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Author: Maurizio PEDRELLI,
Pragmata srl
Reggio Emilia, Italy

Editor: Graham CHAMBERS, STOA, DG IV

Project Manager: Theo KARAPIPERIS, STOA, DG IV

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Executive Summary

The unequal provision of opportunities to access and contribute to information, knowledge and networks and to benefit from the development- enhancing capabilities of ICT (Information and Communication Technology) is known as the Digital Divide.

The first and fundamental option is to decide whether this field is worthy of particular attention or not.

In the past ICT was generally considered a luxury and was not considered a viable option for development policy where other needs, such as building roads and hospitals and providing drinkable water, etc. were considered more urgent.

However, the Digital Divide has today become one of the most prominent considerations in the Development Divide, and the early judgement is no longer sustainable, especially when considering the following points:

- ICT provides ***unprecedented opportunities*** to effectively fight against poverty in the developing countries: for example, ICT can support the poor in business development, foster empowerment of the poor, facilitate access to education and health, help improve the environment and prevent natural disasters.
- ***United Nations*** (UN) considers ICT a priority for the development of poor countries, and many developing countries agree on the importance of the role that ICT can play in their development;
- ***International initiatives are proliferating***: the G8 Dot Force, the UN ICT Task Force and several other initiatives are aimed at effectively promoting access to ICT in the developing countries.
- Exclusion from ICT increases the divide between the developed and developing countries.

To support the diffusion of ICT in developing countries, the EU has to move within a rather complex international scenario, one in which many donors are already active.

The ***top-down*** approach is typical of large international organisations (e.g. World Bank, ITU, UNDP, G8 …), and results in strong influence by national governments on political choices. This approach is necessary to create a favourable environment for the use of ICT and its diffusion.

The ***bottom-up*** approach is typically adopted by NGOs (Non-Governmental Organisations), which strictly co-operate with local (often non-governmental) entities such as schools, businesses, hospitals,… with the aim of carrying out projects in the field directly impacting on local stakeholders (the poor in particular). To support ICT capacity-building in low-income countries (LICs), both approaches are equally necessary: the *top-down approach* towards the LICs' governments and regional organisations, in order to implement and manage large infrastructure projects as well as create a favourable political and regulatory environment, and the *bottom-up approach* working with local stakeholders to develop ICT capacity locally.

A strong link between the top-down and the bottom-up approach is still missing in most of the developing world. It is evident that the micro (local stakeholders) level is essential to create sustainable conditions for ICT use and diffusion in the LICs. NGOs typically operate at this level, while the governments and the international organisations are often not used to effectively carrying out projects in such a context.

It is at "bottom up" level where ***the EU can really improve the effectiveness of its actions.*** If it is able to co-ordinate its financing frameworks with an innovative bottom-up approach, it may be possible to adequately support the diffusion of ICT in the developing countries. A programme such as EUMEDIS, whose aim is to fund projects in the field, can be effective in the LICs only if connected to an innovative bottom-up action, aimed at building ICT capacity by way of strong co-operation directly with local stakeholders in:

- new ideas,
- project design,
- drawing up *funding proposals*
- implementation.

This approach allows empowerment of local entities, which learn and acquire the necessary technical and organisational skills, to autonomously sustain the project and to develop future projects without foreign assistance.

In this context, the EU could exploit these opportunities by:

- *developing higher level co-operation with those organisations* operational at local level, by using an innovative approach, thereby contributing to an increase in their funding capacity;
- *stimulating other organisations to adopt similar approaches*, particularly the ones involved in developing countries as direct interfaces to the local stakeholders (NGOs), to favour ICT diffusion.

At the macro (policy) level, there is a lot of room for improving the EU's commitment and the effectiveness of its actions, with the aim of reducing the obstacles that today prevent developing countries from benefiting immediately from ICT opportunities. In this field the EU has an advantageous position, because of its great tradition of providing support to the developing countries. The EU could increase its efforts in Asian and Latin America countries which have already decided to promote ICT, but new means of co-operation should be investigated. As far as the LICs are concerned (the most of which are concentrated in Sub-Saharan Africa), alliances with international organisations, such as the World Bank and the ITU and with the private sector could help identify innovative solutions.

In particular, it is important that the EU co-ordinate the existing bottom-up approaches with its own top-down actions when working with national governments and regional organisations.

With the aim of removing the various obstacles to the diffusion of ICT in developing countries, the EU has the following options:

- *Stimulating awareness of the advantages of ICT in donors and LIC policy makers*, promoting studies and seminars, making direct proposals and suggestions, diffusing best practices and success stories;
- Supporting the LICs w.r.t *telecommunication regulatory* issues at national and regional level, creating favourable conditions for the development of telecommunications infrastructure
- Contributing to *telephone and Internet cost reduction* in low-income countries, homogenising Internet conditions between the USA and the others (including the EU and the LICs), contributing to the rationalisation of regional Internet organisations and establishing an effective low-cost second-hand equipment market
- Supporting the diffusion of the most interesting technologies for the LICs, above all *satellite* with the specific aim of bringing telephone connections to many dispersed rural areas
- Supporting the diffusion of *telecentres* at the political level, thereby improving their capability to reach economic self-sufficiency
- Stimulating the *involvement of private operators* configuring ICT programmes not through donations but as investments (some examples of projects producing good rates of return already exist)
- Allocating *more financial resources* to ICT development programmes
- *Building ICT capacity at international level*, enhancing co-ordination and consistency among the many different actors (natural leadership in this field is still lacking)
- Building ICT capacity at the local level, agreeing with national governments the establishment of local consulting companies, supporting development of recent advances in graphical user interfaces (GUIs), applications based on pictures, icons and voice, and supporting the development and translation of software into a wider variety of languages.

Within the European Institutions, the European Parliament could play a specific role in stimulating the Commission to become a more effective operator in the ICT field, by (on the basis of the previously described options) creating a specific monitoring and evaluation system, requiring the Commission to produce the adequate reports.

The World meeting that will be organised by ITU in Geneva in 2003 (ITU Telecom World 2003) will be an important occasion to assess the actions undertaken so far.

Introduction

The objective of this project is to *look at the potential role of the EU in supporting ICT capacity-building in low-income countries*.

Since 1984 the Maitland Commission report entitled *The Missing Link* stated that "no development programme of any country should be regarded as balanced, properly integrated, or likely to be effective unless it includes a full and appropriate role for telecommunications".

Nowadays, the Information and Communication Technologies (ICT) are so deeply rooted in developed countries, that most economic and financial sectors (from banking to the manufacturing industry, from logistics to air traffic) would nearly collapse if these systems stopped.

The developing countries will more easily integrate into the current economic environment, which is heading towards the global village, if they exploit at their best the opportunities offered by the new technologies. Taking part to the exchange of data and information they will be able to develop their economic and industrial system in a sustainable way, to foster democracy, to identify solutions for environmental problems locally and at a world-wide level, to improve their health care system and so on. The so-called "digital divide" should be prevented from adding to the several gaps dividing the developing countries from the developed ones.

The potential role of the EU in supporting these countries should be thoroughly analysed in order to identify the most appropriate actions to be undertaken; this study *presents the range of policy and technological options currently under consideration among professionals in this field*.

Actions to identify sustainable alternatives to fight against the digital divide have been launched by international organisations such as the United Nations (UN) and the G8, creating specific task forces to investigate on the subject; some developed countries recently funded and published studies analysing their potential role in this field as well.

Our study considers these previous works as the basis to identify the range of viable options for the European Institutions, and adds the opinions of several field experts, collected by means of interviews and questionnaires.

Attention is particularly paid to the problems of the low-income countries (LIC)[1], that are primarily sub-Saharan, Asiatic (Afghanistan, Bangladesh, Laos, Maldives, Nepal), Caribbean (Haiti) and Pacific (Samoa, Solomon islands), and to the link between ICT and poverty reduction.

1 See the list in C. Technical files

A. Options

Despite the numerous actors involved at a world-wide level in ICT diffusion and support, the field is so wide that there remains much to do. This chapter describes the main options that can be widely recognised as the most significant for the EU, considering its specific position and acknowledged capacity.

The Digital Divide can be defined in terms of one of unequal possibilities to access and contribute to information, knowledge and networks as well as to benefit from the development enhancing capabilities of ICT.

The first and fundamental option is to decide whether this field is worthy of particular attention or not (par. A.1).

The second option is to decide the right level of the approach within the complex context of the international co-operation (par. A.2).

Many options for operating on the field can be considered, working with a bottom-up approach involving the local stakeholders (par. A.3): to make ICT access easier to the poor supporting their many different businesses, to launch eHealth and eEducation programmes, and so on. But maybe in this part of the report it is meaningless to discuss all of them singularly: the possible fields of intervention are well known (for details refer to par. B1.3), and there is wide agreement that a successful ICT intervention should be tailor-made, because there are many critical components that interact (infrastructure, human capacity, policy, private sector, other donors, …), and their interaction can vary depending on the locality.

So it is surely more important to identify here a successful approach, because it is still too frequent the case of programmes and projects that do not produce any real or valuable impact. A real problem today is the identification of organisations to co-operate with and programmes to finance, because the ex-ante assessment of their perspective results concerning effective capacity building of ICT in the developing countries requires a multifaceted evaluation.

Therefore it is particularly important the identification of and the co-operation with organisations adopting successful implementation methodologies.

Moreover, such organisations represent a small share out of the total; therefore the EU should also act as a vehicle to promote the diffusion of similar approaches in the field.

The general opinion is that this is the key to ensure EU actions supporting ICT diffusion are effective in the LIC (Low-Income Countries) as well.

The top-down approach (par. A.4) is finally the more typical approach for an institution like the EU. In such an approach the different options are to fight against the many obstacles that today prevent the developing countries from benefiting immediately from the ICT opportunities (for details refer to par. B1.4).

A.1. Supporting ICT diffusion in the developing countries

In the past ICT was generally considered a luxury good, therefore it was not considered a viable option in the definition of the policy supporting the development of the South, the primary needs to be satisfied being roads, drinkable water, hospitals, and so on.

But today the Digital Divide has become one of the most evident components of the Development Divide, and the above mentioned judgement is no longer sustainable, above all if reflecting on the following:

- ***ICT gives new unprecedented opportunities to effectively fight against poverty in the developing countries:*** there are already numerous examples that show how ICT can support the poor in business development, making it easier to access information and new markets. ICT is also an effective tool to foster poor empowerment, facilitating access to education and health, helping improve the environment and prevent natural disasters. Thanks to the huge amount of information easily accessible and hardly controllable by governmental institutions, it strengthens democracy (for more details refer to par. B2.3).

- ***United Nations (UN) considers ICT a priority for the development of poor countries:*** the Ministerial Declaration of ECOSOC (Economic and Social Council) on July 2000, released at the end of a session attended by a great number of high level personalities, including several heads of international financial and trade institutions, a head of State and several cabinet ministers, states: "We recognise a wide consensus that information and communication technologies (ICT) are central to the creation of the emerging global knowledge-based economy and can play an important role in accelerating growth, in promoting sustainable development and eradicating poverty in developing countries […].The ICT revolution opens vast new opportunities for economic growth and social development but also poses challenges and risks. […] the majority of the world population still lives in poverty and remains untouched by the ICT revolution. […] We are deeply concerned that, at present, ICT's huge potential for advancing development, in particular of the developing countries, has not been fully captured. This reality has given rise to manifestations of the "digital divide". In this regard, urgent and concerted actions at the national, regional and international levels are imperative for bridging the digital divide and building digital opportunities and putting ICT firmly in the service of development for all".
- ***The developing countries agree on ICT's role:*** a high-level panel of ICT experts, coming primarily from the developing countries, held a meeting on the subject in April 2000 (New York) and the resulting report, prepared for the ECOSOC conference, states that: "Developing countries have great potential to compete successfully in the new global market, but unless they embrace the ICT revolution promptly and actively, they will face new barriers and the risk of not just being marginalized but completely bypassed. Members of the panel, coming from all regions of the world and from countries at all stages of development, are unanimous in their belief that the issue is not whether to respond to the challenges brought about by the revolution in ICT, but how to respond and how to ensure that the process becomes truly global and everyone shares the benefits. The experience of a number of countries, including developing and transition economies, some of them working under conditions of a severe shortage of resources, complex political environments and acute socio-economic problems, demonstrated that bold actions in bringing their countries into the digital age paid off and brought tangible positive results in economic, social and political terms. Moreover, this experience has proved that the argument that ICT should only be introduced once progress has been made in tackling poverty is spurious: ICT brings early, tangible and important benefits to the poor. These countries, by extensively and innovatively using ICT for their development, were able to extract value from globalization, rather than watching globalization extract value from them".
- ***The international initiatives are boosting:*** the ***G8 Dot Force***, the ***UN ICT Task Force*** and several other initiatives of the developed countries that are aimed at effectively promoting ICT access in the developing countries. The European Union (EU) cannot lag behind as it can play an extremely important role in this field, thanks to its experiences and peculiar characteristics.
- ***The exclusion from ICT leads the poor countries to the final marginalization.*** Information and communication have become indispensable assets. Therefore ICT is actually recognised as one of the most essential forces to promote economic and social development. The cost, in terms of lost opportunities, of not being fully aware of ICT implications is as high as the cost of lacking the capability to access and use its contents. The risk connected to an increasing digital divide is a growing phenomenon of the 'globalisation backlash'.

A.2. The correct approach: top-down <u>and</u> bottom up

To support ICT diffusion in the developing countries, the EU has to move within a rather complex international scenario, where many donors are already active and the beneficiaries have their own expectations.

The EU is one of the few actors that can operate at all levels (policy level with international organisations, countries and regions, operational level with local stakeholders). Therefore the EU can assure a superior co-ordination and consistency between the top-down approach, typical of the large international organisations (World Bank, UN, ITU, G8, …) and the bottom-up approach, typical of the field organisations (for instance the NGOs, Non-Governmental Organisations).

Unfortunately the European Commission (EC) seems to have adopted a too weak and too traditional approach, which is probably not suitable for the ICT field (see the following discussion).
Therefore the EU should adopt ***innovative methodologies of action, particularly as regards to the bottom-up approach***; these methodologies should be more co-ordinated with macro level policy actions and capable to increase their effectiveness, also in the LIC, for the traditional financing frameworks promoted by the EC, like EUMEDIS and the others. The A3 paragraph discusses some options to pursue such objectives.

The international co-operation system

The framework of the existing programmes and actors is widely described in par. B2.2 and B2.3. We can identify two main different types of actions, one at a macro (policy) level and the other one at a micro (local stakeholders) level. As regards the former, the most diffused approach is typically top-down; on the contrary, the typical approach adopted by the latter is bottom-up.

The ***top-down*** approach is typical of large international organisations (ex.: World Bank, ITU, UNDP, G8 …); its effectiveness is guaranteed when dealing with a developing country's government, resulting in a strong influence on the country's political choices. This approach is necessary to create a favourable environment for the use and diffusion of ICT.

Until now, these organisations have operated by:

- making declarations with the aim to let donors entities and developing countries become aware of ICT benefits on economic development and poverty reduction;
- delivering studies on poverty reduction and ICT;
- promoting some relevant programmes[2], such as the large telecommunication infrastructures development programmes, focused on a regional level.

On the opposite front, the ***bottom-up*** approach is typically adopted by the NGOs, that are directly involved and strictly co-operate with local (often) non-governmental entities (like schools, enterprises, hospitals, and so on), with the aim to carry out projects in the field directly impacting upon local stakeholders (on the poor particularly).

To support ICT capacity-building in low-income countries, both approaches are equally necessary: the top-down approach towards the LIC governments and the regional organisations, to implement and achieve the large infrastructure projects and to create a favourable political and regulatory environment, and the bottom-up approach with local stakeholders (public entities and private enterprises) to make local interventions and build the ICT local capacity.

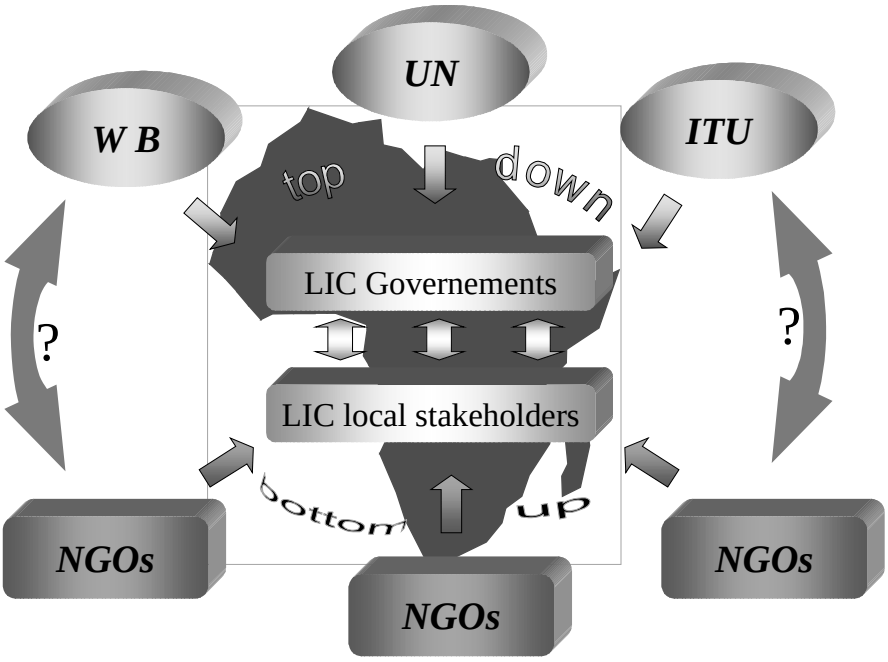

Fig. 1 *- Top-down and bottom-up approaches in low-income countries*

These two approaches still require a higher level of integration: the World Bank, the G8 and the UN, for instance, are hardly able to co-ordinate themselves with field organisations.

In this framework only a few countries (and particularly some EU Member States and Canada) have demonstrated their capability of combining a top-down and a bottom-up approach: the top-down approach is used to make direct agreements at a government level, while at the same time they finance organisations using a bottom-up approach to carry out field projects. Among such organisations we can mention for

[2] see par. B2.2 and B2.3

instance the CTO (Commonwealth Telecommunication Organisation), the international organisation of the Francophonie (i.e. OIF and AUPELF) and the AHCIET for the Spanish speaking countries. But these countries generally undertake projects at a national level only, operating in a *limited number of linked countries* because of common language, history or trade habits.

A strong link between the top-down and the bottom-up approach is still missing in most of the developing world.

The current European Commission strategy

The EC has adopted mixed strategies, co-operating with the large international organisations and the regional associations of the developing countries, but also launching programmes to finance projects in the field (for more details refer to par. B2.1); but a powerful and clearly focused strategy still seems to be lacking.

At the macro (policy) level some results have been achieved:

- in *Africa* the EC contributed to the Rascom foundation: it is an entity that manages, in an integrated and synergetic way, the segments of more than 40 African countries on the Intelsat satellite; moreover the EC recently committed some studies focused on the telecommunication regulatory issues, some of them much appreciated;
- In the *Mediterranean region, in Asia and Latin America* three main financing programmes have been recently launched (or will be launched in the near future): EUMEDIS, AsiaIT&C and @lis.

Nevertheless the EC intervention at operational level has often been criticised: many experts[3] declare that the EC traditional bottom-up approach is not adequate to support ICT diffusion, because of excessive bureaucracy and slowness of intervention, while, on the opposite side, the real scenario is continuously and rapidly changing. A mentioned obstacle is the constraint to co-operate with five year-old organisations at least, while the new-born ICT-related organisations are probably the most active ones.

Moreover, *the link between the top-down and the bottom-up approach, that can make a programme really effective, is still to be created*.

Let us consider, for instance, the EUMEDIS programme (AsiaIT&C and @lis in Latin America, have been launched on a similar framework)[4]. Its aim is to link the EC political intervention at the macro level (with all the Mediterranean countries) with the launch of regional pilot projects on the field. These projects are selected among proposals submitted by European and local entities (bottom-up approach).

But this approach is not very structured and the project success is completely entrusted to the proponent capacity to propose and achieve the goals. For instance sustainability, local capacity building and poverty reduction are often basic requests for these projects to get funding, but their effective achievement is under the proponent responsibility.

Actually, *these programmes are simply financing frameworks and not programmes of real action on the field*.

This approach, borrowed from the traditional EC funding programmes like ERDF and RTD FP, could be successful in the EU and maybe also be successful in some developing countries with local ICT skilled resources (i.e. India, China, the Mediterranean Countries, …), but *could it work in the LIC as well? The experts we interviewed do not think so.*

The EC seems to be aware of these difficulties and, as a matter of fact, no programmes of this kind have been launched in Sub-Saharan Africa, where most of the LICs are concentrated.

But, as a consequence, the EC is not pursuing any link with the bottom-up approach in Africa.

A.3. Co-operation for an innovative bottom-up approach (at the local stakeholders level)

As discussed in the previous paragraph, the micro (local stakeholders) level is essential to create the sustainable conditions for ICT use and diffusion in the LIC. Both political capacity and practical management capacity are lacking in these countries, as services entities with the necessary technical skills and users with adequate culture (literacy at least) are scarce.

[3] We mean experts interviewed for the present study.

[4] For more details refer to par. B2.1

The NGOs typically operate at this level, while the governments and the international organisations are often not used to effectively carry out projects in such a context.

This is the level where *the EU can really improve the effectiveness of its actions*, above all if the EU will be able to co-ordinate its financing frameworks with an innovative bottom-up approach, adequate to support the ICT diffusion in the developing countries.

A programme aimed to fund projects on the field, like EUMEDIS, can be effective also in the LIC only if it is connected to an innovative bottom-up action, aimed at ICT capacity-building by means of strong co-operation directly with the local stakeholders in:

- new ideas generation,
- project design,
- drawing up the *proposals for funding*
- implementation.

Some organisations have already started to adopt such an approach: among those, we can quote the cases of *IICD* (The Netherlands, recently joined by UK) and of *Acacia Initiative* (Canada), described in B2.3.

This approach allows the empowerment of local entities, which learn and acquire the necessary technical and organisational skills, in order to be able to autonomously sustain the project and to develop future projects, without foreign assistance.

