

Mechanisms for financing the Information Society from a Global Public Goods perspective

Fernando Prada

Document prepared for
Instituto del Tercer Mundo (ITeM)

January 2005
(Revised version - July 2005)

*ITeM gratefully acknowledges the funding support of the
International Development Research Centre*

Table of contents

1. Introduction: Information societies from a global public goods perspective.....	2
2. Conceptual framework: The structure of an idealized delivery system for global public goods 4 <i>Describing the elements in the system.....</i>	5
3. The information society: “Deconstructing” the global public good.....	7
<i>The information society as a GPG: Why is this concept applicable?.....</i>	7
<i>Components of the “information society” GPG delivery system.....</i>	9
<i>GPG information society: Core component and complementary activities.....</i>	13
4. Exploring financing strategies for the information society	15
<i>How much would it cost to develop the information society?.....</i>	16
<i>How far is it possible to internalize externalities?.....</i>	18
<i>Financial mechanisms for the information society.....</i>	19
<i>Towards a strategy for financing information societies.....</i>	25
5. Conclusions and recommendations.....	28
6. Bibliography.....	29
7. Annex 1: Summary of Financial instruments for the information society.....	33

1. Introduction: Information societies from a global public goods perspective

Global public goods (GPGs) have gained relevance in response to a crucial question – How can financial resources be increased in a context of declining trends in international cooperation for development? Although the concept of GPGs has been widely used by economists,¹ it sprang from a study published by Kaul and Stern (1999). Since this publication, a series of academic and policy documents have been produced and seek to call attention to the potential gains of collective action aimed at tackling different common problems whose externalities go beyond the action of individual states.

In spite of the enthusiasm generated by this new perspective and efforts by the international community and academy to make this concept operative, no clear specification has been made as to how this concept can contribute to solve the problem of additionality of international cooperation resources² and the under-provision of GPGs. The setting up of different forums has been an important step towards promoting policy decisions at international level, such as the “International working group on global public goods” which is sponsored by the Swedish and French governments.

Similar efforts are being made to establish and finance the information society. The first phase of the World Summit on the Information Society has prompted talks geared to obtaining an international commitment and a plan of action which will allow the benefits of the information society to be extended worldwide. This discussion partly focuses on the financial mechanisms needed to meet these challenges, but it also extends to other aspects such as Internet governance, the relation between information technologies and development, international cooperation mechanisms to support less advanced countries, and the setting of concrete goals for this sector to be met by 2015.

The GPG perspective has emerged from concerns of the international community when faced with specific global problems (*global public bads*). However, a complex group of negotiations and agreements at the global, regional and local levels are necessary to make up a “GPG delivery system” (Sagasti and Bezanson 2001). The political process which leads to setting this up has far-reaching implications when it comes to the financing mechanisms that are most suitable for providing this type of goods.

The main objective of this study is to propose financing strategies for the information society by using the GPG conceptual framework. To this end, we will evaluate the use of different combinations of financial mechanisms which could promote increased flows of international cooperation aimed at developing the information society in Southern countries.

¹ Although Samuelson defined public goods in 1954 based on the principles of *non-rivalry* in consumption and *non-exclusion* from benefits, David Hume had previously coined the idea of “common good” (in 1793), and Adam Smith, David Ricardo and David Malthus had stressed that concerted action could serve to provide goods that would benefit the community as a whole.

² Since the concept is still not clear, it has been incorrectly used to proclaim that almost any activity could be considered as a public good and thus should be financed by the international community. For example, Sachs (2001) said that during the Cold War the United States and its allies provided the public good of containment, and invested billions of dollars to stop the spread of Communism. Camdessus (1999) said that the international monetary system could be seen as a global public good in the sense that everybody is affected by it. Banca Etica (2001) considered that “the means to preserve sustainable development conditions for each individual and his or her community should be considered as global public goods, regardless of the scope of their effects.”

In the first section we briefly present the conceptual framework and the structure of a GPG delivery system. In section 2 we apply this conceptual framework to the specific case of the information society, indicating the elements that make up the delivery system and showing how the different forms of international arrangements can influence the financial mechanisms available for providing it. In section 3 we explore financing strategies for the provision of goods, and propose and evaluate some specific financial mechanisms to grant them. We also deal with the threats and opportunities posed by such strategies. Lastly, we present our conclusions and recommendations, proposing next steps towards achieving suitable levels of financing for the information society.

2. Conceptual framework: The structure of an idealized delivery system for global public goods

The concept of public goods is associated with three interrelated characteristics. First, public goods produce significant *externalities*³; second, there is *non-rivalry* in their consumption and *non-exclusion* from benefits to a significant degree⁴; and third, they generate opportunities to improve individual and social well-being through collective action. However, this concept should not only be defined in an abstract way,⁵ since social and cultural preferences – which are expressed through public opinion and political will – determine which public goods will be provided, and the trade-offs these societies are willing to make. When it comes to GPGs – and international public goods to include regional public goods – these trade-offs are determined within a domain that goes beyond nation states, but which does not necessarily conflict with them.⁶

Complex negotiations should have to take place from the time international public opinion becomes aware of a specific problem, until the time when a global public good is defined; and even a longer period before such good is provided. This process requires a great effort in terms of collective action, and the results are strongly influenced by public opinion and policy decisions at international level, which involve national governments, private corporations and civil society organizations.

Sagasti and Bezanson (2001) proposed an *idealized delivery system*⁷ for global public goods. They propose a way of integrating the concept of GPG, the decision-making processes of different agents involved in their provision and the financial implications. The aim of this delivery system is to recognize the different elements needed to deliver a GPG, and to distinguish those elements that constitute its *core component* from those which represent *complementary activities* (Figure 1).

This idealized delivery system allows to answer the question of how the different elements for providing the GPG interact. These elements form a continuum from the *global domain* to the *national/local domain*. In this delivery system, the *global domain* (related to the whole of humanity and to public awareness) interacts with the *network domain* (related to institutional agreements at international level) and with the *local domain* (related to national governments, private enterprises and civil society), in the following ways:

³ “Externalities” are the unintended positive or negative effects arising from any action, which are not borne directly by the person(s), organization or country responsible for the action. Public bads in particular are very often the result of such negative externalities, and likewise, the motivation for providing public goods stems from the desire to generate or enhance positive externalities and correct negative ones.

