, the world population continues to expand in all the developing regions of the world, even if at a reduced rate. As will be seen in the next section, this reality poses a direct and immediate challenge to education: that of coping with growing numbers while also facing severe shortages of trained personnel, facilities and materials. Yet, if in the short run the provision of education is a major problem, in the longer run, education holds out the promise of being a crucial factor in reducing both fertility and mortality rates in the developing regions of the world.

3. The demographic challenge to education

The demographic pressure placed on education systems is evident in the growth of primary school enrolments during the past decades. As shown in figure 2, during the 25-year period 1970-95, total world enrolment at the primary level increased from 396 million to 650 million. This growth was confined exclusively to the developing regions of the world in which enrolment increased from 305 million in 1970 to 561 million in 1995. Even this rapid growth in enrolment, however, was insufficient to provide every primary school-age child with a place in school. The number of out-of-school children increased from an estimated 90 million in 1985 to 110 million in 1990, before declining to about 83 million in 1995. Fifty million of these out-of-school children are girls. Indeed, when the least developed countries are considered alone, the number of out-of-school girls of primary-school age is seen to have increased from an estimated 14 million in 1985 to 19 million in 1995.


In 1995 there were 83 million out-of-school children. Fifty million of these were girls.
The school experience of many children in the developing world is relatively brief and unsatisfactory. Only 66 per cent of primary school-age girls and 72 per cent of boys pursue their studies as far as grade 5. Indeed, many students drop out between the first and second grade, having acquired not even the most basic elements of an education. High rates of repetition also slow the progress of learning and increase the cost of education in developing countries. By one estimate, 16 per cent of education budgets in developing countries is consumed by the cost of repetition in the first four grades of primary school alone. This disappointing record probably reflects both the poverty of the children concerned and the inability of the school to respond adequately to their needs.

**Shortages and overcrowding**

Ultimately, of course, what matters is not only how many children attend schools, but also — and above all — how much learning and understanding occurs inside the head of each child. While learning achievement is more difficult to measure and monitor than mere attendance, many experts have expressed concern over the conditions of learning in the over-crowded schools of the developing world, and their impact upon achievement.

To cope with growing numbers of students, class sizes have been significantly increased. In India, for example, more than 60 per cent of teachers report teaching about 50 students on average. Some 34 per cent teach between 51 and 100, and 5 per cent teach more than 100 students. In many countries, the problem of large class sizes is compounded by that of multi-grade classrooms in which the teacher must instruct students of different ages and levels. Double — and sometimes even triple — shifts have become a common means of coping with growing student populations in many countries. In such circumstances, a student’s school “day” may consist of only two to three hours.

**Conditions of learning**

The provision of quality education in poor countries is often hampered by inadequate facilities and lack of necessary supplies and equipment. In a pilot survey of conditions of learning in the least developed countries commissioned by UNESCO-UNICEF, it was found that in most countries one-third or more of students gathered in classes without even a usable chalkboard. In virtually all countries there are no teaching aids such as wall charts and almost no pupil will ever see a world map in his classroom.

"In ten out of fourteen countries, one-third or more of the pupils are in classrooms without a teacher’s table and the situation is only marginally better with respect to a chair for the teacher. In eight out of the fourteen countries, more than 90 per cent of the pupils attend schools which do not have electricity; almost as many attend schools without piped water and one-third or more of the pupils attend schools which do not have any water at all. Moreover, in half the countries, over 90 per cent of the pupils in the final grade of primary education do not have any textbook in their mother tongue, over a third of them do not have a maths textbook in any tongue.
and over a third do not have a desk or writing place, as distinct from just a place to sit" (UNESCO, World Education Report 1998). The main finding of this study is, in effect, that if education is expected to help the poor to lift themselves out of poverty, then in the poorest countries, education itself needs, first, to be lifted out of poverty.

The "trinity of deprivation" that accounts for the poverty afflicting many education systems comprises rapid population growth, under-developed economies and high dependency ratios. Thus, even though most developing countries devote a higher percentage of their gross national product and national budgets to education than do the developed countries, their allocations are woefully insufficient to provide quality education for all. Education systems in developing countries are reeling under the pressure of numbers: too many students and would-be students, too few trained teachers and too little money to provide even the most essential requirements and tools of learning.

Given the extreme shortages they face, developing countries have tended to define education narrowly to mean schooling and little more than that. While understandable, this has done a disservice to education in a broader and more meaningful sense. In most developing countries, children do not enjoy the stimulus to learning that libraries, museums, radio and television, school newspapers and magazines and specialized teachers and services can provide.

Once students finish or abandon school, which often happens before they reach their teenage years, there is a severe shortage of opportunities for adult or continuing education. Each year, millions of students leave primary school, often with fragile literacy skills and no vocational training of any kind. Their prospects of employment are, at best, meagre. Moreover, their out-of-school environments offer few reading materials or opportunities and incentives to learn. The problem of education has to be seen in this wider prospective. It is not merely a problem of schooling – as serious as that may be – but a far wider crisis concerning the availability and quality of all types and forms of educational services and opportunities.

The prevailing low rates of economic growth – even negative rates in some cases – also fail to provide adequate incentives and the enabling environment without which education cannot flourish. Thus, poverty subverts education both by denying the providers of education – formal and non-formal alike – the necessary means and conditions for effective teaching and learning and by weakening the incentives and opportunities that motivate and sustain the desire to learn. Poverty also attenuates the impact of education on fertility reduction by weakening other forces that work for social and demographic change. These forces include modernization, secularization, wage employment, rising living standards and changing lifestyles.
Progress and problems

While it is necessary to emphasize the severe problems confronting education in developing countries, the enormous efforts these countries have made and the significant successes they have achieved needs also to be underscored. With few exceptions, these countries, most of which achieved independence in the post-World War II era, inherited education systems aimed at educating tiny minorities to serve colonial administrations, not systems of mass education. In the ensuing decades, the developing countries have managed, despite enormous difficulties, to enrol the vast majority of their students in school, achieving in 20 to 40 years what the industrialized nations of Europe took nearly a century, and in some cases considerably longer, to accomplish.

This progress can be seen in the halving of the adult (15 years +) illiteracy rate during the last half century, from an estimated 43-45 per cent in 1950 to just over 20 per cent of the world's adult population at present. As concerns population matters, the decline of female illiteracy, which is approximately 5 percentage points greater than male illiteracy, is of particular importance. Table 1 shows estimated female illiteracy rates by birth cohort in the developing regions of the world. It will be observed, for example, that women who were born in Africa in 1925 and reached adulthood in 1940 had an estimated rate of illiteracy of 82 per cent whereas women who were born in 1980 and reached adulthood in 1995 had an illiteracy rate of 28.5 per cent. The same pattern of decline in female illiteracy is evident in all regions. Along with this increase in literacy has come greater access to information and the mass media. Thus, even though levels of economic development have remained low in many countries within these regions, there is reason to suspect that there has been a certain "modernization of the mind".

### TABLE 1
Female illiteracy rate (%) by birth cohort in Africa, Latin America and Asia 1925-1980

<table>
<thead>
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<td>76.0</td>
<td>65.5</td>
<td>51.5</td>
<td>38.5</td>
<td>28.5</td>
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</tr>
<tr>
<td>Latin America</td>
<td>32.0</td>
<td>24.5</td>
<td>16.5</td>
<td>10.2</td>
<td>7.0</td>
<td>4.0</td>
<td>13.4</td>
</tr>
<tr>
<td>Asia (without Japan)</td>
<td>67.2</td>
<td>54.3</td>
<td>40.9</td>
<td>29.9</td>
<td>23.9</td>
<td>21.0</td>
<td>36.1</td>
</tr>
<tr>
<td><strong>All Developing Countries</strong></td>
<td>65.5</td>
<td>54.1</td>
<td>41.6</td>
<td>30.7</td>
<td>24.1</td>
<td>20.3</td>
<td>36.9</td>
</tr>
</tbody>
</table>

Nonetheless, the education being provided in most countries is inadequate to both the current needs of learners and the future needs of their society. The hardest part remains to be done. Putting children into boxes called schools is a first and necessary step in providing the education needed to enable them to take command of their lives and destiny. But much more needs to be done to improve the quality and relevance of the education provided and to ensure that it leads not to a dead end, but to a process of lifelong learning. The education that is relevant in population matters is not limited to the three R’s; it has at least as much to do with one’s sense of confidence, efficacy and responsibility to self, family and society.

**ICPD objectives**

The Programme of Action of the ICPD emphasizes the importance of achieving “universal access to quality education, with particular priority being given to primary and technical education and job training, to combat illiteracy and to eliminate gender disparities in access to, retention in and support for, education”. These goals remain far from being achieved. At the mid-term assessment held in Amman, Jordan in 1995 to review progress towards the goals set at the World Conference on Education For All (Jomtien, Thailand, 1990), it was noted that advances have been made in many countries, especially in expanding primary school enrolments. But progress in closing the gender gap — a factor of crucial importance in accelerating the demographic transition — was termed “excruciatingly slow”. Moreover, it was observed that the “expanded vision of basic education espoused in Jomtien [and forcefully reiterated in Cairo] has often been reduced to a simple emphasis on putting more children into school: an essential step, but only one of many measures needed to achieve education for all.”