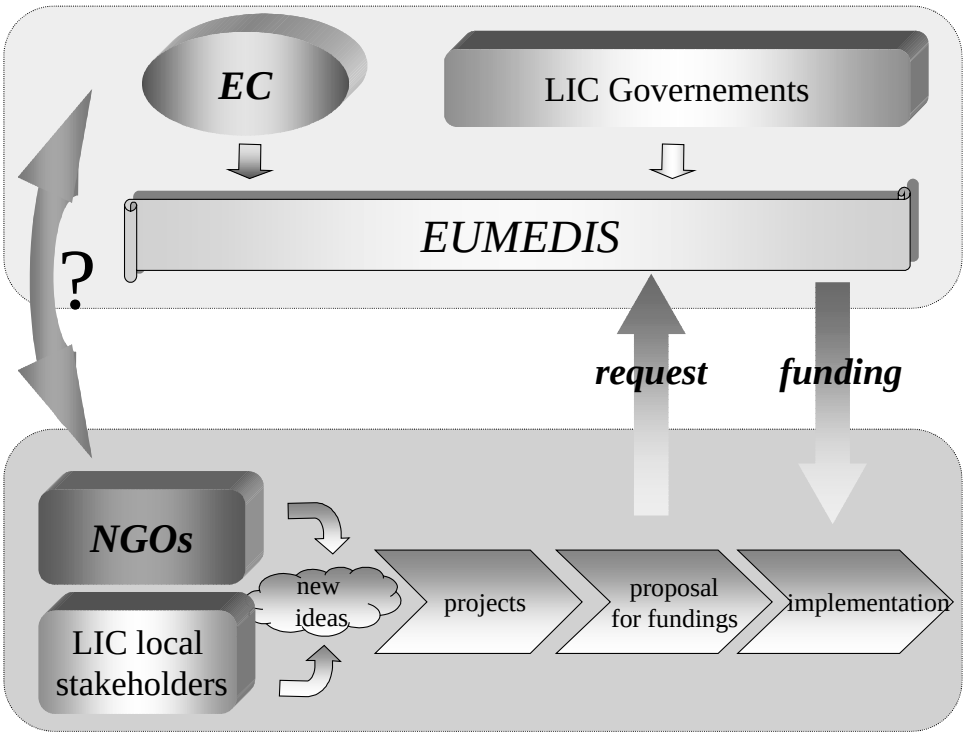

Fig. 2 *- The link between the EC intervention and the LIC local stakeholders*

This kind of approach is complementary and absolutely necessary to make effective a financing framework like EUMEDIS also in the LIC, as it can build the local capacity to produce new ideas and generate proposals for funding. If the experts guarantee support also during the implementation, this approach will allow an internal monitoring of the project and a more effective control of the achievement of the stated goals, as for instance *sustainability*, *local capacity building* and the *fight against poverty*, as well as, *corruption* and *illicit use of funding*.

In this context, the EU could exploit these opportunities by:

- *developing a higher level co-operation with those organisations* operational at a local level, using an innovative approach, therefore contributing towards increasing their funding capacity;
- *stimulating other organisations to adopt similar approaches*, particularly the ones involved in the developing countries as direct interface to the local stakeholders (NGOs), in order to favour ICT diffusion.

A.4. The EU potential role at the macro (policy) level

Although the EC has been successfully operating at this level, there is a lot of room for improving its commitment and the effectiveness of its actions, with the aim to reduce the obstacles that today prevent the developing countries from benefiting immediately from ICT opportunities.

The EU should become ***more proactive in the top-down (political) approach***, identifying synergies among the different actors, assuming an adequate role compatible with its own characteristics and strength, and contributing to an improvement of the governance and co-ordination of the international support.

In this field the EU has an advantaged position, because of its great tradition of support to the developing countries[5]. The EU could increase its effort toward the Asian and Latin America countries, that have already decided to promote ICT. But new means of co-operation should be investigated as far as the LIC are concerned (the most of which are concentrated in Sub-Saharan Africa): alliances with the other large international organisations, like World Bank and ITU for instance, and the private sector could help identify innovative solutions.

In particular, it is important that the EU will be able to co-ordinate the existing bottom-up approaches with its top-down actions toward national governments and regional organisations.

With the aim to remove the different obstacles against ICT diffusion in the developing countries (discussed in par. B1.4), the EU has the options described in the following paragraphs.

A.4.1. Stimulating awareness of ICT advantages in donors and LIC policy-makers

An analysis of the most successful ICT applications and experiences in the developing countries (Brazil, Costa Rica, Ghana, India, Malaysia, Mauritius, Senegal, Tanzania, Uganda, …[6]), shows that local political leaders played an extremely important active role to foster ICT diffusion. Some African governments are trying to design and implement National Information and Communication Infrastructure Plans (NICIs) following the African Development Forum, organised by ECA, October, 1999. Some of them are explicitly including the term ICT as a component of ministry denomination (e. g. Senegal).

But many donors and policy-makers of developing countries (and particularly of LIC) are not yet aware of the importance of ICT use and diffusion, and this a big obstacle to remove.

"If ICT continues to be seen as luxury goods rather than as a development infrastructure, and if extending access is considered unimportant, then the ICT potential for empowerment will not be achieved, and technology could then increase inequality rather than reduce it"[7].

Many donors and LIC policy-makers are still sceptical about ICT effectiveness in the fight against poverty, because they wonder how the poor could benefit from the utilisation of such complex tools. Moreover they are afraid that ICT will create an *internal digital divide* between the upper classes, that will be able to benefit from ICT advantages, and the poor, that will remain excluded.

Promoting studies and seminars

The EU could assume a firm and influential position, promoting studies and seminars that, through case histories and best practices, demonstrate and diffuse the following assumptions (see the numerous cases discussed in par. B2.3):

- ICT tools open great and unprecedented opportunities to improve the condition of the poor;
- If the poor (and particularly in the LIC[8]) are allowed to access to ICT, they are perfectly able to use it and get the related advantages.

[5] See also par. B2.1

[6] See the cases quoted in par. B1.3

[7] David Souter, *The role of Information and Communication Technologies in Democratic Development*, in the Influence and Access seminar (London, May 1999).

[8] An interesting opinion is that in the LIC there are many people that are poor not because of a low potential but because of the lack of opportunities. The poor with high potential can surely get advantages from his access to ICT.

Direct proposals and suggestions

Sometimes the LIC governments are aware of the ICT advantages, but they are not able to give priority to ICT instead of to short term issues, such as: lack of class rooms, tables and books, scholarships for the students, health care delivery facilities, epidemic or pandemic diseases, the debt burden etc.

In these cases, direct proposals or suggestions from donors (such as Canada-IDRC or CIDA, the Netherlands-IICD, the Norwegian NORAD, USAID-Leland initiative, the UK-DFID, ITU, UNDP …), although based on self defined selection criteria, have proved to be efficient and helpful. Governments are receptive[9].

Diffusing best practices and success stories

Many actions for the ICT diffusion in the developing countries are under implementation, and each of them could potentially be referred to as a case history increasing knowledge and awareness of ICT advantages. Identifying best practices and scaling up success stories will constitute important bases for action. Some experiences of case history collection and elaboration already exist[10]. The EU could join such efforts.

Such a database could be used both to support the diffusion of experiences at the micro level and to diffuse the awareness of ICT advantages to the LIC policy-makers.

A.4.2. Supporting the LIC as regards telecommunication regulatory issues at national and regional level

The ICT use and diffusion in the LIC is highly dependent on the development of the related infrastructures. Above all the availability of electric energy and telephone connections are relevant obstacles experienced by the poor living in remote rural areas and around the cities. Granting funds and technologies cannot be the only viable solution: the key issue is to support the States, creating the favourable conditions for development, through deregulation, public access (Telecentres) and universal access (rural areas) policies, and the empowerment of the independent regulation. These actions can further stimulate foreign investments.

In sub-Saharan Africa the EU has an interesting potential role, because the African countries, which are characterised by a very fragmented telecommunications sector, are probably more interested in the European model than in the American one. In this region the EU has recently assumed also an actual role, thanks to the appreciated BIPE study and the following conferences (like in Botswana).

But experience transfer from EU to Africa is not easy, and this should be acknowledged. Therefore, the European Parliament could stimulate and support the Commission with new resources and more energy along this path to support ICT development.

The interventions should be mainly directed at a macro-level (governments and regional organisations) to facilitate deregulation. A close co-operation with the international organisations that already operate in this region, with particular reference to ITU and World Bank, and the African regional organisations (i.e. Africa Connection and UEMOA) would be extremely helpful.

The interventions should mainly concern:

- the transfer of the experiences dealing with the telecommunications deregulation management in Europe;
- the support to the deregulation planning process (time-schedule and methods for deregulation, privatisation, stimulation of private investments)
- the e-Commerce regulation
- the support to the creation of independent regulatory systems, funding the expenditures (the cost of a good market salary for an effective independent regulator and his team could be very high for a LIC), and providing technical expertise.

A.4.3. Contributing to telephone and Internet cost reduction in the low-income countries

Internet demand is currently low because of its high price: typical charges still far exceed levels that would permit popular use in the developing countries:

[9] Source: our interview to Mr. Zongo (Acacia Initiative)

[10] For details refer to the par. B2.3

- The cost of leasing a high-capacity line from a telecom service provider would be around $3,800 in the USA, but about $180,000 in Argentina (Panos)
- The economics of connecting rural areas, especially remote ones, in low-income countries are very unfavourable: assuming capital costs of $1,000 per line, a telecom operator would need to generate revenues of $330-400 per line to be profitable, which is above the average per capita income of quite a few poor countries.

Telephone cost reduction could be generated by deregulation (see the above paragraph) and by the diffusion of new technologies (satellite and mobile telephone) and innovative telephone services (like telecentres), as described in the following paragraph.

But *Internet* cost reduction needs specific actions.

Balancing the Internet conditions between the USA and the Others (including the EU and the LIC)

Internet is very expensive also because the LIC local Internet Service Providers suffer from a strict dependence abroad (on developed countries and on the USA in particular). Anyway, the dependence on USA operators is a problem also for the EU Member States, whose operators are still disadvantaged in comparison with their American counterparts.
Balancing the EU and USA conditions is an institutional task that the EC is now carrying out; while accomplishing this objective, the LIC needs could be taken into account and represented as well.

Contributing to the rationalisation of the regional Internet organisation

Another possibility is direct intervention on the field, stimulating and supporting a more rational organisation of the local Internet operators[11], for instance through the institution of networks among the local ISPs (Internet Service Providers).

Establishing an effective low-cost second-hand equipment market

As the hardware is often a relevant cost component, an interesting option is to establish an effective mechanism for making low-cost second-hand ICT equipment readily available in the LIC.

A.4.4. Supporting the diffusion of the most interesting technologies for the LIC.

Universal access to telecommunication networks is difficult to achieve in the LIC, above all because of the dispersion of the population in large remote rural areas.

Very promising technologies will solve this problem: the *mobile telephone* and the *satellite* use. While mobile telephone diffusion is achieving great success in many developing countries[12], the other solution needs support actions.

The EU could intensify its participation to the development of ***satellite*** programmes in Africa; for instance, in the early 90s the Rascom project was launched in Africa, with the specific aim to bring the telephone connection to many dispersed rural areas, but it has not really started yet; even though it is expected to produce some results in 2003, its future is still very uncertain. Management difficulties are still to be solved, starting from the agreement with the national Telecom companies as regards traffic management and fares to the huge amount of terminal stations to install on the ground.

Notwithstanding the fact that the EC was an important actor in the establishment of Rascom as the international entity for the integrated management of the satellite traffic in Africa, it has not supported yet the project of the new satellite especially conceived for the rural areas. Probably the EU cannot afford alone the management complexity and the high expenditure required by the project, but it could act as a promoter, while its current position is one of complete absence.

Supporting such new technologies does not mean to forget the more traditional tools like *television* and *radio*, that can effectively be co-ordinated with the new ones. For instance, an interesting solution is to use the radio to diffuse to every dispersed village the news collected in a radio station via telephone or Internet[13].

A.4.5. Supporting the Telecentres diffusion at the political level

[11] as for instance it was proposed by DFID (UK) in the Expert Group Meeting in Brussels, Nov. 2000.
[12] In Uganda the number of mobile telephone is overtaking the number of fixed ones.
[13] Refer to the case histories mentioned in the par. B1.3

Universal access can be pursued also through the diffusion of public services, above all the ***telecentres***. Telecentres are normally privately owned places where small-scale communication services (such as telephone, fax, photocopy, and sometimes P.C. and Internet) are sold to the public.

Telecentres are today considered one of the most successful means to promote ICT diffusion in the developing countries[14]. They increase the access of people to ICT, particularly the poor and people living in remote rural areas.

The telecentres help local communities improve their business performance: they allow the local enterprises (agricultural co-operatives, handicraft industries, artisans, shops, garages and tourist facilities) to access to accurate market and pricing information. Through the Internet and other information transmission systems they can become aware of new market opportunities and also benefit from the training and access to the knowledge network provided by the telecentres. Farmers can also access current meteorological reports, information about the spread of animal and plant diseases, pests and their control. In the low-income areas the shared cost solution of a telecentre is probably the only viable option to provide diffused ICT access.

Moreover, telecentres are maybe the best resource to involve the local private sector and induce people to invest in ICT development.

Many pilot projects have been achieved in several regions all over the world, and different operating solutions have been tested, ranging from the simplest to the more complex like the cybercafes and the multipurpose telecentres. But their future seems to be rather uncertain, because few telecentres have been able to reach economic self-support.

This is a typical example illustrating the importance of adopting a co-ordinated top-down and bottom-up approach.

Normally, a telecentre start-up is successfully achieved only with a bottom-up approach, that involves local entrepreneurs to deliver local services that satisfy local needs. But this is not enough to assure durable effects, if not adequately coupled with a consistent top-down approach that, acting at a policy level, can create the favourable conditions for experience sustainability and diffusion.

For instance, Senegal telecentres are particularly successful because they are organised as a commercial business (franchising contracts lay as their basis) and their activity is not limited to the sale of ICT services. On the opposite front, many telecentres cannot be self-supporting because of legal obligations: for instance some countries do not allow mobile telephone operators to open public access to their network: the EU could apply the necessary political pressure to overcome this limitation.

The EU could operate by funding the telecentres diffusion programmes, carried out with adequate methodologies shared with the local stakeholders, in order to assure the local capacity building and the correct social impact. At the same time the EU should undertake political actions with the national governments to create a favourable environment for their survival and diffusion.

Many solutions have been proposed to solve this problem: for instance, the governments could assign to telecentres (with an adequate reward) some services currently carried out by the post offices, like tax collection and other payments, with the parallel aim to improve efficiency and effectiveness of the services as well. The EU could support the LIC governments to identify the adequate supporting policy.

A.4.6. Stimulating the involvement of the private operators configuring ICT programmes not as a donation but as an investment

To support the ICT diffusion in the developing countries, new means of co-operation with the private sector should be identified: despite the primary role played by the public to promote and diffuse ICT, this goal could not be achieved without the participation of the private sector.

Following deregulation and liberalisation, the private sector is now very active in many developing countries, but not in the LIC and in the dispersed rural areas, where the return on the investment is uncertain.

But some examples of projects with good rates of return already exist.

Thailand has an ambitious programme for rural telecommunications, with policies that favour competition. In 1996 the telephone density in rural areas was only 2.9 lines per 100 inhabitants but the Second Rural Long Distance Public Telephone Project aims at providing complete coverage in terms of access at sub-district (Tambon) level. Under this programme, at least 46,000 new lines will be added to the 7,712 lines installed by earlier projects. The strategy includes

[14] As the BIPE study demonstrates, see also in par.C4.

installing at least one PCO and a couple of payphones in each village and the target of the Eighth Plan is to provide service to a total of some 64,000 villages by year 2001. In 1996 the average annual revenue per PCO was USD 2,352. The financial internal rate of return on investment (IRR) was then estimated to be at least 11% (using a more conservative estimated annual revenue per line of USD 1,411). However, the *economic* IRR (including savings in transport, but excluding many other benefits) was estimated to be about 44%.

To involve the private sector also in these areas, the EU could promote studies with the aim to identify the best options to configure ICT programmes not as a donation but as an investment, with an interesting rate of return. This step is not always obvious, and should be carefully investigated, as it is necessary to stimulate private investor active participation[15].

Involving and supporting the LIC governments to invest in ICT will lead to a service improvement (faster and less expensive) and to an enlargement of the ICT market, thus stimulating an economic interest by the private investors[16].

A.4.7. Allocating more financial resources to ICT development programmes

In general, the total expenditure allocated by developed countries to the support of developing countries is lower than the value the United Nations indicate (up to 0.7% of GNP). In this framework, the share dedicated to ICT development is small, certainly not enough to cover all the needs.

This lack of resources does not permit the launch and the fast implementation of projects that are unanimously considered as value-added and pro-poor.

The EU (the Union as well as the Member States) donates the largest share of funding, but its expenditure, calculated in percentage of the GNP, is still lower than the ideal value defined by the United Nations. There is room to increase the expenditure level. The increase of funding can be devoted to ICT projects, that currently receive a very limited share of the total budget (for details refer to par. B2).

A.4.8. Other contributions to the ICT capacity building

All the previous options can actually be considered as actions devoted to ICT capacity building. Anyway there are other options to be considered, like the following one.

Capacity building at the international level: enhancing co-ordination and consistency

Many different actors are currently carrying out projects supporting ICT diffusion in the developing countries but they seem to be poorly co-ordinated[17]. A natural leadership, which the other actors can refer to (as the World Bank is in the international finance field), is still lacking.
Maybe the EU could assume such a role in the future, because the current conditions are not adequate. The EU could more likely favour the solution of the problem promoting a common room with the involvement of the other main actors of the field: G8, WB, ITU, UN.

Capacity building at the local level

It is a problem of:

- *technical capacity*: knowledge of ICT tools and of their use;
- *literacy*: the basic need is to address the vast number of illiterate inhabitants in developing countries;
- *language*: the anglophone population has an advantage from participating on the Internet using their native language.

At the local level, the ICT capacity should be built by interventions using a bottom-up approach, as described in the par. A.3: when you implement an ICT solution that is really interesting to the local stakeholders, the local ICT contents automatically will come.

Anyway a consistent top-down approach can be really helpful. For instance the EU could give a strong help (see also par. B1.4):

- agreeing with the national governments for the establishment of local consulting companies;

[15] See for example the BIPE Study
[16] A confirmation of such interest derives from our interview in Alcatel.
[17] For details refer to par. B3

- supporting the development of the recent advances in graphical user interfaces (GUIs), applications based on pictures, icons and voice;
- supporting the development and translation of software to a wider variety of languages.

A.5. The potential role of the EP inside the European Institutions

Within the European Institutions, the European Parliament could have a specific role in stimulating the Commission to more effectively operate in the ICT field, on the basis of the previously described options.

Moreover the EP can create a specific monitoring and evaluation system, requiring the Commission to produce the adequate reports.

The World meeting that will be organised by ITU in Geneva on 2003 (ITU Telecom World 2003) will be an important occasion to synthesise the actions undertaken so far.

B. Arguments and Evidence

B.1. ICT in the developing countries: the current situation and the big opportunities in the emerging new world economy

B.1.1. A general outlook on the principal fields of ICT application and on the expected evolution of the new world economy

To describe in a few words the complete range of ICT applications in the new world economy is nearly impossible: these technologies have invaded practically all fields of our working or free time. On the other hand, for the aims of our study it is no use remembering the numerous ICT traditional applications that today are part of our daily habits:

- radio;
- television;
- fixed and mobile telephone;
- computers, from Personal Computers to the mainframes of large organisations.
- ……..

The last applications brought about a revolution in traditional working methods, in public and private organisations, increasing business process efficiency and effectiveness.
The use of databases and data-warehouse applications supporting different activities is widespread, to manage and share among different entities information about:

- Environment;
- Health;
- Market;
- Research;
- New products/processes development (patents, …);
- Public services for citizens;
- ……..

The diffusion of private and public telecommunication networks improved information availability, also at a long distance in a very short time. Among the best known networks we can cite:

- banking networks (private), that by means of ATM services provide a comfortable interface between the customer and his bank all over the world;
- Internet (public);
- ……..

Internet is affecting human and business relationships in many different fields, for instance:

- in education and training, with the introduction of:
  - ⇒ distance education and teleconferences;
  - ⇒ CD-Rom for self-training;
  - ⇒ ……..
- in the professional field:
  - ⇒ teleworking;
  - ⇒ request of new skills;
  - ⇒ ……..
- in the health field:
  - ⇒ Health education;
  - ⇒ Disease prevention;

⇒ Medical care;

- in transportation, substantially contributing to:
  ⇒ safety;
  ⇒ traffic congestion reduction (on road, sky, railway);

From a general point of view, the Information Society can be defined as based on:
- instruments/tools (telephone, radio, television, PC,…);
- telecommunication infrastructures (networks, satellites);
- communication protocols;
- software supporting the applications;
- contents, that are elaborated and transmitted.

The capacity of ICT network has grown faster than any technology in history, doubling every two/three years; while the cost of digital transmission and computer equipment has been dramatically reduced in these years, while the range of services that can be provided by ICT has been continuously expanding.

"One measure of the growth of ICT is the increase in the number of Internet users. For instance, the number of people accessing the World Wide Web reached 100 million by the end of 1998 and it was forecast to amount to 320 million by the year 2002. The estimated number of users buying goods and services on the web is expected to have grown from 18 million in 1997 to more than 128 million by 2002"[18].

Actually the growth is quicker than expected: "in March 2000, an estimated 276 million persons worldwide were users of the Internet, with a growth rate of roughly 150,000 persons per day, 220 million devices were accessing the World Wide Web and almost 200,000 devices were added each day. Web pages totalled 1.5 billion with almost 2 million pages being added each day. E-commerce, or business conducted over the Internet, totalled $45 billion as recently as 1998 and an estimate in January 2000 projected it could explode to over $7 trillion as early as 2004"[19].

ICT is an enabling technology, leading to the development of many activities in a more effective and less expensive way: fax and e-mail, for instance, are much quicker, more reliable and less expensive than the mail.

As regards the future everyone agrees that ICT will continue its revolution, multiplying available information, data elaboration and transfer capacity, and strongly contributing to the creation of the conditions for a more balanced and sustainable development. A precise and reliable forecast is however very difficult: experience has shown that the use people will make of ICT is hard to predict, because it depends on their convenience; for instance, nobody would have expected such a rapid Internet diffusion, because nobody had forecast its actual and current use.

"It is this enabling capacity of ICT – the fact that it allows the users, whether individual or community, to take advantage of it in ways that individual or community chooses – that gives these technologies such democratic and empowering potential"[20]

B.1.2. The level of diffusion and use of ICT in the developing countries in comparison with the developed countries

The level of diffusion and use of ICT is significantly lower in the developing countries than in the developed ones. "The impressive figures of ICT growth, unprecedented by any measure, reflect activity by less than 5 per cent of the world's population. The gross disparity in the spread of the Internet and thus the economic and social benefits derived from it is a matter of profound concern. There are more hosts in New York than in continental Africa; more hosts in Finland than in Latin America and the Caribbean; and notwithstanding the remarkable progress in the application of ICT in India, many of its villages still lack a working telephone"[21].