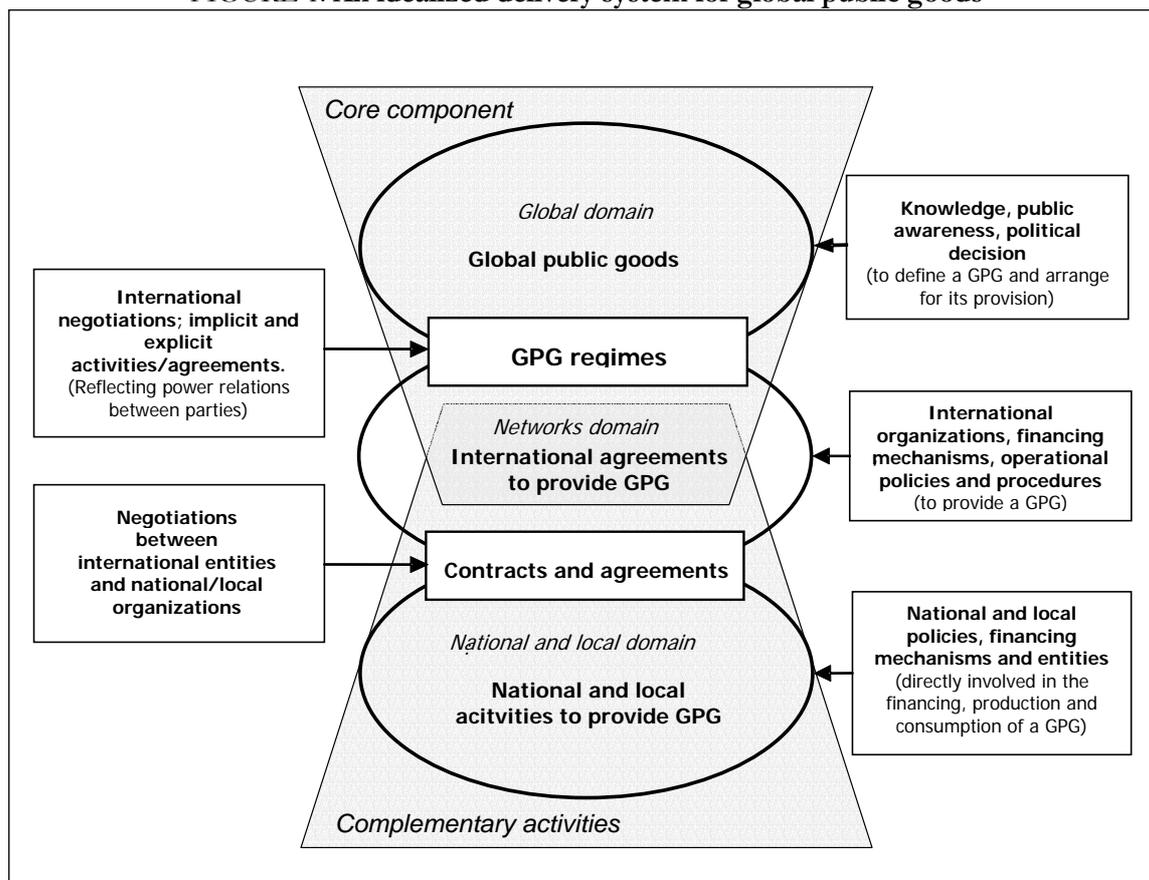
⁴ If a good can be consumed by many people (or countries) without becoming depleted, it is said to be “non-rival” in consumption. Likewise, if no one (or country) can be naturally prevented from benefiting from the good, it is “non-excludable”. It is these characteristics that differentiate these public goods from private goods, whose use by one consumer effectively prevents another from accessing them.

⁵ Ver Eecke (1999) has found problems in the conceptual definition of public goods and has identified around thirteen possible definitions in the academic literature on this subject.

⁶ In a fractured global order (Sagasti and Alcalde 1999) there are fissures between states and also fissures within states themselves, but there are also forces which put the actors involved in contact with each other, such as international civil society, transnational enterprises, regional associations, etc. In this context GPG not only fall within the sphere of states, but are also a spot where pressures from diverse agents meet and converge.

⁷ When considering an ideal system, subjects such as asymmetric knowledge, power relations, and the capacity to acquire benefits, among others, are left behind. They will be considered at a later stage of the analysis.

FIGURE 1. An idealized delivery system for global public goods



Describing the elements in the system

Knowledge, public awareness and policy decision (global domain)

The statement that something is a public good depends firstly on the *knowledge* about its characteristics and effects (impact, consequences, scope), on the degree of *public awareness* about a specific problem and on the *policy decisions* needed to mobilize concerted actions of the international community. To state that something is a GPG without taking all these elements into account would be just rhetoric.

GPG regimes (from the global to the networks)

In the case of GPGs, “regimes”⁸ are international agreements that regulate the relations between agents for the provision of public goods. These rules are not necessarily treaties or international law documents, but also informal/implicit rules of interaction.

International organizations, financial mechanisms, policies and operational procedures (the networks domain)

This domain is composed of institutions in charge of interpreting, administering, monitoring and evaluating the provision of GPGs in accordance with regimes. It is also composed of financial instruments that support the core component and complementary activities for the provision of GPGs, as well as the regulation, working rules and policies.

⁸ Regimes have been described as “arrangements that have to do with specific areas of international relations that are characterized as having complex inter-dependence” (Haas 1980, 1982).

International / national contracts and agreements (from the networks to the local)

International and national domains are linked through mechanisms that govern and regulate the procedures, responsibilities and rights of the different local actors (usually States) involved in the provision of GPGs.

National / local bodies for the provision of GPG (national / local domain)

Providing GPGs also involves a series of activities at the national/local level, mostly funded by domestic resources. This is relevant because if there is no congruence between local activities and global policies, there might be an inadequate provision of GPG.

The GPG delivery system must incorporate these elements in a coherent way so that they form a continuum, extending from the global domain to the local/national domain. However, a critical decision has to be made to identify in what point of this continuum the GPG *core component* is to be located. This decision determines what kinds of organizations and programs should be involved in the production of the core component, and, even more important, how the provision of the GPG should be financed. In the next section we will try to answer this question for the particular case of the information society.

3. The information society: “Deconstructing” the global public good

The information society as a GPG: Why is this concept applicable?

Concerns about the deep fissures in the information society (the knowledge and digital gap) in some countries and within them, have varied over time, incorporating new issues. From 1996 to 2000, the main concerns were related to policies and regulatory frameworks in the telecommunication sector. Since then, the debate has mostly focused on the potential uses of information and communications technology (ICT) to reduce poverty, provide basic social services, and improve the competitiveness of the private sector (Gastón Zongo 2004). Accordingly, the main policy challenges have included the reform of the telecommunications sector and the increase of private investment in this sector, but also the design of policies to promote universal access and the building of domestic capacities to take advantage of the potential of the information society.

The changing policy challenges show how public awareness evolves and how new elements and findings contribute to create and re-create the concept of information society. This process takes place before any political decisions are made and mechanisms are designed for the production of GPG. Box 1 shows how different actors have different perspectives about the information society, its benefits and main characteristics. These perspectives range from holistic visions –the WSIS declaration links the information society to the quest of sustainable development and human welfare–, to more specific visions that focus on new technologies, information flows and the creation of knowledge for the promotion of social and production changes.

BOX 1. Values and aspirations behind the information society

Civil society declaration in the WSIS. “We are committed to building information and communication societies that are people-centered, inclusive and equitable. Societies in which all men and women can freely create, access, utilize, share and disseminate information and knowledge, so that individuals, communities and peoples are empowered to improve their quality of life and to achieve their full potential (...) Societies that pursue the objectives of sustainable development, democracy and gender equality, for the attainment of a more peaceful, just, egalitarian, and thus sustainable world, based on the principles enshrined in the United Nations Charter and in the Universal Declaration of Human Rights,” (Plenary session of the WSIS, December 2003).

Report from the European Union high-level experts group for the information society. “The information society is the society currently being put into place, where low-cost information and data storage and transmission technologies are in general use. The generalization of information and data use is being accompanied by organizational, commercial, social and legal innovations that will profoundly change life both in the world of work and in society generally.” (Nassimberri 1998: 154).

Bávaro Declaration. “The information society is an economic and social system where knowledge and information constitute the fundamental sources of well-being and progress and that it represents an opportunity for our countries and societies, so long as it is understood that the development of that society within a global and local context requires a deeper appreciation of fundamental principles such as those of respect for human rights within the broader context of fundamental rights, democracy, environmental protection, the advancement of peace, the right to development, fundamental freedoms, economic progress and social equity”. (Latin American and Caribbean Regional Conference 2003).

From a GPG perspective information society also exhibits the following characteristics:

The information society produces a significant degree of externalities

The dissemination of ICTs means that knowledge can be transmitted at low cost, generating benefits for the whole population (including poverty reduction, territorial integration, better quality of life and lower production costs). Moreover, exclusion from the information society causes negative externalities, which thus increase existing inequalities. Indicators show that technology access and knowledge gaps are deeper than economic inequalities. This is a matter of concern given the fact that new technologies and the capacities to use them represent essential means within the emerging production methods (Table 1).

