From the information society to knowledge societies

In 1965, when Singapore became independent, the country had all the characteristics of an underdeveloped economy. For four decades, the authorities have implemented pro-active policies, aiming at improving the skills of the population, improving the productivity and attracting industries with strong capital and high added value. Singapore thus became an economic crossroads for Southeast Asia and its GDP per capita ($ 25,000) exceeds today the GDP of a number of industrialized countries.

This example is far from being isolated, and it would be a mistake to think that only East Asia in South-East Asia or South Asia has been so successful. In all the areas of the world, a certain number of countries are changing and promoting a new style of development, based on knowledge. These examples encourage to reflect upon the growth factors involved in the new strategies of development. At the end of the 1960s, researchers like Peter Drucker and Torsten Husén identified these factors: they forecast the emergence of knowledge societies. The development potential of a society depends less on its natural wealth that on its capacity to create, disseminate and use knowledge. The expansion of new technologies and the rise of a knowledge economy confirm this hypothesis.

The international community is reflecting upon the consequences of the digital revolution. The Summit of Tunis on information society, which will be convened in November 2005, will offer the opportunity to confront points of view on a worldwide scale. Under this perspective, the UNESCO World Report shows how it is possible to evolve from the information society to real knowledge societies, which are autonomous sources of development and dynamism.

- Knowledge societies are not limited to the information society. Admittedly, new technologies play an increasingly important part, but knowledge remains the key factor.

- Freedoms of expression and research, as well as pluralism of the media, are essential conditions to the emergence of knowledge societies.

- There is not a single model of knowledge society; moreover, each nation and community has the responsibility to develop local, traditional and indigenous knowledge.

- Knowledge societies constitute a new chance of development on a worldwide scale. However, their rise requires an authentic knowledge sharing, at the service of human and sustainable development.

The UNESCO World Report on knowledge societies encourages the States, the international, governmental and non-governmental organizations, the local and territorial communities, the private sector and the civil society to develop a prospective vision of knowledge societies. The World Report analyses the opportunities and the risks of the current situation, offers tools of reflection and makes recommendations for action and policies. The World Report will have truly achieved its goal only if each actor, in its own field of expertise, uses the contents to guide its own action.

[See chapter 1 of the world Report "Towards knowledge societies"]

Knowledge societies, development and fight against poverty

In 1971, a few thousand poor people driven back from the capital settled in an empty plain twenty km of Lima and created the community of Villa El Salvador. Without any external help, its inhabitants built houses and roads, set up education centres and created associations. After a few decades, a determined action of participative and Community development made it possible to transform this shantytown into an organized city. This effort towards development relied essentially on women and on associations, which played a key-role in the successful outcome of the experiment. In 1983, Villa El Salvador was recognized as a legal municipality and elected its first mayor. In 1987, the Town Council created the free University of Villa El Salvador. It is a success: today, 98% of the children are educated and the illiteracy rate among adults (4.5%) is the weakest of the country. More than fifteen thousand students are registered at the University of Villa El Salvador or in the universities of Lima. Carrying on its action for development, the municipality has started investing in information technologies: it has cyberspaces for its inhabitants, who can give their opinion on the subjects that are being discussed. The existence of a hundred clubs of cultural activities, sporting, artistic and others, bears testimony to the extraordinary vitality of a community that has today more than 400.000 inhabitants.

Are knowledge societies creating new chances and new kinds of development? Can the countries of the South catch up and directly access knowledge societies? Some advanced techniques appear to make such a development possible, as illustrated by the areas which adopted the mobile phone immediately, without transition through the land phone. In addition, a certain number of countries of the South tend to move directly, in a few decades, to a strongly tertiary economy, relying on services, new technologies and the "human capital".

The knowledge economy now evolves towards the accumulation of physical capital. Certain intangible activities related to research, education and the services become the key to the production of wealth. They become increasingly important in the world economy, in countries of the North as in those of the South. Far from limiting itself to the sectors of high technology, this tendency affects the whole production through the introduction of more effective tools.

The knowledge economy is a chance for emerging countries and for the well-being of their populations. In spite of its low income per capita ($432,000 in 2003), the Indian State of Kerala has social indicators and a level of human development close to those of industrialized countries: life expectancy rises at 73 years and the rate of schooling exceeds 90%. Thanks to the quality of its infrastructures of research, Kerala contributes to making India the 8th most important country in the world for scientific publications.

