## INFORMATION, SCIENCE AND TECHNOLOGY

# Digital gap, people gap

Access to communication technologies has generated new inequalities. More than four fifths of the people in the world do not have access to Internet and are therefore disadvantaged when it comes to making progress in production, education, and constructing full citizenship. In the most backwards regions, investment in new technologies is not geared to spreading them on a large scale.

**Social Watch Research Team**[1]

**Selected indicators:**

- Internet users (per 1,000 people)
- Personal computers (per 1,000 people)
- Telephone mainlines (per 1,000 people)
- Scientists and engineers in research and development (per million people)
- Expenditure on information and communication technology (% of GDP)
- Expenditure on research and development (% of GDP)

**TABLE 1. Personal computers per thousand people: the ten most disadvantaged countries by region**

| COUNTRIES | REGION | PERSONAL COMPUTERS PER 1,000 PEOPLE |
|---|---|---|
| Dominican Republic | Latin America and the Caribbean | 0.5 |
| Niger | Sub-Saharan Africa | 0.7 |
| Malawi | Sub-Saharan Africa | 1.6 |
| Chad | Sub-Saharan Africa | 1.6 |
| Burkina Faso | Sub-Saharan Africa | 2.2 |
| Central African Republic | Sub-Saharan Africa | 2.8 |
| Cambodia | East Asia and the Pacific | 2.8 |
| Angola | Sub-Saharan Africa | 3.2 |
| Ethiopia | Sub-Saharan Africa | 3.2 |
| Mali | Sub-Saharan Africa | 3.2 |

For some years now the experts have been talking about the potential of the new "information society" (and more recently about the "knowledge society"[2]), and the challenges and dangers it involves. The capability to manage information is increasingly important, and one consequence of this is that unequal access to communication technologies is currently generating new inequalities in terms of social development.

The global aim ought to be to achieve "computer literacy" for the widest possible range of people. In the information society, a world democratic order depends on equal participation for all in the global information flow. However, there are great inequalities in access to this flow, and this has been called "the digital gap". For example, at the present time 40% of the people in Canada and the United States have access to Internet, but in Latin America and the Caribbean the figure is only 2% or 3%. One of the main challenges facing the world in the new millennium is to narrow this gap.

In fact there is not just one digital gap but several, since people's access to current information systems is conditional upon a whole series of factors. UNESCO has listed economic resources, geography, age, gender, language, education, cultural background, employment and physical well-being as reasons why people may be "left out" when it comes to being able to make use of the new technologies.

Access to personal computers is a prerequisite for access to the new sources of information. Table 1 shows that the countries which are most deficient in this tool are all in the world's poorest regions, which are precisely the regions with the greatest need for insertion into the information society in order to make progress in other spheres like production and politics.

There are more than one billion Internet users on the planet and this has been a great success story, but more than four fifths of the people in the world still do not have access to Internet and are therefore being held back in various ways from making progress in production, education and the construction of citizenship. According to UNESCO, 90% of Internet users are in the industrialized countries.

One measure of inequality is the availability of access to broadband, and this is and will continue to be problematic. According to the United Nations Trade and Development Conference, some countries have made spectacular progress in this respect. China, for example, jumped from almost no broadband subscribers to 23 million in just three years. But at the other end of the scale there are some least developed countries that do not even have statistics about broadband access.

Some governments have placed restrictions on access to Internet, and this goes to show just what a powerful political tool it is for shaping public opinion. Internet may not have turned out to be as pluralistic, horizontal, open, democratic or decentralized as its early promise suggested since there are control mechanisms that can be used to restrict it, but it is still the most participative means of mass communication.