TABLE 1. **Economic, technology access and knowledge gaps**

Indicators (2003 or last year available)	Values and ratios		
	(A) OECD countries	(B) Low income countries	Ratio (A)/(B)
Economic inequalities			
Gross national product <i>per capita</i> *	29,578.0	461.0	64.2
Gross capital formation <i>per capita</i> *	6,730.3	101.7	66.2
Trade <i>per capita</i> (Imports + Exports)*	13,030.9	190.6	68.4
Technology access gap			
Personal computers per 1,000	473.0	7.0	67.5
Mobile telephones per 1,000	650.0	13.0	50.0
Secure internet servers	206,710.0	370.0	558.6
Knowledge gap			
Scientific publications per 100,000	72.9	0.8	88.8
Patents applications per 100,000	75.4	0.4	197.2
High technology exports <i>per capita</i> *	831.6	1.3	645.5

Notes: * In 1995 dollars. The indicators are from World Development Indicators 2004.

Source: Adapted from Sagasti (2004).

The information society shows a high degree of non-rivalry in consumption and non-exclusion from benefits

Let us suppose that the whole world population has full access to the information society. In this ideal world an individual's consumption would not alter other people's consumption, and all the members would be able to share the same benefits. Technological progress has created new technologies with greater capacity (*e.g* more powerful processors and faster communications) and also new means to provide access to the information society that could cover the whole world, at least in theory.⁹

However, the access gap indicates that a significant proportion of the world's population does not have access to these benefits due to lack of infrastructure and capacities to process information and knowledge. Even when new technologies are not available for everyone, it could be argued that some of the benefits of the emerging information society could indirectly benefit the people with no access at all in the form of lower production costs, public knowledge

⁹ Part of the explanation can be found in the economies of scale that apply to this kind of infrastructure. It is capital intensive and is installed in many layers and dense networks known as backbones which allow the capacities of transmission from a centre to peripheral points to be diffused. In the centre the cost tends to be much lower and there can be a problem of over-capacity which is not easily transmitted to distant locations.

generated, gains in productivity, among others. In these examples, both public good conditions are met to a large extent at the global, regional or national level. The Internet, for example, has non-rival and non-exclusion properties to a significant extent at the global level (Accuosto and Johnson 2004).

The information society generates opportunities to improve the well-being of agents through collective action

The potential advantages offered by the information society have been widely recognized and different countries and regional organizations have launched programs that are designed to include the largest possible number of people in the information society through solidarity schemes and direct economic support.¹⁰ These approaches suggest that the information society could be better developed through the collective efforts of different actors. Furthermore, countries can take advantage of catching up with new technologies and benefit from their development.¹¹ The great paradox is that the means and technologies to make this possible are already known or being developed, but for a variety of reasons this is not being put into practice intensively enough to bring about the integration of some regions into the information society (Information and Communication Technologies Task Force, 2004a).

As we argued when describing the conceptual framework, a GPG cannot be defined only by taking into account its degree of non-exclusion and non-rivalry and the existence of externalities. The definition must also include those elements that make up the delivery system to better analyze the financial strategies that can be put into practice.

Components of the “information society” GPG delivery system

The WSIS Declaration of Principles (WSIS 2003) identifies the components of the information societies, which lie on a continuum from the global domain to the national/local domain. Table 2 groups these elements into three categories:

- (i) *Stakeholders and actors*, according to their degree of influence are located in the network domain (international and regional cooperation) or in the local/national domain (national governments, mass media and civil society organizations). In the global domain, the pertinence of a global authority to regulate fundamental aspects of the information society (such as Internet governance) is under discussion.
- (ii) *The technology and means of access* that make communications and the flow of information possible. They can be within the global domain, as in the case of standards and protocols, or within the local/national domain, as in the case of local networks and personal computers.
- (iii) *The capacities, contents and applications* are related to the national/local domain, as in the case of culture, the development of skills for accessing the information society, the generation of contents and applications to improve public administration and the provision of social

¹⁰ For example, European Union policies have paved the way for the development of the e-Europe initiative (http://www.europa.eu.int/information_society/index_es.htm). Likewise, Latin America and the European Union joined efforts in the @LIS Programme (Alliance for the Information Society) and cooperated to develop the first Latin American network for research and education (CLARA) and to establish direct interconnection between it and the European network GÉANT.

¹¹ Carsten and Kenny (2003) analyzed the dynamic of technological innovations (TV, telephones, Internet) and showed how developing countries have adopted Internet faster than other innovations.

services, among others; or in the global domain, as in the case of discussions on the ethical dimensions of the information society.

TABLE 2. Guidelines of the WSIS Declaration of Principles and GPG components

Guidelines of the Declaration of Principles	GPG Components
1. Governments and stakeholders roles promoting ICTs for development	Stakeholders or actors
2. Information and communication infrastructure	Infrastructure and means of access
3. Access to information and knowledge	Infrastructure and means of access
4. Capacity building	Capacities, content and applications
5. Building confidence and security in ICT use	Capacities, content and applications
6. Empowering environment	Capacities, content and applications
7. ICT applications	Capacities, content and applications
8. Diversity in cultural identity, language and local content	Capacities, content and applications
9. Means of communication	Stakeholders or actors
10. Ethical dimensions of the information society	Capacities, content and applications
11. International and regional cooperation	Stakeholders or actors

Source: WSIS 2003

The WSIS Declaration of Principles shows a wide range of components that make up the GPG known as “information society” and the domains where they operate. Although a series of institutions, regimes, norms and standards are emerging and/or being consolidated, it is still unclear how the delivery system will be eventually structured. When comparing the components of the idealized delivering system with current components the following series of questions and challenges are posed.

The global domain: Knowledge, public awareness and political decisions

As above-mentioned, public awareness with regards to the benefits of the information society and the so-called “digital revolution” and the consequences of access and knowledge gaps is progressively being considered by public authorities, civil society, the private sector and international organizations. Therefore, the WSIS represents an opportunity to make political decisions about which aspects of the information society should be given priority and gain attention from the international community, what institutions will be in charge of providing this public good, what concrete agreements will be made to finance the various activities needed to produce the good, and what will be the role of developed and developing countries, civil society and the private sector.

The main challenges are related to the political decisions that are discussed within the context of the WSIS and beyond. This means solving some crucial problems in terms of the design and orientation of the regimes that will serve as framework for the information society. For example, shall national governments regulate the Internet or shall they make a commitment to global standards or shall agreements and standards emerge from arrangements between telecommunication enterprises and the computer sector? What kind of participation will civil society have in this process? The discussion at this moment is framed in terms of what criteria, values and principles should prevail when it comes to designing the governance of the information society and, in a wider sense, of the knowledge society.

Information Society Regimes (international arrangements)

As the information society has expanded, regimes have been developed. Again, the WSIS is a window of opportunity to establish agreements and institutions which will pave the way to setting up a global framework of norms and regulation activities. We can observe that efforts made by stakeholders are directly related to their spheres of influence. The main challenge – which is not limited to what can be decided in the WSIS – is to make regimes the result of debate and consensus, so as to reflect the many interests and visions and to ensure that they do not cater exclusively to the interests of corporations and governments in industrialized countries. The regimes thus emerging from these interactions shape future types of institutions and the strategies that will be used to finance them.¹²

These debates are similar to the previous ones about standards for integration of physical infrastructure (strategies for multi-modal transport in neighbouring regions), energy infrastructure (the integration of networks for international trade in energy) and communications infrastructure (standards for connections with local networks for long distance calls). In each of these cases results emerged after a long process of negotiation and the consequences will be shaping the industries and markets from electronic commerce to digital music.