Knowledge is thus a powerful lever in the fight against poverty. However, all societies are not prepared for such changes. The rise of the knowledge economy should not worsen the disparities between the centre and a periphery unable to produce the goods and the services on which from now on growth is based.

[See chapter 10 of the world Report "Towards knowledge societies"]

Digital divide…

Is the rise of information technologies a factor of new divides in the world and between nations or, on the contrary, an opportunity to improve well-being in our societies? The achievements of the Internet should not conceal the risks generated by the digital divide. The number of Net surfers keeps increasing and has just exceeded one billion. However, nearly four people out of five do not have access to the Net. The objective of a computer for each household remains a remote prospect. Moreover, access to the Internet remains very expensive in a number of countries of the South: in Bangladesh, for example, the annual cost of an Internet connection is the equivalent of food for a family for one year.

To reduce the digital divide is therefore a top priority. Along these lines, several cities in industrialized countries set up digital twinning: their old computers are recycled to be redistributed for free in cities of the South.

Another example, the creation of Community Multimedia Centres (CMC), places of collective access to new technologies. In August 2005, UNESCO inaugurated in Harar the 6th CMC in Ethiopia. There, the local population can use five computers with an access to Internet, scanners, printers and photocopying machines. The centre of Harar also helps to eradicate illiteracy through new technologies.

The digital divide does not spare industrialized countries, where a large part of the population is left in the margins of technological revolutions. Even in the most developed economies, the greatest number of citizens and social categories, including old people, the disabled, migrant workers and all the people coming from social backgrounds who are marginalized by poverty and lack of education should have access to communication and information technologies.

UNESCO World Report puts forth several proposals:

• To facilitate the access to data-processing resources
The dissemination and use of free software and relatively cheap computer equipment must be encouraged and supported in developing countries.

• To increase the number of Community Multimedia Centres
These places of collective access must be developed, in particular in the least advanced countries, with the aim to spread new technologies and to support the dissemination of the resources offered by the Internet among the population.

• To set up contents adapted to disadvantaged public
Disadvantaged groups (linguistic minorities, disabled people…) must be studied in order to assess the technical obstacles to be overcome in the future.

[See chapters 1 and 2 of the World Report "Towards knowledge societies"]

… and knowledge divide

Will knowledge become a new factor of exclusion, giving those who have it exclusive power?

The cumulative advantage of knowledge creates a new divide: those who have access to knowledge develop their capacities to acquire more knowledge. Conversely, the misfits of knowledge societies enter a vicious circle, their deficit of knowledge making it even more difficult to bridge the gap. Indeed, in a context where equal access is granted, those with a higher education level profit more from it than those with only a limited access to education.

This knowledge divide, though very old and deep, takes on a new shape today: it will not disappear with the digital divide. It is unrealistic to try to bridge the variations in knowledge between individuals or nations through the Net. Building highways is not enough to guarantee freedom to move. People still need cars or collective means of transportation, they need to know how to drive and to read traffic signs…

The knowledge divide separates the North from the South and takes place within the richest countries. It is not a fatality, since the economy of knowledge authorizes fast corrections, in so far as investments are made to support the acquisition of knowledge (education), its exchange and its division (good governance, freedom of expression, etc). Along the same lines, the World Report insists on the effort needed, in particular at school, to teach future Net surfers to sort themselves out, to treat on a hierarchical basis and use in a efficient way the information available on the Internet.

Moreover, knowledge, being codified and transformed into information, is not free. Its producers, in particular when they are private firms, do not wish to lose the benefit of their discoveries. The marketing of the data is thus likely to restrict access to them, particularly in the countries of the South. Therefore, a compromise should be found to reconcile the right to knowledge and the protection of intellectual property.

In its Constitution, UNESCO has set itself to "promote the free flow of ideas by word and image", as well as "to give the people of all countries access to the printed and published materials produced by any of them". In the fields of education and research, the World Report abides by the principles of the International Council for Science (ICSU), according to which scientific progress requires a free and integral access to the data.

The UNESCO World Report puts forth several proposals:

• **To encourage equal and universal access to knowledge**

With due respect to the policies and legislations about intellectual property, the Member States are encouraged to promote an equal and universal access to knowledge for the advance in knowledge and generalization of education.