In sum, progress is being achieved, but it is both slow and uneven. If education is expected to come to the rescue of society, by advancing development and accelerating the demographic transition, it is essential that society first come to the rescue of education by providing it with the mission, resources, staff, facilities, equipment and supplies that quality education requires. While the primary responsibility for education rests with national governments, the experience of recent years demonstrates that they cannot shoulder the burden alone. They need the active involvement of civil society and the effective solidarity of the international community.

4. **The impact of education on population – a complex, multifaceted and evolving relationship**

While the impact of population upon education systems is direct and evident, the reciprocal impact of education upon population is subtle, complex and longer-term. Usually, education works, not alone, but through or in combination with other variables to affect population-related preferences and practices. Yet, both historical experience and empirical evidence suggest the power of education to influence the process and pace of demographic change. This section examines the impact of education in...
accelerating the demographic transition as well as its effects on mortality and fertility rates. It also explores related demographic issues such as the phenomena of “missing girls”. a serious concern in a number of Asian countries.

The demographic transition

A good deal of discussion and debate on population matters revolves around the so-called “demographic transition”. This transition is a hypothesized movement from a situation where high birth rates are off-set by high death rates towards one in which low birth rates, combined with low death rates, re-establish population stability. The “trigger” setting off the transition process is usually a rapid fall in mortality rates brought about by an increased food supply or progress in medicine and public health, including the development of vaccines for common illnesses such as smallpox.

A rapid fall in mortality rates occurred in Western Europe during the 18th and 19th centuries. In much of the developing world, it took place during the 20th century. The ensuing imbalance between continued high birth rates and significantly lower death rates sets off a period of rapid population growth. A combination of factors is assumed to be responsible for an ensuing drop in birth rates, which — according to the theory — re-establishes population stability: industrialization, urbanization, secularization, increased income, education, wage employment, the emergence of new lifestyles and, in recent decades, significant advances in contraception. History shows that the interval required for the transition to take place has varied considerably, from less than half-a-century in some cases to well over a century in others. During this period the population may double and often double again. In the 19th century, migration often served as a “safety valve” to relieve population pressures. For example, between 1815 and 1914, around 20 million Britons left their country for the far corners of the earth. In 1900, the British population was about 41 million. Without emigration, it is estimated that it would have been over 70 million.

What role does education play in accelerating the demographic transition? Rising education levels — especially among women — have been statistically shown to be closely associated with declining birth rates, an essential step in slowing population growth. Does this, however, imply that education is responsible for the reduction in fertility? The question is difficult to answer unambiguously because the increase in education does not occur in isolation. It is usually part of a complex change in lifestyle.

Among women, for example, a higher level of education is closely associated with higher status and income, a later age of marriage, employment outside the home, and urban residence as well as with a number of psychological factors such as modernity, positive self-image, self-control, predictability and, perhaps, rationality. While it is virtually impossible to sort out this cluster of relationships and distinguish causation from mere correlation, it is clear that the various factors work in
combination to bring about the reduction in fertility rates that completes the demographic transition.

Even if education is only one of the factors involved in the demographic transition, it is usually the factor most amenable to change through public policies. Public authorities can, for example, mandate school attendance, invest in school buildings, libraries, public television and radio and, indeed, take a whole range of decisions aimed at extending the reach and improving the quality of education. Education, thus, is one of the most effective as well as acceptable means through which policy-makers can "get a handle on the population problem".

As research into the demographic transition has developed, it has become evident that there is no single historical pattern. On the contrary, there is a high degree of variation in situations and a resulting need to pay greater attention to contextual factors. In England, for example, the motive force behind the transition appears to have been the change in lifestyles resulting from the industrial revolution. In France, by contrast, the transition was part and parcel of the political and cultural revolution of 1789 and the tumultuous changes that followed in its wake. As already noted, the interval required to complete the transition may vary substantially from one society and situation to another. This is of critical importance when it is considered that a population expanding at 3 per cent per year – as is often the case following a sharp decline in death rates – doubles in approximately 24 years.

It would be a mistake to think of the demographic transition as a sort of deus ex machina that automatically acts to restore population balance without human intervention. There may, however, be a psychological corrective mechanism at work involving some form of intuitive economic and social calculus. Where children are perceived to enrich their parents – through their work or by other benefits, such as old-age security – families tend to remain large. On the other hand, when urbanization, the rising cost of raising and educating children, the availability of social security systems and other factors change the economic calculus, children may come to be seen as a "drain" on family income, not a means for increasing it. Or, to put the matter more positively, parents may feel that they can give greater support and assistance to their children, if they have fewer of them. In such circumstances, smaller families tend to prevail. Indeed, it has been argued that in modern societies, where abrupt and often brutal changes in situations have been commonplace, the demographic transition is more likely driven by the hope of achieving higher living standards and the fear of sudden pauperization. In such circumstances, individuals may seek to limit their burdens and vulnerabilities. This may mean limiting the number of children for whom they must provide, often for a period of 25 years or more.

What deserves to be emphasized is that while the forces that trigger the demographic transition may involve very small numbers of people – even a single individual in the case of the discovery of a vaccine – the re-establishment of population balance requires changes in the preferences and behaviours of millions of individuals. Education, in the broadest sense
of the term, plays an evident role in the re-thinking of individual values and ways of life that, taken collectively, completes the demographic transition.

**Lowering of socio-economic thresholds**

At the extremes of tradition and modernity, the level of development appears to be decisive in determining family size. In an illiterate, fully subsistence agricultural society, fertility regulation will be unknown, or at least uncommon, and families will tend to be large. By contrast, in a highly educated society, with a market economy and high rates of urbanization, where both men and women work for wages, there will be a strong tendency towards smaller families. At intermediate stages, where most of the developing world is today, the situation is more ambiguous. What is interesting, however, is that the demographic transition appears to be taking place at progressively lower socio-economic thresholds. This trend is reflected in the declining fertility evident in those societies that are still poor and have large rural populations, but which often have rising levels of female literacy and access to modern communication such as radio or television. Bangladesh may be an example.

The case is made that the demographic transition in such countries is not spontaneous, but contrived and socially constructed. It is triggered not by actual changes in socio-economic conditions so much as by the diffusion of ideas through education and communication and the power of example. One proof of this is that the demographic transition appears to spread rapidly across nations that share a common language, touching not only the economically more advanced portions of the population, which would be expected, but also communities at lower levels of socio-economic development that would normally not be affected. Globalization, then, seems to be taking place in the realm of attitudes, values and lifestyles as well as in economics. Education and communication are increasingly regarded as "engines" of this change, the impact of which can be seen in the lowering of fertility levels that is presently underway in all developing regions.

**Maternal and child mortality**

Although in decline, maternal and child mortality continue to be a significant element in the population statistics of developing countries as well as a source of enormous personal sorrow and distress to millions. In some rural areas of Africa, more than one birth in every 100 costs the life of a mother. Infant mortality takes a far greater toll: nearly one-quarter of all deaths in certain developing regions claim the lives of children below the age of five years. Serious and often prolonged illness of both mothers and children are even more prevalent.

What role does education play in combating this shameful reality? First, as already noted, education is associated with higher levels of income which, in turn, give access to safer and more comfortable conditions of life and better nutrition and health care. But education, presumably through the awareness and knowledge it generates, also has a direct effect. The

*Education and communication are increasingly regarded as "engines" of demographic change.*

*More than one birth in a hundred costs the life of the mother. Nearly one-quarter of all deaths in certain developing regions claim the lives of children below five years of age.*
individuals and families who most consistently seek care are those with
higher levels of education, even where health care is available to all.
Indeed, the World Fertility Surveys (WFS) of the 1970s and the
Demographic and Health Surveys (DHS) carried out in the 1980s and
1990s suggest that the education of the mother is a better predictor of
reduced maternal and child mortality than either the education of the father
or the socio-economic characteristics of the household. Five years of
education for mothers, according to one estimate, reduces the rate of child
mortality by ten deaths per thousand births. The mechanisms through
which education works are certainly complex and multiple.

One important factor is the reproductive behaviour of educated women
who tend to bear fewer children and to have longer intervals between their
births, thereby reducing the risk of the pregnancy to both the mother and
her child. Educated mothers are also more likely to receive prenatal and
postnatal care and to have deliveries assisted by trained personnel. They
are also more inclined to report symptoms, seek care for illnesses, extract
better quality care and more closely follow the recommendations they
receive.

The protective influence of education continues throughout childhood. One
of the most pervasive and consistent effects of maternal education is its
impact on the nutrition and health care provided to children. An analysis of
data from 18 developing countries participating in the DHS confirmed that
the education level of the mother was strongly associated with survival of
children between the ages of six and 60 months. Several factors have been
put forward to explain this finding: educated mothers are less fatalistic
about illness, more attentive to nutrition and hygiene, more prone to seek
medical care, more aware of the need for preventive measures, such as
vaccination. In brief, while the precise mechanisms through which
education has an effect remain unclear, its impact is unambiguous.