The networks domain: International organizations, financial mechanisms, policies and procedures

International organizations, financial mechanisms and operational policies and procedures reflect the agreements made on regimes. The connection, regulation and utilization standards and norms, for instance, contribute to create and develop institutions and modes of production, as well as procedures aimed at ensuring and enforcing such agreements.

Multilateral banks and United Nations agencies, for example, have adopted and reinforced the use of market mechanisms for telecommunications infrastructure, using their financing and technical cooperation resources. In this context, the emergence of privatization and concessions in the telecommunications sector has, on the national level, opened the way for regulatory bodies and the creation of financial mechanisms such as syndicated loans, guarantees, and hedge funds against private investment risks (ITU 2003; ITU 2004).

In the area of ICTs it is clear that agreements on regimes contribute to reinforcing current trends in the adoption and use of technologies in the information society. In spite of this, concerted action by the international community could contribute to generate financial mechanisms and institutions that would promote solidarity among nations aimed at achieving global objectives in connectivity, for example. In this context, mechanisms to mobilize financial resources for the development of technologies at reasonable cost or programs to build local capacities among the less-advantaged population groups, should be considered as a priority.

¹² Regimes for the information society are still under construction and they depend on the interaction of the stakeholders' interests. An example is the case of the management of Internet resources: The ICANN receives pressure to incorporate a wider vision than that of corporations and the United States government about how the industry should develop. Other important actors propose that standards be integrated without the intervention of countries and regulation bodies, as in the case of an agreement between *IBM* and *Microsoft* (October 2003) to implement their own standards, known as *WS Splat*, which means coordination to put into operation specifications of *Web Services Architecture*. In this case, the relative size of both these enterprises in the software and PC industries excludes the interests of other actors, mainly consumers (Vierboom 2004). The design of these standards could contribute to stop the increasing application of free software by using market power to impose *de facto* protocols.

Contracts and agreements

Contracts and agreements represent the framework for the provision of the GPG information society at the national/local domain. In the area of new technologies, the main trend has been to allow competition in order to stimulate private investment. The International Telecommunication Union annual report 2004 (ITU 2004) indicates that, while 40% of basic services (fixed telephone lines, and data transmission lines) are produced by monopolies and 60% by private competition, when it comes to new technologies (local wireless networks, mobile telephony, cable television, internet providers) private competition accounts for 85% of the market. In some regions we can notice differences in this trend. While in Europe more than 80% of countries evidence competition in terms of these new technology segments, the Arab markets remain monopolistic. These differences influence the provision of public goods at the global level.

When it comes to the contracts and agreements that link the networks domain to the local/national domain, the main challenge is how to ensure the effective implementation of commitments. The many and varied commitments undertaken by governments do not often include suitable financial mechanisms, nor they pose specific changes in terms of national priorities or influence the structure of the public budget (Sagasti, Prada and Espinoza, 2004).

Just as regimes have an impact on actors at the international level, so agreements and contracts have an impact on the local/national level. An example that is constantly being mentioned is that, following the adoption of free software by the public sector, consumers and business at the national/local level would tend to adopt free software, as well.

The local/national domain: Activities of national and local bodies within the information society

Activities aimed at the provision of GPG take place – to a large extent– within the local/national domain¹³, and this is particularly true when it comes to the information society. There are three main subjects involved:

- i) *Strategies to provide infrastructure for communications and information flows*, which may be provided publicly, privately or through a mixed system, and may be subsidised or covered by users, under a monopoly or in competition,
- ii) *the role of education in building capacities* so that people can take advantage of information and knowledge, as in the case of national universal access programs,¹⁴ affirmative action programs for sectors with limited access, the incorporation of local content and the development of research programs to establish a critical mass of experts, among others; and

¹³ It is necessary to point out that, in general, the activities described in the local/national domain probably do not have the properties of non-exclusion and non-rivalry, and their externalities are manifested only in this domain. This situation disqualifies them from being considered as global public goods. This is what often causes confusion about whether a good can be classed as a global public good. Sagasti and Bezanson (2001) argue that a GPG exists when the international community, through knowledge, policy decision and public awareness, considers it so.

¹⁴ Universal access policies are aimed at increasing access to communication and information technologies, either at households or through public facilities providing that prices are affordable for users in the community. These conditions are defined by the regulator in each country, in order to determine which communities would be covered by the market and which communities would need a subsidy, and which cannot be provided with any available technology and thus need alternative mechanisms to be included (ITU 2003).

- iii) *strategies for adapting national activities to international standards*, such as the decisions on free or proprietary software and the regulation of intellectual property rights, among others.

Each of these subjects is included in the WSIS lines of action.

Different elements must be considered when defining a GPG, especially regarding the activities that would make up its core component, and the its complementary activities. The section below tackles this question.

GPG information society: Core component and complementary activities

Figure 2 shows the components of the “information society” delivery system. The activities for delivering a GPG form a continuum from the global domain up to the local/national domain.

Core components activities can be defined in two ways. As stated above, the decision about where the GPG core component is located will have an impact on the design of the mechanisms that are more suitable to finance its provision.

Option 1: The GPG core component is defined from the global domain to the networks domain

In this case the core component is exclusively defined according to the public good characteristics: existence of externalities, non-rivalry, non-exclusion, and the welfare gains from collective action. The subjects under consideration, for example, are the flow of information that is generated and transmitted through the Internet, the proposals and agreements for standardizing information technologies, the regimes of Internet governance, the design of enforcement mechanisms and the design of mechanisms to improve security in information technologies, among others. Likewise, we could consider – if it keeps developing – the infrastructure which has scope that is strictly global, and the rules that govern it (the use of electromagnetic space, the incorporation of new technologies to extend coverage of information technologies to a global level, such as *stratellites*).

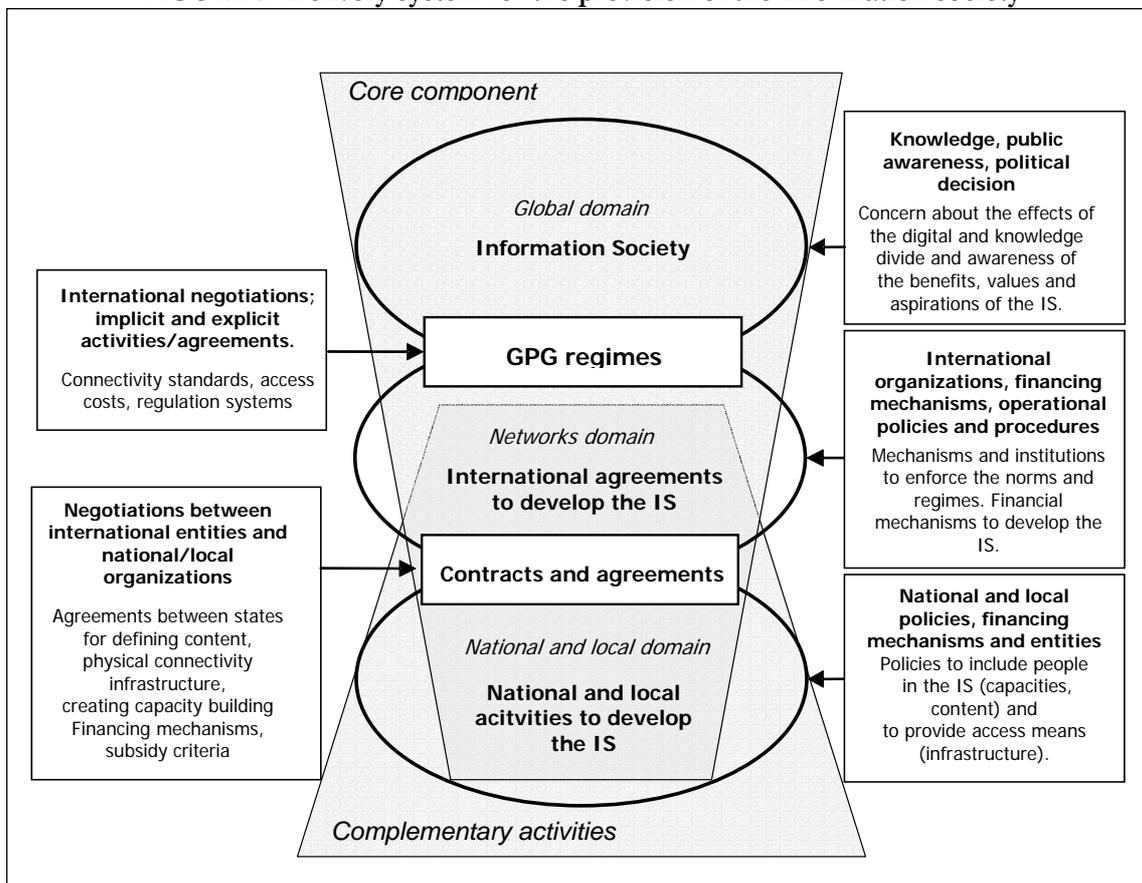
Option 2: The GPG core component includes the local domain