• **To progress towards a normative approach of the knowledge on the Internet**

It will be advisable to encourage the setting-up of standards and of objective criteria to identify, with the use of the Net surfers, the Internet sites whose information is particularly reliable and is characterized by its quality. Such a normative work, done by public, private institutions and nongovernmental organizations, could lead to the introduction of seals of quality covering a broad range of knowledge.

[See chapters 2, 5 and 10 of the World Report "Towards the societies of knowledge"]

To invest in basic education

The right to education has been universally proclaimed as a human right, but many people still do not enjoy it. Approximately 100 million children do not receive any education. Some 800 million adults are illiterate, with a particularly strong geographical concentration in South Asia and sub-Saharan Africa. At the time of the Summit of Dakar (April 2000), the international community laid down six objectives:

1. Expanding and improving comprehensive early childhood care and education, especially for the most vulnerable and disadvantaged children;

2. Ensuring that by 2015 all children, particularly girls, children in difficult circumstances and those belonging to ethnic minorities, have access to, and complete, primary education of good quality.

3. Ensuring that the educational needs for all young people and adults are met through equitable access to appropriate learning and life-skills programmes.

4. Achieving a 50 per cent improvement in levels of adult illiteracy by 2015, especially for women, and equitable access to the programmes of basic education and lifelong education for all adults.

5. Eliminating gender disparities in primary and secondary education by 2005 and achieving gender equality in education by 2015, with a focus on ensuring girls' full and equal access to, and achievement in, basic education of good quality.

6. Improving all the aspects of the quality of education and ensuring excellence of all so that recognized and measurable learning outcomes are achieved by all, especially in literacy, numeracy and essential life skills.

In 2004, 35 countries were still far from achieving these goals. The fight against illiteracy thus remains a top priority. These objectives are not unrealistic, but require a strong political good-will and enhanced means. Thus Senegal decided in 2004 to allocate nearly 40% of its budget to education. The World Report stresses the importance of trained teaching staff, who must teach the pupils old and new forms of knowledge. However, in a great number of countries, one notes a crisis of the recruitment of the teachers, due to the poor social status of teachers, the difficulties of the job in a number of local contexts, and the fact that teachers are poorly paid when compared with other jobs which require a similar educational level and diplomas.

The UNESCO World Report puts forth several proposals:

• To invest more in quality education
The countries should earmark a significant part of their GNP to education expenses and implement the principle according to which no State seriously committed for basic education will be thwarted in its endeavours by a lack of resources.

• To increase the international assistance intended for education
The donor countries should commit to increase the percentage of the assistance intended for education and to make it flexible and sustainable. They should in particular commit to providing to the countries the complementary resources necessary to achieve the goal of a universal primary education.

• To improve the status of teachers
National institutions must grant the teachers a social recognition and a salary in keeping with their competences and the crucial part they play in the development of knowledge societies.

[See chapter 4 of the World Report "Towards knowledge societies "]

Transformations in higher education

Higher education is currently confronted with major changes: the boom of manpower and the necessary evolution of curricula.

The fast increase in manpower poses huge problems of management to institutions of higher education. If one must be pleased with the democratisation of the access to the knowledge, the increasing number of students should not harm the quality of teaching.

Universities will undergo deep changes, because of globalization. The international mobility of students and teachers in higher education is a powerful factor of integration for societies and dissemination of knowledge. To support it, the European Union standardized higher education in its 25 Member States. The Erasmus programme allows more than 1,2 million students to study in another Member State. However this new mobility should not result in a brain drain, emptying the countries of the South and even some countries of the North of their scientific and intellectual assets. Universities are key institutions for the generalization of knowledge societies. Some of them changed their organization. Some institutions generalized the experiments of distance education to reach populations who did not have an access to higher education for geographical or professional reasons.

The African Virtual University committed to bridge the digital divide and the knowledge divide between sub-Saharan Africa and the rest of the world thanks to modern technologies (Internet and satellite). This project offers quality teaching at a reasonable price, aiming at training a new generation of scientists, engineers, technicians and managers, able to promote the development of their countries.