Broadly speaking, technological scientific development in a country depends to a large extent on government decisions, and indicators such as public spending on research and development (R&D) can give a clear idea of how governments are performing in this respect. Public investment in R&D as a percentage of Gross Domestic Product (GDP) is high in the countries that belong to the Organization for Economic Cooperation and Development (OECD), where the average is 2.2% and the top investors, relatively speaking, are Israel (4.7%) and Sweden (4.0%).[3] But what is worrying here is that the rate in most underdeveloped countries is under 0.2%. For example, at the start of the millennium the Arab countries in North Africa and Asia were allocating only 0.1% of GDP to R&D.

It has been calculated that in Latin America and the Caribbean more than USD 20 billion has been invested in private telecommunications projects, while in the Middle East, Southern Asia and sub-Saharan Africa less than USD 2 billion has been invested in information and communication technology (ICT). To make matters worse, the investment in ICT that there is in these countries is very often just private initiatives to provide services for wealthy users in urban areas, and is not geared to the large scale diffusion of these technologies.

It is clear that State investment is a key factor. This is confirmed by the fact that experiences that are successful in terms of scientific and technological progress usually enjoy solid support from the government. This is what is happening in China, where the current surge in ICT has been underpinned by a big increase in State investment in R&D, which jumped from 0.83% of GDP in 1999 to 1.23% in 2002.[4] China's recent progress not only in ICT but

1 The members of the Social Watch Social Sciences Research Team are listed on the credits page at the start of this book.

2 UNESCO (2005a). *World Report: Towards Knowledge Societies*. Paris: UNESCO Publishing.

3 *Ibid*, p. 110.

4 UNESCO (2005b). *UNESCO Science Report 2005*. Paris: UNESCO Publishing.

## TABLE 3. Averages by indicator of the countries in better and worse relative situations in science and technology

| | | INTERNET USERS (PER 1,000 PEOPLE) | PERSONAL COMPUTERS (PER 1,000 PEOPLE) | TELEPHONE MAINLINES (PER 1,000 PEOPLE) | EXPENDITURE ON INFORMATION AND COMMUNICATION TECHNOLOGIES (% OF GDP) | EXPENDITURE ON RESEARCH AND DEVELOPMENT (% OF GDP) | SCIENTISTS AND ENGINEERS IN RESEARCH AND DEVELOPMENT (PER MILLION PEOPLE) |
|---|---|---|---|---|---|---|---|
| Countries in better situation | Average | 570 | 564 | 565 | 6.76 | 2.40 | 3,972 |
| | Number of countries | 26 | 26 | 26 | 20 | 22 | 22 |
| Countries in worse situation | Average | 31 | 26 | 52 | 4.51 | 0.29 | 308 |
| | Number of countries | 87 | 84 | 87 | 17 | 29 | 37 |
| Total of countries | Average | 206 | 159 | 180 | 5.76 | 0.95 | 1,409 |
| | Number of countries | 176 | 172 | 176 | 69 | 92 | 103 |

also in biotechnology and new materials development has been largely based on financial support from the government.

Another key statistic is the amount of human capital that each country has, in terms of researchers and scientists. It has been reported[5] that only 3% of the world's researchers are in Latin American and the Caribbean, and, as regions go, this is not in the worst situation. These deficiencies serve to perpetuate a vicious circle which denies under-developed countries the tools they need to make progress towards sustainable development.

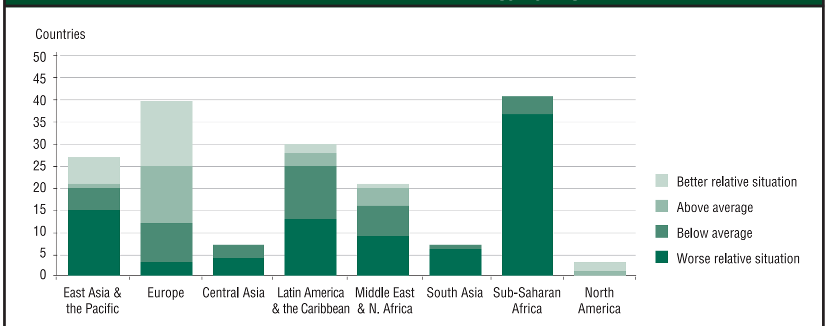
In some countries there is almost no generalized access to "techno-science", and this seriously impairs their development prospects. In others there are sectors that are linked to the information society, but there are also sectors that are very far indeed from any connection with how the modern world works. This schism can be found in India, for example, and in various Latin American countries, and it amounts to a chasm that cuts right across society. There are basic skills to do with people's cognitive capabilities, and acquiring these skills depends on whether or not an individual has access to, and can participate in, the world of scientific and technological information.

