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COMMUNICATION FROM THE COMMISSION
TO THE COUNCIL AND THE EUROPEAN PARLIAMENT

Information and Communication Technologies in Development

The role of ICTs in EC development policy

1.   INTRODUCTION

The rapid market and technological advances that are taking place in the area of information and communications technologies (ICTs) have an impact on almost all areas of society, not only in the north, but also in **developing countries**.

While the socalled **'digital revolution'** generates truly global information flows and profoundly changes the way businesses, markets and politics work, the term **'digital divide'** indicates that not everybody benefits from these revolutionary changes. There is a wide gap between those who have access to ICTs and those who have not.

One third of the world's population has never made a telephone call. More than 3 billion people have no money to spend on communication services, or live in rural and remote areas, where access to information and communications technologies is scarce or absent. These facts are disturbing, but do not – as such – provide sufficient reason to incorporate the promotion of ICTs in development cooperation efforts. After all, one may question the relevance of talking about access to computers if the same people do not have electricity or clean drinking water. Development budgets are limited and development policy is a matter of setting priorities.

This Communication makes one step forward. It is argued that, while ICTs are not to be seen as a priority sector as such for Community development cooperation, they do provide an **important tool** for more efficient and effective aid delivery and need to be recognised as an **increasingly important element** in the economic and social fabric of countries world-wide.

Furthermore, this Communication also recognises that assisting the poor to obtain **access to ICTs** can indeed contribute to the fight against poverty. As stated in the Communication on the new EC development policy[1], poverty should not be defined merely as a lack of income and financial resources. It also includes the deprivation of basic capabilities and the lack of access to education, health, natural resources, employment, land and credit, political participation, services and infrastructure. When and where developing countries try to provide their citizens access to knowledge, information, and communications at affordable prices, these efforts may therefore under certain circumstances qualify for support under the EC development cooperation programmes.

This communication starts with a short introduction on the **term ICTs** and the activities of the **international donor community** in this area. Then it describes how the use of **ICT tools** can improve the effectiveness of development cooperation programmes. Subsequently it presents a section about how ICTs are currently used by developing countries, and what **risks and constraints** these countries are facing when they want to increase the utilisation level of ICTs in their society. The following section presents elements of a **possible policy framework** to address these risks and to overcome these constraints. Finally this Communication summarises what, according to the Commission, the **future role of the EU and the future actions of the EC** in this area should be.

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[1]   COM(2000)212 final, 26 April 2000, p.16.

2. DEFINITION: WHAT ARE icts?

Information and communications technologies (ICTs) is a term which is currently used to denote a wide range of *services*, *applications*, and *technologies*, using various types of *equipment* and *software*, often running over telecom *networks*.

ICTs include well known telecom *services* such as **telephony**, **mobile telephony** and **fax**. Telecom services used together with computer hardware and software form the basis for a range of other services, including **email**, the **transfer of files** from one computer to another, and, in particular, the **Internet**, which potentially allows all computers to be connected, thereby giving access to sources of knowledge and information stored on computers worldwide.

Applications include **videoconferencing, teleworking, distance learning, management information systems, stock taking**; *technologies* can be said to include a broad array ranging from 'old' technologies such as **radio** and **TV** to 'new' ones such as **cellular mobile** communications; while *networks* may be comprised of copper or fibre optic cable, wireless or cellular mobile links, and satellite links. *Equipment* includes telephone handsets, computers, and network elements such as base stations for wireless service; while *software* programmes are the lifeblood of all these components, the sets of instructions behind everything from operating systems to the Internet.

Thus services as basic as telephony are at issue, as well as applications as complex as "telemetering", for example, to remotely monitor water conditions as part of a flood forecasting system. Indeed, **many services and applications can be made available as soon as telephone service is provided:** the same type of technologies that are used to transmit voice can also transmit fax, data, and digitally compressed video.

The importance of ICTs is not the technology as such, but its enabling function in access to knowledge, information, and communications: increasingly important elements in today's economic and social interaction. ICTs have **characteristics** that are partly similar to other areas of infrastructure, such as roads, postal services and railroads, and that are partly different and specific.

- Just like the classical areas of infrastructure, ICTs are enabling and facilitating technologies. Individuals, community groups, businesses or government departments with access to affordable communications and computers can use them to **save time and money** and improve the **quality** of their work or home lives, whether in developed or developing countries. Phone calls, fax or email messages are usually cheaper, quicker and/or more reliable than postal or courier services.

- Setting up ICTs infrastructure **requires very high investments**, and traditionally assumed a dominant role of the national state and parastatal entities. However, as compared to other infrastructure the economy of ICTs appears to be more **dynamic**. Continuing technological changes are making equipment and usage costs progressively cheaper; computer memory and speed are continuously increasing; costs of transmission and computer components are falling; the range of services and applications is expanding, as is the capacity and potential connectivity of the Internet.