Lecture is no longer the only model. The rigid memorization of a predetermined content is no longer the core of training; hence a need for trained teachers. However in the countries of the South, the precariousness of the living conditions of teachers in higher education does not always enable them to access the training they need. The inertia of many old-fashioned universities often widens the gap with the needs of the populations. Everywhere the adjustment of the university programmes to the changes of the labour market proves to be difficult. Moreover, the increasing financial needs for higher education call into question the principle of free education, with the risk of making access to education even more difficult.

The World Report puts forth several recommendations:
- **To promote access to higher education without discrimination.**
- **To put universities at the service of the policies of lifelong education for all by the adjustment of diversified rhythms.**
- **To encourage partnerships between the most developed university centres and universities of the South.**

[See chapter 5 of the World Report "Towards knowledge societies"]

Science education and the research revolution

Knowledge societies require specific skills and a higher level of investment in capital and human resources. At a time when these needs keep increasing, the number of students and researchers in sciences is however decreasing in a certain number of countries, in particular in industrialized countries. The trend is all the harder to track since no statistical analysis has yet been conducted on an international scale. In France, the number of enrolments in first year in sciences at university decreased from 63.000 to 50.000 between 1995 and 2000 and the trend goes on. One observes similar evolutions in Germany, in the United Kingdom, in the Netherlands and in a number of other countries.

What are the reasons of this loss of interest in science? Scientific careers are difficult, poorly paid and scientists enjoy poor recognition. During the debates on GMOs, it appeared clearly that science's beneficent image is no longer accepted as a matter of course. Lately, in many countries, researchers have been confronted with an increasingly precarious situation. Numbers of them still depend, well beyond thirty years, on grants or provisional contracts.

If the career of researcher continues to lose its lustre, two major consequences are to be feared. On the one hand, the staff with technical and scientific training will be in a definitely insufficient number to meet the needs of society. In addition, in order to make up for the shortage of researchers and engineers, the richest countries are likely to continue to poach large numbers of scientists in the poorest countries, thus making the brain drain worse. Several countries launched initiatives to foster interest in sciences among young people and to encourage vocations in the field of research.

In South Africa, the government organized the National Science Week, for young people in primary education up to the higher education sector and for the actors who have an influence on the choice of career of the pupils and the students (families, teachers, media…)

The UNESCO World report sets three priorities:
• **Raising awareness among young people about sciences**
The initiatives aiming at encouraging the pupils to become interested in scientific issues must be promoted at and out of school and largely echoed in the media.

• **Improvement of the condition of the researchers and increase in the investment in scientific research**
The budgets devoted to scientific and technological research must be strongly increased, not only to improve the conditions of researchers, but to take up the new challenges launched by rise of knowledge societies, which relies on massive investments in research and development, both public and private.

• **Setting up bridges between the public and the private sector**
It is necessary to accompany the move from the public sector to the private sector and vice versa, so as to enlarge the scope of the courses of researchers and to diversify the modes of recruitment of the innovation and research centres.

[See chapter 7 of the world Report "Towards knowledge societies"]

The brain drain

If the mobility of the intelligence is a need for scientific communities, it becomes problematic when scientists tend to gather in certain places to the detriment of others, widening existing divides or creating new ones.

The phenomenon of brain drain such as we know it appeared in industrialized countries: the post-war period was a time of exodus of scientists towards the United States, from the United Kingdom, Germany and Canada mainly. The phenomenon of brain drain developed in the 1990s with the rise of communication and information technologies, which increases the demand for qualified staff, in research and education. The risk of brain drain is particularly serious when the country of origin does not benefit from it at all, because its most promising students study abroad. More often than not, they do not return in their country. As shown previously, the risk of brain drain is becoming worse, because of the crisis of science education in a number of industrialized countries and of the shortage of researchers and engineers in these countries.

A vicious circle is set up, attracting researchers in industrialized countries by offering them good salaries, to attract the best brains of the planet who enjoy not only higher wages, but also better means and optimal working conditions. It leads to an increased concentration of the search for excellence in the most developed areas, and the phenomenon is reinforced by the fact that companies tend to set up their most advanced laboratories and advanced technology industries there.

The brain drain is thus one of the principal difficulties that arise if we want knowledge societies to be shared knowledge societies in the future. To quote from the president of Senegal, Abdoulaye Wade, *"For decades, the developing countries have been training graduates who are absorbed by the economy of developed countries when they have completed their studies"*. This brain drain does not have only a financial cost; it tends to accentuate the scientific divide between North and South.