"One must not forget that more than seventy per cent of the world population have never used a telephone and more than two billion people lack access to electricity"[22].

[18] IT in Swedish Development cooperation, August 1999
[19] UN General Assembly Economic and Social Council (22 May 2000)
[20] David Souter, *The role of Information and Communication Technologies in Democratic Development*, in the Influence and Access seminar (London, May 1999).
[21] UN General Assembly Economic and Social Council (22 May 2000)
[22] IT in Swedish Development cooperation, August 1999

Although some ICT projects have been launched in developing countries, the exploitation of new information technologies is very limited in these countries, and the gap between industrialised and developing countries is continuously widening.

"However, there are enough factors for growth. First of all, there is a significant sustainable demand, witness the long waiting lists and connection periods of up to ten years, the existence of veritable "black markets" in telephone lines in some areas, and high levels of average revenue per line. This explains why in many countries there has been a sustained growth in telecommunications, e.g. more than 17% a year for all countries with an income level below US $700 from 1984 to 1994"[23]. On this subject we can cite the cases of Uganda and Morocco, that in the last years have shown a very high growth in telecommunications services, and the case of Ghana, that has already reached a good level of development of its telecommunication network.

For the other information infrastructures, the PC ratio per 100 inhabitants gives an indication of the digital gap, ranging from 18 for high-income countries, to 2.3 for medium-income and 0.01 for low-income countries. In terms of the market share in information technology, the United States account for 34.7%, Europe for 29.3%, Japan for 14.6% and the rest of the world only 21,4%. These differences are also reflected in the figures for data transmission, the spread of Internet servers and the number of users. Here, again, there are enough factors for potential growth, including the drop in prices, the development of multimedia applications and access to the Internet. The PC market is dynamic and could follow in the footsteps of television which is now wide-spread in low-income countries, with 46% of homes having a TV set"[24].

A brief outline of the development level as regards the use of ICT application in the different regions is presented below.

Asia is progressing in production and use of ICT, as well as in linking up to the internet. However, its progress is constrained by the presence of an extensive hinterland of poor regions and people who have little or no opportunity to connect or benefit from the new technology. The opening up of a major digital gap between the privileged, connected to the global networks, and an increasingly outcast poor population, is a real danger in this region.

Latin America has neither the extent of poverty nor the explosion of the ICT sector known in Asia. Limited in the past by relatively low-tech production and export sectors, it has started relatively recently to open up its markets, invest more in the sector, and now has one of the fastest growing rates of acquisition and improvement of ICT. The ICT revolution appears to be just starting to take off.

The *Mediterranean* area. Apart from Israel, with Turkey starting to follow, the Mediterranean seems to be much further behind. Nonetheless, in most countries the awareness has now dawned of the need to develop this sector intensively, and to build bridges between the global economy and Europe in particular. Political restrictions on the use of the Internet may however slow down progress in many of these countries.

Sub Saharan Africa. This is surely the most disadvantaged region. Some countries have been developing their telecommunication networks (Ghana, Senegal, South Africa…) but the most of them are still lingering.

B.1.3. The opportunities of development offered by ICT in developing countries and the specific needs of these countries, above all in relation to poverty reduction

The fast growing ICT diffusion and use cannot absolutely be disregarded in the aid programmes for developing countries: the necessary investments can be high, but the developing countries will surely pay a higher price if they do not sustain them.
The development policy main goals should be the population well-being and the poverty reduction. This paragraph identifies the main fields of actions and the kinds of support ICT use can provide.

The collected case histories and opinions provide a clear evidence that the lack of ICT capacity may result in new kinds of external barriers, on top of possible tariff or other trade barriers, and of internal barriers, dividing the poor and the women from the more advantaged social classes. On the other hand, there are possibilities of technology leap-frogging, i.e. bypassing some unnecessary stages of development, by developing countries and by the poor.

[23] "The Information Society and Development: the role of the European Union", EC, July 1997
[24] "The Information Society and Development: the role of the European Union", EC, July 1997

Attention is particularly paid to the problems of the low-income countries[25], that are the most of sub-Saharan countries, some Asiatic (Afghanistan, Bangladesh, Laos, Maldives, Nepal), Caribbean (Haiti) and of Pacific (Samoa, Solomon islands) countries. Moreover, we look carefully to trace the link between ICT and poverty reduction.

The poverty in the developing countries

Poverty still widely exists in the world. 86% of global consumption is concentrated on 20% of the world's population. In 1960, the world's richest 20% had an income 30 times higher than the 20% poorest, rising to 82 times higher in 1995[26]. Out of a global population of 6 billion, 1.5 billion people live on less than USD 1 a day. Most of those living below the poverty threshold are in South and East Asia (800 million); in sub-Saharan Africa and in South Asia poverty affects over 40% of the population[27].

Despite conspicuous progress in terms of food availability, literacy and life expectancy in most developing countries, poverty remains more than ever an unmet challenge.

The description of a typical poor village in a LIC is effectively outlined in the recent World Bank report[28]:

- There was a cyclone last year that blew away the villagers' straw huts; compensation was established by local government, but local delivery left much to be desired and local officials were unresponsive;
- The government imposed a fishing ban to protect fish stocks, but only the small fishers of the village actually pay the price, because the big trawlers continue to fish as long as they pay the right officials;
- There is a school for children, but the teacher is there only once a month, because of the protection by the district education officer;
- The nearest doctor is 10 km far away from the village, and because of difficult road communication medical assistance cannot be immediate (in the village none have a car);
- The village women do craft work (embroidered and tie-dyed products) with high demand and good market price (150 rupees/piece in the international market and 60 rupees in the government outlet), but the traders offers very low price (20 rupees/piece) because of the women isolation.

The World Bank report says that this is the condition of the poor you can find all over the world, from the villages in India to the favelas of Rio de Janeiro, the shantytown outside Johannesburg and the farms in Uzbekistan.

If you ask the poor about their conditions, they will highlight, the lack of earning opportunities, the difficult relationship with the market, the insufficient correspondence to their needs by the institutions, the insecurity (above all concerning health), the risk of being out of work, the continuous risk of losing their crops and to see their earnings vanish.

Poverty causes come from the availability of few assets, from the scarce return (productivity) of such assets and from the high volatility of such return (problems associated with market prices, weather, political turbulence, and so on). There are different kinds of assets:

- Human assets (labour skill and good health)
- Natural assets (land, …)
- Physical assets (access to infrastructures, …)
- Financial assets (savings and access to credit)
- Social assets (networks of contacts, political influence, …)

So poverty does not only mean low income and low financial resources, but also difficult access to education, medical care, work, earth, services, infrastructures, policy; to be poor means also to be more vulnerable to economic crisis and natural disasters.
In this context you can read the objectives given some years ago by DAC (Development Assistance Committee-OECD, 1996) for the 21st century[29]:

- *Economic well-being*: reduce by one-half, by the year 2015, the proportion of people living in extreme poverty in developing countries
- *Social development*: primary education for all by 2015, gender equality in primary and secondary education by 2005, fall by two-thirds in mortality rate of new-born and young children by 2015, access to reproductive health for all those of procreating age by 2015.
- *Environment*: implementation by 2005 of national sustainable development strategies in order to reverse by 2015 the current trend towards degradation of environmental resources.

[25] See the list in C. Technical files
[26] Report on Human Development, UNDP 1998
[27] World Bank, 1999
[28] World development report 2000/2001, World Bank
[29] "The European Community's Development Policy", Brussels, 26-4-2000

The World Bank[30] points out that in the past decade on average the world has not been on track to achieve the goals. But progress in some countries shows what can be done. China reduced its number in poverty from 360 million in 1990 to about 210 million in 1998. In Mauritius, today all citizens have access to sanitation, 98% to safe water and skilled health staff attend 97% of births.

The various interventions to fight against poverty in the developing countries

In this paragraph we see the main measures that a developing country can adopt to successfully face the poverty reduction problem. *For the moment let us leave the ICT out of consideration*: their potential use is the object of the next paragraph.

To support the economic growth of the country

The economic growth of a country always permits to reduce poverty[31], but not always is the reduction equal in the different geographical areas and between the different social classes. Economic growth is supported by interventions aimed to reduce the risk for private investors, thanks to a stable fiscal and monetary policy, a transparent business environment, an easy access to credit, a low cost of necessary transactions to reach the market (through fairs, Internet, …). These conditions are not so common in developing countries: the flow of private investment in developing countries has increased substantially in the last ten years, but 80% of that goes to just a dozen countries[32].

Economic growth is facilitated also by the market. Market reforms above all concerned the reduction of barriers to international trade and capital flow. On average the result was an inflation reduction and a faster growth. But the passage to the market economy was not always successful (see the cases of Russia and Africa); and in the successful cases, not always did it contribute to poverty reduction, because access to the market can be difficult for poor people (living in remote areas for instance).

Easier access to business for the poor

Sometimes poor people experienced even negative impacts by the market reforms, as for instance in the case of poor craftsmen that cannot face the concurrency of industrial products imported from abroad. To avoid this, the state should manage to permit an easier access to business for poor people, simplify administrative incumbencies for small business (typically those ones of the poor) and facilitate their access to the credit market. The last one is very useful to face the crisis periods (because of agricultural price fluctuations or natural disasters) and permit business to be made with improved peace of mind. But the financial market often does not work well for the poor, because it requires guarantees on assets that poor do not own. A better approach is the micro-credit, experienced in Bangladesh (LIC), that is effective for poor (particularly poor women) thanks to innovative methods of collection and loan. The micro-finance success in risk reduction and assets accumulation suggests that these programmes should become priority for governments and donors.

Easier access to education for the poor

In developing countries more than 50% of people are under 25. The school frequentation index is 83% in developed countries, but in developing countries it is only 57% and goes to 36% in LIC.

To give better education increases the peoples well-being and also creates the conditions for future increases in income and the exit from poverty.

Easier access to medical care for the poor

Average life expectancy is 62 years in the developing countries (51 in the least advanced) as against 74 years in the industrialised countries. AIDS kills 2 million people per year in Africa. Life expectancy is diminishing in a number of countries[33].

800 million people (1 in every 5 in the developing countries), 200 million of them children, suffer from chronic malnutrition.

Some programmes have been successful, for instance those ones that permitted to eliminate measles and onchocerciasis (river blindness), but many things still need be done.

To improve health means to reduce the possibilities of losing income through disease that sometimes is the cause of the fall into poverty for whole families.

[30] World Development Report 2000/2001, Attacking Poverty

[31] World Development Report 2000/2001, Attacking Poverty

[32] UN General Assembly Economic and Social Council (22 May 2000)

[33] UN General Assembly Economic and Social Council (22 May 2000)

Generally speaking it is important to say that human development and economic growth are strictly linked, and that there is the possibility to start a virtuous cycle: public intervention in education and health for the poor generates more economic opportunities and so more resources to reinvest in social policies, and so on.

Better public services for the poor
The services and the infrastructures provided by the state are very important assets for the poor, but in the LDC these are very scarce. Indeed, one third of the world's population (around 2 billion people) do not have access to adequate energy services. These services are very useful for the poor: in Sri Lanka, for instance, the availability of telephones in rural areas permitted to increase the selling prices of farmers produce from 50% to 80%[34].

To eliminate discrimination
As we said above, economic growth always allows a reduction in poverty; but the amount of the actual reduction largely depends on the starting inequality. To remove ethnic, racial and gender inequality is certainly one of the first objectives to fight against poverty and make the above mentioned measures effective.
For instance, educated women can better contribute to the family planning, as regards the number of children and their aspirations for the future. It is demonstrated that the countries that invest more resources in girls' education have a higher index of economic growth. And this is true also at the family micro-economic level: studies made in Kenya show that families with women with the same level of education than men produce a 22% higher harvest[35].

To improve the environment
The developing countries are probably the most polluted, with particular sufferance of poor people.
In 1995, among the 23 mega-cities (with more than 8 millions inhabitants) 17 belonged to developing countries; Africa and Asia are the regions in which urbanisation is rising fastest[36].
The phenomenon of deforestation is concentrated in the developing countries (200 million hectares lost between 1980 and 1995) (World Resources, 1998-99).
The water problem is likely to become one of the most pressing ones in the 21st century. In 1997, one third of the world's population lived in countries experiencing a shortage of resources compared with consumption needs; this could rise to two thirds by 2025. (World Resources, 1998-1999).
Current trends show that in 2010, developing countries carbon dioxide emissions will surpass those of developed countries including eastern Europe (EC, Poles Model, 1999).
In 1990-98, developing countries suffered more than 97% of natural disaster-related deaths (World Bank draft Report 2000-2001).

To improve the empowerment of the poor
This means to improve the capacity of the poor to influence the public institutions that have impact on their life. The main interventions can be summarised in the following sentences[37]:

- Legal defence of the poor, that often are not protected from abuses, do not know their rights and can be deliberately misinformed;
- Dissemination of information that permit poor people to know the public services (as for instance in Uganda regarding the education expenditures, before being published in the newspapers reached the only 30% of schools, and now today reach 100%), and then to monitor them;
- Decentralisation can be a very useful measure to ameliorate the presence of public institutions near the poor. A study in South Africa shows that the involvement of the community in the decisions reduces the job creation costs and improves the cost-effectiveness of the transfer of resources to the poor;
- Pro-poor coalitions, that link together the interests of poor and non-poor, are an important key to reduce poverty; but poor often cannot participate because of the lack of time, resources and information.

To reduce the vulnerability of the poor
Poor people are not sufficiently protected from the risks (diseases, natural disasters, economic crisis, and so on). The state should facilitate the access to credit and the income diversification, and improve insurance services. The pension system is limited in the LDC, and concerns only the 16% of the work force [38].

[34] UN General Assembly Economic and Social Council (22 May 2000)
[35] World Development Report 2000/2001, Attacking Poverty
[36] World Resources, 1998-99
[37] World Development Report 2000/2001, Attacking Poverty
[38] see above

The opportunities that come from ICT for the human development and poverty alleviation

There is a general agreement among experts that ICT can play a central role for the economic and social growth of developing countries, that often mentions the opposite danger regarding the possible exclusion of some LDC from the e-economy (digital divide)..

On the other hand, there is no agreement about the link between ICT and poverty reduction. Many people say that other actions have the priority, like road construction for instance, and drinkable water distribution, and so on. Anyway there are some important positions that stress the importance of ICT also in these fields:
"The experience of a number of countries, including developing and transitional economies, some of them working under conditions of a severe shortage of resources, complex political environments and acute socio-economic problems, demonstrated that bold actions in bringing their countries into the digital age paid off and brought tangible positive results in economic, social and political terms[39]. Moreover, this experience has proved that the argument that ICT should only be introduced once progress has been made in tackling poverty is spurious: ICT brings early, tangible and important benefits to the poor. These countries, by extensive and innovative use of ICT in their development, were able to extract value from globalisation, rather than watching globalisation extract value from them"[40].
China is a good example. The important success in poverty reduction that China achieved in the last 10 years has already been quoted above in this paragraph. Now we can have a look at the efforts that this country is making for its national ICT development. Since 1997 to the end of 1999 the number of computers connected to Internet had surged from 0,3 to 3.5 million. There are now 35.6 million e-mail accounts. Great efforts are under way to increase connectivity with the rural population. The 1,000 web sites providing e-commerce support services generated an estimated $55 million in 1999. China's rapidly expanding telephone system has reached 110 million connections. Cellular telephone growth is the fastest in the world: it has exploded to over 50 million units since 1994.

Therefore, let us examine the actual ICT uses for improving economic development at country level and poverty reduction, and the most significant examples.

ICT can strongly contribute to the economic growth of the country
ICT sector itself can give a substantial contribution to the economy, in particular to exports. In this regard, the examples of India and Costa Rica are particularly striking[41].
India is a low-income country but it is advanced in the ICT field, that is becoming more and more important in the economy of the country. Internet access is now widely available and the mobile phone network is rapidly expanding. Software development and expansion of the service industry have been impressive. Progress with the development of telecommunications has likewise been satisfactory. Over 200,000 professional jobs have been created in ICT-related activities. Exports from the software development and services sector earn approximately US$ 40 million a week. The service economy already contributes more than 60 per cent to the economies of cities such as Mumbai. **Costa Rica** attributes much of its recent economic growth to the widespread adoption of ICT: the installation of computer laboratories in 100 per cent of the nation's public high schools, the introduction of "smart cards" nation-wide and their widespread application with respect to public administration, transportation, public telephones and health services, the development of self-contained multi-purpose/multimedia mobile units that can be taken to any rural community and provide a variety of functions, including Internet access, training in ICT, a small theatre and e-mail facilities.
Other examples are **Malaysia** and the **Mauritius Island**, whose governments fostered ICT development, and that are currently experiencing an important economic growth. Regarding **Africa**, to some extent the recent development of the internet, the mobile communication subsequent to the implementation of good quality infrastructure has impacted upon Senegalese economy as has been recorded over the last four years. In addition to that, many new enterprises are being created. Uganda and Benin are also significantly recording the same impact[42].
The ICT contribution to the economic growth of a country is however much larger, and impacts on the capacity to attract capital from abroad and to increase employment. Indeed, developing countries can no longer expect to base their development on their comparative labour advantage – that is, on cheap industrial labour. Today the enterprises are more and more founding their competitive capacity on other factors, that can improve much more the efficiency and the effectiveness of their business processes. And ICT "plays a decisive role in improving competitiveness by raising production quality (more stringent standards, quality control) and its fashion-related aspects (textiles) or by integrating production in a complex process such as in the case of spare car components, or by offering facilities for the transmission of orders and specifications as the first steps towards electronic commerce"[43].
We can surely affirm that nowadays it is really hard to develop enterprises that are not founded on the management of their production and administrative processes through the wide use of ICT; it is not simply a problem of efficiency, that could be overcome by low salaries that make competitive the LDC work force; the

39 Some examples are in annex to the UN document
40 UN General Assembly Economic and Social Council (22 May 2000)
41 UN General Assembly Economic and Social Council (22 May 2000)
42 Source: our interview with Mr. Gaston Zongo, Acacia Initiative
43 IS and Development (7)

matter is that the enterprises in the LDC must be able to maintain business relationships with their partners belonging to developed nations, that have more and more difficulties in managing information on paper.
An Italian entrepreneur that recently opened a small enterprise in Ghana confirmed to us that, among others, an important element in his choice of Ghana is the fact that it has one of the most advanced telecommunications systems in the region.
ICT not only creates the best conditions to attract foreign investments, but it can also develop the employment and allow improved use of its natural resources..
In **Senegal** (a LIC) Telecentres were developed in an independent way through contracts with the main Telecom operator, Sonatel. Actually, there are around 10 000 (including 4000 located in the rural areas and small towns) privately owned telecentres and they employ around 18 000 people with an indicative revenue of around $800 US per year for each person, which is far above the minimum salary in Senegal. The Telecentres have created twice as many jobs as Sonatel alone. Furthermore the centres have created an infrastructure offering an excellent basis to provide villages and small towns with a collective access to the Internet. This is a good example of how information technologies are also providing opportunities for job creation and development in poor countries. A survey conducted in 1999 has indicated that 92% of people who do not have telephone connection at home can nevertheless receive and place calls using the telecentres facilities or their neighbour's[44].
For small island nations ICT provides new opportunities to participate in the global economy, enabling access to niche markets for tourism and local goods. The **Small Island Development States Network (SIDSNET)** is a global network of 42 island nations in the Caribbean, the Indian Ocean, the Atlantic Ocean off Africa, and the Pacific Ocean. Internet web pages have provided up to 80 per cent of the market for some small tourism ventures and have transformed traditional access to the tourism market.

ICT can make it easier for the poor to access business
Somebody noticed that market globalisation is dangerous for poor people, because it can reduce some local market advantages (for instance, poor craftsmen can keep higher prices thanks to their market isolation). But it is clear that the defence of such small privileges is a short term battle: an open market can bring to the poor much larger advantages if they have access to it, and this can be possible using ICT to break down the remaining infrastructure barriers.
In **Arabian** countries, for instance, the "virtual souk" has a good success, and allows hundreds of craftsmen to directly reach the international market. In **Bangladesh** the mobile telephones allow also farmers living in remote rural areas to have market information in real time, therefore to be able to more effectively contract prices with traders. The analogous case in **Sri Lanka** has already been quoted above. Similar experiences come from many different countries all over the world[45]. Very particular but interesting because it is easily transferable to other countries is the case of the e-business of poor households in **Peru**[46]**.** An association (Tortasperu) allows them to communicate via the Internet with the numerous Peruvians working or studying abroad, that can surprise friends and relatives back home by sending them a home baked cake.
A recent example is **Peoplelink**, a non profit organisation based in the USA that provides support to craftsmen around the world to market and sell their products on the Internet, leaving a larger portion of the selling price in the pockets of the producers.
Kaya Beachy in **Senegal**, where members of the Grand Coast Fishing Operators' Union salt and smoke the day's catch to prepare it for market, may seem light years away from cyberspace, but for these women the Internet is a boon. With the help of Environmental Development Action, a Dakar-based NGO, and Acacia, a Canadian government-sponsored initiative, the co-operative has set up a website that enables its 7,350 members to promote their products, monitor export markets and negotiate prices with overseas buyers before they arrive in Senegal[47].
Therefore, the use of ICT supporting the businesses of the poor is one of the most successful solutions: poor people know their business, know their needs and they simply have to be provided with ICT to be able to use it in a convenient way.