- Increased use of ICTs allows for unparalleled access to **information and knowledge** as well as to the means to use that information. Arguably the Internet potentially represents the largest transfer of technology and know-how seen to date. The need for a certain level

of **externalities** is also a particular characteristic of telecommunications networks. The value of telephone or Internet service depends on the number of people that can be reached. An unconnected computer is much less useful than a connected one. The value of access to a network increases exponentially with the number of people that can be reached on that network.

3.   ICTS AND THE INTERNATIONAL DONOR COMMUNITY

One of the first events where the international community addressed the subject of ICTs and development was at a **G7 Conference on the Information Society** hosted by the EU in **Brussels** in 1995. The Conference expressed concern about the digital gap separating the industrial countries from the developing countries and called for "a shared vision of human enrichment". It called for the integration of all countries into a global effort, as this would provide countries in transition and developing countries with opportunities to leapfrog stages of technological development and to stimulate social and economic progress.

The Brussels conference led to one of the first conferences specifically devoted to information society and development, which was held in 1996 in Midrand, South Africa. The **Midrand Conference** provided a forum for a first reflection between developed and developing countries on the **common rules** required, the areas of co-operation towards building the global information society, and the **priorities for development**.

Within the UN system, the **International Telecommunications Union (ITU)** plays a key role in the area of telecommunications: setting standards for frequency spectrum management, interconnection standards, telecom regulatory issues, accounting rates, etc. Through its Telecommunications Development Bureau, ITU also provides technical assistance to its developing country members. ITU is co-ordinating on behalf of the UN system the preparation of the forthcoming **World Summit on Information Society**, which is to be organised in two phases, the first one in Geneva in 2003 and the second one in Tunis in 2005.

Several other international organisations are active in ICT issues within their respective remits. The **WTO** adopted in 1996 an Agreement on Trade in Information Technology Products to provide for the elimination of duties on a large number of IT products (there are currently 55 signatories to this agreement; developing countries have been granted extended transitional periods for some products). The WTO concluded in 1997 an agreement on telecommunications services that opened market for investments and introduced pro-competitive regulatory frameworks in a number of countries: countries acceding the WTO afterwards (which are all developing countries) all adopted also this model. In 1998 the WTO adopted a declaration introducing a moratorium on customs duties for electronic supplies. It also launched a work programme to study the application of trade rules to e-commerce, including its impact on developing countries. Since the beginning of the Year 2000, the WTO has embarked upon negotiations for all services to further liberalisation and investment.

In 1998 the **OECD** has introduced socalled Taxation Framework Conditions for e.commerce among its members. **UNESCO** and **WHO** are exploring the role of ICT in education and health respectively. Of the UN Economic Commissions, the **Economic Commission for Africa** has been particularly active in supporting analytic work and policy formulation in the context of the African Information Society Initiative. Building partly on this work, the **New African Initiative** that was launched by a group of five African Leaders in July 2001 called for African states to "extricate themselves and the continent from underdevelopment and exclusion in a globalising world". ICTs feature explicitly as part of the overall strategy.

The **World Economic Forum**, the think tank of world leaders meeting regularly in Davos, has launched in 2000 a Global Digital Initiative to transform the digital divide into an opportunity for growth. The Task Force created for the purpose has been very active, particularly in connection with the G8 process.

At the occasion of its millennium session, the **UN General Assembly** paid special attention to ICTs on the basis of a report by a high-level panel of experts. It acknowledged the existence of a widening digital divide and the need to narrow the gap between developed and developing countries. A **UN ICT Task Force** has thus been created as a practical step aimed at strengthening the UN system's role and leadership and in developing effective partnerships with the private sector, civil society and other relevant stakeholders. The July 2001 ECOSOC session revisited the theme of ICTs with a special emphasis on knowledge networks.

A very important actor is also the **World Bank.** Its wide and diversified portfolio of activities include support for telecom reform, the financing of innovative pilot projects (InfoDev), applications for distance education (e.g. African Virtual University, cofinanced by the EC) and the creation of knowledge tools (Global Development Gateway).

In recent years also the **UNDP** has shown to be a creative and proactive player. It launched several initiatives and partnerships with the private sector and foundations. It implemented country-level assistance to build national strategies, and contributed to the general policy debate. The 2001 Human Development Report focuses on the role of new technologies in development.

Another active forum for discussion is the **G8.** At the Okinawa Summit of July 2000 the G8 produced the 'Okinawa Charter' on the global information society and created a 'Digital Opportunity Task Force'. The '**DOT Force'**, as it is colloquially known, produced a report, *'Digital Opportunities for all: meeting the challenge'*, that was submitted to the **G8 Summit in Genoa** in July 2001. The report is the result of a unique international collaboration effort over several months among representatives of the G8 countries plus the European Commission, nine developing countries, multilateral organisations, and both the private sector and non-governmental organisations. It has charted the roles and responsibilities of the various actors - national governments, the private sector, civil society organisations, international organisations - in creating digital opportunities for all.