Concerns about inclusion into the information society and the access and knowledge gaps have prompted a wider definition in terms of the GPG core component. That is to say, one that agrees more with those activities taking place in the local/national domain and which, for other kinds of GPGs, could be considered as “complementary” to the GPG delivery system.

In this case, the subjects considered as part of the core component, apart from those indicated in the first option, are the provision of connectivity infrastructure for countries, or people within countries, with more difficulties in terms of access to the information society, as well as support for the adoption of standards, at the local level, which would allow greater connectivity and access. This would be compatible with the aim to set “universal access” schemes for new technologies in developing countries, as has already been done in the European Union and the United States.

The second option is illustrated by Figure 2.

FIGURE 2. Delivery system for the provision of the information society



In both options, the implications for financial strategies are important. In the first option, the financial strategy could involve mechanisms to reduce externalities by making the users pay for the services they receive¹⁵. However, this vision of the information society only ensures the rights of those users who already benefit from the information society. In short, this arrangement seeks to protect rights and provide better service to those who are already in the information society.

The international community has stressed the importance of adopting the widest possible definition of information society in order to progressively include the whole world's population in its benefits and potentials. This wide vision also appears in the governments' Declaration of Principles and in the Civil Society Declaration in the first phase of the WSIS. Based on this general aspiration it is possible to design a financing strategy which would allow to channel and distribute resources from those who are part of the information society to those not yet included in it. Moreover, it is possible to go beyond a user-service vision, such as that described in the first option, and include innovative financial mechanisms in harmony with the market to channel resources towards communication and information infrastructure. International and domestic resources can be mobilized to build capacities in countries that are currently left behind, thus enabling them to take advantage of the information society.

¹⁵ For example, enterprises providing communication access pay fees for the exclusive use of some Internet resources or users "buy" the services of secure servers or information filters to avoid junk mail.

4. Exploring financing strategies for the information society

The academic literature proposes some schemes to link financial resources to the intrinsic characteristics of a GPG as an option to efficiently allocate resources and reach multilateral agreements. Therefore, different typologies have been suggested to assign responsibilities and degrees of participation in financing and producing these goods.¹⁶ Sandler (2001, 2004), for instance, proposes the allocation of contributions according to their participation in the production of the good, using *aggregation technologies* as criteria (Box 2). In short, these criteria could serve to define the different types of financing (public, private or mixed) in the provision of a particular good.

BOX 2. Aggregation technologies, global public goods and financing sources

Aggregation technologies are criteria aimed at the efficient provision of global public goods. These criteria explain how individual contributions are combined in order to achieve an adequate level of GPG provision. By using these criteria it is possible to assign responsibilities (reflected in institutional arrangements) and to identify the most adequate financing sources. Public goods can be classified into three types and three sub-types, according to their aggregation technology:

- **Summation:** *The aggregate level of the public good (or bad) is equal to the sum of contributions provided by actors (i.e. air pollution, where the total emissions equal the sum of pollutants emitted by all sources, cleaning a lake, preserving a tropical forest).* **Weighted sum** subtype indicates that the level of the public good delivered is equal to the weighted sum of individual contributions (the reduction of acid rain, elimination of terrorist threat). In these cases collective action and international cooperation is the best option, and the financing system will be more efficient if each country finances the GPG delivery according to its (weighted) contribution. However, coordination problems and free riders may be common.
- **The weakest link:** *The aggregate level for the total supply of the public good (or bad) is equal to the smallest contribution - the least reliable part determines the reliability of the entire system (i.e. the integrity of a network, the global eradication of a contagious disease, the creation and design of international standards for the financial market, the prevention and mitigation of natural disasters).* **Weaker link** subtype indicates that the smallest contribution has the greatest influence on the aggregate level, and the other countries have a proportionally decreasing contribution and influence (connectivity to the Internet, transport infrastructure). In these cases the group of actors with more possibilities in terms of the good production would have incentives to provide the good with their own resources or with resources from international cooperation. *If the North has comparative advantage in providing a weakest-link GPG it should do so until the South builds its own capacity*¹⁷
- **The best shot:** *The aggregate level of the good is equal to the largest contribution (finding the cure for a disease, preventing conflicts, agricultural research).* **Better shot** subtype indicates that the largest contribution has the highest influence, and other contributions have proportionally decreasing influence (discovery of a treatment, managing political instability). In these cases the best strategy is that actors provide the good through contributions to a common fund, since there are few actors and coordination mechanisms are less expensive.

¹⁶ These include technologies of aggregation, non-exclusion and non-rivalry criteria (impure and pure public goods); spatial criteria (regional, national or global externalities), among others. See Annex B in Sagasti and Bezanson (2001).

¹⁷ Sandler, T. and K. Sargent (1995), *Management of Transnational Commons: Coordination, Publicness, and Treaty Formation*. Land Economics, cited from Binger, A. (2003) *Global Public Goods and potential mechanisms for financing availability*. Background paper prepared for the Fifth Session of the Committee for Development Policy meeting, April 7-11, 2003.

But how can wide-ranging agreements and automatic results be achieved when the public good includes components with different degrees of non-rivalry, non-exclusion and externalities, decision making asymmetries and differences in patterns of consumption and provision? The information society comprises elements encompassing different degrees of such properties:

- i) A first global public component is located in the *global domain* and *regimes* (information freely flowing through the Internet, connectivity standards and governance regimes, among others).
- ii) A second component that is located in the *networks domain* shows the higher degrees of rivalry in consumption, and influences the *national/local domain* by means of agreements and contracts (the so-called information technologies market, which includes connectivity infrastructure and related services and the design and use of technologies for transmitting information and increasing productivity, among others).
- iii) The third component is more localized in the *local/national domain* and shows a higher degree of exclusion from benefits (skills to access information flows, knowledge building capacities, people's educational level to take advantage of benefits of the information society, the capacity to adapt knowledge to generate increases in productivity).

The complexity of a GPG does not always allow to discern the most efficient way to provide a public good or allocate responsibilities for financing in an automatic way. Although it is possible to apply general criteria for allocating resources to provide specific goods (such as “*who pollutes pay*” when proposing the creation of a market for emissions in the fight against climatic change), it is not always possible to clearly assign responsibilities without negotiations where politics have more weight than technical criteria (as in the case of “*the richest countries should finance the provision of global security against the threat of terrorism.*”). UNDP has taken a step forward in conceptualizing three dimensions of what is “public” in a GPG: the consumption of goods, the policy decisions related to their provision, and the appropriation of benefits (Kaul et al 2003). Accordingly, the ideal provision of public goods is achieved when these three dimensions are in balance.