“Missing girls”

An issue on which the ICPD focused international attention is that of
“missing” girl children. In nearly all societies, particularly where the hold
of tradition remains strong, there is a pervasive tendency for females to be
disadvantaged relative to males. In many societies, these disadvantages
involve the subordination and oppression of women and girls. Such abuse
is often presented and justified as part of time-honoured traditions deriving
from particular systems of values or religious codes. But Nafis Sadik,
Executive Director of UNFPA, has rightly observed in The State of World
Population – 1997 that: “No value worth the name supports the oppression
and enslavement of women. The function of culture and tradition is to
provide a framework for human well-being”. At early ages, when children
are dependent for their survival upon the care and attention of others, this
discrimination can prove fatal. Indeed, demographers have estimated that
in South-central Asia and China, where prevailing customs attach less
value to girls than to boys, there are roughly 250,000 excess deaths among
girls each year. These deaths reflect disadvantages – ranging from the
subtle to the brutal – in the treatment that girls received as compared
to boys.
Altogether, it is estimated that there are well over 100 million “missing girls and women” in the population of South-central Asia and China. This is calculated by comparing the actual proportion of women and men to what demographers would expect it to be if neither sex experienced any systematic form of discrimination. Several factors appear to play a part. The most brutal contributing factors are infanticide and selective abortion of female foetuses. Negligence in the care of girls and greater efforts to protect boys from the malnutrition, disease and other consequences of poverty also play their part. Education is regarded as essential in correcting this tragic situation. The strong links between the education of mothers and the survival of their children suggests that female education must be accorded even greater priority in the future. Education is a means for eroding traditional sex-biased attitudes and encouraging more egalitarian views and more equal treatment of boys and girls. The impact of education in limiting family size and improving the socio-economic conditions of life are other factors that can be expected to reduce the excess fatality rates experienced by girls.

Public policy, of course, also plays a role. The excess death rate of girls results from a cruel combination of poverty and prejudice. Successful efforts to achieve national development, reduce poverty, improve the status of women, and promote education and health would — individually and collectively — have a powerful impact in overcoming this tragic situation. On the other hand, misguided policies that do not take sufficient account of the cultural context can do serious harm. A shift toward greater cost-recovery in the provision of public services and more reliance on the private sector, for example, may accentuate inequality of treatment, if parents use their limited resources to cover the cost of health and education services for sons rather than daughters. Yet, while there are numerous measures that could improve the situation, the heart of the problem is a cultural tendency to devalue girls and women. Until this is overcome — and education is usually the most effective means of action to that end — the problem will remain. The increasing use of medical techniques to determine the sex of the child and abort female foetuses demonstrates that even modern technology can be pressed into the service of misguided traditional values.

**Education and fertility**

Among the most consistent relationships in demography is that between the education of women and fertility: as levels of education rise, fertility nearly always declines. Table 2 shows the total fertility rates — the average number of children that women bear — by levels of education for selected developing countries. Notice that the situation varies considerably from country to country. In Peru, an extreme case, women with ten or more years of education have an average of 2.5 children whereas women without any education have an average of 7.4 children. While the impact of education on fertility is less powerful in other countries, the table reveals the expected tendency for fertility rates to decline as levels of education rise.
### Table 2
Total fertility rates according to women's years of education in selected countries

<table>
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<tr>
<th>Region and country</th>
<th>Total 0</th>
<th>1-3</th>
<th>4-6</th>
<th>7-9</th>
<th>10+</th>
<th>Difference of years of education</th>
<th>Mean number of years of education</th>
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<tbody>
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<td><strong>Africa</strong></td>
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<tr>
<td>Botswana</td>
<td>5.0</td>
<td>5.9</td>
<td>5.6</td>
<td>5.1</td>
<td>4.5</td>
<td>3.1</td>
<td>-2.8</td>
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<td>Ghana</td>
<td>6.4</td>
<td>7.1</td>
<td>6.6</td>
<td>6.4</td>
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<td>4.9</td>
<td>-2.2</td>
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<td>6.7</td>
<td>7.2</td>
<td>7.5</td>
<td>7.5</td>
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<td>-2.6</td>
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<td>Liberia</td>
<td>6.6</td>
<td>6.8</td>
<td>7.1</td>
<td>7.5</td>
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<td>-2.6</td>
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<td>Senegal</td>
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<td>-3.4</td>
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<td>2.6</td>
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<td>2.7</td>
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<td>2.8</td>
<td>2.5</td>
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<td>1.5</td>
<td>-2.0</td>
</tr>
<tr>
<td><strong>Latin America and the Caribbean</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bolivia</td>
<td>5.1</td>
<td>6.2</td>
<td>6.4</td>
<td>5.3</td>
<td>4.2</td>
<td>2.8</td>
<td>-3.4</td>
</tr>
<tr>
<td>Brazil</td>
<td>3.7</td>
<td>6.7</td>
<td>5.2</td>
<td>3.4</td>
<td>2.8</td>
<td>2.2</td>
<td>-4.5</td>
</tr>
<tr>
<td>Colombia</td>
<td>3.3</td>
<td>5.6</td>
<td>4.5</td>
<td>3.6</td>
<td>2.5</td>
<td>1.8</td>
<td>-3.8</td>
</tr>
<tr>
<td>Dominican Republic</td>
<td>3.8</td>
<td>5.8</td>
<td>5.0</td>
<td>4.4</td>
<td>3.5</td>
<td>2.6</td>
<td>-3.2</td>
</tr>
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<td>6.4</td>
<td>6.3</td>
<td>4.7</td>
<td>3.5</td>
<td>2.6</td>
<td>-3.8</td>
</tr>
<tr>
<td>El Salvador</td>
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<td>6.0</td>
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<td>3.9</td>
<td>3.5</td>
<td>2.5</td>
<td>-3.5</td>
</tr>
<tr>
<td>Guatemala</td>
<td>5.6</td>
<td>6.9</td>
<td>5.6</td>
<td>4.2</td>
<td>2.8</td>
<td>2.7</td>
<td>-4.2</td>
</tr>
<tr>
<td>Mexico</td>
<td>4.1</td>
<td>6.4</td>
<td>6.3</td>
<td>4.0</td>
<td>2.7</td>
<td>2.4</td>
<td>-4.0</td>
</tr>
<tr>
<td>Peru</td>
<td>4.5</td>
<td>7.4</td>
<td>6.1</td>
<td>4.6</td>
<td>3.7</td>
<td>2.5</td>
<td>-4.9</td>
</tr>
</tbody>
</table>


How does education work its effects on population? It has been argued that education is the "fuel of the mind", a means not only for providing knowledge and know-how, but also for changing attitudes, re-thinking values and reviewing, where necessary, dearly-held cultural assumptions. Education, it is argued, increases an individual's capacity to master his or her destiny and to come to terms with a universe in which diverse forms of information and abstract symbols play a growing role. If this is, indeed, the case, one would expect that the process of change would begin in the minds of parents - that the intention to have fewer children would precede and largely determine that outcome. There is abundant evidence that this is the case. Almost everywhere, women with higher levels of education indicate a desire to have fewer children than do women with less education. The WFS, for example, found women with seven or more years of schooling had an average wanted number of children 1.3 lower than...
women without education. The most commonly expressed motive for preferring smaller families is to be better able to meet the needs of each child.

The education of the father also has an effect on desired family size, but it is less consistent across cultures. In West Africa, for example, men with no schooling would like to have nearly twice as many children as men with a secondary- or higher-level of education. In Asia, by contrast, the differences in the number of children desired by men with different levels of education tend to be quite small. The point to be made is that fertility reduction begins with a conscious and considered decision. That decision may be influenced by many factors, including considerations of maternal and/or child health and well being, economic necessity, a desire for greater freedom and autonomy, or a sense of social responsibility. Whatever the motive may be, however, the decision centre is the mind of the concerned individual, usually a mother or potential mother, and education – as many surveys have demonstrated – has a predictable effect on the decision made.

Having decided to restrict the number of children she will bear, a woman needs access to information about and assistance with family planning. Here, too, there is ample evidence of the links between education and contraception. The data from the DIHS surveys in 25 countries, for example, show a systematic increase in knowledge of modern contraceptive methods by education level. Better educated women are aware of a wider range of contraceptive options, the proper way to employ them, their potential side-effects and where to obtain them. Women with more education also achieve better results. They have a number of children closer to their desired number than do women with less education. Indeed, a recent analysis of DHS data shows that level of education is the factor most strongly and consistently associated with avoiding unwanted children. As noted above, the children to whom educated women give birth also have a better chance of surviving, avoiding major health problems, gaining an education and having smaller families themselves.