The DOT Force report concluded that, when wisely applied, ICTs offer enormous opportunities to narrow social and economic inequalities and support sustainable local wealth creation, and thus help to achieve the broader development goals that the international community has set. The report acknowledged that ICTs are no panacea for all development problems, but by improving communication and exchange of information, they can create powerful social and economic networks, which in turn provide the basis for major advances in development.

Both in the context of the international policy debate on ICTs and as regards the provision of operational support the **EU institutions** have played a very active and sometimes leading role. The EC and its member states have been active participants in various international policy initiatives mentioned above. The **European Parliament** has spoken clearly on the subject, notably with the adoption of a resolution on ICT and developing countries on the basis of a report by Mrs Dybkjaer[2]. The resolution clearly puts the new technologies in the context of

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[2]   Doc A5-0191/2001.

poverty alleviation and the need to ensure that poor people benefit from it. As a donor the **Commission**, and also the **EIB**, have shown an increasing interest and capacity to integrate ICTs in the EC development cooperation efforts (for more details see section 7).

4. ICTS AS A TOOL FOR DEVELOPMENT COOPERATION

The use of ICTs within development cooperation is not an end in itself. It is a means of **enhancing the effectiveness** of development activities. Like finance, or expertise, or cars or books, it may be seen as a **tool** for development programs and other areas of the economy and social infrastructure.

Following an invitation by Member States, the Commission undertook a review of the use of ICTs in EC development programs in Asia, Latin America and the Mediterranean (**IS-ALAMED Review**) which was published in January 2001[3]. The Review clearly indicates that ICTs are already being used across the board in EC project portfolio.

In the context of development programmes, ICTs have been shown to fulfil several functions:

- **enabling** an activity to be undertaken, perhaps by reducing costs so that something can be done which would previously have been too expensive. For example, a Community-funded project in Bangladesh aiming at infrastructure development in cyclone-prone areas, prepares new coastal maps from aerial photographs. This would have been too expensive without the use of ICTs[4].

- playing a **facilitating** role in support of development objectives in which ICTs *per se* may not be significant. Computer databases simplify the tasks previously performed manually. An immunisation programme, say, may in principle be more effective if the records needed for it are kept in a computer database rather than on a card index file.

- **creating the opportunity** for a development activity which was not previously technically feasible, such as a telemedicine project based on videoconferencing, or teaching languages via the Internet.

- **disseminating** knowledge or expertise. A programme in China, for example, using computer databases and the Internet, seeks to promote IPR (Intellectual Property Rights) protection by raising awareness and disseminating information[5].

- allowing **adaptation to local needs**. The most recent technologies (Internet, language technologies, graphics) allow ease of use also for those who have only basic education and speak no other languages. It is possible now to build graphical user interfaces which, for simple functions, do not require literacy.

However, the ALAMED review also showed that **no systematic approach** or methodology has been devised or followed for using ICTs to enhance development projects and programmes. Certain project officers and technical assistance incorporated the technology into projects. Others did not. It therefore seems advisable to introduce a more systemic

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[3]   See: http://europa.eu.int/comm/external_relations/info_soc_dev/index.htm.
[4]   ALAMED Review: Coastal mapping – infrastructure development in cyclone-prone areas, Bangladesh.
[5]   ALAMED Review: EU-China intellectual property rights (IPR) programme.

approach to the use of ICTs in development, including the accurate monitoring of the cost-efficiency of using ICTs, based on performance indicators.

5. THE USE OF ICTS IN DEVELOPING COUNTRIES

While quickly increasing, the current level of access to ICTs for developing countries is still **very low**. In 1998 the figures of telecom access (both fixed and mobile) per 100 inhabitants were 72.1 for OECD countries and 7.8 for non-OECD countries. While over 30% of people in developed countries have Internet access, the percentage is less than 2% in developing countries[6].

Despite these low figures one has to bear in mind that telecom and ICTs are **already important** to the functioning of developing countries and emerging economies today. Large businesses and governments depend on their communications networks and computer applications to **function effectively** in terms of administration, analysis and information dissemination, and to **reduce transaction costs**, whether it be for airlines, banking, exports, financial services, taxation or tourism. Likewise, the production of '**information services**' is playing an important role in some economies (for example software production in India).