A GPG perspective provides criteria for identifying which options are most suitable for financing the information society though not in an automatic way. Negotiations at the political level must seek to make operative the aims and values of societies in the provision of a GPG, especially when it comes to financial resources and regimes. Only if proposals can be implemented will the vision of the information society be feasible.

How much would it cost to develop the information society?

It is difficult to assess how much a good like the information society would cost, taking into account its complexity and three components (global aspects, infrastructure and capacities).

For example, the information technologies market (part of the second component) was calculated at USD 950 billion in 2004, and it could rise to USD 1,250 billion in 2008 (IDC 2004).¹⁸ And we should bear in mind that ICT's are only one part of the infrastructure that is needed.

¹⁸ This calculation includes three components: hardware (40% of the total cost), software (40%) and services (20%).

According to other estimates, the total value of world physical infrastructure stood at USD 14,966 billion in 2000.¹⁹ Electric sector infrastructure –an indispensable element to ensure connectivity– amounts to 40.4% of the total, and the fixed and mobile telecommunication sectors come to 2.5% and 3.3% respectively (Fay and Yepes 2003).²⁰ The composition of telecommunications and electricity infrastructure has varied considerably: the telecommunications sector accounted for 2% of the total value of infrastructure in the 1960s, although it amounted to 6% in the 2000s. In the same period, the share of the electric sector increased from 22% to 44%. It is estimated that telecommunications infrastructure will make up 10% of the total value by 2010.

One of the shortcomings in estimating the needs for electric power and telecommunications infrastructure in the future is that estimates fall short, taking into account the innovation capacity and technological change in the information society. In developed countries, where there is relatively less need to invest in infrastructure, it is maintained that market development itself will generate incentives to close the gaps in access. As technologies reach the so-called *tipping point*, the adoption of information technologies accelerates and it becomes much cheaper to connect new users. The literature on economics and industrial organization call this the *network effect*: the adoption increases in proportion to its perceived utility. The fact that a large part of the population has already joined the system generates the motivation for other people to get connected, causing the marginal costs of connections to decrease and investments to increase in order to cover the expected new demand. In developed countries, the technological boom has put the market near the tipping point, so an exponential growth in enterprises which adopt web services is expected within the next twenty years, from 25% of firms in 2004 to 75% in 2010 (Schmelzer and Bloomberg 2004).

There have been some attempts to make estimates for this situation in developing countries. The World Bank estimates that the rates of social return of investment projects in the telecommunication sector are close to 21.5% of the total investment value during the 1960-2000 period (Briceño and others 2004)²¹. The same study calculates that developing countries need an annual investment between 6.5 and 7.7% of GDP to close the infrastructure gap and maintain the existing infrastructure –USD 550-650 billion or USD 450 billion assuming higher levels of efficiency (Briceño and others 2004). In these estimates, 30% is absorbed by the electric sector and the telecommunication sector accounts for 5%-7%. It is worth noting that developing countries currently spend 3.1% of their GDP on infrastructure, but the effort to close the infrastructure gap varies according to their income level. Low income countries currently invest 4% of their GDP and have to raise this to 7.5%-9% per year, whereas middle and high income countries have to increase their investment from 2.6% to 3% of their GDP.

With regards to the third component of the information society (capacities), the MDG of “achieving universal primary education” could serve as an approach to the effort needed.²² In

¹⁹ 60% of the total belongs to high-income countries (only 16% of the world’s population), 28% to middle-income countries (45% of the world population) and 13% to low-income countries (39% of the total).

²⁰ The rest is for transport infrastructure (41%), water and sewage services (7.5%) and trains (5.3%).

²¹ At the regional level, Eastern Europe has 31.1% of social return and Latin America only 16.6%.

²² The Index of the Information Society drawn up by Minton and Emberley (2004), and also other estimates, consider that in order to measure capacities to take advantage of the benefits of the information society, the most important indicator is the population’s level of higher education. On the other hand the director of the technology group of the UBS investment bank thinks that 70% of the world’s population are “analogue”, and these people do not have the capacity to use information technologies correctly, 15% are “digital immigrants”, people who adopted the new technologies in their youth, and the remaining 15% are “born digital” since they adopted these technologies in their childhood (The Economist, 2004). It is clear that both these opinions reduce the problem. In the first case information technology is directly related to the better-educated population, and in

this case, investment is estimated at USD 9 - 38 billion annually. Most resources would come from developing countries own resources, but some USD 60 billion could be provided by developed countries between 2004 and 2015 (DESA 2001).

To sum up, the level of investment needed to establish the information society in developing countries is huge, and it calls for a great effort to mobilize domestic and foreign resources and sustain them over time.

How far is it possible to internalize externalities?

From a public good perspective, the first option for financing is to ask if it is possible to *internalize externalities*. In other words, what is the limit of market dynamics in terms of creating conditions to benefit a larger part of the population in the information society and taking advantage of economies of scale and the network effect? This mechanism has its limitations when it comes to the information society, in spite of the advances made in recent years.

First, the incorporation of new users through more investment (private, public or mixed) financed through user payments is limited due to poverty and low incomes. According to the World Bank, the average Internet access cost is USD 37 for 20 hours per month. Consumers in high income countries pay USD 23 and USD 29 in middle-income countries, but in low income countries this amounts to USD 57. Moreover, this cost accounts for only 2% of average personal income in high-income countries and 19% in middle-income countries, while in low-income countries the cost is 250%.

There is also a geographical barrier and the academic literature distinguishes between “universal service” (ICT coverage of each household) and “universal access” (population can access ICTs on a geographic basis). Universal access is a more suitable strategy for developing countries and some experiences have been successful. For example, in Latin America universal access funds receive a fixed percentage of the gross income of telecommunication enterprises to promote coverage in rural areas (or small urban areas) using competition mechanisms such as auctions for subsidies. According to this scheme, a competitive environment is created for enterprises that can provide access to X percent of the population at a distance Y from a public installation, at a price Z. The universal access fund provides the financial resources to cover the fixed costs and guarantees a minimum level of profitability (Intelecon 2004). However, the literature recognizes that even when it is possible to mitigate the income and geographical barrier by means of these mechanisms, there exists a “real access gap” in which market mechanisms are not feasible (Navas-Sabater, Dymond and Juntunen 2002; ITU 2003).

It is not possible to predict the impact of innovations in reducing access costs and increasing coverage. For example, what would be the effect of the accelerated development of low cost computers on coverage for poorer populations, using a sort of *Simputers* for example²³, or the use of community radios with Internet access to spread useful information? Moreover, there is a possibility of using *stratellites*, satellites placed in the stratosphere that would transmit digital data and information that could be received by antennae at lower costs. At the moment this technology is economically feasible only in high populated areas, but we can imagine similar

the second it is reduced to a question of generations and ignores the fact that many infants grow up without any opportunity of access to the information society.

²³ The "Simputer" - a "Simple", "Inexpensive", "Multilingual" computer - is a portable unit developed in India. Its power source has three AAA batteries, and instead of a keyboard it operates with a touch screen interface with icons and graphics. The Simputer uses Open Source Software and costs 200 dollars. (<http://www.simputer.org>).

technology of extended range providing coverage in remote and rural areas. This long-range technology can be developed from applications designed to handle commercial routes, which carry a lot of traffic but are not densely populated.²⁴

Secondly, the internalization of externalities may not be solving the problem of access only through market mechanisms. Capacity – the third component in information societies – becomes highly relevant, even for enterprises that have managed to adopt web service connection schemes²⁵.