The phenomenon affects also some industrialized countries which did not invest sufficiently in research activities. A new wave of brain drain of North towards North is occurring: for several decades, a great number of European researchers have settled indeed in the United States which, with more than 600 000 students accommodated in 2002, remains the first world destination for students and researchers. This trend, slowed down by the consequences of the attacks of September 11, is likely to accelerate because of the lack of resources and professional opportunities in the sector of research in many European countries.

Measures aiming at limiting the brain drain or at supporting their repatriation proved disappointing, because they address the symptoms (loss of competences) but not the causes of the drain. In addition to the fact that they are not very effective, they are in contradiction with the principle of freedom of movement of the researchers. It is thus advisable to support the circulation of competences without the scientists definitely leaving their country, and to promote policies that allow the societies of the South to be gradually transformed into knowledge societies.

[See chapter 10 of the world Report "Towards knowledge societies"]

**United Nations
Educational, Scientific and
Cultural Organization**

"Study-time entitlement"

With societies constantly changing, knowledge quickly becomes obsolete. It is a major factor of exclusion, in particular on the labour market. For this reason lifelong education is a response to the increasing instability of employment and trades. It also makes it possible to give a second chance to those who leave the education system at an early stage.

Vocational training for adults is too often neglected. Simple economic rationale encourages to invest in young people since the training costs of people who have already started a career are higher. Moreover, the success of vocational training is linked to the initial training.

Created by UNESCO, the International Commission on Education for the twenty-first century, chaired by Jacques Delors, launched the idea of "study-time entitlement", a sort of voucher that would entitle each individual to a certain number of years of training, after the end of the compulsory curriculum, to be used according to his/her choices, career and timetable. Such measures are not unrealistic, even if their implementation and their dissemination in many countries are long-term goals.

In 2002, Belgium set up a system of "study-time entitlement" for the employees of the private sector. Thanks to this credit, an employee (in particular women and workers over 50 years) can stop working during one year or work part-time to attend an appropriate training session. Meanwhile, they keep all their social rights. In the public sector, a person who is unemployed must replace the employee on leave. In 2002, the Swedish government set up a new instrument to finance vocational training: all the employees have the advisability of saving each year a free basic amount of taxes (approximately 4,240 euros in 2002) on an account devoted to individual training. These measures are making their way in other countries. In October 6th, 2005, the French Prime Minister made an appeal for the setting-up of a "study-time entitlement" allowing each one to resume studies during his professional life.

Lifelong education will not be always the privilege of rich countries. It is already on the list of goals of developing countries, because their economies change even more suddenly, making it necessary to adapt quickly. Accordingly, UNESCO was at the origin of the creation of Community training colleges, providing services of education to a diversified public, within the framework of the Asia-Pacific programme of education for all.

The UNESCO World Report recommends:
• **To increase the investments devoted to lifelong education**

• **To support the progressive setting-up of a credit of time-education**
Whenever it is possible, the governments, the private sector and the two sides of industry should investigate the possibility of setting up gradually, over the next decades, a "study-time entitlement" of education, which would give a right to a certain number of years of training after the end of the compulsory curricula, to be used by each one according to their choices, career, experiences and agenda.

[See chapter 4 of the world Report "Towards knowledge societies"]

To work in network: the collaboratory

Information technologies create the possibility of a new organization of scientific research. One can from now on set up a research programme relying on the skills of a team of researchers throughout the world, without distances being a problem.

Made after the words collaboration and laboratory, the term "collaboratory" stands for a research centre distributed. By exploiting communication and information technologies, it makes it possible for scientists who live in distant places to work together on the same project. The collaboratory made it possible to accelerate research which, carried out separately, would have caused the same work to be done twice and the waste of invaluable time for the scientific community. This form of organization allowed spectacular achievements within unhoped-for times. The decoding of the human genome is one of the most brilliant examples. One could mention other examples, in the field of medical research (AIDS, etc) or oceanographical.

Well aware of the potential profits in productivity thanks to networking, the twenty-five Member States of the European Union launched projects supporting interconnections. With technology GRID, the European Commission launched twelve research projects for a total of 52 million euros at the disposal of the service companies the data-processing resources used by the research laboratories. The users will be able to study any kind of phenomenon, from climatic changes to the behaviour of a car during a collision.