In addition to its relevance for the economy and state at large, ICTs are increasingly utilised by individual users in developing countries. Obviously, it is only where telephone service and other ICTs are **available** that they are extensively used – and then only by those who can **afford** them. The users are those who can afford a telephone at home (or who can access one at work), or who live in those parts of the urban areas which are well-served. This is still a very small group. Nearly 90% of the telephone connections in India are in urban areas, even though three quarters of the population lives in rural areas. In many other countries, and notably in least-developed countries, the availability of ICTs for poor people is far lower. African LDCs show an average 'teledensity' of 0,6%, which means that there are only 6 fixed telephone connections for every 1000 people[7].

It is evident that this uneven access to ICTs, and thus to the development opportunities they create, both **reflects and exacerbates** existing **inequalities** between and within countries. The 'digital divide' adds to existing and general socio-economic realities.

The constraints facing developing countries are many and varied. Several of them also seriously hamper their ability to develop ICTs. These **general challenges** include:

- increasing the **purchasing power** of the poor

- **training** and building human capacity

- raising levels of **literacy**

- improving electricity **supplies**

- accessing **capital** and attracting **investments**

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[6]   ITU Telecommunication Indicators Update, ITU News, No 2, March 2001.
[7]   ITU Telecommunications and Information and Communication Technologies in the Least Developed Countries 1989-1999, Geneva, 2001.

The World Bank has estimated that some € 350 billion would be needed to upgrade the telecom infrastructure in developing countries and emerging economies. For comparison, global ODA (Official Development Assistance) stood at around € 40 billion in 2000. It is obvious that governments of developing countries, with limited means and many pressing priorities, will never be able to pay this bill. It is hence for the **private sector** and the **market** to deliver the goods.

As yet the level of involvement of the private sector is limited. At first sight one may think that this is a logical consequence of the fact that there is no prosperous consumer market to sell to. However, experience in countries like Uganda has demonstrated that telecom demands are highly price-elastic and that usage levels of mobile phones amongst all sections of the population, including the poor, increase very rapidly once prices are brought down. There is therefore a vicious circle that needs to be broken into. The more services are consumed, the greater the operator's profitability, the more it can deploy networks, the better it is able to meet demand, lower its prices, and so on. Against this background, developing countries are faced with a second, and more **specific set of constraints**, such as

- **lack of appropriate ICT policies.** Many developing countries do not have a coherent strategy for ICTs in general, as appropriate for their own situation and level of development. Such a comprehensive strategy usually include issues underpinning the information society as a whole, related to access to knowledge, electronic commerce, fair and open competition, local content, ICT awareness, training, privacy, dispute resolution, intellectual property rights, copyright, and consumer protection, as well as a focus on the use of ICTs in sectors such as health and education.

- **absence of appropriate regulatory framework.** Through such a framework, developing countries would create conditions for increasing the geographic spread of telecom infrastructure, for introducing lower prices for services, for addressing inequity, for defining the role and responsibilities of regulators and companies, for overcoming weaknesses in connectivity, for providing legal security for potential investors, etc.

- **high tariffs on imported products.** Very high levels of import duty are being imposed on computers (up to 30% in some cases), cellular phones (up to 15%), peripherals (up to 55%) and software in many countries.

While a number of countries have already created impressive national ICT strategies, implementation of these strategies is often held up by the high cost of access to telecom services. These services are currently provided largely under conditions of monopoly, which tend to be slow to deal with unmet demand, charge relatively high prices, and provide comparatively poor service.

In this context, possibly the single most important step that can be taken by many developing countries in order to increase access to telecom and ICTs is for the regulatory framework to **introduce competition** into the sector. Indeed, as many others, the DOT Force report specifically refers to the need to support developing countries in their efforts to put in place a pro-competitive policy and regulatory environment, as a pre-requisite for the establishment of an up-to-date communications infrastructure.

But allowing other players to enter the sector is by no means the only aspect of the required regulatory framework. Pro-competitive policies may stimulate growth and wealth creation, but they will not necessarily address the problems of poor populations or remote areas. They may **actually increase wealth differentials** and produce **uneven development**. Market

liberalisation processes therefore have to be designed to lead to affordable access to ICTs also for poor populations and regions, and should take place as part of a package of measures involving the private and public sectors and other stakeholders, particularly civil society. ICT policies should be conducive to a broader strategy stimulating equitable economic development and trade, promoting education and capacity building, and improving the delivery of social services, to which ICTs can add value.

6. ISSUES ASSOCIATED WITH AN ICT POLICY FRAMEWORK

As noted above, the weaknesses in the **availability** of telecom infrastructures and the shortcomings in **affordable pricing** for telecom services and ICT equipment are the major obstacles for accessing and using ICTs in developing countries and emerging economies. A large part of the answer lies in implementing **policy changes** that aim at increasing the coverage of telephone networks and reducing the price of services, and which draw on the possibilities opened up by **new technologies**.