To be certain, the advantages are not all on the side of modernity and against tradition. Women attached to traditional values rely on time-honoured methods of fertility regulation. Prolonged breast feeding, which delays ovulation, and postpartum sexual abstinence are two examples. The differences in frequency of breast feeding by levels of education, however, are not great and are expected to decline as educated women increasingly recognize the advantages of the practice for their own future health and that of their children. While postpartum abstinence serves to space children, its impact on the total number of children to whom a mother gives birth is slight. Modern contraception represents a more reliable method of reducing fertility.

**The cumulative impact of education – an African example**

What differences do factors such as the demographic transition and the reduction of fertility make in real terms? Take the situation of Tanzania as an example. In 1967, the estimated population of that country was just over 12 million. In 1996, its population was 31 million. Projections of the
population of Tanzania fifty years hence, in 2046, were made under two different sets of assumptions (Popnet, 1998).

Under the first set of assumptions, all population parameters were kept at their 1996 level. The total fertility rate is 6.4 children for women with no education, 5.9 for women with incomplete primary education, 5.4 for women with a complete primary education and 3.2 for women with a secondary or higher education. Life expectancy is 50 years for men and 52.8 years for women. Twenty per cent of male children and 30 per cent of female children leave school with less than a primary education. Under these assumptions, the population is projected to nearly quadruple by 2046, reaching 115 million.

Under the second set of assumptions, increased investment in education both accelerates the demographic transition — thus reducing the fertility rates of all segments of the population — and increases the number of women with higher levels of education and, therefore, lower levels of fertility. It is, for example, assumed — perhaps somewhat optimistically — that the total fertility rate of women with at least a secondary education will decline to 1.3 children. Enrolment levels are assumed to increase regularly so that by 2046, all children — girls and boys alike — have at least a primary education and 80 per cent at least a secondary education. Under these two interacting assumptions, the population is projected to approximately double in 50 years, reaching 61 million by 2046.

Both projections demonstrate the inexorable power of compound growth rates. Under the first assumption, the population nearly quadruples; even under the second assumption, it almost doubles. This simulation — even if somewhat simplistic — shows the potential power of education, aided by communication and modernization in all its many forms, to constrain and moderate population growth. As discussed above, education plays a critical role in determining the number of children that parents desire, the actions they take to achieve the objective they set, and the manner in which they care for and protect the children they have. Individual decisions about family size ultimately add up to differences of tens of millions, even in a nation of moderate size, such as Tanzania.

5. A closer look at half of humanity — the nine high-population developing countries

This section examines the relationship between education and fertility in the nine high-population developing countries that are working with one another and with UNESCO, UNFPA, UNICEF and UNDP to achieve education for all, with priority to girls and women. Attention is also drawn to femininity ratios and ways of correcting the discriminatory imbalance that they reflect. Table 3 ranks the countries by population. Collectively, these countries total 3,151 million people, well over half the world’s population.
TABLE 3
Nine high-population developing countries

<table>
<thead>
<tr>
<th>Country</th>
<th>Population (in millions, mid-1998)</th>
</tr>
</thead>
<tbody>
<tr>
<td>China</td>
<td>1,256</td>
</tr>
<tr>
<td>India</td>
<td>982</td>
</tr>
<tr>
<td>Indonesia</td>
<td>206</td>
</tr>
<tr>
<td>Brazil</td>
<td>166</td>
</tr>
<tr>
<td>Pakistan</td>
<td>148</td>
</tr>
<tr>
<td>Bangladesh</td>
<td>125</td>
</tr>
<tr>
<td>Nigeria</td>
<td>106</td>
</tr>
<tr>
<td>Mexico</td>
<td>96</td>
</tr>
<tr>
<td>Egypt</td>
<td>66</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>3,151</strong></td>
</tr>
</tbody>
</table>

*Source: United Nations, Population Division, Department of Economic and Social Affairs, 1998.*

**The decline of illiteracy**

Table 4 shows the status of female literacy by birth cohort since 1925 in the nine countries. While the rate of progress in reducing illiteracy differs significantly from country to country, with only minor exceptions, illiteracy rates have declined from cohort to cohort in all countries. In some cases – India is an example – the decline has been relatively steady from decade to decade. In other cases – China, for example – there have been periods of especially rapid advance. As might be expected, when the rate of illiteracy drops below roughly 20 per cent, progress tends to slow. At that point, those who can be readily reached and easily served will have already become literate. Those who remain illiterate are likely to reside in locations that are difficult to reach or that present other disadvantages. Special efforts will be needed to reach and serve them.

The literacy/illiteracy distinction is measured as a dichotomous variable whereas the underlying reality is a continuum extending from zero to Shakespeare, to use an English reference. It is thus a very crude measure of education, but also a very broad one. The literate are not, of course, a random sample of the population. In most countries, literacy is probably associated with more urban dwelling places, a higher degree of involvement in the modern economy and greater exposure to the mass media – the written media, obviously, but also radio and television. Thus, the impact of literacy on fertility probably reflects something more than education alone. Looked at in another way, however, the impact of education may be greater than estimated. A good deal of research suggests that the literate members of a community tend to be the innovators and communicators. Their knowledge and attitudes, therefore, have an influence on others. For that reason, a mere handful of educated women in a community might bring about a decline in fertility for the community as a whole. Yet, if the relationship between literacy – or education more generally – and fertility is not simple, it seems nonetheless to be highly consistent and quite strong.
TABLE 4
Female illiteracy rate (%) by birth cohort (1925-1980) in the nine high-population developing countries, 1995

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>China</td>
<td>81.5</td>
<td>51.5</td>
<td>30.8</td>
<td>15.0</td>
<td>7.7</td>
<td>3.0</td>
<td>27.3</td>
<td></td>
</tr>
<tr>
<td>India</td>
<td>86.1</td>
<td>80.7</td>
<td>71.0</td>
<td>61.1</td>
<td>51.3</td>
<td>38.0</td>
<td>62.5</td>
<td></td>
</tr>
<tr>
<td>Indonesia</td>
<td>71.5</td>
<td>49.0</td>
<td>27.8</td>
<td>15.8</td>
<td>5.6</td>
<td>1.5</td>
<td>22.0</td>
<td></td>
</tr>
<tr>
<td>Brazil</td>
<td>41.5</td>
<td>30.4</td>
<td>20.5</td>
<td>12.0</td>
<td>8.5</td>
<td>5.0</td>
<td>16.7</td>
<td></td>
</tr>
<tr>
<td>Pakistan</td>
<td>94.0</td>
<td>90.7</td>
<td>85.5</td>
<td>77.6</td>
<td>69.0</td>
<td>59.0</td>
<td>75.8</td>
<td></td>
</tr>
<tr>
<td>Bangladesh</td>
<td>84.5</td>
<td>84.2</td>
<td>72.5</td>
<td>75.0</td>
<td>74.0</td>
<td>56.5</td>
<td>73.3</td>
<td></td>
</tr>
<tr>
<td>Bangladesh</td>
<td>96.7</td>
<td>90.3</td>
<td>77.5</td>
<td>56.8</td>
<td>33.0</td>
<td>15.0</td>
<td>52.7</td>
<td></td>
</tr>
<tr>
<td>Mexico</td>
<td>35.4</td>
<td>26.6</td>
<td>17.3</td>
<td>9.9</td>
<td>5.7</td>
<td>3.0</td>
<td>12.7</td>
<td></td>
</tr>
<tr>
<td>Egypt</td>
<td>85.5</td>
<td>81.0</td>
<td>72.8</td>
<td>62.0</td>
<td>49.5</td>
<td>39.5</td>
<td>61.7</td>
<td></td>
</tr>
</tbody>
</table>


The decline of fertility

Table 5 – presenting fertility rates, contraceptive prevalence and the percentage of natural population growth – reveals that in only two countries, Nigeria and Pakistan, does the average woman now bear more than four children during her reproductive years. In the 1960s and 1970s, this was the rule in nearly all developing countries; now it is an anomaly that calls out for explanation. The other seven countries are at different points in the demographic transition. Each country has had its own unique experience, but all seven appear to be following a common historic pattern.

China is the extreme case. Fertility has fallen far more rapidly than would be predicted from either educational or socio-economic data. The explanation, of course, is the “one child” population policy that China has sought to apply since the 1970s. This policy has been widely implemented in the cities and, to a lesser extent, in the countryside and has resulted in a sharp drop in fertility rates and population growth. In India, the decline in fertility also began in the 1970s and has persisted. The population growth rate is now below 2 per cent. In Bangladesh and Indonesia growth rates are even lower: respectively, 1.8 and 1.5 percent. Fertility reduction in Egypt has been more gradual, but the growth rate has now declined to 2.2 per cent. If this rate persists, however, the population will double in about 33 years, a troubling prospect for a country, the inhabitable parts of which are already densely populated.

In only two of the nine countries, Nigeria and Pakistan, does the average women now bear more than four children.