ICT can make easier for the poor to access education
The example of the poor village quoted at the beginning of the chapter highlights the education difficulties experienced by poor people, particularly by children. Education is not always an accessible good, because teachers are not there and the school works only a few days a year.
Obviously ICT has a tremendous potential for improving education, particularly in those areas currently not at all or badly covered.
Furthermore, technologies for education and training, in particular distant education and multimedia, and new learning methods offered by the information society may represent an opportunity to meet the needs of

[44] Sources: our interview to Mr. Zongo (Acacia Initiative) and the "Interview with Mr. Robert Verrue, Director-General for Information Society, EC" for the UN Newsletter
[45] See also IICD project in Ghana
[46] Newsletter by DGIS (NL) and DFID (UK), November 2000
[47] Excerpt from *Time* magazine, January 31, 2000, p.45, business section

countries that have to accommodate, train and economically integrate large numbers of workers (in most cases half the population is under the age of 20) in widely dispersed and under-equipped inhabited areas.
Conventional teaching methods and arrangements are increasingly unable to respond to the rising demand for learning, resulting in increasing illiteracy in many poor regions, a dearth of qualified teachers and reduced public funding of the education sector. Long-distance education – via radio, TV and video, CD-ROM and/or Internet – could become a viable complement to conventional schooling and training, reaching out in particular to isolated regions, which often are the poorest[48].
Moreover ICT provides a useful modality for in-service training of teachers and forum for developing and modifying teaching material.
Unfortunately the examples demonstrating the effectiveness of this approach are still limited. There are some examples of distance education in some developing countries, but these concern only the upper level of education (university) and of social classes[49].
Since 1970 experiments using television in the primary schools have been carried out in Niger and Côte d'Ivoire, but without great success[50]. The introduction of innovation (like ICT) in education is much more difficult than in business: the teachers cannot easily modify their teaching methods to the children, maybe a new generation of teachers will be required.
The **Imfundo** project, was launched by DFID (UK) and a number of private sector companies (e.g.: CISCO) to support African teachers (Mozambique e Rwanda) by means of Open and Distance Learning.
The **COL**[51] experience relies on more traditional communication technologies, as the radio, with the advantage to be already widely diffused in the LIC and therefore able to reach the remote rural areas too. Radio stations are being considered in Uganda, South Africa, Namibia and Sri Lanka. Stakeholders have been targeted for each country. They should ensure that the necessary infrastructure is in place for GM radio and that all licensing and issues pertaining to community broadcasting have been met. In most cases, the stations destined for Uganda and South Africa will be broadcast in language of daily use. The national or regional stations do not have the capacity to aim directly at rural community issues, therefore the community-based stations will be effective in providing information and training. The station can also provide rebroadcast of other national or international stations. In the case of Uganda, a local committee has been formed to ensure that different community groups will have access to the community station.
In 1999, with a grant from the British Department for International Development (DFID), **COL** began its three-year pilot project in India and Zambia. The goal is to kick start self-sustaining *literacy programmes* based in community learning centres, using information and communication technologies (ICTs), such as computers and televisions, in the curriculum of the country. The target group is represented by adults and out-of-school youth in the workforce, who have an immediate need for reading and writing skills. Actual programme design and implementation, as well as providing physical infrastructure, is the task of in-country partners: the Indira Gandhi National Open University (IGNOU) of India and the University of Zambia.
Other cases are the introduction of ICT in high schools (secondary schools) in **Senegal**, **Mozambique**, which proved to be efficient. On the other hand, ICTs are used in **Uganda** for non formal education for women entrepreneurs in their local language[52].
In **Rwanda** ITU is developing the Rwandan Educational Network - RWEDNET (Improving Education through the use of Information and Communication Technology). This would provide an integrated infrastructure to support the KIE (Kigali Institute of Education) distance-learning programme. The network will support the Rwandan Government's plans for the development of ICT (including the use of ICT in education), aimed at increasing access to information throughout the country, improving educational standards and building a knowledge-based society, *as core elements of their poverty reduction strategies*.

ICT can make it easier for the poor to access medical care

ICT can make important improvements in the delivery of services such as health care, including through the application of telemedicine, particularly in those areas currently not covered or badly covered.
Some countries have to cope with large-scale endemic and epidemics diseases. Telemedicine may help to meet these challenges by improving the organisation and management of health care. Data bases may be linked through information networks to monitor the development of diseases (epidemiology), provide access to medical expertise through teleconsultation and pave the way for remote medical assistance.
Tele-medicine can provide health services and diagnosis to the rural under-serviced; enhance the quality of health care; provide for training of health workers; facilitate the exchange of records and collection of medical information and data; provide access to medical literature; and allow for expert consultation. Tele-medicine along these lines has already been organised in a few locations through the use of satellite systems. The experiences have been very positive and it should be possible to greatly expand the system[53].

[48] UN General Assembly Economic and Social Council (22 May 2000)
[49] For instance the DPEP in India and the Patagonia Distance Education Programme quoted in Alamed Report (p.77)
[50] Source: our interview in ITU
[51] Commonwealth of Learning, see also par. B2.3
[52] Source: our interview with Mr. Zongo (Acacia Initiative)
[53] IT in Swedish Development

In the northern province of **Uganda**, where the use of mobile phones in a rural area for the follow-up of pregnant women has contributed to reduce the maternal death rate by 50 % in two years.
Two major telemedecine projects are in progress in Senegal and in Uganda. Both aim at providing community health care delivery, continuous training of young doctors posted in the rural areas, support for tele-radiology. These projects are supported by IDRC, ITU and other donor agencies.
Cuba was in the midst of a blockade and an epidemic when it launched Infomed, a national network of the public health system. Created when there was no information infrastructure in the country, it began as a simple network approach to sharing knowledge and facilitating access to information via e-mail. It used the best available technologies. Since its inception, the network has been expanded to enjoy nation-wide coverage with regional and provincial nodes; it has a virtual library component covering medical journals; and it has contributed to the building of national capacity to manage new information technologies and empower people.
The **Healthnet** collaboration spearheaded by Satelife, a US-based NGO, is an e-mail based network and information service that support health care workers in 30 countries (22 in Africa). Healthnet provides summaries of medical research, access to online medical libraries and linkage between healthcare workers in the South and medical practitioners in the North.
In **Tanzania**, the Health Care Sector Programme supported by the Danish government is aimed to improve access to effective and cost-efficient district health services, especially to the poor. Part of the project consists of introducing a national health care information system for efficient planning, implementation and monitoring of the activities within the public health care sector[54]. The Danish government is currently supporting a similar project in **Zambia**.

ICT can improve the environment

First of all, ICT can contribute to reduce the excessive growth of the largest cities: thanks to the new technologies, people no longer will remain marginalized by virtue of distance from the main cities. The introduction of stand-alone energy technologies at village level and the availability of ICT at affordable cost could bring a quality-of-life enhancement also in the remote rural areas.
Moreover it can contribute to the environmental problems solution, as for instance the water management in those regions where water is scarce: a database for water resources management surely allows their better utilisation and therefore it produces a real increment to the available resources.
In **Nigeria** a project using a GIS (Geographical Information System) via satellite and Lap-top to find underground water was carried out by the British Geological Service.
In Côte d'Ivoire the local water delivery company (Sodeci), in co-operation with foreign companies (es: Bouygues), deliver water to the poor with the help of ICT.
Moreover ICT allows the implementation of an early warning systems for weather and other environmental phenomena.
In **India**, the EC supported project in Aravalli Hills, produced 38,050 ha rehabilitated; Green cover increased by 334% in rehabilitated area; Forest area increased from 8,000 to 36,000 ha; 21,000 ha of new fodder sown; 33,000 tonnes/annum of new fodder produced; 15 large water structures constructed plus €1 million worth of water-retaining embankments. Lands can now support roughly three times as many grazing animals. These changes have significantly improved the living standards of the 800,000 people living in the project area. A key facet of all the interventions is that they have been ***targeted specifically for each village*** to meet local demands and exploit local potential to maximum effect. ***Without the Information system this could not have been done*** and the interventions would have had to be planned at division, or even project, level. It is very approximately estimated that the interventions would have only been half as efficient in such a case.
The Lubisi Dam project in Eastern Cape province of **South Africa** is worth mentioning: the LUBISI DAM DEVELOPMENT FORUM (LDDF) received an award for converting the disaster that struck the area in 1968 when a newly constructed dam consumed most of the arable land and cut off 23 villages, about 80000 people from their principle means of existence. Since the inception of the LDDF Project the communities through the democratically elected Forum have developed a strategic plan to aggressively combat poverty and to achieve sustainable development for the people of the Lubisi Area. They built a modern development centre with all amenities to co-ordinate the implementation of the plans and managed to attract technology partners and funding that helped with the installation of wind turbines and solar panels to generate the power required to exploit the centres. As part of the community owned strategic approach the LDDF has among many other things overseen the repairs of the water reticulation infrastructure and the training of 23 'water managers' to help the villages maintain the facilities. It has now secured National funding to expand such infrastructure works. It has further developed a variety of small business activities, biogas experiments, aquaculture and much more. Under a recently launched IDRC financed project the LDDF together with technology partner CSIR will co-ordinate the implementation of a programme of ICT activities with the aim to develop the capacity within the Lubisi community to enhance and expand the current activities with modern Information applications[55].

ICT can make easier the empowerment of the poor

[54] Information and Communication Technology in Danish Development Assistance, DANIDA, May 2000
[55] Source: our interview to Mr. Zongo (Acacia Initiative)

The emergence in many developing countries of a new independent press and the explosive growth of the Internet, the freeing of the airwaves and the shift from state to public service broadcasting are creating an increasing demand for up-to-date information, both written and audiovisual. Such pluralist information contributes to strengthening civilian society and consolidating the democratization process in numerous developing countries[56].

On the other hand, the control of information flows has historically proven to be a critical instrument for repressive regimes to monitor and oppress opposition groups. The satellite connection, widely diffused phone system and Internet access can significantly limit this possibility.

A significant example of the ICT potential in this field can be found in **Sri Lanka**, where a project to connect some local radio stations to the Internet has been launched: the radio stations receive information from the Internet and diffuse them via radio, to a wide local audience also diffused in the remote rural areas (all villages have radios).

The telecentres, the private media, the mobile phones and the web were instrumental in the democratic changes that occurred in **Senegal** in 1999 presidential elections; the results, though non official, have been forecasted and published by the media on the same day, 2 hours after the closing time of the vote; The list of the voters' names as well as the programmes of the candidates were posted on the web[57].

They have also impacted on the last referendum in **Zimbabwe** won by the opposition.

Acacia's SAFEFOD project on local governance aims to provide local and rural counties with municipal budget management software, local information dissemination through the Internet, Web sites and vocal servers. The project aims to allow rural communities to retrieve administrative forms such as death, birth and marriage certificates. The President of the Republic of **Mali** visited the project and instructed his relevant Minister to seek funds to replicate this project in 700 villages of his country[58].

ICT can reduce the vulnerability of the poor

In the domain of research in agriculture, chemistry, water management, fisheries, the environment, urban planning, etc. the development of networks enables researchers in the developing countries to have the necessary information at their disposal and to set up teams of critical size and thus to integrate in the global scientific community to stem the brain drain[59].

And beyond the benefit of networking, the development of the Net is providing the South with comparative advantage in terms of work conditions. The cost of life is cheaper and somehow the environment is better for the researchers, once they are integrated in the global scientific community.

There is also an increased number of teleworking and outsourcing opportunities under which some Northern companies subcontract Southern smart companies in a win-win process. This contributes also to stem the Brain-drain, and the emigration to the North as well.

The **Sri Lanka** Science and Technical Information Centre (SLSTIC) located at NSF has developed seven science and technology related databases relevant to Sri Lanka. Four of these databases are already available online on the Internet and the others will be available online shortly. The network as a whole has played a very important role in breaking the isolation of the Sri Lanka science and technology community. In **Nepal** the EC supported project "Strengthen Veterinary Services for Livestock" is estimated to be effective thank to ICT for 40%[60]. In **China** the EC supported Fuchun River Real Time Flood Forecasting System**.** Local newspapers make annual estimates of the total costs of flood damage. They calculated that CNY 6 Billion was saved through reduced damage over the five years from 1992 to 1996 while the system was fully operational. Furthermore, over the same period the hydroelectric station and generated an average extra 15 million kWh of electricity annually due to the system ensuring the storage reservoir was always as full as possible. Better flood forecasting improved the quality of life for those living downstream of the reservoir. The financial benefits detailed above clearly helped progress in the region. The estimated benefits of €750 million were obtained from an investment of only €1.5 million project costs.

Other interesting African experiences are described below:

The **Francophonie Virtual University** is connecting Southern Universities between them and with the Northern Universities.

CTA, a research institution of the European Commission based in Wageningen (the Netherlands) ensures also the connection of agriculture and environment researchers from the ACP member countries with the European research institution. It is establishing an ICT-observatory to facilitate sharing lessons learned from the application of ICT in agriculture research. **SISERA**, an IDRC/CIDA/WB secretariat is also helping to achieve a network of African research institution in the Economics area.

On teleworking and international outsourcing, Canadian and French companies are **subcontracting** Senegalese companies respectively for remote court-minutes transcription and processing , and civil works drawings pertaining the extension projects of Paris -Underground.

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[56] "The Information Society and Development: the role of the European Union", EC, July 1997

[57] Source: our interview to Mr. Zongo (Acacia Initiative)

[58] like above.

[59] "The Information Society and Development: the role of the European Union", EC, July 1997

[60] The "Alamed Report", EC 2000

ICT shows concrete possibilities of technology leap-frogging

A developing country that today decides not to use ICT for its development, obviously will follow the traditional development path, that was laboriously made by those countries that today are developed. But why make this choice, when now ICT allows them to follow easier and faster paths?

From a technological point of view, the mobile telephone and the use of satellites, with the use of solar energy, seems to be able to avoid the need to install an expensive fixed telecommunication network to cover all the remote areas of the world.

Moreover, wireless ICT avoids the risks of theft (copper wire are often valuable).

Internet development and its continuous performance improvement, also referring to data safety and security, reduce the need to install expensive private networks.

The Internet offers alternative methods of communication that are often more versatile (and sometimes more reliable) than traditional methods such as telephone or mail. For international correspondence, this service is less expensive and considered more reliable than traditional mail. One advantage of e-mail is that messages can be delivered reasonably reliably, even when telephone connections are weak or damaged.

The development of the industrial system can also be directed toward the ICT use from the beginning, without the necessity to pass through the phase of traditional (manual) process management, that today are competitive only for a low-income work force.

If a developing country uses ICT for its development, it will have from the beginning people with professional skills adequate for the new technologies, avoiding the problem of all the developed countries that now must reskill their work forces that have been trained on old technologies.

Mozambique and Eritrea are two particular cases of leap-frogging: devastated by the war, they decided to start the reconstruction process using as much as possible ICT tools, above all in education (to train teachers).

The exclusion from ICT is dangerous

Many experts agree that exclusion from ICT is dangerous, and some liken it to suicide. A condition of further disadvantage and marginality will be experienced by the countries that will remain excluded from the e-economy and the global market. When the most of the international commerce will be on Internet (from 10 to 25 % of the world trade by 2003, according to the UNCTAD estimation), countries where Internet will not be largely and easily available will inevitably lose their commercial space. The same thing will happen in the tourism field, one of the most important resource of developing countries[61].

Information and communication have become indispensable assets. This has had the effect that ICT today is recognised as one of the most essential forces in economic and social development. The cost, in terms of lost opportunities, of not being aware of the implications of ICT is high as is the cost of not having the capability to access and use its contents.

ICT's great impact on society, combined with the rapid expansion of the field, must be taken into account by all organisations involved in development co-operation. Although the costs for developing digital infrastructure and utilising information technologies are high, developing countries must participate in this process or risk paying an even higher price in the long run if they do not do so[62].

Such an exclusion is also dangerous for the developed countries, because of the possibility to enhance the "globalisation backlash" recently experienced.

B.1.4. The main obstacles (as regards politics, technology, infrastructure, know-how, language, investment capacity, …) that today prevent the developing countries from benefiting immediately from these opportunities

There are many obstacle to the ICT diffusion in the developing countries, and the most important is probably the lack of the basic infrastructures (electricity distribution and telecommunication networks).

[61] See the "Interview with Mr. Robert Verrue, Director General for Information Society, European Commission, for the UN Newsletter, November 2000.

[62] IT and Swedish Development

But a major obstacle is surely the fact that local policy-makers (and sometimes also of donors countries) are not aware of all the advantages that can be drawn from the use of ICT tools, and for this reason they seem to be reluctant to invest in such a direction.

Donors are not always convinced that ICT can contribute to poverty reduction

Everybody agrees that ICT is today and will be tomorrow the engine of the economic development of the developed countries. Few people doubt that this is true also for the economic improvement of the developing countries. To avoid an increase in the economic gap between the North and the South of the world, it is necessary to fight against the "digital divide", that means to insert the LDC into the international network as soon as possible.

On the contrary, there are many doubts as regards the link between ICT and poverty reduction.

Surely there are some examples that show how ICT can reduce poverty (see par. B1.3), above all concerning the improvement of the access to business information to enhance the position of the poor. But other more traditional interventions (for instance the road construction, the drinkable water distribution, …) are commonly regarded as more effective in the fight against poverty.

Some, also inside the European Commission, argue that if ICT is directly provided to the poorest communities, no relevant results will be accomplished, because the poor do not have the necessary knowledge to use them; on the other hand, promoting the use of ICT tools by middle class communities, the achievable results in terms of development will indirectly produce a future poverty reduction, because the poor will get benefits from the general development.

On the opposite side, others are worried by the possibility to create an internal digital divide, between a small elite (able to get benefits from ICT) and the large majority of people that become poorer and poorer.

Obviously these doubts are obstacles to the ICT use and diffusion in developing countries.

Many developing countries do not ask for ICT

The scepticism of many donors about the effectiveness and the priority to be given to ICT in the fight against poverty seems to be shared by the policy-makers in many LDC (see the UN document quoted in par. B2.4). During the last experts meeting in Brussels (held by the EC in November 2000) many experts mentioned this theme.

During the Africa-EU summit (April 1999), that produced the Cairo Declaration, the EC made an effort to introduce the Information Society aspects in the document, because the African leaders gave priority to other issues. Probably many African policy-makers are not yet aware of the possible use of ICT, and prefer to deal with other more familiar fields[63].

Even if they are aware, facing dual problems and the balance between short term versus medium long term planning is not that easy. On the one side, they have to deal with short term issues: lack of class rooms, tables, and books, scholarships for the students, health care delivery facilities, epidemic or pandemic diseases, and the debt burden etc. While they recognise the potential of ICT to address the same issues, it has a medium or long-term impact. The lack of self-financial resources makes the allocation to ICT difficult within survival conditions.

And on the other side, donor agencies (such as the EC) support programmes only upon request from the government that decides to allocate part of the national aid-pot to ICTs. The trade-off is then very difficult for the Government.

The lack of infrastructures

To be effective, ICT initiatives require a competitive telecommunications environment.

The level of telecommunication infrastructures in the developing countries is highly diverse but mostly far removed from that in the industrialized countries. Per 1,000 population, Internet users are 61 as a world average, 228 in EU, 20 in Asia/Pacific, 27 in Latin America and only 4 in sub-Saharan Africa; fixed telephone lines are 528 in EU, and only 16 in sub-Saharan Africa; PC's are 249 in EU, 17 in Asia Pacific and only 8 in sub-Saharan Africa[64].

This quantitative difference is further aggravated by qualitative weaknesses of networks, affecting the quality and reliability of communication and by structural disparities between urban and rural areas. Teledensity in

[63] An interesting opinion collected during our interview in CTO is that actually only the Finance Ministers do not understand the ICT advantages.

[64] A review of the EC experience in ALAMED, EC 19 November 2000

rural areas, for instance, does not exceed 0.8 in low-income countries[65]. In some very low-income countries with predominantly rural populations, such as Cambodia, Chad, and the Democratic Republic of Congo (formerly Zaire), this number is below 0.1. The infrastructures fail to meet local demand and cannot guarantee access to global communication networks.

Therefore a large majority of people living in the developing countries have no access to telecommunication services. Nearly 2 billion people have no access to electricity services.

The situation is highly dependent on the examined countries: there are regions much more disadvantaged than others (sub-Saharan Africa above all).

An adequate set of actions and measures implemented by the state could support telecommunication development also in the most disadvantaged countries, like the African ones. This region has been recently examined by the BIPE study, committed by EC[66]. This study demonstrates in a convincing way that the potential telecommunication growth rate is high in those countries, also if environmental conditions are adverse and families have a low expense capacity.

Current demand is low because of the cost of telecommunication services. The cost of Internet usage is the key issue, with typical charges still far exceeding levels that would permit popular use[67]:

- The cost of leasing a high-capacity line from a telecom service provider would be around $3,800 in the USA, but about $180,000 in Argentina (Panos)
- The economics of connecting rural areas, especially remote ones, in low-income countries are very unfavourable: assuming capital costs of $1,000 per line, a telecom operator would need to generate revenues of $330-400 per line to be profitable, which is above the average per capita income of quite a few poor countries.
- Because Internet Service Providers (ISPs) are concentrated in cities, telephone charge costs are particularly high for rural users

But costs are high because demand is low.

Probably the key for the missed development of telecommunications is the lack of regulatory issues, that often are not adequate to favour:

- the *privatisation*, avoiding that the process neglects the rural areas, less interesting from an economical point of view;
- the *deregulation*, the only way to attract foreign investors and capitals, essential for the necessary huge investment;
- the diffusion of *public access* (through Telecentres)
- the *universal access* (also in the disperse rural areas)
- the creation and the empowerment of the *independent regulation*.

Lack of Foreign Direct Investment

The capacity to attract foreign investments certainly supports the economic growth, as discussed in chapter B1.3. And indeed a good improvement has been reported in this field: foreign direct investment into developing countries has emerged as the largest and fastest growing single component of external finance for this group of countries, taken all together. Foreign direct investment to developing countries has increased from a mere $ 25 billion in 1990 to $ 170 bn in 1998. In the same period official development assistance flows decreased from $ 59 bn to $ 52 bn.

Asia and Latin American countries have achieved most success in attracting FDI. However, the gap among developing countries widens with the top five countries receiving 55% of all developing countries' inflows and the 48 Least Developed Countries receiving less than 1%. Certain regions, in particular Africa, remain particularly marginalised[68].

This is the current framework where funds are still missing to create the technological infrastructures in the LDC. According to the World Bank, the necessary annual investment for the growth of telecommunications in the developing countries over the next five years amounts to US $60 billion. Financing in the form of international public aid would not exceed 2.3 billion and most countries cannot make up the difference. The necessary investment can only come from the private sector. However, to mobilise private investors a

[65] "The Information Society and Development: the role of the European Union", EC, July 1997
[66] See par. B2.1 and C. Technical files
[67] A review of the EC experience in ALAMED, EC 19 November 2000
[68] World Investment Report, UNCTAD, 1999.

legislative and regulatory framework will have to be established that is stable, predictable and transparent, making it possible to take rational economic decisions[69].

Moreover the private investors are interested only if the potential market is large enough. The regulatory conditions have been improved, but the internal market is small; therefore, some regional projects have been launched to overcome this obstacle (i.e. UEMOA).

The private sector has already largely shown its interest to invest in the telecommunication of the poor African countries. Some Telecom companies have acquired the public networks of some African countries: the small Leshoto had 10 proposals for the purchase of its network. And this is true also for the small investors: the case of Senegal should not be forgotten, where all the telecentres were opened by private investors.

The rapid growth of the cellular networks, the increasing number of ISPs, and start-ups, the spread of telecentres and cybercafes give a clear indication of this potential.

Lack of capacity

To be sustainable, the ICT use for economic development and poverty reduction requires a local capacity to manage such technologies:

- political and institutional capacity, to create a favourable environment supporting development (regulatory issues, liberalisation, …)
- technical capacity: knowledge of ICT tools and of their use
- literacy: the basic need is to address the vast number of illiterate inhabitants in developing countries;
- language: the growth of the Internet favoured the use of English as the world language. An important issue is that most information on the Internet today is delivered in English, and the same for IT literacy. The anglophone population has an advantage from participating on the Internet using their native language.