In the same way, the collaboration of Europe, of the United States, of Japan, the Federation of Russia and China in the project of international experimental engine with thermonuclear fusion (ITER) offers a remarkable example of the acceleration of the rhythm of research thanks to this type of organization. The principle of the collaboratory can create links, which are still too few, between the research centres of North and the South, as the partnership as regards nanotechnologies between Vietnam and the United States shows.

The potential of research in collaboratory is particularly promising in the fields of health and sustainable development. The setting-up at the beginning of 2004 in Africa of an international consortium of research intended to sequence the genome of the glossine, a fly carrying the parasite responsible for the sleep disease.

The UNESCO World Report puts forth the following proposals:
• **To facilitate networking**
In developing countries, work in network of the researchers can be encouraged through free software and toolboxes for virtual laboratories.

• **To develop work in collaboratory**
The installation of collaboratory could allow the creation of platforms of knowledge sharing, research and sustainable innovation between the various areas of the planet (North-South co-operation and South-South).

[See chapters 6 and 8 of the world Report "Towards knowledge societies"]

**United Nations
Educational, Scientific and
Cultural Organization**

Women in knowledge societies

Gender equality constitutes one of the principal challenges for emerging knowledge societies. Today, two thirds of the illiterates in the world are women and 29% of the girls are not given an education. Women are under-represented in the trades of teaching and scientific research.

Albeit equal *de jure*, men and women are not equal *de facto*. Poverty, gender discrimination, illiteracy, linguistic barriers and the shortage in computer skills significantly contribute to block access to the information society for women.

Thanks to communication and information technologies (Internet, telephony and television), the family hearth can also become a place for training or working (telecommuting). It is thus there a promising innovation in countries where women traditionally tend to remain at home. In developing countries, their participation in the knowledge economy would allow an acceleration of the rhythm of correction and a faster bridging of the world cognitive divide.

Empowerment of women can also be encouraged by practices of co-operative development or micro-credit. In developing countries, those support a practical form of education and associative activity.

UNESCO World Report recommends:
• **To promote women education**
The access of women to primary education, secondary education and higher education must be supported through appropriate means (grants, adapted schedules)

• **To increase the number of female teachers and researchers**

• **To have Ombudswomen**
The improvement of the insertion of the women and the fight against discriminations would be supported by the creation of Ombudswomen, also in charge of the follow-up of the achievement of the objectives of the Report.

[See chapter 10 of the world Report "Towards knowledge societies"]

To promote linguistic diversity

Half of the some 6.000 languages currently spoken in the world are likely to have died out by the end of the twenty-first century. According to some linguists, the phenomenon of language extinction is taking place on an even larger scale, and 90 to 95% of the languages currently spoken could disappear within one century. The appearance of new technologies is likely to foster this phenomenon because of homogenisation which rise accompanies by the common languages. Safeguarding linguistic diversity does not mean necessarily ignoring the languages of mass communication, but means that a two-fold course of instruction one strand being based on the lingua franca and giving access to the scientific knowledge, and the other provided in the mother tongue and covering more to what is called 'the humanities'. This proposal is not utopian, insofar as half of the human beings are bilingual.

From this point of view, UNESCO launched in 2001 the initiative "The awakening to languages", aiming at rehabilitating languages that are usually thought to be of less value. This initiative encourages pupils to address the problem of the transition to writing traditions that were primarily oral.

Three quarters of the pages of the Internet are written in English. However, the number of Net surfers for whom English is not the mother tongue exceeds from now on 50% and this figure has been steadily rising. Moreover, the Internet helps to bring language communities more closely together, especially when they are scattered, as is most strikingly illustrated by the Spanish-speaking world. This rebalancing should not benefit a restricted club of languages.

In its Recommendation concerning the Promotion and Use of the Multilingualism and Universal access to Cyberspace (October 2003), UNESCO called the States, the private sector and the civil society to support multilingualism on the Net. Microsoft decided to launch a Kiswahili edition of its Office software, Kiswahili being a main East-African language spoken by over 50 million people.