Much has been launched already in developing countries, pushed by technology, by events in developed countries, by the regulatory provisions involved in the WTO negotiations, and by support from donors. Indeed, the ITU estimates that over 100 telecom regulatory authorities have now been set up around the world. However, more than ever has the realisation dawned that communications services and the way they are regulated are only part of the broader role which ICT's have started playing in the economy and every day's life. As a result, countries need to be able to pursue a broader vision and policy framework which encompasses policy areas such as economic planning, taxation and fiscal policy, education, health, and social services, justice and home affairs, etc.

There is now a very large body of experience on which to draw, both in developed and developing countries, and including policies that have worked as well as those that have not. The main policy lines include the following complementary and mutually supportive components.

6.1 Ownership

ICT related initiatives should be driven by user demands. New initiatives must be identified and realised through direct participation and ownership. This will help to ensure that the initiatives are ' built to last'. They should also be sensitive to local conditions and limitations and the interest of stakeholders must be broadly aligned with each other and with the goals of the intervention. Finally, initiatives will have most impact if they approach development problems in a holistic and co-ordinated way, not only through the provision of ICTs.

6.2. Entry of additional market players

As mentioned above there is a persistent need for introducing more competition into the ICT sector. Countries, both developed and developing, tend to benefit from gradually exposing existing public telecom monopolies to competition with private service providers. Of course it should be acknowledged that that the starting position of these countries is not the same. Developed countries usually have a history of many decades of public utility companies building up rural electrification and a telephone network. Most developing countries did not go through that process and hence many of them consider it appropriate to maintain state support and protection

for national telecom companies. In any case it is not implied that all public enterprises should necessarily be privatised; it is a matter of allowing other players to enter the market. Experience in the EU and around the world has shown that this is not an easy process, but that, once introduced, the consumer benefits of such liberalisation efforts are considerable.

Furthermore, opening up the ICT market would also involve a reduction in high levels of import duties being imposed by many developing countries on both hardware and software, notably when a local production capacity for these products is absent. Initially this may have repercussions for a country's fiscal revenues, and hence for its financial capacity to address questions of equity and redistribution. But usually this revenue setback would be quickly compensated by the fact that the quantity of imported items on which a (now reduced) tariff is raised will significantly increase. Additional government revenues may arise from auctioning licenses, notably in the area of mobile telephony.

6.3. Independent regulators and capacity building

The most encouraging results tend to be seen where governments have ensured that the historically grown regulatory functions of public telecom monopolies are separated from the operational activity, and where **independent regulators** have been established, to govern the field in a transparent and objective manner. This is a vital element if investment is to be attracted to the sector.

However, also in the areas of trade, competition, taxation, government services, and justice and home affairs, new expertise is required. Many of the relevant issues are currently discussed at international level in WTO, ITU, UNESCO, UNCTAD, UNDP, World Bank, WCO, Internet governance bodies such as ICANN, and other organisations relevant to developing countries. Participation in international discussions and decisions, and implementation of internationally agreed measures, are of importance to developing countries.

6.4. Issuing of rules

In order for the ICT policy to have concrete effects, clear and transparent rules are necessary, and their application has to be carefully supervised. The regulatory system has a strong economic dimension, determining the entry of players into the market, their obligations and often their profitability, and maintaining a balance between the benefits gained by consumers, on one hand, and the service providers, on the other. The regulatory bodies generally carry out a wide range of tasks, including the following:

– **Licensing** controls the entry of players into the sector. In order to legally enter the market, new and incumbent players alike need to be granted mobile and fixed network licenses. This has to be done on the basis of objective, non-discriminatory and transparent conditions that could include obligations on the provider to service low-user areas, eventually in conjunction with subsidies.

– **Interconnection** between new entrants and the networks of incumbent operators is necessary to allow newcomers in practical terms to deliver, transit or terminate traffic from and to their own customers. Conditions and prices for interconnection determine the real economic conditions for market entry, and

the regulator needs to set the rules for the negotiation of interconnection standards, prices and agreements.

– **Pricing policy** gives the regulator a possibility to put in place a requirement for affordability of voice telephony for targeted groups of citizens in the context of universal service or access. In addition, the incumbent has to be required to charge its competitors cost-oriented tariffs for providing interconnection to its network, or for leasing its circuits.

6.5. Universal access

Universal service or access is clearly a major preoccupation for developing countries with low telephone penetration. The concept is commonly understood to denote a set of minimum services (e.g. voice telephony) which must be **available to all** at an **affordable price**. Ensuring universal service or access mainly involves addressing the question of how to finance non-profitable lines.

'Available to all' does not necessarily mean to each individual home, but possibly within reasonable walking distance (see also next section). 'Affordability' is for each country to define in the light of different priorities and differing standards of living.