The importance of strong political leadership, of a national leader or champion to lead the ICT campaign cannot be overemphasised. When leaders such as Heads of State committed their prestige and authority, rapid progress resulted. But a leader need not necessarily be an individual — it can be a successful network in health or education, for example. The ICT campaign must be part of a clear national strategy and plan for the use and application of ICT within the country[70].

It is important for the community of developing countries to be able to offer consulting services so that companies of other sectors can reap the huge benefits of computerising their operations.

However, the consulting fees of suppliers in the developed world are far too high for the vast majority of companies in the developing countries. Hence, an important task for developing co-operation is to aid in the establishment of local consulting companies initially staffing them and then providing training for the emergence of a local work force of skilled consultants.

About illiteracy, with the recent advances in graphical user interfaces (GUIs), applications based on pictures, icons and voice could be developed for basic communication needs such as e-mail, voice-mail and general community information services.

About English as the predominant language, one role for development co-operation agencies is to assist in the process of developing and translating software to a wider variety of languages. This is of greatest importance when the purpose is to reach the less educated.

Thus, there are two opposing factors to take into account – the desire to reach out to the world (favouring English) and the desire to preserve the local culture (favouring local languages).

The fast Internet diffusion in China, quoted in the previous chapter, was achieved developing local content as a result of a national technological initiative to develop Chinese character sets for use in ICT, since over 95 per cent of the population neither speaks nor reads English. Very rapid expansion of ICT activities followed the achievement of this goal in 1996[71], with an explosion of Internet usage: tripling to over 2 million in 1998 and doubling again to 4 million by 2000.

Similarly, the introduction of Cyrillic character sets for computer interface in 1997 has dramatically increased local content provision in Russia such that 60 percent of traffic is now within the country.

[69] "The Information Society and Development: the role of the European Union", EC, July 1997

[70] UN General Assembly Economic and Social Council (22 May 2000)

[71] UN General Assembly Economic and Social Council (22 May 2000)

Other issues

Other issues raise in the discussion of ICT diffusion in the developing countries, but generally these are considered less important than the above mentioned ones, and include:

- the security of on-line transactions,
- computer crimes,
- the protection of intellectual property rights,
- the feasibility of restrictions on Internet traffic containing material that could be considered offensive or that might threaten social stability,
- lack of participation by developing countries in the management of the Internet, in particular the assignment of top-domain names.

B.2. The EU contribution: what has been done so far in relation to ICT in developing countries, what the other developed countries are doing and the role that the EU might assume in the future.

B.2.1. The EU contribution: what has been done so far in relation to ICT in developing countries

Considering the efforts made by the Union Institutions and by the Member States, the EU is the organisation with the highest level of expenditure supporting developing countries at a world-wide level.

But the EU did not concentrate its financial contribution on ICT development. Recently, the focus on these themes has been growing, as it is shown by the new ICT based development programmes launched in Latin America, Asia and the Mediterranean, and the initiatives about regolamentary issues in sub-Saharan Africa. Finally, the EU has launched the eDevelopment programme.

Anyway the EC intervention does not seem to be so effective: the eDevelopment document has been considered by many experts as too generic and not well focused. Many doubts still remain about the capacity of the launched programmes to have a real impact on the field: the EC adopts an approach that is similar to the approach of the funding programmes within (ERDF, RTD framework programme, …), but nobody is sure that this approach will work in the developing countries too (and particularly in the LIC).

EU support to the developing countries[72]

The European Union is one of the major actors in international co-operation and development assistance. On the whole, the European Community and the Member States provide some 55 per cent of total international Official Development Assistance (ODA) and more than two thirds of grant aid. The share of European aid managed by the Commission and the European Investment Bank (EIB) gradually increased from 7 per cent registered thirty years ago to the current 17 per cent. The European Community has the political and financial responsibility for more than 10 per cent of total ODA world-wide. It is also the largest donor of humanitarian aid in the world.

Official Development Assistance of OECD/DAC Members in 1998

Total DAC (OECD)	0.23% of donors' GNP
Of which EU	0.34 % of GNP
Of which non-EU	0.18 % of GNP
UN target:	0.70% of GNP

At bilateral level, the Community's trade policy can contribute to development by facilitating access to its market. In this view, the EC grants all developing countries non-reciprocal trade preferences, with more favourable arrangements for the least developed ones.

[72] "The European Community's Development Policy", Brussels, 26-4-2000

What more can be done?

Despite these concessions LDCs still face a trade deficit with the EU:

1998	EU	US	Japan	Canada
Trade with LDCs	€ 18.8 bn	€ 7.7 bn	€ 2.9 bn	€ 0.4 bn
Exports to LDCs	€ 10.1 bn	€ 2.1 bn	€ 2.0 bn	€ 0.2 bn
% QUAD* - exports	70%	15%	14%	1%
Imports from LDCs	€ 8.7 bn	€ 5.6 bn	€ 0.9 bn	€ 0.2 bn
% QUAD* – imports	56%	36%	6%	2%

Source: Eurostat - * Quad = EU+US+J+Can

It is worth it to say that the EU still maintain high duties on import of agricultural products, the most of which come from developing countries[73].

EU ICT Programmes launched in the developing countries

An exhaustive examination of ICT intervention in the developing countries with an EU contribution is nearly impossible[74]. However, a brief overview is interesting, on its history and on the main interventions concerning ICT promoted or financed by the EC in the last decades:

- The budget devoted to ICT related projects is limited, in comparison with the whole budget supporting developing counties (some hundreds Meuro in many years vs. almost 9000 Meuro allocated in 1999 alone);
- High priority has been given to the Telecommunication network development;
- Some developing countries are involved in EU programmes like the RTD Framework Programme
- Other programmes, like ECIP (EC International Investment Partners) launched in 1986 with the aim of promoting joint venture investments in developing countries, financed some ICT related projects for a total of 2.5 MECU (in Latin America, Asia e Africa)[75].

The first interventions (prior to year 1997)

The Mediterranean area

Since 1982, the EIB has been providing finance to telecommunication investments in support of productive sectors of these economies for an amount of 1062 MECU. Fields of activities have mainly concerned modernisation and/or extension of existing telecommunications networks. The EIB contributed with 80 MECU to the extension of Moroccan international links through satellites and cables. The sub-marine cable link permitted to link Tétouan to Spain as well as Casablanca to Portugal and France[76].

Since the early '90s, contacts have been set out with some Mediterranean countries (Cyprus, Malta) or groups of them (League of Arab States) with the aim to create a telecommunication infrastructure which is compatible with the areas of economic integration and interoperability through world-wide standards. Following these contacts the League of Arab States adopted the GSM (Global System for Mobile - digital cellular mobile telephony) standard.

Latin America

Most of the countries concerned have already restructured their telecommunications systems and developed infrastructures with the active participation of European industry and operators or have set out to do so. Co-operation, based on the principle of mutual benefit, should encompass standards, industrial aspects, research and priority applications[77].

[73] World development report 2000/2001 – par. b13, World Bank

[74] an approach with this aim was recently tried in the ALAMED project but with outcomes that the authors themselves think to be unsatisfactory.

[75] European Community Co-operation with Countries in Transition and Developing Countries in Telecommunications and Information Society – Serviante, Soupizet and Lopriore

[76] see previous note

[77] "The Information Society and Development: the role of the European Union", EC, July 1997

In 1991, a regional assistance programme was launched in Central America in the telecommunications sector. The Community contribution amounted to a total of 13.8 MECU. Also, a regional study (2.2 MECU) was carried out with the Andean Pact on satellite communication (SATS).
In 1994, a seminar was organised in Chile in the frame of ALINVEST bringing together both European and Chilean telecommunication industries. A major activity was launched in 1995 by the EIB in Chile for 75 MECU with a view to connect 400,000 new subscribers in the next 2 years, representing an increase of 26% compared to the current teledensity (around 12 main lines for 100 inhabitants). The investment was granted within a larger programme of modernisation and extension[78].
A project (18 Meuro) to improve telecommunication is now going on with COMTELCA (a regional organisation).

Asia
The EC communication in 1997 described the following scenario: "the countries of Asia have emerged as consumers and dynamic producers of computer and communications equipment. With approximately half of the world's population, they appear very attractive in the eyes of European operators who are eager for closer co-operation, as was illustrated by a recent study on prospects for co-operation between the EU and Southern and South East Asia. On the basis of the findings of this study, an initial co-operation framework with these countries is currently being studied. It mainly covers priority areas of ICT application and the creation in Asia of a "technology window" to facilitate co-operation between companies in Europe and Asia and enable assistance on aspects like deregulation and standards. For the ASEAN countries, a programme was launched at the ASEM Summit held in Bangkok in April 1996. The ICT occupy an important position in the Partnership with ASEAN meeting planned for November 1997 in Singapore. The projects using satellite observation have contributed to the development of local know-how. Today the strong demand emanating from this region calls for a specific programme which would as its first objective foster partnerships between companies. In relations with India and China, targeted industrial co-operation should be pursued while for the poorest countries, such as Vietnam and Mongolia, action should by priority focus on basic information and communication services and preparations for their access to the IS"[79].
Since 1988, scientific and technological co-operation projects have been launched with third countries for an amount of 53 MECU of which 30 MECU went to Asian countries such as China and India. The Fuchun telecommunications project launched in 1988 in China aimed at achieving real-time management of waters from the Fuchun basin. The project is in operation since 1991 and has produced a better irrigation of rice fields, higher electrical energy production and safer navigation on the Fuchun river. Benefits from the projects have been estimated by the Chinese authorities to reach 600 million Yens -around 56 MECU[80].
ECIP programme financed in Asia more than 20 joint ventures in the ICT sector.

ACP countries
Africa, Caribbean and the Pacific area comprehend nearly all the LIC, and ICT development seems to be a real challenge. For these regions the most important reference is the *Lomé Conventions,* the largest collective agreement with developing countries. The fourth Lomé Convention signed between the Community and ACP/OCT countries covers a 10-year period from 1990 to 2000. The financial aid draws on 5-year financial protocols and is implemented via the European Development Fund. For Lomé IV, the first protocol (1991-1995) comes to a budget of 12000 MECU where 1250 MECU are earmarked for regional co-operation.
Since Lomé I, projects have been funded for a total of 183 MECU with a view to improve telecommunications networks in ACP/OCT countries[81].
In Africa, priority was assigned to:

- Rural telecommunication in Mozambique (13 Meuro) and Tanzania (25 Meuro) (VI e VII EDF, European Development Fund)
- satellite telecommunication for civil flights safety in West and Central Africa (38 Meuro)
- network and new programmes development for the Namibian Broadcasting Corporation (5 Meuro)
- Education, with the African virtual University AVU (1Meuro).

In 1995 the EIB granted a loan of 8 MECU to Eritrea directed to the improvement of its internal network as well as its international connections. The loan was granted within a regional programme including Ethiopia and Djibouti.

[78] European Community Co-operation with Countries in Transition and Developing Countries in Telecommunications and Information Society – Serviante, Soupizet and Lopriore
[79] "The Information Society and Development: the role of the European Union", EC, July 1997
[80] European Community Co-operation with Countries in Transition and Developing Countries in Telecommunications and Information Society – Serviante, Soupizet and Lopriore
[81] European Community Co-operation with Countries in Transition and Developing Countries in Telecommunications and Information Society – Serviante, Soupizet and Lopriore

The main objective is improving the physical infrastructure which remains a critical problem in most of these countries, particularly in less favoured areas such as rural ones, where market forces alone may not ensure full coverage.
The South Pacific provides a good example of regional co-operation. The Community and other partners like UNDP, Australia, New Zealand, ITU, and the United Kingdom, contributed to modernise and upgrade equipment to international standards, and to provide the majority of the population with easier access to these services. Under Lomé I, the Community financed the installation of high quality telephone and telegraph services in Fiji, Tonga and Western Samoa, and the construction of an INTELSAT earth station in Western Samoa. Under Lomé II, similar stations were built in Kiribati and Papua New Guinea, while Fiji, Tuvalu, Vanuatu and Western Samoa received aid for various items of equipment connecting them to the international network. Lomé III and IV went further with seven countries of the Pacific in promoting maritime radio and satellite communications[82].

Co-operation with International organisations
The Community also co-operates with several relevant international organisations. It is particularly interested in the work of the ITU Development Bureau for Telecommunications (BDT) on development policies and objectives, of the OECD for telecommunications and information society, and of the UNESCO for training and human resources development.

Scientific and Technological co-operation under the FP
Since 1990 international scientific co-operation projects with the developing countries have been fostered under the accompanying actions (APAS) of the Framework Programme (FP); projects totalling MECU 27 were launched between 1990 and 1994, including activities in China and India. Since 1995 this co-operation has formed part of the fourth R&D framework programme, Action 2, International Co-operation, with 25 projects totalling MECU 9, covering subjects ranging from microelectronics, telematic applications (telemedicine in Latin America, distant teaching in Africa and Latin America, management of natural resources and linguistic engineering in the Arab countries), management of natural resources (in particular for tropical forests) and industrial applications (textile industries in the Maghreb and machine tools in Latin America)[83].
In 1995 the European Initiative for Agricultural Research and Development (EIARD) for sustainable development was launched: it recently achieved an information exchange system (InfoSys); however it is not used, yet.

A new impetus to ICT use supporting developing countries: the "IS and Development" document by the EC, July 1997

The chapter titled *"Giving a new impetus to community action for the developing countries"* reports the fundamental strategy to improve the effectiveness of the EU intervention in the developing countries, clearly because of some negative comments concerning the activities undertaken. The document stressed the importance of ICT, and the strategy seems to be consistent with the developing countries needs discussed in chapters B1.3 and B1.4 (see in part C.2).

Recent activities (after 1997)

The EU opened a roundtable with the Member States and created an experts group. At the same time, the EU intensified its dialogue with the developing countries, particularly in the Mediterranean and in Latin America (summits in Rio de Janeiro in 1999 and in Cairo in 2000). In the Cairo Declaration the EU succeeded to include also the Information Society aspects, but with a big effort because African leaders seemed to have other priorities[84].

The most important action is the recent ***EUMEDIS*** (Information Society for Mediterranean countries), the largest project undertaken by the European Commission in the development of the global information society. The EUMEDIS initiative pursues and implements concretely the political message of the *Communication on Information Society and Developing Countries* and the final declaration of *the Bonn Conference on Global Networks.* The project is the result of the *formal requests* made by the Mediterranean Partners' representatives to the European Commission during *the Euro-Mediterranean Ministerial Conference on the Construction of the Euro-Med Information Society* held in Rome 30-31 May 1996. The project is also complementary to a regional telecommunications regulatory framework project *"New Approaches to Telecom Policy"* launched at the beginning of this year by the Commission with a financing of 2.5 million euro. EUMEDIS aims essentially to achieve three objectives[85]:

[82] European Community Co-operation with Countries in Transition and Developing Countries in Telecommunications and Information Society – Serviante, Soupizet and Lopriore
[83] "The Information Society and Development: the role of the European Union", EC, July 1997
[84] Interview to Mr. De Backer, DG Infso
[85] ALAMED Report

- Within EUMEDIS' strand one (which covers the Provision of basic resources for the development of the I.S.), EUMEDIS will fund:
  - ⇒ The creation of a network of Mediterranean Information Society Focal Points;
  - ⇒ The (Internet based) interconnection between the European research network and the Mediterranean research networks.
- In the second strand of the initiative, EUMEDIS will fund *regional pilot information society projects* in five sectors of application (around 35 million euro, EU contribution).The five sectors for the application of EUMEDIS pilot projects will be:
  - ⇒ Information and communication technologies applied to Education;
  - ⇒ Electronic Commerce and Economic Co-operation;
  - ⇒ Health Care Networks;
  - ⇒ Multimedia Access to Cultural Heritage and Tourism;
  - ⇒ Information and communication technologies applied in industry and innovation.

The European Commission has already backed the Euro-Latin America meetings in Sao Paulo on the *Information Society*, echoed in the Declaration of the Heads of State in Rio and in studies carried out by actors in the information and telecommunications society, and has contributed through measures accompanying the RDT programmes for Information Society technologies. Thanks to these preparatory elements, the Commission will be able in the near future to put forward a programme, "Alliance for the Information Society" **(@lis)**, which will aim to demonstrate, through concrete cases, the benefits linked to the employment of the technologies of the Information Society: in particular, it will propose backing for demonstration projects aiming at the "take-up" of information and telecommunications technologies that involve actors in the two regions. @lis will also propose measures to support the improvement of the communications infrastructure and the adaptation of the framework of regulations to the development of the Information Society, the pillar of the new economy[86].

Recently a specific intervention "***Asia IT&C***" has been adopted, concerning the ICT development in the South and South/East Asia countries (51 Meuro of which 25 by UE).

The EC also carried out a report concerning its experiences on the use of ICT in co-operation programmes in Asia, the Mediterranean and Latin America (*ALAMED Report*), recently presented to the Member State experts group.
Another study has been carried out by *BIPE* under CE (DG Infso) commitment, concerning the sub-Saharan Africa, where most of the LICs are located. The study was requested by the World Bank and afterwards followed by Africa Connection. This study deeply analyses the telecommunications regulatory aspects; presented in Europe and in Africa, it was very much appreciated and it represents now the basis for EU future initiatives in that area. African countries should look upon the EU as a model for telecommunication development, above all at a regional level. Other co-operation studies have been started with other African regional organisations (i.e. UEMOA), but until now the results cannot be considered satisfactory.

The EC communication (Brussels, April 2000) on the EC development policy

The general political guidelines (not specifically ICT-related) elaborated to support the developing countries were discussed and reviewed again in April 2000[87]. The undertaken support projects were not very favourably evaluated (see details in part C5):

"The evaluations of Community aid policies[88] have pinpointed a number of problems. The Commission has recognised their relevance and considers that these problems are mainly signs of a growth crisis, where policies and structures have not been adapted sufficiently fast to meet the growing responsibilities of the Community in the more-and-more complex area of development co-operation".

The document offers an interesting analysis of the potential EU added value in this field. Among the others items (see details in part C5), there is one that we regard as particularly interesting:

"The private sector is an engine for growth, a source of employment and revenue. It is also a key actor and partner in the development process. The Commission's strategy combines support at the macro level - aiming at improving the business environment and the investment climate -, at meso - financial and non-financial - or intermediary level, and at micro level to help increase business competitiveness. Consultation with private sector organisations and a strengthening of their capacities is an integral part of this strategy. Specific attention should be given to the specific needs of micro, small and medium-sized enterprises and to the development of a sustainable financial sector".

[86] Alamed Report
[87] "The European Community's Development Policy", Brussels, 26-4-2000
[88] Global evaluation reports: ACP (951338), ALA (951401), MED (951405).

The support at the bottom level is very important to assure the local ICT capacity-building. This aspect is one of the fundamental aspects we deal with in A-Options.

Then the EC communication indicates the Strategic Activities. Apart from the following brief mention:
"the real opportunity in both developed and developing countries to use research and information technology in applications that support health care , education, food security, etc…Scientific and technological knowledge is a strategic element in promoting sustainable and equitable development and consequently in reducing poverty.", the Strategic Activities do not deal with ICT (see details in part C.5). These tools are likely to be used inside the other programmes. Anyway, it is worth mentioning that after this recent document, the eDevelopment document has been presented, specifically devoted to ICT.

The eDevelopment programme

An eDevelopment initiative was presented by the EC at the experts group meeting in Brussels at the end of November, 2000.
The document is inspired by the eEurope initiative, and indicates objectives, priorities and the implementation modalities (see part C.6 for an extract).

At its presentation in Brussels, some experts did not positively comment on it, because it seems to be still too indefinite, lacking focus in a specific direction. As a matter of fact this document lacks the strength that for instance you can find in the eEurope document, and it does not clarify how the future EC actions will be more effective than in the past.

B.2.2. The ICT in the EU: what has been done so far in relation to ICT at the European level

ICT is quickly developing from being simply a technical subject (yesterday) to a basic component for economic development (the digital divide of today) to pervading component of every aspect of the civil society (the Information Society of tomorrow). As regards this evolutionary process, every country has assumed a different position, and not all of them have decided to be a digital power. To be or not to be a digital power always implies a political choice, that needs a political will: until now, all the fundamental steps in this field have been driven by political choices, even if afterwards the actual path of ICT development did not follow the initial political vision. For instance take the case of Internet, developed by the USA Government for defence goals and never used for such goals, or the case of the WEB, developed in Europe by the CERN for research goals and afterward used in a completely different way

As regards ICT, until now Europe missed many opportunities to be the leader (the WEB was commercially developed by the USA). Anyway the EU has had an important role in creating a wider market and much more opportunities for the European ICT operators.

Whether the EU really *wants* to become a digital power is not clear yet. The EU has a lot of potential: some of its Member States (UK, France, Germany, Spain), are already digital powers, also if dimensionally not comparable to the USA, and the Northern Countries have a good industrial production. Summarising all these components, today the EU is probably the second digital power in the world, after the USA. Could the EU aspire to become the first one in the future? Maybe it could, in the past many other times the leader country lost a leadership that seemed unassailable (think only of the UK in the industrial revolution). But it needs a precise political will.

The EU shows some structural advantages that the USA does not own:

- EU business operators are more used to dealing with foreign entities (another Member States is still considered a foreign one because of a different language and habits);
- The EU is acknowledged as the leader in the expenditures devoted to supporting the developing countries;
- The European vision of the Information Society is more likely closer than the American one to the other countries lifestyles, particularly as regards Asian and African culture. The extremely open American social system is very peculiar, and the large majority of the other countries have more restricted social systems, that the Americans do not easily understand. Also, the EU has always had a more balanced vision (i.e. "market economy yes but market society no"), and demonstrated to be able to respect the diversities.

The eEurope programme, recently launched by the EU, finally seems to show a more determined political will.

Historical overview

Two steps can be regarded as particularly significant:

- The deregulation of the telecommunication market, that dates back to 1993 and was accomplished in 1998;
- The 1994 Action Plan decision establishing that the public sector is responsible for the definition and empowerment of regulatory issues, while the private sector should develop and finance technological infrastructures; following this decision, the Bangemann Committee set to work to elaborate recommendations to achieve these objectives.

Subsequent political steps were taken to accelerate the development of an information society: the White Paper on *Growth, Competitiveness and Employment*, the Bangemann report and an Action Plan.

The White Paper of December 1993

The Commission's White Paper on *Growth, Competitiveness and Employment* stressed that information and communication technologies and related services have the potential to promote steady and sustainable growth, to increase competitiveness, to open new job opportunities and to improve the quality of life of all Europeans.