The Economist (2004) argues in favour of the potentiality of the market to internalize externalities: It is argued that the next step is to simplify the complexity of technologies, thus lowering the access barrier and reducing access costs. For example, US companies spend USD 700 billion per year in operation costs, and 80% of their information technology budget goes to adapting or repairing software and hardware systems. The objective of ICTs should be to reach a point at which the user can easily utilize the services already available.²⁶

A third limitation is that while externalities are internalized, the results are not technology neutral, and this could lead to higher costs when adopting a new technological standard in the future. For example, in the area of mobile telephony there are three main technologies in use: the open European standard or Global System for Mobile Communications (GSM), the Time Division Multiple Access (TDMA), and the cdmaOne (2G). TDMA is more used in Latin America (60% of the mobile telephony market), while the world trend shows that TDMA accounts for only 10% of the world market compared to 69% of GSM. In Latin America GSM technology only accounts for 6% of the market (ECLAC 2003).

Financial mechanisms for the information society

What happens when the mechanisms for internalizing externalities do not operate automatically? With this question in mind, this section describes some financial instruments and their perspectives, which will act as building blocks in the construction of strategies for financing the information society.

There exist many financial options and specific instruments to cater to the diverse requirements of developing countries (summarized in Annex 1). Some of them have not been widely applied to the information society and others are being developed. These instruments can be differentiated according to their financial source, the amount of resources mobilized, the institutions involved, the kinds of activities financed, the criteria for eligibility, the administrative

²⁴ See <http://www.globetel.net> for information about the potential of this technology and the advantages of *Wireless Fidelity* (Wi-Fi), which is spreading very fast in the developed countries and big cities of developing ones.

²⁵ For example, research carried out in MERCOSUR countries indicates that hardware and software only account for 40% of total Enterprise Resource Planning (ERP) systems, and training, internal equipment and organizational costs are 60% of the total (Symnetics, 2000).

²⁶ Electricity provides a good example of this: The user can benefit from the technology simply by using a socket or a switch. The average user does not have to know about the processes beforehand (energy production, transmission and storage, among others). Simpler applications and uses of technology for users who already are in the information society, could benefit latecomers that would need less skills and time to obtain the same benefits.

capacities required and their sustainability. The information society can be financed by a combination of the financial instruments mentioned below.²⁷

Bilateral sources

Bilateral instruments involve the direct provision of financing from donor to recipient countries. Resources are channeled primarily through aid agencies as part of Official Development Assistance, and also via the international programs of line ministries (Health, Education, and Agriculture) and independent agencies (export financing, technical assistance or those that promote and guarantee investments by national companies, such as the Overseas Private Investment Corporation in the United States).

Bilateral development assistance is one of the tools available to governments of developed countries for putting into practice their foreign policies, and is usually aligned with their strategic objectives and interests. The motivations and eligibility criteria vary from country to country, ranging from international solidarity and geopolitical interests to the provision of international public goods (peace and security, financial stability and investment protection). The ICT sector has not been prioritized: investment on information technologies fell from USD 1.2 billion in 1990 (2.5% of total bilateral ODA) to USD 194 million in 2002 (0.3% of the total).

There are two options to increase bilateral financing for this sector. First, the promotion of private investment from national companies by exchanging debt for investment swaps or by using bilateral guarantees to mitigate risks, which can be done on a small scale and directed to the poorest countries. Second, targeting bilateral aid at the poorest countries through budget support to cover infrastructure maintenance costs, or by ensuring access to multilateral funds for investment (for example, by paying amounts due to multilateral sources or by canceling bilateral debts to increase the recipient's absorption capacity and raise investment, both in infrastructure and to provide services aimed at building capacities to access the information society).

International organizations

Organizations in the UN system make small grants mainly to support public sector programs in developing countries and contribute to create capacities through technical cooperation. They also play an important role in designing standards, transmitting best practices and knowledge. Their support for reforms is crucial in countries with a lower level of institutional development. Their contribution is focused both on the first component of the information society (in the area of regulation and standardization) and on the third component (creation of capacities, especially those to support strategies for building the information society at the local and national level).

International organizations have the capacity to coordinate the points of view of different countries, civil society organizations and private sector on aspects within their field of expertise. However, this is also a weakness. These institutions operate in a variety of areas and are financed by means of contributions from countries and voluntary contributions from different sources. This means that transaction and administrative costs are high. Unlike bilateral funds, which can choose which countries they wish to support, these institutions operate at the global level in accordance to their mandates.

²⁷ This section is based on Sagasti, Bezanson and Prada (2005) and supplemented by the preliminary report of the Task Force on Financial Mechanisms (TFFM) (20th November, 2004).

Multilateral development banks (MDBs)

MDBs have a privileged position among development organizations. They interact with a wide range of institutions including governments in developed and developing countries, regional and national organizations, bilateral aid agencies, companies, private banks, capital markets, and the academy, among others. MDBs mobilize resources from capital markets and official aid sources to make loans on less than market terms. They also make grants, give guarantees, and fund projects in developing countries. In addition, they provide technical assistance for the development of the information society, specifically in terms of developing infrastructure and aptitudes, and also in disseminating best practices and academic research.

MDBs have a wide range of instruments operating with different eligibility criteria to adapt their instruments to country needs. Thus they can offer loans at concessional rates for long-term projects in which the private sector would not make a profit, or in which the benefits are less tangible. In some regions, MDBs have created big networks and they have been relatively successful in providing sustainable anti-cyclical funds, as has happened in Latin America (Sagasti and Prada 2002). MDBs have managed to deal with the financial requirements of each of the three information society components, with emphasis on mobilizing resources for the infrastructure sector, providing long-term sectoral loans to build capacities in education, and offering grants and technical support in areas like regulation, standardization and generation of information.

Two elements should be highlighted with regards to the future of the information society financing in terms of MDBs. First, their role in mitigating private investment risks and mobilizing resources for the infrastructure sector. As yet, guarantees have not been fully developed, but some emerging economies have benefited from the lower costs of long-term credits – even lower than sovereign risk (Griffiths-Jones and Lima 2004). Second, MDB financial support should be better coordinated with national development strategies. It has been found that appropriation and coordination to avoid duplication, bring about significant gains in terms of efficiency and well-being.

Outside the sphere of multilateral banks but closely related, is the role of the International Monetary Fund in the information society. The IMF mandate is to provide short term financing for financial stability, although the implications of its policies have a crucial impact on public investment decisions. A first factor is related to the limits placed on public investment through long-term indebtedness resulting from fiscal deficit ceilings set in the Letters of Intent (especially in the case of highly indebted countries). Peru and Brazil have suggested a temporary softening of deficit ceilings, excluding investment from the calculation of fiscal deficit in some projects. These mechanisms could be explored for projects that promote connectivity. To avoid higher indebtedness, only those projects backed by the public sector (or multilateral banks) which mobilize significant percentages of private investment would be eligible. Nevertheless, if the projects are neither profitable (socially or economically) nor sustainable or countries evidence no technical proof of their profitability, this window of opportunity would not be available.

Private sector and international capital markets

The private sector has been very dynamic when investing in communication infrastructure through privatization or concessions. The level of private investment in telecommunications projects in developing countries amounted to USD 265 billion during 1990-2003, according to the World Bank's Private Participation in Infrastructure database (PPI). This has been concentrated on emerging middle-income countries, and has been highly volatile – the amount

of USD 20 billion allocated to purchase shares in Telebrás-Brasil in 1998 doubled the 1997 figure. In 1998 the private sector invested USD 70 billion in telecommunications, compared to USD 33 billion in 1997, and following the Asian crisis in 1999, investment fell to USD 10 billion.