The regulator may chose to make the universal service requirement more operational by providing compensatory measures if network deployment is extended to the most geographically and economically disadvantaged areas, or to demand new players to invest in unprofitable areas. For example, the Philippines requires new franchisees for international gateways and cellular systems to install a specified number of lines in currently unserved rural areas.

6.6. Public access

An area of the policy framework which is increasingly attracting attention is the question of improving **physical and economic access** to telecom and ICTs for those in remote areas or on low incomes. through **public access**. The assumption that every person has to own or rent their own telephone or PC is incorrect. Just as telephony was very widely used by people on low incomes in industrial countries (through public payphones) at a time when the costs of personal ownership were too high for most people, the same system could apply to developing countries. The setting up of **public access points** has already proved to be a good strategy, particularly in remote areas. These include payphones, Internet cafes and telecentres of various kinds, and can be established either **privately** in commercial areas or NGO-run facilities, or through **public** or **public/private** means, in public facilities such as libraries, schools, post offices and community centres.

The challenge is to be able to have the right pricing to meet the low purchasing power of low-income communities, while being financially self-sustainable. Public access points such as telecentres can, if well designed, help to meet this challenge through allowing very small quantities of service to be consumed. After all, there is a big difference between being able to pay for a single short phone call and being able to pay for a whole phone-card for use in a payphone.

6.7. Internet connectivity

The high price of Internet access is often cited as an obstacle for users in developing countries. While international Internet connectivity is a complex and rapidly evolving commercial and policy issue, reform in this area poses the difficulty in the short and medium term of the loss of revenues associated with international calls. However, as more and more traffic is carried using the Internet rather than by traditional telecom networks, policy makers in developing countries need to pay urgent attention to this issue, which in most cases needs to be addressed in a broader, macro-economic context, rather than by focusing on narrower concerns. Closer international co-operation of governments and the private sector on the issue of international connectivity and implementation of appropriate regulatory measures to increase competition is becoming urgent.

Furthermore, the protection of the citizens in terms of data security and privacy are of great importance particularly, but not exclusively, on the Internet.

6.8. Infrastructure

Telecommunication technologies have evolved radically over the past decade, and many recent innovations offer promising solutions for extending services at lower costs than had previously been thought possible. The recent availability of those types of wireless technologies which are relatively low cost - such as radio, wireless local loop and certain aspects of satellite technologies for serving rural areas - makes it possible to reach even even very remote locations, with the combination of increased demand and lower cost technologies making rural areas more attractive for investment.

The optimum technical solutions (fixed or wireless, satellite, fibre trunking etc.) for any developing country will depend on a balance of factors including geography, population density and economic activity. It is for the regulatory framework to induce operators to opt for the most cost-effective technology and for passing the cost-reduction to the consumer.

Apart from the specific ICT infrastructure, the policy framework also needs to address the overall state of a country's infrastructure, and in particular the state of power supply. Furthermore, the situation of roads, rail networks, ports and airports and the social infrastructure will affect economic progress generally, and thus the demand for and profitability of ICT services.

It is clear that this is an expensive and complicated challenge, which requires both public planning and private investments.

6.9. Private sector development

This leads to an even more general aspect of the policy framework, the **stimulation of economic activity, entrepreneurship and trade**. There is no need to expand, within the context of this Communication, on the need for sound economic governance or the setting up of private sector development programmes. But within the particular framework of ICT policy, developing countries could give special attention to support programmes for SMEs and other companies entering into *e*Commerce and for business start-ups in the ICT sector.

6.10.   Human resources

Equally general, and equally important, is the development of **human resources**. This could include support for education related to ICTs, from computer literacy to technical training; teacher training; distance learning; network-based centres of excellence; strengthening the potential of universities, developing interactivity with educational and research networks, including South-South relations, etc. Investments in infrastructure and related policies are likely to be futile if there is no effort on the development of human resources, new and appropriate curricula, and the close involvement of universities which can draw on their international networks.

6.11.   Local content

Finally, any policy framework should include provisions to **foster the development of local content**. ICT applications will only be successful if the contents is responsive to the user needs, in a language that is commonly understood and adapted to the local conditions and working environment of users. The local ownership of the information is key to the sustainability of the project.

7.   ICTS AND THE EUROPEAN COMMUNITY DEVELOPMENT POLICY

7.1   Ongoing programmes

As a donor the EC is gradually enlarging and diversifying its portfolio in ICT and development. Historically active in telecommunications infrastructure, particularly in Africa, the EC has more recently shifted to the broader information society agenda. It has recently launched two such major programs in Asia (Asia IT&C) and the Mediterranean (Eumedis and a related telecom policy program). It is in the process of launching a comparable one for Latin America (@LIS).