There is evidently no single factor that provides an adequate explanation for fertility levels or the rates at which they evolve. In the past, culture – especially religion – was often evoked as an explanation. Even a glance at these nine very diverse countries suggests that this is not any longer the case – if, indeed, it ever was. The answer has to be sought in the specific circumstances and complex histories of each country or region. The degree to which education has been diffused among the population would appear to provide the most convincing general explanation, but many other factors are certainly involved.
TABLE 5

Total fertility rates (TFR*), percentage of women using contraception and rate of natural increase in 1998

<table>
<thead>
<tr>
<th>Country</th>
<th>TFR (average number of children per woman)</th>
<th>Contraceptive prevalence %</th>
<th>Natural increase % per year</th>
</tr>
</thead>
<tbody>
<tr>
<td>China</td>
<td>1.8</td>
<td>83</td>
<td>1.0</td>
</tr>
<tr>
<td>India</td>
<td>3.4</td>
<td>41</td>
<td>1.9</td>
</tr>
<tr>
<td>Indonesia</td>
<td>2.7</td>
<td>55</td>
<td>1.5</td>
</tr>
<tr>
<td>Brazil</td>
<td>2.5</td>
<td>77</td>
<td>1.4</td>
</tr>
<tr>
<td>Pakistan</td>
<td>5.6</td>
<td>18</td>
<td>2.8</td>
</tr>
<tr>
<td>Bangladesh</td>
<td>3.3</td>
<td>49</td>
<td>1.8</td>
</tr>
<tr>
<td>Nigeria</td>
<td>6.5</td>
<td>15</td>
<td>3.0</td>
</tr>
<tr>
<td>Mexico</td>
<td>3.1</td>
<td>65</td>
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</tr>
<tr>
<td>Egypt</td>
<td>3.6</td>
<td>48</td>
<td>2.2</td>
</tr>
</tbody>
</table>

* Average number of children per woman


In the case of Brazil and Mexico – and more generally in Latin America – the decline in fertility can be dated to the end of the 1960s and early 1970s. Up to that point, the countries of the region had exceptionally high population growth rates. Between 1955 and 1975, for example, the Mexican population nearly doubled. The annual rate of growth has since declined from a high of 3.3 per cent to 2.2 per cent at present. In Brazil, the drop in the population growth rate has been even sharper, falling to 1.4 per cent per year. Both Mexico and Brazil have effective and distinctive family planning programmes, with Mexico’s being more public-oriented and Brazil’s more oriented towards the private sector. In both countries, contraception is prevalent. It is being used by 65 per cent of couples in Mexico and 77 per cent in Brazil. Both countries, it should be emphasized, are also engaged in strenuous efforts to extend the reach of basic education and improve its quality.

The femininity ratio

Indicates the number of women per 1,000 men in a given population. In the absence of sex discrimination, for example in access to food and medical care – one would expect to find approximately 1,040 women for every 1,000 men. The biological tendency for male births to outnumber female births by approximately 5 per cent is more than off-set by the higher survival rates and longer lives of women.

China and India are two great exceptions to this rule of demography. In China, there are approximately 940 females for every 1,000 males and in India approximately 929. The factors that appear to account for this include selective abortions of female foetuses, infanticide, and deaths due to malnutrition and lack of adequate care for female children. As noted above, it is estimated that there are well over 100 million “missing women” in China, India and other South-central Asian countries. While many factors, especially the weight of prevailing traditions that favour boys over girls, account for this discrimination, education appears, at least

The deficit of females may be explained by selective abortions of female foetuses, infanticide, and deaths due to malnutrition and lack of adequate care for female children.
in the case of India, to be a factor in explaining and correcting such disparities.

Table 6 shows the femininity ratio for India’s seven most populous states together with the number of literate females per thousand women in each state. It will be observed that Uttar Pradesh and Bihar, the two most highly populated states, have both the lowest levels of female literacy and the highest disparities between the number of males and females in their population. Conversely, Tamil Nadu has the highest female literacy rate of the seven states and, together with Andhra Pradesh, the highest femininity ratio.

<table>
<thead>
<tr>
<th>State</th>
<th>Population (in millions) end 1998</th>
<th>Feminity ratio (females per 1,000 males) 1991 census</th>
<th>Number of females literates to 1,000 females</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Uttar Pradesh</td>
<td>165</td>
<td>882</td>
<td>140</td>
</tr>
<tr>
<td>2. Bihar</td>
<td>103</td>
<td>912</td>
<td>136</td>
</tr>
<tr>
<td>3. Maharashtra</td>
<td>95</td>
<td>936</td>
<td>348</td>
</tr>
<tr>
<td>4. West Bengal</td>
<td>82</td>
<td>917</td>
<td>303</td>
</tr>
<tr>
<td>5. Andhra Pradesh</td>
<td>80</td>
<td>972</td>
<td>204</td>
</tr>
<tr>
<td>6. Madhya Pradesh</td>
<td>79</td>
<td>932</td>
<td>155</td>
</tr>
<tr>
<td>7. Tamil Nadu</td>
<td>66</td>
<td>972</td>
<td>350</td>
</tr>
<tr>
<td>Total (1-7)</td>
<td>670</td>
<td>920</td>
<td>215</td>
</tr>
<tr>
<td>All India</td>
<td>1,000</td>
<td>929</td>
<td>248</td>
</tr>
</tbody>
</table>


Some caution must be used in interpreting the data in Table 6. The states that have the highest literacy rates and highest femininity ratios also tend to be the more economically developed. Thus, education influences the femininity ratio both directly – through its impact on knowledge and attitudes, especially the erosion of prejudice and the promotion of more egalitarian views – and indirectly, through its positive effects upon development. There are certainly many cultural and contextual factors that need to be taken into account as well. Yet, whatever the mechanisms of causality, education is strongly associated with higher femininity ratios.

Kerala, a south Indian state of 31 million, is the extreme illustration of this point. The number of women per thousand in that state who are literate is nearly twice as high as that in Tamil Nadu – the highest of the seven large states on which data is presented in table 6. Its femininity ratio of 1,040 is what would be expected in the absence of any form of discrimination. But Kerala is unique in many ways. It has a long history of missionary education that has had a powerful impact on the society.

What Table 6 would seem to suggest is not that education alone will overcome discrimination, but that education – at the very least – is an essential part of the answer. Education does not so much change prejudices
as it changes the societies that harbour them. In cooperation with all the forces of economic and social change, it eliminates the habitat that sustains ignorance, prejudice and discrimination by fostering development and increasing access to information and ideas.

To a considerable extent, the demography of the world will be determined by that of the nine high-population developing countries. These countries host over half the world’s people and mirror the major trends in all developing regions. It is for these reasons that the international community – led by UNESCO, UNFPA, UNDP and UNICEF – has assigned particular importance to the promotion of education in these nine countries. For the same reasons, this monograph has given special attention to the situation of education and fertility in these highly populous states.

6. Targeting population and health objectives through education

The discussion in earlier sections of this monograph concerns the overall impact of all forms and levels of education on population dynamics. This section has a more specific and limited focus: it examines a special set of experiences – population education projects and programmes – that consciously seek to use education as a means for achieving particular population or health objectives.

Population education has been defined as an educational process aimed at enabling learners to better understand the nature, causes and effects of population dynamics and the manner in which they affect – and, in turn, are affected by – the actions of individuals, families, communities and nations. Properly conducted, population education is not indoctrination or propaganda. It does not seek to impose particular attitudes or behaviours upon learners, but rather to enable them to make informed decisions that serve their own best interest. That said, it is hardly surprising that programmes conducted in countries with well-defined population policies tend to reflect and support those policies. In general, however, if population education must take a stance, it is for rationality. The process favours decisions that are carefully studied and considered over the arbitrary dictates of tradition or authority.

Population education has been defined as an educational process aimed at enabling learners to better understand the nature, causes and effects of population dynamics.

The nature of population education

Population education is neither a subject nor a discipline. It may be taught in the context of any number of subjects – biology, history, social science, anthropology, psychology, sociology, religion, ethics and is interdisciplinary by its very nature. During the past three decades, population education has been incorporated, in a wide variety of forms, into the school programmes and, to a lesser extent, the university systems of over 100 countries. It is also finding a growing place in out-of-school literacy and education activities and – as box 2 reveals – achieving useful results in that context.
While much has been written about the specificity of population education, a generalization is in order: good population education is good education. The subjects on which population education is based are of universal interest. Whether it be the biology of reproduction, the history of discrimination, the psychology of sexuality or the ethics of sharing, the issues treated are important and compelling. The pedagogy followed reflects—or should reflect—both the lessons of experience and the findings of recent research. “Begin where the learner is” constitutes an essential premise: start in the classroom and the community and gradually reach out to the world. Employ an active pedagogy that requires people to think, to act to express and judge themselves; not one based on rote learning and classroom drills. Teach with clear purposes and objectives in mind. Recognize that the power of example—how teachers act—often conveys a far more powerful and persuasive message than what teachers say.

Perhaps the greatest service that population education renders to a school, teacher’s college or university curriculum is to connect it to the life of the community and the nation. Education requires relevance and population education unmistakably provides that. It addresses, in a variety of forms, the issues of development, social justice, sustainability, individual responsibility and other questions that democratic societies and thoughtful individuals need to consider.