UNESCO World Report proposes:

• **To encourage bilingualism and, as far as possible, trilinguism in primary education.**

• **To promote linguistic diversity in the cyber space, relying on adapted technical devices:**
multilingual operating systems, automatic translation software, development of the non-Latin alphabets on the Net.

[See chapter 9 of the world Report "Towards knowledge societies"]

To develop local and indigenous knowledge

Cultural diversity is jeopardized. Each year, ancestral traditions disappear and indigenous cultures are marginalized. Far from being an obstacle to development, as many authorized people have claimed them to be for a long time, local and indigenous knowledge is invaluable. For example, the ancestral traditions of the Amazonian populations contain data that could be exploited commercially on a large scale.

Certain pharmaceutical or agro-alimentary firms lead active campaigns of bio-prospection. The mission of their teams is to draw the list of the genetic material that could be the object of research in laboratory. The local cultures of the populations therefore incur the risk of being plundered for commercial ends. It is a true bio-piracy, which fuels the mistrust of indigenous populations.

In order to solve the problem, maories medical practices in New Zealand are protected by "treaties" on medical knowledge, the practical use and the development of indigenous plants in association with the world foundations for research and health.

Local initiatives very often depend on the goodwill of the actors involved and prove therefore more or less successful, but they should be generalized. Under this perspective, it was decided, at the World Summit of Johannesburg, in 2002, that the convention of 1992 on biological diversity could provide an international legal framework for the establishment of legislations relating to the pooling of the outcomes of research on biodiversity. The fight against bio-piracy will be a strategic stake for the construction of knowledge societies.

UNESCO World Report puts forth the following proposals:

• To recognize the value of local knowledge, which must be regarded as integral part of knowledge and to be protected by appropriate means.

• To encourage the local initiatives to promote local knowledge in projects of sustainable development.

• To associate, at all levels, indigenous communities with the decision-making process.

[See chapter 9 of the world Report "Towards knowledge societies"]

How can we control risks?

Although knowledge societies are privileged tools of risk prevention on the short term (natural disasters) or on the long term (environmental pollution), they also create new risks that will have to be dealt with.

Natural disasters require suitable and fast response. New technologies ensure faster transmissions, an extension of the collection of information and a new effectiveness in the preparation of the populations. Even if risk zero does not exist, a prevention policy of the risks and disasters are now possible through the networks of actors.

The consequences of the tsunami of December 2004 (300,000 casualties) tragically revealed the scope of the cost in terms of human lives caused by the absence of an early warning system in the Indian Ocean. The need for such a system had been underlined for a long time by UNESCO, but the scarcity of the tsunamis on a great scale in the Indian Ocean and the Caribbean, and lack of resources had led the countries of the area to postpone its implementation. In Kobe, in January 2005, the United Nations decided to require UNESCO to set up a comprehensive system, making it possible to sound the alarm for any kind of natural risks: droughts, forest fires, floods, typhoons, hurricanes, tropical storms, earthquakes, landslides, volcanic eruptions or tsunamis.

Although less visible, environmental pollution (global heating, pollution, desertification, reduction of the biodiversity) endanger humanity on the long term. The concept of sustainable development (to meet present needs without jeopardizing future generations ability to meet their own) requires thinking at the same time of the short, medium and long term, by confronting a multiplicity of viewpoints. The debates on GMOs or on biodiversity showed the importance to foster interaction among scientists, decision-makers and consumers. New technologies, by the virtual forums they offer, create a new space of confrontation where such debates can take place.

At the same time, knowledge societies generate new risks, because they can enlarge the scope of criminal projects, as illustrated by the appearance of new terrorist organizations or by the spread of cyber-criminality. Criminal also profit from new networks. These risks justify the introduction of new methods of control.

UNESCO World Report recommends:
• **To set up prevention tools of natural risks**
The introduction of comprehensive devices, relying on local knowledge as well as on technological and scientific knowledge, will contribute to the prevention of all kinds of natural risks.

• **To share the environmental knowledge**
In order to meet the objectives of sustainable development, it is necessary to share knowledge between industrialized and developing countries within the framework of new partnerships.

[See chapter 8 of the world Report "Towards knowledge societies"]

Knowledge societies, freedom of expression and democracy

There are close links between knowledge, freedom of expression and democracy. The vote for all became an effective democratic reality only with the generalization of education for all and the existence of free and independent media. Knowledge is thus a pre-condition to the orientation of the political choices for the common good.