As for the ACP region, there are several programs with ICT components but no major one specifically devoted to information society. Such a program is being currently appraised for the Indian Ocean countries and discussions are ongoing with the Caribbean region for them to join the @LIS program with EDF funds. Within the current policy and financing frameworks, similar programs for the African region may be considered in the context of the 9th EDF programming exercise.

The **European Investment Bank** for its part has lent support to a number of telecommunication projects in developing countries designed to extend and modernise fixed and mobile telecom networks. This support accounted at about EUR 750m in last five years. EIB also supported small size SME-projects investing in the adoption of computer technologies or providing of ICT services.

7.2.   Future activities

Further EC action in the area of ICTs and development co-operation will take place within the strict context of the new EC development policy, and notably its **six priority sectors,** with an overall focus on **poverty reduction**. Hereunder a series of possible actions are mentioned. This list is not exhaustive. More applications or other specific programmes may be developed during future policy and programming exercises.

Priority 1 - Trade and Development

Widespread access to ICTs makes it easier for locally-based firms to participate in local, regional and international trade. In order to facilitate the use of ICT by developing countries' private and public actors in the context of trade and development, the EC will consider undertaking (or, where appropriate, continue to undertake) the following actions:

- Technical assistance and capacity building to developing countries for the setting up and implementation of appropriate ICT policies and regulatory frameworks.

- Technical assistance and capacity building for the application of ICT by private actors, notably for SMEs.

- Technical assistance and capacity building for the application of ICT for customs and other trade related services to help facilitate procedures and reduce transaction costs.

- Assistance for the establishment and development of community telecenters (including power supply and infrastructure) in rural areas so as to facilitate, inter alia, the access by local entrepreneurs to trade information relevant for them. At a later stage, assistance to universal service schemes to certain developing countries could be considered, when they are transparent, non-discriminatory and neutral towards competition.

- Promotion, in the context of the appropriate bilateral or multilateral negotiations, of the gradual elimination of customs duties and the reduction of non-tariff measures on ICT products, as well as assistance, where appropriate, for regulatory reforms towards the introduction of competition in relevant services, in particular telecommunications and electricity services.

Priority 2 – Regional integration and co-operation

Regional co-operation in the ICT-sector can offer considerable leverage for action by governments, legislators and national regulators. It can reduce the distortions which significant divergences between different country's regulatory frameworks will create, as between national markets. It can establish models and benchmarks for good conduct and jurisprudence at supranational level, and perhaps by gradually evolving harmonised regulations. It can also help the market to reach the critical mass which will trigger new possibilities for technological development and financial investment. Against this background the EC will consider providing, inter alia:

- Support and assistance to regional groupings that wish to develop common rules on telecommunications and e-commerce regulations, based upon the work of international bodies.

- Support to regional groupings to establish e-readiness assessments and benchmarks of their member states.

- Support to virtual regional research networks working in the priority areas of EC development co-operation with a view to improve knowledge production and dissemination

Priority 3 – Support to macroeconomic policies and promotion of equitable access to social services

ICTs are tools for improving public financial management, and are an instrument to operate policy-based assistance and direct budgetary support. Delivering social services, like health and education, to the poor is more wide-spread and cost-effective if appropriate ICTs are applied. Lack of access to information is a serious constraint for the medical profession. The ability to access teaching materials over the Internet offers great potential, as do distance-education programmes. Access by poor people to ICTs offers a potential for wealth creation (e.g. to get information on current market prices, to get involved in productive business, to reduce the role of middlemen) and empowerment (e.g. strengthening the advocacy role of disadvantaged groupings and organisations). Amongst other things, the EC will consider assisting developing countries to:

- improve their public financial management system and budgetary process through an integrated ICT scheme.

- incorporate the appropriate use of ICTs in their national health and education systems.

Priority 4 - Transport

Public-private partnerships can be developed for the creation of telecom infrastructure and intelligent transport systems in developing countries, particularly in terms of regional backbones. As the EC is a major donor in the road sector, particularly in sub-Saharan Africa, it could invite private companies or other interested parties to lay fiber-optic cables during all new road construction (the main expense of doing this is not the cable, but the digging up of the road). The EC could therefore, for example

- facilitate the work of other public or private actors, to the improvement of telecom infrastructure in developing countries, notably in the context of regional high-speed interconnections and where low-cost synergetic effects can be obtained.

- assist developing countries in incorporating appropriate ICTs in civil aviation or maritime transport operations.

Priority 5 – Food security and sustainable rural development

ICTs allow for collection and dissemination of essential information and 'market intelligence' for their economic activities (e.g. planting calendar, commodity prices) and social needs (e.g. keep in touch with family that migrated). ICTs can provide better insight into natural resources and natural disasters. There is in particular a wealth of satellite-based information that can be processed and used by farmers and environmentalists across the developing world. The EC will consider supporting, inter alia,

- the setting up of extension service facilities by agricultural ministries and NGOs linked to international agricultural (research) centers of excellence (FAO, CTA, CGIAR system etc), in view of the development of content relevant for the rural population, particularly in local languages.