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**Box No. 2**

**IMPACT OF NON-FORMAL ADULT EDUCATION IN THE ASIA-PACIF REGION**

**Woman’s status in the family:** The programmes have “played a significant role in improving the status of women within their own families. Whereas traditionally, women, particularly in Nepal and India, had little say in family decision-making, they, through participation, have begun to express their newly found self-belief in having a say both within and without the family”.

**Concerning family planning practices:** The impact studies revealed “adult education campaigns had enabled women to be far better aware of the avenues open to them for restricting the size of their families. This had prompted greater use of prophylactic methods. Simultaneously, this has brought greater pressure to bear on the health service delivery system. The demand for better extension services and increased availability of prophylactic devices is on the increase”.

*Source: Quoted from Impact of non-formal adult education in the Asia-Pacific region: a four-country synthesized study, UNESCO Regional Office for Asia and the Pacific, Bangkok, 1997.*

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**Life skills**

The value of any course or subject depends not only on what is taught, but also on how the lessons learned can be applied to life. Whatever the
particular content of a population education curriculum, an underlying goal is to teach broadly applicable skills and knowledge. First, both the subject matters selected and the ways of presenting them place an emphasis on future-oriented thinking and the development of problem-solving skills. Students, for example, learn how to make projections, simple or complex depending upon the level of the class, of what the future is likely to be if past trends continue unchanged. If these projections produce alarming results, they are asked to consider precautions or steps that could be taken to avoid future problems or dangers.

Secondly, a good deal of attention is placed on evaluating information and proposals. Students are taught to question whether the source of the information is reliable or reflects vested interests or other forms of bias. Next, they must examine to see if all the information needed to understand or solve a problem is presented and then determine whether the conclusions reached are reasonable and realistic.

Thirdly, population education has always dealt with the clarification and classification of values and views. It seeks to help students to understand both their own values and those of others. It also teaches students to be aware of the influence of gender stereotypes and peer pressures on their thinking and decision-making. Above all, it helps students learn to evaluate the implications of their actions and to be conscious of the attitudes, values, susceptibilities and pressures that influence them to behave in particular ways.

Population education has emphasized the development of these skills because of their broad applicability to all aspects of life and especially to the emotionally charged issues of sex and reproduction confronted by young adults, particularly young women. The goal is to teach people to think and reason for themselves, to develop self-respect as well as respect for others, to think ahead and plan their future, and to carefully consider the implications as well as the consequences of their behaviour on themselves and others. Obviously, what is presented here in condensed form is included in very specific and concrete ways in the courses themselves. Messages about the need for planning and considering the implications and consequences of one's behaviour, for example, are discussed with young women in relation to the advantages of postponing their first pregnancy and the attitudes, behaviours and precautions that will enable them to do so. The goal is to teach broadly applicable life skills in relation to immediate, often urgent, problems.

Addressing the needs and situation of women

A considerable number of population education courses have been addressed specifically to girls and young women. While these courses do not conform to any "standard model", nearly all seek to change attitudes and build confidence. They also provide information and, where necessary, referrals to health services. In much of the world, women still face persistent prejudice and are regarded as inferior to men. There is a danger that such societal attitudes may become internalized and undermine the willingness of women to express views and pursue actions that are in their
best interest. Many studies show that girls and women suffer from lower self esteem and expectations than do boys or men in similar situations. Often schools, rather than correcting such attitudes, tend to reinforce them. School textbooks and the attitudes of teachers reflect, rather than counter, gender stereotypes. Such situations have to be strenuously combated. Population education programmes, when well conceived and executed, become the leading edge of a school’s response to such problems. Realistically, such programmes on their own will rarely, if ever, be able to remedy a problem so pervasive and deeply entrenched as gender prejudice, but they can provide a necessary point of entry for launching the struggle.

The problem, of course, extends well beyond the school. In many developing countries, large numbers of women – and the children for whom they care – live in extremely precarious economic situations which make them vulnerable to abuse in many forms. An extreme expression of this abuse is the rising level of HIV/AIDS among women. According to a WHO study, the ratio of infection was seven men for every woman in 1990. Today, the ratio is estimated to be 1.5 women to every man. Women are biologically more vulnerable than men, being two to four times more likely to contract the virus from unprotected intercourse. This circumstance is a compelling argument not merely for population education, but for education in all its forms. The low level of literacy among women, especially in the rural areas of developing countries, is a major obstacle to providing them with the information they need to protect themselves and their children. Illiteracy and oppression are proving a lethal combination.

Testing innovative approaches and practices

Population education programmes have proven to be a valuable laboratory for testing innovative approaches and practices on a limited scale to see if they achieve their intended objectives. Once effective approaches and easy-to-use materials incorporating them – have been developed, they can then be integrated into existing curricula and applied on a much wider scale. For a time, there was a strong tendency to develop separate population education courses or distinct units within courses. The curriculum, particularly at the primary level, was becoming seriously overloaded. This is less the case today. Not every problem requires a separate school course. Designing an education curriculum might be likened to packing a suitcase: the goal is not to pack in as many garments as possible, but to prepare for the full range of climatic conditions and social requirements that one is likely to encounter. Population education, can be “dressed” in the garments of biology, social science or history. What counts is that essential information and understanding are provided to all learners, not the manner in which they are packaged.

While stand alone population projects are now the exception, not the rule, there are situations in which integration into broader educational efforts is difficult or impossible to achieve. This is the case, for example, where programmes are directed to out-of-school populations. India and Iran, among other countries, have conducted population literacy projects with reported success. Distinct population education programmes have also been conducted in teacher training colleges. This is a strategic entry point
for introducing needed information and, more importantly, for providing training in the communication skills, attitudes and approaches that a subject dealing with intimate behaviours requires. Probably no single factor is as important to the success of population education as the training and motivation of teachers. Even a poor curriculum succeeds in the hands of an able and motivated teacher. Conversely, even the best planned and most carefully designed curriculum is condemned to failure, if not taught with competence and commitment.

**Impact of population education**

Evaluating the impact of population and family-life education programmes presents a number of inherent difficulties. While many studies have measured changes in knowledge, attitudes and values during or immediately following a course or unit of study, changes in behaviour – the ultimate measures of success – become evident only years or decades later. Even when changes in attitudes and/or behaviours are documented, it is often difficult to determine to which influences or sources they are to be attributed. Was it the population education course that made the difference or the impact of the mass media or some other factor?

Despite these difficulties, systematic efforts to evaluate population education in a number of countries (including Bangladesh, China, India, Iran, Mauritius, Morocco, Nepal, Sri Lanka and Tunisia) have provided a good deal of evidence that such programmes do in fact make a difference. At a minimum, they make participants more conscious of population issues and their impact on the quality of life. It has also been repeatedly demonstrated that those who participate in such programmes are better disposed to smaller families, later marriages and the need for family planning.

In Nepal, for example, among students at the Faculty of Education who had taken a family-life education course, 45 per cent considered that the ideal age of marriage was 24-26 years, 86 per cent were favourable to family planning and the average desired family size was two to three children whereas the average in the country, at the time, was at least five. Both in this study and in another conducted in Tunisia, it was shown that girls were more favourable than boys to pushing back the age of marriage, practising family planning and reducing the size of the family. Box 3 provides a retrospective look at the impact that participation in a population education programme has had in a rural region of China. The study is unusual and especially valuable because it compares programme participants with a comparable control group approximately ten years after leaving school.
Box No. 3

EVALUATION OF POPULATION EDUCATION IN RURAL CHINA

The population education programme under review had been conducted in a rural region of China during the 1980s. The evaluation was carried out in 1993-94. Those interviewed for the study had completed the programme between 1982 and 1986. A sample of former students from five rural middle schools that had offered the programme were randomly selected and then matched with students from five comparable control schools. Both the trial and control groups had roughly the same composition in terms of age, sex and level of education. A total of 1,389 former participants from the trial schools were interviewed and their responses compared with those of 677 former students from the control schools. Those who participated in the population education programme:

- married at significantly later age;
- had children at a later age;
- had a greater number of one-child families;
- had fewer two-child families;
- had higher rates (16.2 % higher) of family planning; and
- adhered more successfully to family planning.

The evaluators concluded that population education had had a significant impact on reproductive behaviours. For many, the effect of participation appeared to be still having an impact more than ten years after completion of the course.


On the basis of extensive reviews and evaluations, it may be concluded that successful population education programmes shared a number of common characteristics. They appeared to be well adapted to their socio-economic conditions and institutional structures; they provided coherent, easy to understand and convincing messages; they made use of well-trained teachers and enjoyed the unequivocal support of the education system and its leaders. Evidently, many factors, both within and beyond the education system, also helped to determine the impact of population education activities. If the media echoed and reinforced the messages of the school, their content became more credible and persuasive. Much seemed to depend on the nature of the school experience provided. Where education was assigned high value in the culture and was seen as instrumental to success in life, schools tended to be more effective than in less supportive settings.