The main concepts expressed by the White Paper with reference to the Information Society are summarised below[89]:

- The dawning of a multimedia world (sound - text - image) represents a radical change comparable with the first industrial revolution;
- Tomorrow's world is already with us: by the end of the century there will be 10 times as many TV channels and three times the number of subscribers to cable networks. In the USA it is estimated that six million people are already involved in teleworking;
- The USA has already taken the lead: 200 of its biggest companies already use the information highways;
- At the heart of the development model for the 21st century, this issue is a crucial aspect in the survival or decline of Europe;
- It can provide an answer to the new needs of European society: communication networks with companies; widespread teleworking; widespread access to scientific and leisure databases; development of preventive health care and home medicine for the elderly.

The document further discusses the need of developing the trans-European networks, and analyses four priority areas for applications[90]:

- Teleworking: Projects are already under way in the Member states. The Community would support pilot programmes on the establishment of a trans-national network for the management of human resources.
- Teletraining: The objective is to establish a network linking more than 100 universities or colleges by 1996 and giving them all access to common training modules.
- Telemedicine: By the year 2000, multimedia links are to be established between the main cancer research centres, bone marrow banks and social security centres.
- Links between administrations: To ensure smooth operation of the internal market (taxation, customs, statistics), it is essential to improve the interchange of data between administrations and to provide companies and the public with easier access to this information

The Bangemann report of May 1994.

A high-level group of industrialists under the chairmanship of Mr. Bangemann was requested to draw concrete recommendations for action which were unveiled in the report "*Europe and the global information society*." The report highlights the need for an acceleration of the liberalisation process as well as the achievement and the preservation of universal service and the internal market principles of free movement. Public authorities will have to set new "rules of the games", control their implementation and launch public interest initiatives. The deployment and financing of an information infrastructure will be primarily the responsibility of the private sector.

The report was submitted to the European Council at its meeting in June 1994 in Corfou. The Council's conclusions recognised the importance of the opportunity and the scale of the challenge facing Europe. It emphasised that the prime responsibility for acting rests with the private sector, and that the role of the Community and the Member States is to back up this development by giving a political impetus, creating a clear and stable framework and by setting an example in areas of their direct responsibility.

[89] White Paper, p. 13

[90] White paper, p. 26

The Action Plan of July 1994

Finally, the communication forwarded by the Commission to the Council and to Parliament entitled *Europe's way to the global information society in Europe: an action plan,* is a response to the invitations of the Corfou Council. The communication constitutes a comprehensive framework of actions focusing on: (a) the definition of a regulatory and legal framework for the development of new networks and services, (b) the development of networks, new applications and content, (c) on the social and cultural dimension of information, and (d) on the need to raise awareness in key economic parties about the effects of multimedia and new communications.

An example: the health telematic programmes[91]

The Telematics Programme for Health Care is the continuation of the previous AIM programme (Advanced Informatics in Medicine), a research and development activity of the Commission of the European Communities. It was started in the middle Eighties to contribute to the establishment of an appropriate framework for the free exchange of health care information and medical data across Europe. Its objectives are to improve the quality of health care services offered to citizens, regardless of the time or place of provision. The focus has been on the possibilities of information and telecommunication technologies, and the necessary requirements in terms of standardisation, compatibility, acceptability, confidentiality, etc., in order to obtain the highest possible benefit from these means and resources. This has been mainly done through R&D projects funded by the programme and carried out by consortia of organisations such as universities, companies, hospitals and others from Member States of the EU. Thus bringing together the potentials of industry, administrations, users, and professionals. Apart from this, a certain number of concerted actions, strategic studies and accompanying measures have been carried out, or are currently in progress.

The scenario of AIM projects is limited to the 12 member States of the EU (Belgium, Germany, Denmark, The Netherlands, France, Luxembourg, United Kingdom, Portugal, Italy, Ireland, Spain and Greece) and to some extent to the countries of the European Free Trade Association -EFTA- (Switzerland, Austria, Sweden, etc.). Nevertheless, the programme has demonstrated a proven willingness to expand international collaboration with other regions of the world.

The eEurope programme

The European Union launched the eEurope programme in the year 2000, with the aim to guarantee that the EU maximises the benefits produced by ICT diffusion. In 1998 it was estimated that the growth of the Internet generated around 2.3 million of jobs, with around 1.6 million of jobs indirectly connected, in the USA only. Unfortunately Europe is behind, but the objective of filling the gap can be achieved: combining its strength in the mobile telecommunication sector with its consolidated know-how of digital technologies, the EU can take the lead in the development of wireless Internet.

At a European level, several actions were devoted to strengthen the promotion of the Information Society:

- Telecommunication liberalisation
- The establishment of a transparent regulatory framework concerning electronic commerce (privacy, authentication, security, …)
- Support to companies producing information
- Support to research and development

However, a favourable taxation framework and a complete regulation for the protection of intellectual rights is still missing.

The primary goal of the eEurope programme is quite challenging, aiming at the provision of on-line connections to all European citizens, schools and companies.

The Council and Commission established an Action Plan, presented at the European Council in June 2000 in Feira. The main goals of the Plan are summarised below:

1. A cheaper, faster, secure Internet
   a) Cheaper and faster internet access
   b) Faster internet for researchers and students
   c) Secure networks and smart cards
2. Investing in people and skills
   a) European youth into the digital age
   b) Working in the knowledge-based economy
   c) Participation for all in the knowledge-based economy

[91] The Information Society: Why Europe and Developing Countries Should Boost Partnership in Health, Knowledge Transfer and Telematics? (Marcelo Sosa-Iudicissa)

3. Stimulate the use of internet
    a) Accelerating eCommerce
    b) Government online: electronic access to public service
    c) Health on line
    d) European digital content for global networks
    e) Intelligent transport systems

The action plan deals with the actions to be implemented, the actors and a rough time-schedule. As regards the actors, it makes a distinction among the European Commission, the European Parliament, the Member States and the private sectors.
eEurope goals will be achieved by means of three main methods:

- Accelerating the set up of an appropriate legal environment
- Supporting new infrastructures and services across Europe
- Applying the open method of co-ordination and benchmarking

With reference to this project, the eEurope programme can provide helpful information, as it highlights the main obstacles related to the development of the European Information Society and identifies the solutions to be implemented, distinguishing the roles of the different actors (Member States, EC, EP, private sector).

The EU and the management and regulation of the Internet

The eEurope programme is focused on the diffusion of the Internet. However, Europe appears to be still behind the USA, whose government has been establishing the rules of the game.
The EU capacity to counterbalance the current situation could indirectly favour the developing countries, which actually experience a wider gap towards the USA.

B.2.3. What the other developed countries and International Entities are doing

Many programmes concerning ICT are currently undertaken in developing countries thanks to international co-operation funding.

An overview of the main actors involved in this field is discussed below, providing information on their roles and the main goals of their actions.

The main aspects of this scenario can be summarised as follows:

- At the *macro (policy) level* many actors are moving but nobody has assumed a reference role yet, in order to assure the necessary co-ordination and the introduction of a consistent approach. The World Bank is very active, but it is not acknowledged as the natural leader (as in the international finance field); the G8 launched the Dot Force, but this will last until next meeting in Genoa; the United Nations are launching the Task Force, but it has not set to work yet.
- At the *micro level*, where concrete actions on the field are performed, many more actors are moving (particularly the Non-Governmental Organisations, NGOs). S*ome of these entities are adopting a very interesting and effective approach to ICT diffusion in the developing countries,* but they indicate a lot of difficulty in dealing at the policy level and to co-operate with the above quoted organisations.

Actors involved at the macro (policy) level

The World Bank
The World Bank is involved in a large number of projects including the following ones:
The ***InfoDev*** (Information for Development Program) and the ***Africa Connection*** Initiative: its goal is to promote the development of telecommunication infrastructure in Africa, supporting the elaboration of an action plan for telecommunications, regulatory reform, capacity building, funding and information society development. InfoDev played a key role in an intensive Y2K Initiative (about $26 million) to help governments address Y2K risks and to develop and implement national solution plans: it has funded 35 technical assistance missions providing Y2K experts. InfoDev's activities include projects in tele-medicine, distance education, electronic commerce, and regulatory reform. It is an active part of Global Knowledge Partnership. Other projects involving infoDev include: African Virtual University (AVU), South African Telematics for African Development Consortium (TAD).

The ***Global Knowledge Partnership*** and Knowledge Management: aiming to store the best development knowledge from the World Bank as well as from outside organizations.
The ***Knowledge Society realignment***, to support the application of ICT in all Bank's sectoral programmes
Regional Environmental Monitoring Programme (REIMP) and Programme for Environmental Information Systems in Africa: to support environmental information management in Africa.
Direct ICT support: the goal is to carry out direct support programmes for ICT in Universities in Africa.
Content and Knowledge development: supporting a Database system for national (Ethiopia, Mozambique and Rwanda) and regional economic analysis.
Indigenous Knowledge for Development Initiative, (IK).
Around 40 connectivity projects in 25 African countries.
Moreover, the World Bank is directly involved in some large international projects (see below).

G8
In the Okinawa Summit the G8 took a strong position about the use of ICT to support the developing countries. Confirming their commitment to fight against poverty and reach the objectives defined by the UN, the Okinawa document states that:
"Access to the digital opportunities must, therefore, be open to all. In this regard, we welcome contributions from the private sector, such as those of the Global Digital Divide Initiative of the World Economic Forum and Global Business Dialogue on Electronic Commerce (GBDe). The G8 will seek to promote the creation of a stronger partnership among developed and developing countries, civil society including private firms and NGOs, foundations and academic institutions, and international organisations. We will also work to see that developing countries can, in partnership with other stakeholders, be provided with financial, technical and policy input in order to create a better environment for, and use of, IT".
As far as education is concerned, the Okinawa document declares:
"We call on IFIs, in partnership with developing countries, to focus on education in their poverty reduction strategies and provide greater assistance for countries with sound education strategies. These strategies should maximise the potential benefits of IT in this area through distance learning wherever possible and other effective means. We must take a concerted approach to high-tech crime such as cyber-crime, which could seriously threaten security and confidence in the global information society".
The Okinawa Summit was not only full of willingness but it also gave life to an operative taskforce:
"We agree to establish a *Digital Opportunity Taskforce* (***dot force***) with a view to integrating our efforts into a broader international approach. To this end, the dot force will convene as soon as possible to explore how best to secure participation of stakeholders". The dot force will look for ways to take concrete steps on the priorities identified below:

- Fostering policy, regulatory and network readiness, particularly to encouraging more effective and greater utilisation of IT in development efforts encompassing such broad areas as poverty reduction, education, public health, and culture;
- Improving connectivity, increasing access and lowering cost: with a particular emphasis on a "partnership" approach involving governments, international organisations, the private sector, and NGOs;
- Building human capacity: education and life-long training
- Encouraging participation in global e-commerce networks, ensuring that the "rules of the game" as they are emerging are consistent with development efforts, and building developing country capacity to play a constructive role in determining these rules.

United Nations
The United Nations launched several initiatives on the use of ICT in developing countries.
UNDP (United Nations Development Programme) is a United Nations agency that supports the transfer of technology, adaptation, and access to technology. UNDP projects include:

- APDIP (Asia-Pacific Development Information Programme),
- IIA (Internet Initiative for Africa) to reinforce national Internet development in 12 countries by means of 2–3 year project partnership between governments,
- SIDSTAP (Small Island Developing States Technical Assistance Programme) to establish content development and hosting infrastructure for small island states,
- UNTCDC (UN Department of Technical Co-operation and Development), aiming at strengthening existing technological capacities in the developing countries, to improve the effectiveness in using such capacities, to increase and improve communications among developing countries, and to improve the capacity of developing countries for the absorption and adaptation of technology.
- ITDP (Information Technologies for Development Programme), that seeks to raise awareness among UNDP's development partners about and to promote a better understanding of the ICT potential in the development context, test the feasibility of different approaches, and assess their effectiveness and

value as tools for development in general and the empowerment of communities and the development stakeholders in particular.

UNESCO (UN Educational Scientific and Cultural Organisation) is involved in many ICT-related projects including the following programmes.

- IIP - Intergovernmental Informatics Program for the ICT human resources development.
- RINAF - Regional Informatics Network for Africa
- TCP - télécentres Communautaires Polyvalents (pilot project in Timbouctou-Mali)
- IHHD - Information Highways for Human Development
- UNECA **(UN Economic Commission for Africa) manages several initiatives on IS in Africa:**
- AISI (African Information Society Initiative) adopted in May 1996, consists of 7 component areas: policy awareness, development of national strategies, internet connectivity, training, democratising access to IS, sector applications, content creation. Several bilateral and multilateral donors are partners in the initiative, including the UNDP Africa connection program, and CIDA-funded Acacia program.
- ACI (African Connection Initiative): at the instigation of the South African Telecom Minister, African Ministers of communications adopted in May 1998 the African Connection Initiative. It consists of the following 5 programs submitted to the donor community for support: Least Developed Countries and rural telecom; policy and regulatory framework; human resources and capacity; NII financing and funding; information society.
- RASCOM - Regional African Satellite Communication Organisation (see further in this chapter)

The future UN strategy about ICT for development is expressed in the recent document of ***UN General Assembly Economic and Social Council*** on 22 May 2000, that declares:

"The United Nations could potentially become a major force in promoting and fostering the application of ICT for development and in serving as a possible arbitrator with respect to certain key legal and policy issues, such as security and intellectual property rights. The United Nations can be instrumental in helping its Member States to overcome existing cultural and mental barriers that are currently among the major impediments in the pursuit of the benefits of ICT for development. The United Nations should help developing countries understand challenges and options in this area".

This document contains the operative proposal to create an *ICT task force*:

"This task force should bring together multilateral development institutions, private industry, foundations and trusts and would facilitate, including by investment, the expansion of the market for ICT in developing countries, thereby helping to bridge the digital divide. A fund should be created that the task force would administer and for which up to $500 million would be solicited from sources such as the United Nations Fund for International Partnerships".

From the political point of view, the document proposes inter alia:

- Adoption, in bodies such as the Economic and Social Council and the General Assembly, during 2000, of resolutions that, first, recognise the importance of ICT in national development plans; second, call for a much higher profile for ICT in official development assistance portfolios; and third, request all parties, specifically public and private sector initiatives at the national level as well as bilateral and multilateral programmes, to re-examine their ICT policies to ensure that equal opportunities are being provided to all sectors of society;
- Adoption of a national ICT strategy by mid-2001 including, as a first step, setting of minimal connectivity targets to be reached within a year.
- Building on the ongoing initiatives of the Secretary-General, form, as soon as possible, a strategic alliance between the United Nations, the private sector and financing institutions.
- Prepare a special programme to intensify South-South co-operation in ICT for development projects, including ideas and projects for enhancing direct connectivity among developing countries;
- Start immediately an active exploration of new, creative financing initiatives for ICT, including a debt-for-connectivity fund
- Start immediately an exploration of measures that would reduce the average cost of access to the Internet within developing countries by a factor of five by the end of 2001 compared with the beginning of 2000;
- Facilitate a tenfold increase in the number of computers supplied to developing countries by the end of 2001, compared with the beginning of 2000;
- By the end of 2001, mobilise 30,000 new ICT trainers, primarily from developing countries, for training programmes in developing countries.
- Facilitate a tenfold increase in national training and education budgets for ICT by the end of 2001 relative to allocations at the beginning of 2000.

ITU

ITU (International Telecommunication Union) is an intergovernmental organisation under United Nation Organisation, within which the public and private sectors co-operate for the development of

telecommunications. The ITU mission is primarily political (to promote, at the international level, the adoption of a broader approach to the issues of telecommunications in the global information economy and society) and technical (to promote the development and efficient operation of telecommunication facilities). As regards the developing countries, ITU aims to promote and offer technical assistance to developing countries in the field of telecommunications.
Many ICT projects in developing countries are sponsored by ITU itself:

- *Africa One* (see further the paragraph “Large International Projects”)
- *Global Telemedicine Network*, that provides access to medical services and data bases via the Internet (for the identification of problems or information on new developments), teleconsultation and tele-education (for health care professionals and public health programmes), vital signs monitoring (communication of patient data to distant doctors using simple devices for recording ECG), pulse rate, oximetry, blood pressure and respiratory parameters, image transfer and videoconferencing (for distance conferencing, consultations with local and international specialists).
- *Multi-purpose Community TeleCenters* that, besides access to public telephone and fax, may offer (shared) office facilities for local small business and "teleworkers", including computers, printers and photocopiers. Such centres provide access to data networks (e.g. Internet) for e-mail, file transfer, electronic libraries and databases, government and community information, systems, market and price information and environment monitoring.
- *Relief Emergency Communications*, for the rapid deployment of telecommunications resources to deal with natural disasters, wherever they may occur.
- The *SPACECOM Project*, that will combine satellite and terrestrial communications systems to give access to basic telephone services (telematics, data transmission, advanced data applications including tele-health and tele-distance learning) to more than two billion people world-wide, and particularly increasing the accessibility of telecommunications services in rural and remote areas. The basic concept for implementation of SPACECOM activities and pilot projects is to encourage and build strong partnerships between the space industry, the international and regional satellite systems operators and the beneficiary developing countries, with the BDT acting as a catalytic co-ordinator.
- As part of the *Education for All Programme*: ITU/UNESCO Interactive Television for Distance Education, which combines the potential of television, telecommunications and computers and brings knowledge and learning directly to those with the most need and least opportunities. The aim is to improve performance of less-qualified teachers and to introduce the Internet to learning centres
- Information Society and Development (*ISAD*), that takes the G7 Information Society Initiative, launched during its Ministerial Conference in Brussels (1995), beyond the industrialized world in order to ensure that developing countries share the opportunities which the information highways will create over the next decades. The ISAD Conference held in Midrand, South Africa in 1996, identified a number of areas in which developing countries need assistance to ensure their participation to the Global Information Society.
- EC-DC - *Electronic Commerce for Developing Countries*, launched in March 1998, the ITU (BTD - Telecommunication Development Bureau) crosses a number of ITU programmes aimed at bridging the digital divide: nearly 20 out of a total of 48 LDCs from all regions are benefiting from assistance provided by the ITU and its industry partners in establishing an e-commerce infrastructure. ITU has actively participated in various workshops and seminars with particular emphasis on assisting LDCs in setting up their e-commerce endeavours. As an example, ITU has assisted the Nigerian Regulatory Agency organise an e-commerce workshop, Afrinet2000, in September 2000. A workshop for the Asia sub-region (Vietnam, Lao P.D.R and Cambodia) took place in October 2000.

The Commonwealth
Countries belonging to the Commonwealth have undertaken a number of common initiatives.
The **CTO** (Commonwealth Telecommunications Organisation) promotes telecommunications in the interests of consumers, business as well as social and economic development.
The CTO provides technical assistance, information resources and other services to Commonwealth governments and telecommunications business. Activities include: a Programme for Development and Training (training and expert assistance), organisation of conferences and seminars, management of the Cable & Wireless Commonwealth Scholarships Programme, provision of Internet-based and other information resources; facilitation of networking and sharing of experience between Commonwealth telecommunications sectors.
The CTO supports the restructuring and commercial development of national new-born telecoms operators and also develops activities with new market segments, including mobile communication and Internet.
The CTO Website provides access to general information resources on telecommunications and development issues, and discussion forums.
COL (Commonwealth of Learning) encourages the development and sharing of open learning and distance education resources and technologies. Some of its projects are summarised below:

- projects involving ICT in Africa for distance education in rural areas.
- innovative technologies, desktop video production in Maldives.
- training distance educators, in collaboration with IGNOU.
- teleconferencing networks, Canadian educational technology used to establish Malaysian Medical Education Network.
- electronic media, the Commonwealth Educational Media Centre for Asia (CEMCA).

The **COMNET-IT** (Commonwealth Network of IT for Development) supports activities related to policy-development and capability-building in implementing, managing, and using new information and communications technologies. Its mission is to foster the building and enhancing of institutional and human networks through the mediation of computer communication networks. The organisation facilitates the brokering and funding of IT-related projects, develops Internet-based services and engages in capability building through policy and training workshops.

It is well-placed to deliver advisory services and assistance in the following areas:

- acquisition and deployment of IT infrastructure for the public administration
- facilities management of Government networks, E-mail and internet services
- systems specification and acquisition, standards and quality management
- training in a wide range of IT-related topics and development of computer based training materials
- software engineering and case tools, text processing and text language translation

It is also fostering partnerships and affiliations with similar institutions such as the OECD, the International Council for IT in Administration (ICA), AISI, UNESCO.

COMBINET (Commonwealth Business Network) links Chambers of Commerce and Manufacturing Associations and Businesses in Commonwealth Countries.

This network has been organised to enable the following stages of businesses:

- obtain knowledge on market opportunities;
- interaction with each other by e-mail, web chat, video conference;
- negotiate product attributes, discuss one to one or one to many relationships;
- conclusion of a business deal and legal binding to a deal.

The EU Member States

The majority of the Member States are involved in international initiatives, like Bellanet, Infodev and others. Some Member States have also launched significant bi-lateral programmes with a limited number of developing countries, generally selected because of common language or history.

France started in 1989 with the IRD (Institut de Recherche pour le Développement). The most recent programmes deal with the use and diffusion of the Internet: "WEB en Afrique francophone", and "Internet en Afrique". On the other hand, the Agence Française de la Développement is focused on financing private programmes on the development of telecommunication infrastructures, like: Aquila project (telephone in African rural areas) and TCP (Télécentres Communautaires Polyvalents).

Spain has focused on two geographical areas: partner countries in the Mediterranean region and in Latin America. In the Mediterranean region, its action was later undertaken by the EU EUMEDIS programme[92]. As regards Latin America, Spain channels its information society co-operation activities through the scientific and technical co-operation programme CYTED (Science and Technology for Development). Other various projects and thematic networks have been developed concerning the information society (IS): multimedia and hypermedia systems, co-operative software systems, web with applications in various fields: education, business, organisations, etc.

The **Netherlands'** most interesting co-operation initiative about ICT is the one started in 1997 by the International Institute for Communication and Development (IICD) in The Hague, established through a grant of NLG 27 million for a period of five years. IICD acts as an independent broker between countries in development and the stakeholders that drive the international market of Information and Communication Technologies (ICT). In order to achieve this, IICD assists key players in developing countries to obtain access to ICT markets, become involved in decision making processes and to use these technologies for sustainable development (for more details on IICD initiatives, see further in this chapter).

Germany's most important bilateral activities include a financial co-operation (soft loans or grants) for telecommunications, especially *rural telecommunications* in China, Mongolia, Laos, Cambodia, Mozambique, Namibia, Uzbekistan, executed through the KfW: 197 mio. DM

In **Sweden** the development co-operation policy is managed by SIDA, an independent agency. SIDA participates to international programmes and activities such as Bellanet, *info*Dev, the Global Knowledge Partnership and OneWorldOnline. Sida supports about 2,000 projects in developing countries and countries in Central and Eastern Europe. Current ICT efforts are focused on research co-operation, primary and secondary education, and Internet connectivity.