Put simply, a country's ability to take advantage of the new information systems is connected to its capacity to revalue its culture, traditions and values, and this revaluation should involve full integration into the modern world. If a poor country cannot do this it will remain as a receiver of information and it will be limited to a passive role in the information society. A country's development is directly connected to ICT tools, and this also applies to political aspects that have to do with sovereignty.

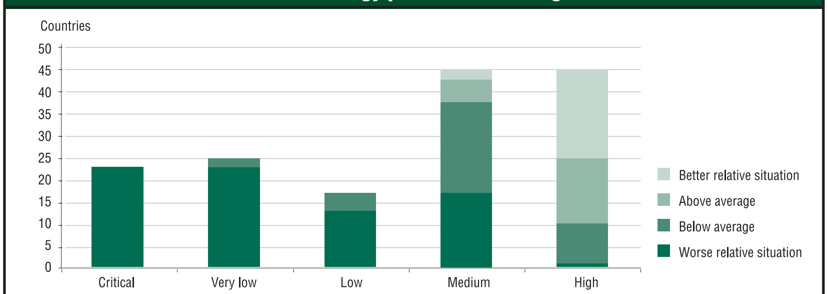
It has often been said in recent years that access to these technologies is directly linked to other dimensions of social development. The way that gender inequality, education and reproductive health are managed in a society is closely connected to the way and the extent to which that society accesses modern information and communication systems.

The countries that according to the Basic Capabilities Index (BCI) rank as developed are mostly in a

## CHART 1. Current situation of science and technology by regions




## CHART 2. Final science and technology position according to BCI




## TABLE 2. Current situation by evolution in science and technology

| | SIGNIFICANT REGRESSION | SLIGHT REGRESSION | STAGNATION | SLIGHT PROGRESS | SIGNIFICANT PROGRESS | TOTAL |
|---|---|---|---|---|---|---|
| Countries in worse situation | 0 | 2 | 12 | 66 | 7 | 87 |
| Countries below average | 0 | 0 | 9 | 22 | 10 | 41 |
| Countries above average | 0 | 0 | 0 | 9 | 13 | 22 |
| Countries in better situation | 0 | 0 | 1 | 15 | 9 | 25 |
| Total | 0 | 2 | 22 | 112 | 39 | 175 |

favourable situation as regards information, science and technology. This relation is not as marked as in other areas of development but it is clear enough, although there are some exceptions, like Cuba for example.

It is also worth noting that nearly all the countries for which information is available made progress in information, science and technology. Only Kazakhstan and Tajikistan showed regression on this indicator.

The overall geographical picture is that, like in so many other dimensions of development, sub-Saharan Africa is the region in the worst situation as regards technological development, and it is particularly backward in ICT. All the sub-Saharan countries are below the world average, and nearly 90% of them are in a worse relative situation.

The digital gap between the countries where science and technology are more developed and those that are most backward is huge. Access to personal computers is an important indicator in this area. In the more developed countries there are 563 computers per 1,000 people but in the most backward there are only around 25 per 1,000 people, which is to say there are 20 times more in the developed world. That is just one measure of the size of the digital gap. ■

5 Red de Indicadores de Ciencia y Tecnología (2003). "El Estado de la Ciencia. Inversión en I+D: un período de fluctuaciones". Available from: <www.ricyt.org/interior/difusion/pubs/elc2003/3.pdf>.