According to article 19 of the Universal Declaration of Human Rights of 1948: *"Everyone has the right to freedom of opinion and expression; this right includes freedom to hold opinions without interference and to seek, receive and impart information and ideas through any media and regardless of frontiers"*. The article takes on a new meaning at a time when knowledge societies are emerging.

Without freedom of expression, there can be no information society. The Internet offers individuals the means of realizing, on a new scale, what democratic constitutions already guarantee to the citizens. Communication and information technologies carry in them the promise of a development for all by the alliance of freedom of expression, knowledge, the democratic principles and the ideal of justice.

Moreover the work of Amartya Sen showed that freedom of expression could not be regarded as a principle limited to the political sphere. Because freedom of expression has a strong impact on the economic and social development, making it particularly useful for development. No famine, still observes Sen, ever occurred in an independent and democratic country, enjoying a relative freedom of the press. Famines stopped in India when a multi-party democracy was founded.

In certain cases, freedom of expression can nevertheless come into conflict with other universally proclaimed principles, as illustrated by speeches which incite to racial hatred, genocides or crimes against humanity… Communication and information technologies thus give rise to a reflection on issues such as control and censure of the information, free flow of data and information, the freedom of the press or the protection of the private life (personal data). After the attacks of September 11, the legislations of a number of State evolved in the direction of a reinforcement of the safety devices of national safety. However, the States are sometimes helpless given the evasive nature and the mass of information circulating on the Internet. It is also necessary to reconcile the protection of intellectual property with the promotion of the public domain of knowledge, an essential issue if universal access to knowledge is to be guaranteed.

The democratic crisis that many developed societies are undergoing today can be solved with the emergence of knowledge societies which include citizens in the decision-making process, as shown in the leading experiments of E-*Administration* or E-*Government*. Some see in them the premises of a model of prospective democracy, more participative, where every one can voice their opinion and where the number of forums increase. Knowledge societies could thus be the place of a renewal of the forms of democracy.

[See chapters 1 and 10 of the world Report "Towards knowledge societies"]

Can we afford knowledge societies?

The development of knowledge societies demands ambitious actions: to promote lifelong education for all, to generalize the efforts of research and development in all the countries of the world, to monitor the world circulation of skills, and that even in the most disadvantaged countries and to reduce the digital and knowledge divides. All that has a cost. Does the world have the means to promote knowledge societies at a world level?

It is necessary to invest long before being able to reap the benefits of knowledge societies. By 2015, the number of additional teachers is estimated between 15 and 35 million including more than 3 million for sub-Saharan Africa. That represents a considerable increase in budget expenses that these countries will doubtless not be to make. To reach universal access to primary school by 2015 in developing and in countries in transition, approximately 9 billion dollars additional per annum are needed, i.e. more than four times the amount currently allocated by the donor countries per year.

Are we doomed to lose hope? As pointed out it the UNICEF report 1999, the amount of the additional expenditure that would have to be authorized each year to carry out basic education for all is hardly higher than the expenditure in one year of the United States in cosmetic products or Europe in dairy ice creams. And we should bear in mind the fact that the military expenditure in the world represents now more than 1000 billion dollars (source: SIPRI).

The budgets of developing countries have hidden resources, mainly in the military. Important financings could be raised by courageous reforms improving the productivity of the public services, removing ineffective subsidies and fighting against corruption.

Access to knowledge societies does not only depend on the income or on the level of development. The recent initiative in favour of heavily indebted poor countries consisting in cancelling part of their debt is very encouraging. It is noted indeed that these countries took advantage of the reduction of their debt to increase the budget of education (40% of the resources thus recovered) as well as the budget for health (25% of the resources).

UNESCO World report contains several proposals:
• **To direct the government aid for development towards education.**
Donor countries should increase the government aid intended for education and make this help more foreseeable and sustainable. These countries should pledge to provide to the countries the complementary resources necessary to have a universal primary education.

• **To encourage debt swaps**
The international community should encourage the innovative methods of financing of education and research. Debt swaps are a tool to enable the creditors to cancel the refunding of the remaining debt, in exchange of a firm contract of indebted countries to invest these funds in activities of social and human development.

[See the conclusion of the world Report "Towards knowledge societies"]