Portugal is focused on the infrastructure development, above all in Portuguese speaking countries.

[92] See par. B2.1

In the **United Kingdom**, the *Department For International Development (DFID)* is probably the most important entity in the field of ICT for developing countries. It has recently launched the Bridging Digital Divide programme, in partnership with a number of key organisations who are active in the field: IICD, CTO, One World Online, World Association of Community Radio Broadcasters (AMARC) and the Panos Institute. It developed a set of concrete proposals to drastically reduce the cost of Internet in Africa[93]. The *Institute of Development Studies (IDS)*, located in Sussex, has a long history in providing information services on development issues. Its library on development is the largest in the world. Recently, it has undertaken two activities aiming to spread the use of ICT to diffuse knowledge: *ELDIS*, financed by DANIDA, serves as a "gateway" to development and environment information. On its website, online documents can be read and information can be obtained on organisations and countries. The *ED21* (Information for Development in the 21st Century) information service on research results provides a selection of "the latest and best UK-based development research". It offers summaries of problem-solving work on critical development dilemmas around the world.

Other developed countries

In the **USA**, the USAID (U.S. Agency for International Development), has launched several initiatives, mainly devoted to the diffusion of the Internet in Africa. The *Leland Initiative* intended to extend full Internet connectivity to twenty or more African countries in order to promote sustainable development. Its Strategic Objectives are to promote policy reform to reduce barriers to open connectivity, to assist private sector ISPs to develop their industry and to increase the ability of African communities to use the communication and information tools of the Internet. In November 1998, the President announced the Internet for Economic Development (*IED*) Initiative, with the aim to expand access in developing countries to the Internet and its applications such as e-commerce, distance education, e-governance, tele-medicine, and environmental surveillance. Activities are already in progress in thirteen countries: Ghana, Guinea, Mozambique, South Africa, Uganda, Egypt, Morocco, Bulgaria, Guatemala, Haiti, Jamaica, India and Jordan. Moreover there are some initiatives engaged to facilitate access to the Internet for USAID colleagues and partners in Africa (*AfricaLink*).

The IED initiative is directed at assisting developing countries in four ways:

- encourage the creation of a pro-competitive policy and legal regulatory environment, for example organising *study tours* for a total of about thirty key African policy and regulatory officials;
- support the development of *Telecentres*, in Ghana and it is now also supporting broadband connectivity to secondary cities and towns in Guinea as well as linking schools in Uganda.
- provide education and training to local entrepreneurs, knowledge workers, policy-makers and regulators.
- foster the use of specific Internet applications such as e-commerce, tele-medicine, distance education, environmental surveillance, and improved access to government services.

Canada moves through its International Development Research Centre (IDRC) and the Canadian International Development Agency (CIDA). Particularly interesting is the experience of the first one, with its ICT programmes Acacia, Unganisha, and PAN. The Acacia initiative is focused on very few countries (Mozambique, Senegal, South Africa, and Uganda) and it is important in the co-operation field because of the aim toward poverty reduction and the strategy adopted, involving local entities. This experience is more widely described in the following paragraph.

Large international projects

Projects improving the intracontinental network for data transmission

The **Rascom project**, carried out by operators from 44 countries, is intended to set up a space-based infrastructure covering the African continent from which it will even offer a broad range of services.

The total cost of the project is estimated at $500 million. The satellites will support telecommunications and low-traffic link services for non-connected rural areas and services supporting corporate networks (audio-visual transmission, multimedia access, …).. Rascom (operative in 2003) is intended to provide 500,000 direct access facilities in rural areas.

Each terminal station including its antenna, telephone set and PC will cost $ 1,400. By adding the costs of the other service components Rascom estimates that it can achieve a price of $10 cents for a domestic minute (competitive in certain sections of the network) and an intra-African international minute at a similar price, which will thus exert a downward pressure on international rates.

[93] see section C. technical files

Another very interesting project is **Europstar**, a satellite that covers Western Europe, Northern India and a large portion of the Sub-Saharan Africa. This satellite allows for High Speed Internet access a goal that is not covered by the Rascom project, because it dates back to the early Nineties [94].

Some **cable systems** linking the African continent and providing both direct links between African countries as well as with the other continents are under construction. These projects will enhance interconnectivity between African countries but should also strongly contribute to revitalising intra-continental communications whose infrastructure, set up in the 1970s via PANAFTEL, which has been relatively poorly maintained and relatively little extended since that period.
These cables are initially extended to highly-populated urban and coastal centres only, but they must complement existing and planned intra-regional systems. In particular, they will have to share traffic with PANAFTEL and satellite systems in place or planned (RASCOM) to avoid inland areas being bypassed by the information highway.
The **Sat-3/WASC/SAFE** cable (West Africa Submarine Cable/South Africa Far East) is currently under construction on a large part of the African perimeter and it will link Europe to Malaysia. The vast majority of West African countries are expected to be able to connect to the cable (13 landing points). The global investment is estimated at over $600 million, committed by telecom operator (Telekom SA, Marconi (Portugal), Sonatel, Cote d'Ivoire Telecom, Ghana Telecom, OPT Benin, Nigerian Telecommunications Ltd, Camtel, OPT Gabon, Angola Telecom, BT, Cable and Wireless, Teleglobe (USA) and AT&T).
AFRICA ONE is a regional submarine fibre-optic cable committed by: AT&T, PATU (*Pan-African Telecommunications Union*), RASCOM, ATT-SSI, ITU-BDT (*International Telecommunications Union-Telecommunication Development Bureau*). This cable will literally encircle the African continent connecting 41 of its coastal countries and islands.
These cables are expected to complement existing and planned land and satellite infrastructure, in co-ordination with other major projects, such as OXYGEN, SAT3/ WASC/ SAFE and SEAMEWE 3.
It is a current belief that these cables will exert major pressure to open international networks: the only cables currently serving sub-Saharan Africa are Sat 2 (direct link from Europe to South Africa), Atlantis 2 (which links Europe to Latin America via Senegal and Cap Verde) and cables passing under the Red Sea, notably Seamewe 3 and Flag.

Projects to improve the local contents production
Vinakey-Vitranet is the first actual EC-DC centre (ITU) in operation[95]. Promoters are: the World Trade Centre (WTC) Geneva, the World Internet Secure Key (WISeKey), with the Vietnamese Government and private sector.
This E-Commerce Centre is the first in the Asian Region to establish a Global Electronic Commerce Network for Developing. This project will allow the interconnection of major E-Commerce projects in both developed and developing countries using secure and reliable infrastructures, digital certification and electronic payment.
It provides:
Trade News, Newspaper News and periodical Bulletins (in English or in Vietnamese from different sources, both domestic and abroad).
Legal Documents: a search engine of Microsoft facilitates users to access documents rapidly, exactly and economically.
Enterprise information: company profiles, calling investment projects, existing investment licenses, foreign representative offices and legal issues related to export, import, investment, customs, insurance, banking etc...
Vietnam Economic Information edited from different sources, updated and stored for a long time.
Import and Export Tariffs, import-export rates …
Marketing information: enables small and medium-sized entrepreneurs to open their business to global partnership.
Its staff also provides email services, trade information, partner searching for local enterprises and traders, trade and investment brokerage, advertisement or specific trade information requested by customers, website design, design and installation of LANs and WANs, software development and computer hardware and software services.

Knowledge diffusion among operators
The ***IDML*** (International Development Mark-up Language) initiative is an open proposal to define and implement a specific Internet mark-up language for the international development community, which will facilitate transparency, learning and co-ordination. The idea is that IDML would become a data exchange standard for information that is specific to international development. It is based on XML (Extensible Mark-up

[94] Source: our interview in Alcatel
[95] See also ITU paragraph

Language) and will be able to use most standard tools that will inevitably be developed within the next few years. Thus, if the standard is widely adopted, the development community will gain a powerful and versatile tool: being able to share and pool information and the co-ordination of efforts to avoid duplication and misunderstanding are essential, particularly in the rapidly growing ICT area.
Organisations currently discussing the IDML initiative include: Bellanet, CGNet, CIDA, IDRC, IICD, One World, University of Sussex, IISD, NGO-Net, PlaNet Bank, UN Centre for Human Settlements (UNCHS), UNESCO, UNICEF, Wageningen University, The World Bank.

Bellanet is an important experience that involves Canada (CIDA, IDRC), Denmark (DANIDA), The Netherlands (DGIS), Sweden (SIDA) and the UN (UNDP), that share projects and information available on Internet databases. Also some private foundations take part to this initiative, like the John D. and Catherine T. MacArthur Foundation and the Rockefeller Foundation.
The Bellanet project relies on the idea that effective co-operation among development agencies will increase the impact of their programmes, and that the use of information and communications technologies can improve the environment for such co-operation.
Bellanet is active in promoting collaboration and learning and for this purpose offers a range of services, including:

- web-based workspaces offering discussion lists, databases and other resources to permit effective partnerships;
- advice on ICT policies for organisations and collaborations;
- implementation of projects in the South on behalf of donors;
- user-friendly information management solutions;
- assessment of ICT impacts;
- seminars and training.

Activities include:

- African ICT Activity Information Management System (AI-AIMS) and GK-AIMS system - GK-AIMS is a set of online tools which facilitates information sharing on "who is doing what" and allows for greater collaboration among project planners.
- MicroFinance Network
- Association for the Development of Education in Africa (ADEA) is a network of partners promoting the development of effective education policies based on African leadership and ownership. (The Communication for Education and Development (COMED) aims at building ministerial capacities for communication and improved media understanding of education issues (World Bank, Norwegian Education Trust Fund and West African News Media and Development Centre (WANAD).
- Support to AISI /Harnessing Information Technology for Development program and to a forum for open discussion Global Development Gateway (World Bank)
- Web-to-Email - There is still a large community of Internet users who have only access to email but that cannot surf the Web. Many of these users rely on the Internet for communication, access to essential medical, scientific, human rights and business information, and world news. Web-to-Email servers allow to retrieve information from any public Web site, anywhere in the world: they fetch documents from the Web, and send them to the user as email messages, either in plain text or html.

World Bank, co-operating with Bellanet, IMF, and other private and public entities, launched the **Global Development Gateway** (GDG) (over $60m in 3 year budget). It is envisioned as a portal website on development issues, from which users will be able to access information, resources, and tools, and into which they will be able to contribute their own knowledge and experience. The Gateway is intended to serve the needs of a broad array of stakeholders, including developing countries, the official donor community, civil society, the private sector, and other key partners. The Gateway will assist these stakeholders by providing links to ideas and good practice, information about development activities and trends, funding, and commercial opportunities. Local government in developing countries, community representatives, and NGOs are expected to play a vital enabling and intermediary role.
Gateway services could include online training modules, research findings, best practices and ideas, case studies, procurement services, information on development projects, funding, commercial opportunities, product reviews, news, jobs, and directories -- all tailored to the needs of specific audiences such as community leaders, policymakers, local government officials, private investors, and academics.
Several country gateways are at an advanced planning stage: pilot Country Gateways are already operational in East Europe.
Some criticise this project because of the excessive influence and control performed by World Bank: every publishing subject should be independent, otherwise the risk is to weaken the publishing initiatives.

The actors involved at the micro (stakeholders) level

IICD - International Institute for Communications in Development

The Dutch Minister for Development Co-operation originally established the IICD in 1997. One of the main goals is to promote access to information and communication for developing countries. IICD is involved in assisting key players in developing countries to obtain access to ICT markets and supporting them in the use of these technologies. Considerable effort is devoted to the promotion of round-table discussions, involving stakeholders such as national governments, key specialists, industries, the media, NGOs, and end-users.
IICD operates at a national level, in 8 of the 14 LIC prioritised by the Dutch government[96].
The IICD approach is well structured and very interesting: it does not finance projects, it gives methodological support, training and expertise about ICT.
In each country IICD creates a link with local entities, in order to transfer its knowledge and become able to locally deliver organisational, ICT training and ICT expertise support; it generally operates using the following three-staged project approach:

1. *Roundtable*: 1-2 weeks workshops attended by local public and private entities; following some discussions and some ICT information sections, participants generate some ideas about ICT use to develop the country and reduce poverty.
2. *Project formulation*: the best ideas become actual projects, in 1 year of work made by the project owner (the local entities that generated the idea) with the support of an IICD expert (project manager); at the end of this phase the funds research starts.
3. *Project implementation*: this is the last phase; the IICD expert supports the project for the first 5 years.

Interesting examples of projects accomplished in different sectors are the following ones:

- In agriculture, the ECommerce for non-traditional exporters, with 5 Internet connected Telecentres that provide easy and low-cost access to market information for more than 1000 farmers living in remote rural areas;
- In Education, a Training centre for ICT;
- As regards environment, a network linking the information systems of the entities dealing with environmental data.

It is clear that the main goal of these actions is country development and not only poverty reduction; anyway the poverty reduction is automatically achieved by some of them, like the ones dealing with poor farmers.

Acacia Initiative (Canada in sub Saharan Africa)

On April 1st 1997 the Acacia Initiative was officially launched. It is an international effort to empower sub-Saharan African poor communities with the ability to apply information and communication technologies to their own social and economic development. The idea began to take shape as an effort to fill an important gap in development activities in Africa, as well as a leading contribution by Canada to the objectives of the African Information Society Initiative. It works mainly with rural and disadvantaged communities, and it is particularly addressed to women and young people.
What makes Acacia different is its intention to tackle these issues with a *community focus* and to do so within an integrated conceptual and operational framework that builds into the program a strong element of *continuous learning*. To help ensure that lessons learned are quickly acted upon, the initiative will incorporate a substantial set of evaluation activities aimed at real-time learning to support effective management and speedy dissemination of results.
Access to ICTs in and of itself can be rendered meaningless in the absence of measures to ensure both affordability and easy use of the technologies. Thus the initiative stresses the need for mutually reinforcing action on four fronts: infrastructure, tools for local content creation, applications related to community needs, and policy. This approach is being tested through national strategies in four target countries, Senegal, South Africa, Mozambique and Uganda, with successful projects in one country being tested elsewhere to determine if, as offshoots and opportunities, they could be replicated across the continent.
In every country Acacia establishes a National Steering Committee composed by people from the local ICT stakeholders including the government, the private sector, NGOs, international organisations and institutions of learning and research. The Steering Committee is responsible for developing liaison and partnership between Acacia and all the local ICT stakeholders, recommending to IDRC for funding various ICT research and demonstration projects.
Local community centres (Telecentres) which use ICTs to support their development objectives, and which are managed at the community level, are emerging as a central feature of the national strategies and are becoming an important modality for identifying supportive actions on grounds such as policy, technology and applications.

[96] Our interview with Mrs. Hagen in The Hague

Not only national strategies, but also cross-cutting issues would have to be pursued, particularly to address potential road-blocks relating to:

- gender,
- youth,
- human resources development,
- technology research, and
- social and political research.

Acacia is committed to the core hypothesis that ICTs will enable poor communities in Africa to contribute more effectively to their own development and avoid, or get quickly beyond, the traditional stages of the development process. *ELSA* is Acacia's instrument to test the core hypothesis and stimulate learning in the communities where development takes place.

The initial ELSA strategy focuses on establishing the mechanisms through which community learning and impact assessment can take place in the context of Telecentres development. The Telecentres are considered the points where many of the critical issues converge - policy, infrastructure, technology and applications.

The *partnership* construction is a key issue. IDRC has already developed effective Program-Wide Partnerships (through, for example, the African Information Society Initiative and the African Networking Initiative) with ECA and a number of international organisations (UNESCO, ITU, Bellanet) in support of ICT use in Africa. This co-operation will be reinforced and extended through Acacia. As suggested by the African organisations consulted so far, identifying and capitalising on synergies among donor programs is a key to supporting a needs-based approach to ICT implementation.

But in addition, the notion of 'partnership' will be directly linked with the principle of community participation. In addition to program wide partnerships, Acacia's projects will use community-level partnerships to enhance the principles of community empowerment and project sustainability in all activities. Thus, when interacting with communities, Acacia will emphasise certain groups as partners:

- groups within the community -- schools, clinics, information centres, chambers of commerce, community-based organisations -- which propose projects using ICTs for addressing a specific development problem;
- intermediary groups outside the local community that work at the local community level -- NGOs, government extension agents, researchers, welfare agents -- that want to reinforce their means of action, train their members, or experiment with the use of ICTs at the level of their work with communities;
- decision-makers at the community, regional or national level that want to use ICTs for local developmental purposes, study the use of ICTs for development applications or introduce related policy frameworks.

Partnerships are being pursued which will assist Acacia to... (in no particular order)

- address specific African community development problems;
- promote rural connectivity;
- ensure project sustainability;
- build human and institutional capacity in Africa;
- promote new forms of development assistance;
- encourage greater Canada-Africa co-operation;
- empower communities in their relationships with regional and national governments, development organisations, the private sector, etc.;
- encourage a South-South or a South to North flow of knowledge and information.

NGOs

Lots of NGOs are involved in co-operation projects.

Normally a project is undertaken by two NGOs, one from a developed county and the other one from the developing country. They together develop an idea and ask the financing entities for funds. The EC is seen as one of these financing entities.

An overview of some international NGOs operating to develop the Information Society in Africa is provided below.

APC (Association for Progressive Communications) is a global communications network, which focuses on providing low cost connectivity to environmental, development and human rights networks. The APC has also provided communications support to a number of large UN conferences.

The APC consists of autonomous members who operate local hosts connected to the Internet in 18 countries, including one in South Africa - SANGONeT. As part of the members' commitment to assisting with local network development in developing countries, APC nodes provide low cost dialup connection points

and technical support for emerging systems in Africa, Latin America, Eastern Europe and Asia, many of which are heavily used by local non-governmental organisations involved in development projects.
Because of the low cost of connections with South Africa in the Southern Hemisphere, SANGONeT provides an Internet connection hub for local hosts in Malawi, Zimbabwe and Mauritius, and for users in these and other countries who need direct access to a full Internet connection. In London, which generally has cheaper and better connections to the rest of Africa, the APC node provides links and support for systems in Angola, Cameroon, Ethiopia, Ghana, Kenya, Morocco, Senegal, Sierra Leone, Tanzania and Uganda.
Action Without Borders was founded in 1995 to build a network of neighbourhood Contact Centres that would provide a one-stop shop for volunteer opportunities and non-profit services in communities around the world.
There was no single directory that would make all the non-profit resources available on the Internet easily accessible to the millions of people who were already online. Action Without Borders set out to find every non-profit site on the Web and to arrange all of these resources by both topic and geographic location, thereby creating a 'virtual Contact Centre'.
It is a Web-based system, named Idealist, that allows any non-profit or community organisation - whether it has a website or not - to be on the Web, promoting its mission and activities.
Idealist has become the richest community of non-profit and volunteering resources on the Web, with information provided by 20,000 organisations in 140 countries.
Helping.org is an easy-to-use online resource designed to help people find volunteer and giving opportunities in their own communities and beyond. With customisable services and comprehensive information, it's never been easier—or more secure—to donate your time, services, or financial support.
Helping.org is a partnership between the AOL Foundation and its non-profit partners who bring specialised expertise and resources to the site. Helping.org also provides comprehensive online resources and tools to help nonprofits integrate the power of the Internet into their strategic planning and to organise, recruit, fundraise and publicise their mission and successes online.

C. Technical files

C.1. Developing countries and low-income countries list

		Sub-saharan Africa		Asia		Europe and Central Asia		Middle East and North Africa		
Income group	subgroup	East and Southern Africa	West Africa	East Asia and Pacific	South Asia	Eastern Europe and Central Asia	Rest of Europe	Middle East	North Africa	Americas
Low income		Angola Burundi Comoros Congo,Dem. Rep. Eritrea Ethiopia Kenya Lesotho Madagascar Malawi Mozambique Rwanda Somalia Sudan Tanzania Uganda Zambia Zimbabwe	Benin Burkina Faso Cameroon Central Africa Republic Chad Congo,Rep. Côted'Ivoir Gambia Ghana Guinea Guinea-Bissau Liberia Mali Mauritania Niger Nigeria São Tomé And Principe Senegal SierraLeone Togo	Cambodia Bangladesh Bhutan India Nepal Pakistan	Afghanistan Bangladesh Bhutan India Nepal Pakistan	Armenia Azerbaijan Georgia Kyrgyz Republic Moldavia Tajikistan Turkmenist. Ukraine Uzbekistan		Yemen,Rep.		Haiti Nicaragua

		Sub-saharan Africa		Asia		Europe and Central Asia		Middle East and North Africa		
Income group	subgroup	East and Southern Africa	West Africa	East Asia and Pacific	South Asia	Eastern Europe and Central Asia	Rest of Europe	Middle East	North Africa	Americas
Middle income	Lower	Namibia Swaziland	Cape Verde Equatorial Guinea	China Fiji Kiribati Marshall Islands Micronesia, Fed. Sts. Papua New Guinea Philippines Samoa Thailand Tonga Vanuatu	Maldives Sri Lanka	Albania Belarus Bosnia and Herzegovina Bulgaria Kazakhstan Latvia Lithuania Macedonia FYR[a] Romania Russian Federation Yugoslavia Fed. Rep.	Turkey	Iran Iraq Jordan Syrian Arab Republic West Bank and Gaza	Algeria Djibouti Egypt Morocco Tunisia	Belize Bolivia Colombia Costa Rica Cuba Dominican Republic Ecuador El Salvador Guatemala Guyana Honduras Jamaica Paraguay Peru St.Vincent and The Grenadines Suriname
	Upper	Botswana Mauritius Mayotte Seychelles South Africa	Gabon	American Samoa Korea, Rep. Malaysia Palau		Croatia Czech Republic Estonia Hungary Poland Slovak Republic	Isle of Man	Bahrain Lebanon Oman Saudi Arabia	Libya Malta	Antigua and Barbuda Argentina Barbados Brazil Chile Dominica Grenada Mexico Panama Puerto Rico St. Kittsand Nevis St. Lucia Trinidad And Tobago Uruguay Venezuela
Subtotal	157	25	23	23	8	26	2	10	7	33

		Sub-saharan Africa		Asia		Europe and Central Asia		Middle East and North Africa		
Income group	subgroup	East and Southern Africa	West Africa	East Asia and Pacific	South Asia	Eastern European Central Asia	Rest of Europe	Middle East	North Africa	Americas
High income	OECD			Australia Japan New Zealand			Austria Belgium Denmark Finland France Germany Greece Iceland Ireland Italy Luxembourg Netherlands Norway Portugal Spain Sweden Switzerland United Kingdom			Canada United States
	Non-OECD			Brunei French Polynesia Guam Hong Kong, China Macao, China New Caledonia N .Mariana Islands Singapore Taiwan, China		Slovenia	Andorra Channel Islands Cyprus Faeroe Islands Greenland Liechtenst. Monaco	Israel Kuwait Qatar United Arab Emirates		Aruba Bahamas, The Bermuda Cayman Islands Netherlands Antilles Virgin Islands(U.S.)
Total	157	25	23	35	8	27	27	14	7	41

C.2. "IS and Development", EC communication, 1997 (extract)

"Promoting the establishment of an economic and regulatory framework remains a first priority target, mobilizing local and international capital to ensure access for the developing countries to ICT for their benefit. The second target is to put technology at the service of development.
Creating the conditions favourable to such integration requires the following:

- establishing the prerequisites to the development of the information society: regulatory framework conducive to investment, commitments under the WTO on the basic regulatory principles for telecommunication, standards;
- facilitating the access of the developing countries to the information society through measures relating to human resources, technology transfer in particular in production and trade activities, demonstration of applications; this also includes their participation in Community R&D activities.
- supporting measures to foster partnerships between private operators of the Union and the developing countries;
- contributing to better integration between the information and communication systems of the developing countries of the same region so as to encourage interconnection of their systems and the development of new services, following the Community model;
- fostering dialogue and co-ordination with international initiatives of the Member States and those of the international organisations concerned.