- programs for the collection, processing and dissemination of earth observation data and information pertaining to natural resource monitoring and management, weather forecasting as well as natural disaster preparedness and mitigation, relevant for users in developing countries, on a regional basis (e.g. Africa) and/or a thematic basis (e.g. to monitor illegal logging).

Priority 6 – Institutional capacity building

The creation and strengthening of autonomous regulatory authorities for the telecom sector is an important component of a proper regulatory framework. In general, ICTs can be a potential tool for improving government services, by increasing the efficiency and transparency of the state and local authorities (including public financial management). They can also facilitate a more democratic interaction with the population and contribute to the promotion of democracy in general. Access to ICTs plays a crucial role in facilitating access to information on laws and rights, which help individuals and civil society to fight for their cause and is thereby a key step along the road to securing good governance and human rights. The EC will consider, inter alia, to

- Support the creation and strengthening of autonomous regulatory authorities for the telecom sector.

- Promote the inclusion of appropriate ICTs, and notably the use of Internet, in government or NGO programs in the area of democracy, human rights and good governance.

- Promote programs that improve public service delivery to the citizens. Priority areas would be voter registration, census, electoral observations, creating sustainable taxation systems and registration of land property.

7.3. Planning, programming and implementation

As for the actual planning, programming and implementation of the actions mentioned above, normal procedures will be followed and existing funds will be utilised. The decision making procedure is country- and region-specific, and is guided by the following considerations:

- The question of whether and in what form the use of ICT tools or the strengthening of domestic ICT policies in developing countries should receive special attention in the context of development co-operation with the EC is a matter to be addressed in the framework of the **Country and Regional Strategy Papers**. The November 2000 development Council underlined the importance of country and regional strategy papers as a driving force in seeking complementarity. The first 'cycle' of Country Strategy Papers (CSP) and Regional Strategy Papers (RSP) concerns ACP countries and regions, in the context of the new Cotonou Agreement. The European Commission shall ensure that ICTs and their potential role in development will be given due consideration

in the elaboration of these strategies. Incorporating ICTs in CSP/RSP will ensure '**ownership**' by the country or region concerned as well as differentiation and prioritisation according to needs and policy situation.

- Once it is decided in the context of a CSP or RSP to undertake specific activities in the field of ICTs and development, the EC would usually follow a '**multi-stakeholder**' approach both at international and national level. At international level, the EC could work more actively with representatives of the business community as well as of civil society. Development NGOs are key partners for empowering the poor through ICTs (and are major users of ICTs themselves). At national level the Community could support policy and program formulation with the proactive participation of key local stake-holders.

- ICTs and development is a relatively new area of co-operation. As shown in the ALAMED review, a more **systematic approach** to the use of ICT in development needs to be devised with a view to monitoring and evaluating better outputs. Some Management Information Systems already exist to capture lessons learned and best practices. It is suggested that the EC and Member States join proactively such initiatives and/or create among themselves a **knowledge management system** in ICT and development. Periodic reviews similar to the ALAMED one should be encouraged.

- As an increasing number of Member States' aid agencies are getting involved in ICTs and development, it is important that the current provisions on **complementarity and coordination** be effectively applied. The EC/Member States' informal experts group on information society and development could moreover continue to play a useful role of exchange of experiences and brainstorming on future courses of action. It is hoped that the current international initiatives, in particular the G 8 and the UN IT Task Force, will also provide some guidance on wider issues of co-ordination and synergy with other international 'players' (bilateral donors, development banks, the UN system, etc).

8. CONCLUSION

Information and Communication Technologies offer both challenges and promises for social and economic development and this is nowhere more apparent than in the world's poorest countries. ICTs offer enormous opportunities to decrease social and economic inequalities and to support sustainable local wealth creation, thus helping achieve the broader development goals. On the other hand, if misapplied ICTs might result in a further marginalisation of the poor and disaffected, thus adding a digital dimension to the existing social and economic inequalities in and amongst developing countries.

As with other development challenges, the decision to embrace these new opportunities belongs to developing countries themselves and the relevant stakeholders, notably the local communities. Ownership by them is indispensable. For its part the international community can play an active role, by pointing to the potential benefits of new policies and assisting interested countries in designing appropriate policies in function of their situation and priorities.

The EC will support and use ICTs not as a priority sector, but rather as a tool to achieve the objectives within the focal areas and cross-cutting themes of the new EC development policy. ICTs are not to be considered in isolation, but as part and parcel of an overall development strategy and the policy dialogue with beneficiary countries.