The prevailing attitudes and practices within schools were also important in either strengthening or undermining the messages of population education. Discussion of gender equality, for example, proved pointless wherever the school itself limited the opportunities available to girls to participate equally in all fields of study and activities. Finally, the relationship between the school and its community was judged to be critical. Where education was seen as being isolated from the realities of life, it was generally ineffective. Conversely, where parents and the community were deeply involved in supporting education activities, they

Discussion of gender equality, for example, proved pointless, where the school itself limited the opportunities available to girls.
assumed greater relevance and ultimately had a greater impact upon the lives of learners.

In the past – and to a lesser extent today – population education has encountered resistance from those who fear that opening the subject of sex for discussion is to take the top off Pandora’s box. Even broaching the subject, it is feared, will soon lead to experimentation and reckless behaviour, bringing on precisely the problems the class or course is designed to counteract. The facts suggest otherwise.

A study conducted by the WHO Global Programme on AIDS, for example, reviewed the impact of family life education programmes – a specific form of population education – on teenage pregnancy, abortion, births, sexually transmitted diseases and self-reported sexual activities. It showed that the sex education provided in such courses did not lead to earlier or increased sexual activity among young people, even when contraceptives were made available. Indeed, participation in the programme appears to have delayed the initiation of sexual activity, decreased its frequency and contributed to safer sexual practices.

Other studies have shown that even a four-fold increase in condom use did not increase casual sexual activity or increase the number of sex partners. A review of the research literature conducted by UNAIDS, which examined 53 studies, generally confirmed these results. In brief, the danger of sex education is, to say the least, greatly exaggerated. The programmes have not always lived up to the high hopes placed in them, but there is little, if any, evidence that they have done any harm.

**Summing up**

There is a growing body of evidence that education can be consciously used to achieve population and health objectives. This effect, it should be added, is over and above the usual impact that higher levels of education have on fertility and other aspects of population dynamics. Increasing general levels of education is an important and, over time, a highly effective means of dealing with population issues. It is a policy, moreover, that is justified by a range of other motives. These may include human rights considerations, human resources and development needs, building of public understanding of key issues, such as sustainability, and the policies and sacrifices needed to achieve them. But education, used in this manner, is a blunt instrument. Relatively high levels of investment and long periods of time are needed before significant results are achieved. Population education, by contrast, is a sharper instrument, one that can be focused on urgent problems, such as HIV/AIDS, or vulnerable groups, such as poor women in developing countries. Such programmes cannot be expected to make fundamental or overall changes in society, but they have proven to be an effective means for achieving specific development aims.
7. Education and population in the quest for development

The relationship between education and population assumes greater meaning and relevance when discussed, not in isolation, but in the broader context of development and sustainability. Indeed, it is only in this broader context that the impact of education on population can be fully appreciated. What counts is not only the effect of education on mortality, fertility and other population variables — as important as these relationships evidently are — but the wider power of education to promote invention and innovation and advance public enlightenment and understanding. It is through these latter channels that education influences, in myriad ways, the critical interactions between population, economic growth and sustainable development. Ultimately, it is the balance among these variables that will shape the quality of life that present and future generations will enjoy.

In a world in which the population has more than doubled during the past fifty years and, potentially, could nearly double again in the next 50 years, the pursuit of development and sustainability assume new difficulty and urgency. It is increasingly evident that “business as usual” approaches will not suffice. Innovative and imaginative solutions will be required to address the challenges and problems of an increasingly crowded and fragile planet. Education is certainly not a panacea for all of life’s problems, but it is a means — one of the very few available — for developing the creativity, imagination, awareness and altruism that the future will require. This chapter is devoted to a discussion of the broader context and numerous considerations that have — and continue — to influence the interactions between education, population and differing visions of development.

The population and development debate

From the 18th century onward, population’s relationship to development has been discussed and, frequently, hotly debated. In its earliest and simplest forms, the debate was over how to feed a growing population. By the 1960s and 70s, development had taken on a wider meaning and the debate had become more general and conceptual: Are many children an asset or a hindrance to economic development? At first glance, this question seems straightforward, but it proved impossible to provide an unambiguous answer. In fact, the response depends on the specific context.

In an extreme case, such as Bangladesh, it would probably not be difficult to gain wide agreement that population increases pose a challenge to development and should, if possible, be limited. In all cases, however, the answer depends not only on the size and rate of growth of the population, but also on the social, economic and environmental “carrying capacities” of the society in question. A nation’s style of life is as important as the size of its population in determining if it is over-populated or under-populated. There is, in brief, a constant and critical interaction between demographic, social, economic and environmental factors that determines the quality of life and state of well-being of a society as well as the burden it imposes upon ecological systems.
Which comes first, population regulation or development?

In the 1970s, the majority of developing countries argued that "development is the best contraceptive", meaning that if living standards were improved and education, health and a degree of social security provided, population growth would slow without a need for policy interventions, as it had in the older industrialized countries. The opposing viewpoint held that the analogy drawn between the situation of densely populated developing countries in the 20th centuries and the relatively sparsely populated countries of Western Europe in the 18th and 19th centuries was misleading. Reduction in fertility, it was contended, had to be viewed as a prerequisite for development, not as a consequence of the development process.

In the 1980s, the same issues were still being debated, but the sides had changed. Alarmed by the continuing growth of their populations and the strains it was placing on development efforts, most developing countries now advocated vigorous family-planning programmes. Many industrialized countries, however, had also changed positions, moving to the "development first" side of the argument, now dressed in neo-liberal garments. The best development model, they contended, was one based on free, individual initiative, with a free market as the principal instrument of regulation. Only this approach, they insisted, was capable of ensuring lasting development and creating the conditions under which couples would, in their own best interests, come to modify their perception of the family and freely choose to have fewer and more widely spaced children.

Sustainable development

The 1980s also witnessed the emergence of the notion of "sustainable development". While sustainable development is often viewed – by friend and foe alike – as placing arbitrary limits on the development process, this is an erroneous understanding. The argument is not about limits, but about balance. The most widely discussed definitions of sustainable development focus on the relationship between social development and economic opportunity, on the one hand, and the requirements of the environment on the other. The goal is to improve the quality of life for all, especially of the poor and deprived, within the carrying capacity of supporting ecosystems.

Such definitions do not set fixed limits on development, but recognize that the prevailing notions and definitions of development must themselves evolve in relation to changing requirements and possibilities. Caring for the Earth, for example, notes that a sustainable economy "can continue to develop by adapting, and through improvements in knowledge, organization, technical efficiency and wisdom" (IUCN, 1991). Sustainability, in sum, calls for a dynamic balance among many factors, including the social, cultural and economic requirements of humankind and the imperative need to safeguard the natural environment of which humanity is a part. While sustainable development policies are not "population neutral", population is only one of several important factors that have to be weighed in the balance.
Education serves the pursuit of sustainability in several ways. The role of education is especially important in winning acceptance for new ideas that involve unfamiliar concepts and require unconventional ways of thinking. Education's role in such undertakings is not only to make people wiser, more knowledgeable and better informed, but also more ethical, responsible and critical as well as capable of continuing to learn and respond to new situations. Were all people to possess such abilities and qualities, the world's problems would not be magically solved, but the means and will to address them would be at hand.

Education must also serve society by providing a critical reflection on the world, especially its failings and injustices, and by promoting greater awareness, exploring new visions and concepts, and inventing new techniques and tools. The quest for sustainability depends on persuading millions of people to think in new ways and pursue corresponding values. Ultimately, the majority of humanity must be prepared to abandon the earlier definition of development — which is leading to increasing difficulties and, possibly, to catastrophe — and start the hard uphill climb towards sustainability. Indeed, education would seem humanity's best hope and most effective means in the quest to imagine and achieve a sustainable future.

Educating for sustainable development is complicated by the fact that environmental issues tend to be complex and often ambiguous and thus difficult to “package” into simple and credible messages. The dangers of global warming and loss of bio-diversity, for example, are very real but, as yet, not very tangible. However, by the time these problems become apparent to all, it may be too late to act in order to avoid the dangers they pose. Both of these major environmental dangers are related to population growth. The increased use of fossil fuels in all regions of the world to respond to human needs, usually without adequate measures to control emissions, is contributing to the build-up of greenhouse gases. Population growth is also impinging upon natural reserves, such as the Amazon basin, which are the living storehouses of the earth’s bio-diversity. The idea of sustainability must, of necessity, become an integral part of — and constraint to — development on an ever more densely populated planet.

**Equitable development**

This concept — often presented as a corollary to sustainable development — is a relatively new element in the debate. It has been put forward by certain economists and social scientists in response to the growing inequalities within and between countries. A recent analysis, for example, suggests that the most privileged one-fifth of humankind has access to incomes and opportunities 150 times greater than those available to the least fortunate fifth, a disparity probably greater than at any previous time in history (Baker and Nordin, 1999).