In these activities account will be taken of the priorities of the Partners. Often, they will not modify the objectives of co-operation but, rather, strive to serve them more efficiently in the light of each country's specific economic situation. Nor is it the intention that the Union should substitute itself for the developing countries. Rather the Union intends to provide them with the means to participate in working out the global frameworks for the information society and developing internal models for its use.
It is proposed that co-operation should follow eight courses of action comprising the following:

- *Raising awareness and fostering dialogue*, including social and societal aspects. This can be achieved by including the information society dimension in the institutional dialogue between the European Union and most of the developing countries. Where possible this activity should be pursued in co-ordination with the awareness-raising initiatives of international organisations such as the World Bank (InfoDev), UNESCO and the ITU (in particular the World Conference on Development and Telecommunications to be held in Malta in 1998, and regional conferences) and, where appropriate, by supporting the initiatives that could be taken in the follow-up to the Conference of Midrand. In this context, it is important to encourage the establishment of consultation bodies between suppliers, operators and users (governments of developing countries, local decision makers, companies) to examine how the new technologies could improve national and local development strategies.
- Supporting the establishment of a regulatory framework suited to the *development of infrastructures* for which the EU has wide-ranging experience in gradual liberalisation, which may serve as a model, obviously with national nuances. This includes technical assistance in implementing the commitments made to the WTO by developing countries, and support for countries contemplating such commitments.
- The use of the *financial instruments* administered by the Commission and the EIB, taking account of the other funding organisations (World Bank but also the BID, ADB, etc.) and by making financial co-operation subject to a number of conditions conducive to structural adjustment and progressive adaptation of the operators. Financial assistance should be clearly targeted and linked to consecutive stages of change. Thus, support will be given by priority to credible and qualified operators offering prospects of efficiency and sustainability. A particular focus could be aimed at projects for rural areas or projects of regional significance.
- Action oriented towards the regional adoption of identical *standards* ensuring inter-connectability of networks and inter-operability of services and enabling users to benefit from falling prices resulting from economies of scale. At the same time, an impetus should be given to the adoption of strict quality requirements for systems and components. The EU has evolved a dynamic standardisation policy which has led to such standards as GSM, ISDN, DECT and ERMES. The developing countries could be more closely interested in standardisation and thus benefit from Community experience. Such co-operation should take place in the framework of European bodies such as the ETSI and CEN/CENELEC.
- *Pilot projects* which make it possible to demonstrate the specific benefits of applications, test their technical feasibility and evaluate their economic implications and cultural acceptance. They enable users to move forward in successive stages in adapting the specific applications and learning how to use them. It is therefore recommended that projects be incorporated in the existing programmes that are targeted at areas regarded as requiring priority under regional action plans. This should be achieved in close co-ordination with the projects launched at global level in the G7 framework following the conference of Brussels. The Global Inventory Project could serve as a basis for data exchange in this field.
- Taking account of *ICT in industry*, in particular in sectors where there is co-operation with the EU.
- Support for defining a *strategy for the development of the information society*, requiring provision of the necessary human resources, in particular through the transfer of experience in matters of training, multilingual access to knowledge and the utilization of new technologies in this domain. Particular emphasis should be placed on targeted training, especially at a

regional level, for regulators, decision makers, distributors and managers, high-level technicians and media staff, both audio-visual and printed. Priority ought to be given to local training facilities, in particular for technical staff, and to improving these where they are insufficient.

- Inclusion by the EU of the information society among the principal areas for action in the *5th Framework Programme* in research and development. In some cases developing countries will be able to take part in Community programmes in this field on a project-by-project basis. This has to be implemented under the provisions on international co-operation in the framework of the Fifth Framework Programme. Specifically, the interconnection of European research networks and those of the developing countries should be systematically promoted, in particular to break the isolation of researchers in developing countries and give them access to specific documentation.

In order to take account of the specific economic, political and cultural characteristics of the developing countries and their requirements, the action contemplated should be modulated according to the particular features peculiar to each major region and the nature of the dialogue the Community carries on with each one of these. Specifically, a regional action plan should be drawn up and implemented in each case".

C.3. The EC Alamed Report (comments)

The report analyses the EU activity in ALAMED countries (Asia, Latin America and Mediterranean regions), providing a meaningful examination of the actions taken. The report describes the few projects where ICT plays an important role. These projects do not appear to be elements of a consistent strategy pursuing ICT development in those countries.

Notwithstanding the interest for the complete overview and the discussion of the projects funded by the EC until now, this reports is criticised by field experts because, in their opinion, it is focused on drawing conclusions from the past experiences, overlooking the fact that technological development makes out-of-date even recent experiences; furthermore, the report emphasises the role of ICT in each specific project, without clearly pointing out:

- The importance of the project for the real bridging of the digital divide;
- Its effectiveness to fight against poverty.

On the contrary, the report states that:

- ICT in itself cannot represent a goal, but it is only one of the several tools to achieve the goal of the project
- In situations of extreme poverty, when the primary needs are not satisfied and people are illiterate, the focus must be necessarily directed towards other actions than towards ICT.

Caution towards the role of ICT to foster development is expressed more than once, commenting on the flood control program undertaken in China, which experienced a crisis due to the poor software maintenance performed by the Chinese after 4 years of excellent results, and referring to another project where the software adopted was far more user-friendly than the one originally selected.

C.4. The BIPE study (synthesis and comments)

The outline described by the study is summarised below.

On average, telephone lines represent good investment opportunities also in Africa. Because of the family low usage rate (106 min/year), mobiles and telecenters are less expensive, thus avoiding the cost of a fixed monthly rent required for a traditional telephone. Utilization is low because prices are high in comparison with purchasing power; if these prices were reduced, for instance thanks to a liberalisation policy, demand would naturally increase. The simulation shows a final scenario where teledensity grows from 0,5% to 6% in 10 years. The telecommunication network can be developed through a virtuous circle: improving accessibility to families the consumption grows, telecommunication companies improve their profits and therefore can reduce prices and develop the network increasing investment, therefore stimulating demand and so on.

Technological evolution and the consequent reduction of the necessary cost to develop the network (around 10% per year) surely favour this process. Network development determines cost advantages, scaling down personnel cost and interconnection rates. Nevertheless regulation should set up and govern this virtuous circle, liberalising the access of new operators to the market, leading the existing operators to favour new

actors interconnection and constraining the creation of telecentres or other structures allowing universal access.

The regulation has to favour the liberalisation process, because it eliminates the primary causes of monopoly: the centralised development of the network is no longer necessary and the new services on the network require more providers. The new services (mobile phone and the Internet) were liberalised from the very beginning almost everywhere. Fixed telephone services have not followed the same path. But this defensive action is senseless, as the cell phones will get the upper hand on the fixed ones in the near future.

As regards international calls, the Intel satellite practically has the monopoly in Africa. But this monopoly is threatened by the callback connections (and by IP protocol telephone calls) and above all by the new Sat-3 oceanic cables, that will surround Africa and will be completed by 2002, generating an international connection over capacity. This evolution leads towards a liberalisation of international calls, directly involving all international operators. A delay in the liberalisation process would be extremely dangerous, because it could be eluded connecting to the operators of the nearest countries. The use of the satellite seems to be particularly advantageous to connect regions of difficult land access, but existing cases (GMPCS) show such high rates (higher than 1 Euro/min.) that they do not appear as a real threat for land phone services (0.5 Euro/min. for cell phones). On the other hand, the Rascom project, which should connect around 500.000 rural areas, should introduce more competitive rates ranging from 2,4 to 4 US cents/min.. A specific regulatory issue should be defined to connect borderland areas to the border country network, as it may be less expensive than connecting them to a national network.

An **interconnection** policy is required in a competitive situation (more than one operator in the same market) to allow telephone subscribers to communicate with the others. In this case, a political arbitrage may be required if the ex-monopolist tries to define expensive interconnection rates in order to oppose the access of new operators.

To support the development of the telecommunication market a **public access** policy is required, to favour the diffusion of the telecentres. Their increase could bring direct economic effects: in an average African country (Afriland) it could lead to the creation of 10.000 new jobs. The regulation in force is sometimes unfavourable with respect to telecentres diffusion: for instance, mobile operators are not allowed to open public network access points in some countries. On the other hand, in other countries such as Tunisias' telecentres' rates are undoubtedly more favourable reduced by rates of up to 50% and they are also allowed to offer Internet connection.

A **universal access** policy should be established, because some African regions do not have a direct network access. Paradoxically, the recent liberalisation process restrained the diffusion of the fixed network in rural areas, because their perspective economic return is considered poor (the diffusion of mobile coverage is continuously progressing because it is a mandatory condition included in the licence).

Their attractiveness will increase only if costs are reduced or income are increased (per line). The regulation could support this process:

- Subsidising the existing lines, for instance creating a universal access fund financed by income taxes on operators;
- Constraining operators to invest in less favoured areas;
- Subsidising subscribers.

Liberalisation and privatisation can be supported at the same time, because they do not influence one another in a considerable way.

An **independent regulatory authority** will have to be created in a couple of years, as country governments have too large an economic interest (share capital, fiscal and social interest) to be a fair arbitrator. In the liberalisation process the regulatory authority is essential to manage the relationship between the new operators and the ex-monopolist. Unfortunately, this process shows delays in the African countries, because of specific difficulties, such as the availability of adequately skilled human resources: technical, law and economic competencies are required and they are not easy to be found at the same time. The legitimisation of such resources, which should be sanctioned, is not an easy task; furthermore, the rules are sometimes disregarded by the public administration itself, which does not pay the bills. The regulatory authority should control the economic status of the different operators and oppose possible dominance positions (too high income) and guarantee the adequate management of the sector. This is an essential condition to attract new private investment, which can offer good economic returns in Africa as well.

A regional high-level co-operation effort is required, to make homogeneous the regulatory framework among the different countries (the most important body is the SATCC, located in Mozambique), and to strengthen the independent regulatory authorities through experience exchange and benchmarking.

C.5. "The European Community's Development Policy", Brussels, 26-4-2000

Here we report some extracts from the quoted EC document. The first is about the policies evaluation.

"The evaluations of Community aid policies[97] have pinpointed a number of problems. The Commission has recognised their relevance and considers that these problems are mainly signs of a growth crisis, where policies and structures have not been adapted sufficiently fast to meet the growing responsibilities of the Community in the more-and-more complex area of development co-operation. The main evaluation results can be summarised as follows:

- The Community's aid system is too complex and fragmented in terms of objectives, instruments, procedures and institutional mechanisms. Streamlining should be an objective in itself.
- Policies are guided by the instruments rather than by policy objectives and clearly defined priorities. The Commission should develop more precise sectoral strategies to make the objectives operational.
- Human resources are too thin both on the ground in Brussels in relation to the volume of aid managed. On average, to manage 10 million USD of aid, there are 2.9 staff at the Commission, compared with 4.3 at the World Bank and from 4 to 9 in the major Member States.
- The concern to disburse substantial funds rapidly is often at odds with the concern to ensure quality of interventions, with focus on input to the exclusion of outputs and impacts.
- Financial controls have to be simplified, by putting more stress on ex-post controls on the basis of verifiable performance indicators.
- Monitoring, evaluation and institutional learning need to be strengthened.
- Internal and external control systems should avoid duplication and be mutually reinforcing and designed with complementarity in mind.

Finally, it has to be recognised that EU's large-scale disbursement does not entail proportional influence. The EU bears a significant share of multilateral financing. Its presence should be reinforced in the discussions on economic reform policies or other major topics which constitute key issues for developing economies".[98]

Another extract is about the EU's value added.

"The special features and value added of Community policy can be identified as follows.

In relation to the Member States …

- Community policy pursues EU's shared objectives and interests. In principle, this policy is dictated by political, economic and trade interests that are shared by all or by a majority of Member States;
- The Community has a presence in virtually all developing countries through trade and co-operation agreements, and a broad network of representations in the field;
- The EC projects and programmes are usually bigger than those of most Member States. The Community is a natural focal point for mobilising the Union's economic and political weight, its existing technical resources, and its expertise in areas where the required critical mass is high.
- The Community embodies Europe's collective experience of regional integration.
- The Community's capacity to formulate sectoral policies can benefit from the accumulated experience of fifteen Member States, including major donors, and countries with quite different experiences and approaches.
- Community development policy conveys a certain image of Europe in the world. The culture and values of co-operation and collective action carries a strong and positive message to partners in developing countries.
- European social values, the diversity of the existing social systems and the importance attached to environmental considerations, give EU policy a distinct profile as regards the quality of sustainable development.

In relation to the IFIs[99] and other multilateral bodies …

- The Community's competence is not only on financial and technical aid, but extends to trade, economic and monetary matters and to political issues. This enables it to incorporate these various aspects into development co-operation processes.
- The Community is a major donor and the biggest trading partner of the developing countries.
- The Community's aid is given almost exclusively in the form of grants (except for EIB loans and certain kinds of balance of payments support).

The private sector is an engine for growth, a source of employment and revenue. It is also a key actor and partner in the development process. The Commission's strategy combines support at the macro level - aiming at improving the business environment and the investment climate -, at meso - financial and non-financial - or intermediary level, and at micro level to help increase business competitiveness. Consultation with private sector organisations and a strengthening of their capacities is an integral part of this strategy.

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[97] Global evaluation reports: ACP (951338), ALA (951401), MED (951405).

[98] The EU, as a whole, financed for example 64% of the cost of the structural adjustment programmes in Africa, while the cumulated voting right of the Member States in the IMF is only 27%.

[99] In particular the IMF and the World Bank.

Specific attention should be given to the specific needs of micro, small and medium-sized enterprises and to the development of a sustainable financial sector.

The last extract concerns the Strategic Activities.

Whilst respecting the specific circumstances of different countries and regions, the EC's development co-operation would gain in visibility and coherence with the adoption of a common integrated framework for development programmes and policies for all geographical areas. In such a framework, best practices, as identified within the DAC, must be promoted.

Integrated framework for Community activities Central objective: Poverty reduction
Strategic areas deriving from the Treaty
A Sustainable development, in particular through promoting equitable growth, investment, employment, social and human development and environmental protection B Integration into the world economy, including through support to regional co-operation and integration C Fight against poverty D Democracy, human rights, rule of law and when necessary peace-making and conflict prevention.
Guiding principles (mainstreaming)
1 Effect on poverty reduction 2 Support for institutional development and capacity-strengthening 3 Gender equality 4 Sustainable management and use of environment and natural resources 5 Enhancement of economic, social, political and cultural rights

Levels of action
➢ Global, regional national, local ➢ Partners and actors (public sector, private sector, civil society)

(…) The following priority fields are proposed as those in which Community development co-operation activities will be concentrated. The order in which they are listed does not reflect a ranking. Rather, the priority areas should be seen as interdependent.

1. *Trade and development*, including the development of trade and investment policies, assistance with integration into the multilateral trading system and into the world market. Without integration into the world economy, be it directly or through regional trade agreements, development will not be sustainable. Trade is a major factor of growth and creation of wealth for all countries.

2. *Regional integration and co-operation*, including tackling of transborder economic, social and environmental problems. (…)

3. Support to *macroeconomic policies* with an explicit link with poverty reduction strategies, in particular sector programmes in social areas (health and education). Economic growth through trade must be part of the service of poverty eradication. This can only be done by ensuring that the gains from trade are distributed equally. (…) The IMF and the World Bank have made the Commission the European partner of choice for discussions of adjustment in developing countries.

4. *Transport*: reliable and sustainable transport plays a key role in access to basic social services. Sectoral policies in transport are necessary to make it sustainable, to keep it balanced in terms of social, economic and environmental requirements. Transport is an area in which the comparative advantage of the Community derives from the fact that it has been the major donor in the sector for many years and on this basis has considerably built up experience and expertise.

5. *Food security* and sustainable rural development strategies. Together with health and education, food security is an essential element in any poverty reduction strategy. A coherent food security policy reduces the necessity of food aid and ensures that the considerable environmental damage caused by the struggle for food is minimised. In this area the Community has the following comparative advantages: its critical mass in financial terms; its experience in this field and long-term research and development co-operation in this area (…).

Institutional capacity-building, good governance and the rule of law. It is generally recognised that the lack of institutional capacity and institutional control of the use of public funds are a fundamental obstacle to sustainable development. Institutional capacity building must thus be a key element in the fight against poverty. (…).

C.6. For an eDevelopment initiative, Brussels, November 2000

Some relevant extracts from the document follow.

"This action could take the form of an initiative *e* Development with the following objectives:

– To bring support for the development policy of the EC, by incorporating the dimension of the ICT into the development programmes;

– To open with the countries concerned a dialogue on the basis of the assets and experience of Europe in this field;

– To act by means of the foreign policy tools on a reduced number of specific objectives instruments, being used in their turn of the purpose of development; in this respect, priority has to be given for the ICT use as an element of the Community strategy of the fight against poverty. To ensure that these technologies also benefit the less favoured people, the Commission should re-examine its co-operation instruments and strengthen its partnerships with the NGOs;

– To take part accordingly in the efforts of the international community, by taking, if necessary, the leadership, on the basis of the guidelines agreed upon for Okinawa, at the UNO/ECOSOC meeting and of the Commission Communications referred to above;

– To identify complementary and effective co-operation with the Member States. In the majority of the cases, those as moreover the Commission are at the beginning of a process which will lead them to define or to specify policy and to increase the portfolio of the projects in the field".

[…..]

In this context, the following guidelines could be considered:

I) To develop the principles, the methodology and the structures necessary for
the integration of the ICT in projects and programmes in a way which contributes to the aim of poverty reduction (cf. the statement of the Council at its meeting on 10 November) and equitable, and which takes account of the sectoral development aspects (education, health, agriculture, water management..). It is not a question only of modernising the implementation modalities of projects, but also of taking into account the value added of these technologies, in particular in terms of knowledge management, development of the local capacities and strengthening of institutions including at regional level, as well as improving the efficiency and transparency of public management.

II) To encourage appropriate national and regional policies, aiming in particular at Internet access, in particular the precondition of technical infrastructures, of access and costs :

– To promote awareness-raising and the mobilisation of actors at national and regional level;

– To define the legal and regulatory frameworks and the public-private partnerships to build networks and offers that make affordable access possible; this falls within the institutional strengthening required by the Council;

– To encourage technological developments adapted to developing countries in connection with Community research and technological development programmes.

– To ensure a favourable environment for enterprises, in particular SMEs, to benefit from the growth potential of these sectors (incubators, innovation..); the Commission and the EIB could for their part, use better the co-operation instruments for private sector support in favour of the ICT sector;

– To develop e-commerce knowledge and practice;

– To support regulatory convergence at the regional level in particular within economic integration organisations.

III) To invest in the development of human resources

– To give priority in the short run to the training of ICT and information sector's professionals;

– To give priority to basic as well as life-long education;

– To promote networks among education, research and cultural institutions, and, in view of their multiplier effect; strengthen in particular the role of the universities;

– To develop new approaches using ICT technologies to increase the scope and the effectiveness of traditional training methods".

[…]

Among implementation modalities, one could in particular envisage the following:

– **To include the ICT dimension in country strategy,** papers and, as appropriate, regional ones: the development Council of 10 November has i. a. approved provisions for a harmonised framework for country strategy. The effort of mainstreaming ICT should reflect itself in these documents.

– **To ensure flexible but effective co-operation and co-ordination** : it would be useful to maintain this group of experts as a sharing mechanism for sharing experiences, approaches and policy co-ordination. The exchange of the experiences recommended by the Council at its meeting on 10 November is particularly interesting in view of unlimited experience, that of us. The review, carried out by the Commission on its experiences in the ALAMED regions is only a beginning. A knowledge management system based on the experiences of the Commission and of the MEMBER STATES, could be envisaged.

– **To act in concert on international initiatives** : several initiatives have been launched in the international context: ECOSOC, G8, the World Bank, UIT, World Economic Forum, etc. We could together reflect on a limited number of interesting initiatives which we could support in a concerted way.

– Leading a dialogue of region to region according to a methodology that could be favoured at European level: the process of the 1999 Rio Summit between EU and the countries of Latin America and the Caribbean have just resulted in a Commission communication [COM 2000 628/3] where ICT are one of the three pillars. With the countries of Asia and the Mediterranean , economic co-operation programmes developed along similar lines. A dialogue between Regions could also be envisaged with the ACP STATES (or each sub-region, for example following the results of the Summit held with Africa in Cairo), or with the TACIS countries. In this context close attention could be given to 'regulatory convergence' of economic integration organisations, a field in which the Union has unique experience, as well as to the promotion of the partnerships between the European private sector and that of the partner regions.

– **To associate civil Society** to the ICT revolution: concerning information society and development, our objective will be achieved when these technologies will contribute to improving the conditions of the most disadvantaged sector. The Commission and Member states could engage a dialogue with development NGOs to identify the most effective approaches on this subject and to adapt, if needed, implementation modalities.

– **To envisage ICT for a more efficient State** : one of the areas identified by the November Council is the institutions strengthening. Indeed the use of the ICT represents a significant potential to improve efficiency and the transparency of the state and of the local authorities. A Commission Member States reflection could be particularly profitable on this question".

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STOA PROGRAMME

European Parliament
Directorate-General for Research
Directorate A

Room SCH 04 A034
Schuman Building
Kirchberg
L-2929 Luxembourg,
Tel (352) 4300.22511;
Fax (352) 4300.24167
E-mail: gchambers@europarl.eu.int

or

Room ASP 6D46
Altiero Spinelli Building
60, rue Wiertz
B-1047 Brussels,
Tel (32-2) 284.3812
Fax (32-2) 284.49.80
E-mail: tkarapiperis@europarl.eu.int