Proponents of equitable development propose to establish a new international division of labour oriented towards promoting more equitable trade relations between developed and developing countries. Such a scheme, it is contended, would make it possible for developing countries to
finance efforts aimed at reducing poverty, improving environmental protection, education, employment, housing, health care – including family planning – and social security. However, such policies would only be possible if the developed countries, which hold the reins of world economic power, become convinced that the long-term security and well-being of all countries depends on a concerted campaign to overcome demographic and environmental problems. At present, there is little evidence that this is about to occur. Moreover, while no one would deny the need to strengthen the economies of developing countries and improve the welfare of their peoples, the experience of the past decades demonstrates that in the struggle for justice and against poverty, a major effort to establish, consolidate and extend democracy is often a prerequisite. Perhaps the road to economic reform begins with political reform.

Most proponents of equitable development insist that if constraints are required, those who should make the greatest sacrifices are the affluent, both because their lifestyles are imposing the heaviest burden on the environment and because they can best afford to bear the burden. Thus, the debate over environmental issues tends, inevitably, to interact with the struggle for greater equity. Behind both issues, of course, is the reality of growing populations whose basic needs must be met without destroying the ecosystems of the planet.

*Ensuring equal rights and opportunities for women*

The Fourth World Conference on Women, held in Beijing in 1995, emphasized what one might think and hope would be a self-evident truth: "Eradication of poverty based on sustained economic growth, social development, environmental protection and social justice requires the involvement of women in economic and social development, equal opportunities and full and equal participation of women and men as agents and beneficiaries of people-centred sustainable development". As noted in previous chapters, education of women is consistently related to declines in mortality, morbidity and fertility rates. Moreover, education of women broadens the opportunities for them to participate fully in the lives of their societies and to enjoy the full benefits that derive from doing so. Thus, as far as population issues are concerned, the most important and urgent issue of equity is that between women and men. Providing opportunities for women is not only a means for mobilizing "the other half of humanity" in the quest for development; it is also the most effective means for reducing population pressures and creating a better future for the world's children.

*Education – the intervening variable*

Education figures in the population debate as an intervening variable that acts upon both population growth and development. It slows the former and accelerates the latter. The relationship of education to development – usually defined as growth in national or per capita income – has been extensively documented over the past three decades and is universally accepted, as is the role of education as an instrument of social and demographic change. Indeed, the "discovery" by economists in the 1960s...
that education is an investment in development, not a drain on the economy as previously considered, has had a powerful impact on both educational and development policy. It has made individuals as well as governments more generous in funding education, but also more exigent in evaluating it: they want to know what it is, exactly, that they are “buying”, and what is its content, its quality and even its rate of return.

For individuals, there is abundant empirical evidence demonstrating a strong association between levels of education, on the one hand, and socio-economic status, earnings and employment, on the other. The strength of the relationship, however, varies between countries and, within countries, between groups. Where, for example, tradition or other factors limit the participation of women in the work force or constrain the jobs that they can fill, the economic return on investment in the education of women is reduced. At both the societal and international levels, the educational rank of a country, group, or community is associated, often quite closely, with its level of socio-economic development. Of even more immediate concern, it is now clear that education plays a critical role in accelerating the demographic transition. The level of education that young people receive — especially the level of education available to girls and young women — serves as a reliable predictor of future fertility rates.

In brief, education is both an indicator of and a force for modernization and social change. The emergence of a world economy in the closing decades of the 20th century based on an international division of labour has greatly increased the role and importance of education as a factor in development. Knowledge, more than labour or raw material or capital, has become the key resource in modern economies. And inequality resulting from unequal access to knowledge has become a major challenge.

**Summing up**

It would seem fair to conclude that during the last decades the need for population policies as a component of overall development policies has been widely recognized, especially in developing countries. There is, to be certain, a continuing debate over the means for achieving fertility regulation. The ICPD has stressed that the human rights, religious and ethical values and cultural backgrounds of all peoples must be fully respected in all efforts to stabilize population or to promote development. The clear intention is to make fertility regulation a prerogative of individuals and families, not of the State. To this end, the POA recognizes the “right of men and women to be informed and to have access to safe, effective, affordable and acceptable methods of family planning of their choice ...” Naturally, the removal of compulsion and coercion also increases the importance of education and persuasion in societies that are seeking to slowing population growth.

The IPCD certainly did not end the population debate, but it placed it in a broader societal context and, at the same time, focused it more clearly on the role and rights of the individual. After decades of discussion, population policies are increasingly seen as an essential element in a broader vision of development aimed at improving the quality of life of all peoples must be fully respected in all efforts to achieve population regulation or to promote development.
present and future generations. The aim is to establish a sustainable balance between demographic rates and social, economic and environmental goals. In seeking this balance, education is expected to play a double role: contributing to economic growth and accelerating the demographic transition in developing countries.

In the knowledge economies of the 21st century, education — and invention, innovation and research based on education — will be powerful forces for growth. In the developed societies, “knowledge workers”, people who earn their living by applying theoretical knowledge to their work, already make up the largest and fastest growing sector of the work force. The coming decades should witness the expansion of knowledge-based economies to all regions of the world. But education is more than a useful economic tool. It is a powerful instrument for developing the capacities of individuals to understand themselves and their relationship to a social environment, to develop new views and values and, when needed, to adapt their preferences and behaviours to changing situations and circumstances.

Thus, education’s impact on population, as already noted, is both direct and indirect. It enables people to make informed decisions on desired family size and to systematically pursue the objectives they set themselves. At the same time, education contributes to structural changes in the society and the economy that in the recent past have led people to prefer smaller families in order that they may be better able to assist and educate each child. Indeed, the importance of education was not a point of debate at the ICPD or earlier population conferences. There was common agreement that education is a force that will shape the societies of the 21st century, leaving its mark on their economies and social structures as well as on their environments and demography.

8. Conclusions

On the eve of a new millennium, the world is confronting unprecedented problems, but with unprecedented means at its disposal for coping with them. The world of the 21st century will seem smaller and more crowded, linked as never before by communication networks and a world economic system. It will be inhabited by 6 billion people at the dawn of the century and a projected 9 billion by 2050. The Programme of Action of the International Conference on Population and Development recognized that enormous effort and immense resources would be needed to feed, clothe, house, educate and employ this burgeoning population and to do so in a manner that would not destroy the fragile ecosystems of the planet.

The challenge is not merely to ensure survival, but to provide humanity with a more productive, peaceful, just and meaningful future. In this challenging situation, education is humanity’s best hope. Without invention, innovation, new systems of organization and values, and new ways of thinking and acting — the products and by-products of education — future prospects are bleak. New learning and learning systems, open to all, are the keys to a brighter future. If the new century is to witness the triumph of democracy and a decline in the coercive powers of states, it will require a new sense of responsibility and self-regulation on the part of humanity.
individuals. If peace and tranquillity are to prevail, they will have to be based on increased mutual understanding and respect. Conflicts and violence must gradually be replaced by a culture of peace. These developments, if they are to occur, will take root in the minds and hearts of women and men – planted there and nourished through education.

This monograph has examined the interactions between education and population. It has illustrated and discussed the impact of education – especially of women and girls – in moderating population growth and ensuring the health and survival of mothers and children. It has shown that education is not the only factor at work. Urbanization, industrialization, wage employment – indeed, most aspects of modernization – tend to reduce population growth. But the influence of education is both consistent and strong and – what is even more important – amenable to public policy decisions. Moreover, the influence of education and communication appears to be increasing. This can be seen in the lowering of the socio-economic thresholds required to trigger the demographic transition and in the rapidity with which ideas and modes of living are diffused from the few to the many. The impact of population education programmes and projects on carefully targeted objectives is further evidence of the efficacy of education in the quest to enlighten individuals and empower them to act in their own best interest.

A critical failing in current development policy is a shortsighted underinvestment in education. The most evident proof of this is the more than 850 million adult illiterates in the world and the estimated 83 million out-of-school children between the ages of six and eleven years. But it can be seen as well in the persisting gender gap, the high rates of dropout and repetition and low levels of achievement that characterize education in many developing countries. Such outcomes are hardly surprising in schools that not only lack running water and electricity, but even chalk boards, books, pencils and paper. If the world expects education to “ride to its rescue”, it had better first come to the rescue of education.

While more resources are essential, education also needs a new sense of purpose and inspiration, new structures and methods, and a greater openness to innovation and invention. The world has undergone revolutions in information and communication, but its schools even in wealthy industrialized countries – have largely escaped them. The enormous potential of the new media for education remains largely unexplored and unexploited. Indeed, there are ongoing debates over whether communication is more important than education, or vice versa. This is an argument that, upon reflection, makes little sense. Education and communication are not competing approaches, but profoundly complementary forces. The truth is that education needs communication to diffuse its messages and keep them current and relevant. Communication, in turn, needs education to provide the background knowledge and learning skills that can turn “sound bytes” into meaningful messages and information into understanding.
To address the problems of the new millennium, a more extensive, more effective and more integrated use will have to be made of both communication and education. The need is enormous. Poverty, war and civil strife, injustice, disease and irreversible ecological damage are growing at an alarming pace. If they are to be counteracted, it is essential to begin by mobilizing minds and wills. Education is the means for doing so. It is the force that will enable humanity to shape its future – provided, of course, that humanity has the wisdom to place its faith and resources in education.

*Education is the force that will enable humanity to shape its future.*
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