However, the private sector offers a variety of financial instruments for investment that have not been fully explored (Mistry and Olsen 2003). Risk mitigation mechanisms are among them, for example, by providing guarantees, derivatives or insurance (at least to emerging countries with lower risk levels). An area with high potential is the development of infrastructure investment funds in poor countries. This has been tried with relative success in Africa, thanks to the capacity of bilateral agencies and multilateral bodies to provide guarantees for operations in capital markets (*e.g.* the Emerging Markets Partnership and the South Africa Infrastructure Fund). Similarly, these mechanisms could be furthered to include socially responsible investment (SRI), which involves the participation of private investors who allocate resources to maximize return but also seek social profitability and could be used for developing infrastructure in poor countries. At the moment, less than 1% of SRI funds are invested in developing countries. According to the World Bank there are big investment opportunities, taking into account the social rate of return of the telecommunication sector in developing countries (Briceño and others 2004).

Another field to be explored is the role of the private sector providing well-being in those countries where it invests in, so that the philanthropic activities of private foundations in developed countries could spread. Philanthropy is still aimed at their own countries, but some mechanisms could be explored in order to increase foreign investment, possibly channeled through United Nations organizations or through private foundations which operate in developing countries, so as to avoid administrative costs or duplication.²⁸ These funds could be allocated to programs aimed at building capacities for the information society among a specific population. However, an important limitation is that these funds tend to be thematically volatile and often respond to the swings of public opinion, that is, they suffer from the “flavor of the month” syndrome.

Another field to be explored is the use of workers’ remittances for local development and for delivering public goods at the local level. One of the mechanisms proposed is the creation of saving funds to guarantee and mobilize public resources under the modality of matching grants. These could be channeled to provide small scale infrastructure thus supplementing investment, for example, in the field of connectivity in rural areas (for example, the location where a group of remitters come from).

*International taxes*²⁹

Apart from the financial instruments which are not exclusively aimed at the information society, there are proposals to set up some mechanisms to exclusively finance the components of the information society. International taxes would solve the question of additionality for the information society. These taxes have great capacity for collecting funds, are highly redistributive, and solve the under-provision of GPG in an efficient way (internalizing externalities).

²⁸ In 2002, individual and corporate philanthropy in the United States was USD 241 billion. Individuals accounted for 76%, private foundations and fiduciary funds for 19%, and corporations for 5% of the total (American Association of Fundraising Council 2003).

²⁹ Technically, international taxes are useful to internalize externalities. However, these mechanisms are conceptually distinct from those discussed above, as they do not need market mechanisms to operate, but public intervention.

Nevertheless, these proposals face strong political opposition in some developed countries owing to the fact that a high share of the burden would fall on their citizens. Even so, the potential for the collection of revenues has made those countries to consider taxes as a way of supplementing their fiscal revenues, as in the case of the carbon tax (OECD 1997:6). Civil society organizations have joined some developing countries in exerting pressure for putting these mechanisms into operation.

The most well known example of global taxes for the information society is the Bit Tax. According to UNDP (1999), this could have generated about USD 70 billion in 1999 if USD 0.01 per megabyte transmitted had been charged. But this proposal has not been feasible given the fact that it evidences not only political but also technical limitations. First, the tax could lead to high costs for the transmission of information. Even if a charge was imposed on undesirable information (such as spam or junk mail), the task of monitoring a considerable number of servers would involve high administrative costs, making it virtually impossible to keep track of the enormous amount of information both transmitted and received. Second, the tax would be very regressive if it was imposed globally since it would impose higher costs on developing countries where Internet access costs are higher in relation to personal income. If the tax was to be imposed only on providers in developed countries it is very likely that these activities would start migrating to emerging countries with great technological potential (India, Brazil or China), thus favouring nations that have better access to different financing sources. All this reduces potential revenues and could turn out not to be cost effective (which has not even been proved in its original version).

An idea of global tax that has gained strength, which would avoid the potential problems of collecting a Bit Tax, is a tax on electronic components or Chip Tax. Whatever the component used as tax base, the tax would have the advantage of being applied only to a relatively small and easily identifiable number of producers. Two types of semiconductors can be used as tax base: the components in the memory or in the central processing unit (CPU). In the case of the latter, only two firms have more than 97% of the market (Intel with 86.8% of the total market in 2004 and AMD with 12.1%). The total value of this market stood at USD 30.2 billion in 2004 and it is expected to rise to USD 35.2 billion in 2007 (World Semiconductor Trade Statistics). In this case, a possible tax on net sales of these companies for the creation of a universal access fund is analyzed in Box 3. An additional incentive for these companies would be that positive externalities generated by means of increased access in developing countries, could be appropriated by them.

Box 3. The feasibility of a global tax for a universal access fund

Intel (2003) and AMD (2003) annual reports offer a first look to analyze the feasibility of this initiative. Intel's 2003 net sales of microprocessors amounted to USD 21.8 billion, and only USD 4.2 billion came from other products. AMD's 2003 net sales amounted to USD 1.9 billion from microprocessors and USD 1.4 billion from memories. A tax of 1% on net sales of microprocessor in both enterprises (98% of the world market) would have generated USD 237 million to start up a fund. If this trend of annual sales continues, the fund could accumulate USD 1,500 million in 5 years. To obtain higher capacity for investment within the first years, a leverage mechanism could be used (e.g. bonds in international capital markets guaranteed by future income from net sales association with multilateral banks acting as guarantors). Logically, the income of this fund would go to finance connectivity projects in poorest countries, using competition schemes such as auctions for the lower subsidy).

However, an important threat is posed on the feasibility of this scheme. First, these companies operate under taxation schemes that are defined and localized in a single country. 75% of Intel's production takes place at its US facilities (Oregon, Arizona, New Mexico, Massachusetts, California and Colorado) where it produces microprocessors, chipsets, memories and networks; and the other 25% is produced at its Israel and Ireland facilities, where it produces components for microprocessors. Facilities in Malaysia, the Philippines, Costa Rica and China are mainly engaged in assembly and testing phases. As to AMD, the microprocessors are all manufactured in Dresden, Germany, and the memories are produced in Texas, US and in Yakamatsu, Japan. Therefore, these companies pay taxes there where their production takes place. Intel's pre-tax income was USD 7.4 billion, and the provision for taxes was USD 1.8 billion, while AMD had a negative net income of USD 0.8 billion, and only paid USD 2.9 million in taxes in 2003. The negotiation process would be mainly with the US Government, which has been reticent about initiating cooperative schemes of this type and on this scale. The German government would also be involved, but to a much lesser extent.

Another threat, which is less tangible, is dependence on market trends. The fund's income would be subject to the evolution of gross sales of both companies. However, it is most unlikely that there would be any significant reduction in the fund's income if market trends continue the same.

Partnerships

This is an alternative approach for obtaining a global financing scheme for the information society exclusively. In the first phase of the WSIS, the Senegalese delegation presented the possibility of setting up a "Digital Solidarity Fund" which would be financed with a solidarity tax, voluntary donations from sales of personal computers, software and network equipment (one dollar each one), and also voluntary donations from developed countries. These funds would be used for many activities aimed at developing the information society, including developing infrastructure, developing applications and services for public administration and social services, developing new markets and creating stable jobs, developing human resources capacities, and preventing brain drain. The proposal is still being formulated, and it will be presented again at the second phase of the WSIS.³⁰

³⁰ The proposal, at this stage, has two basic problems. First, it does not create the incentives that are needed to encourage developed countries or private enterprises to make contributions. Voluntary donations have been problematic for some United Nations programs in that they do not have stable income, causing instability. Moreover, there is evidence that obligatory contributions (for current costs, and which come mainly from European countries) serve to cover the administrative costs of programs based on voluntary contributions (Bezanson and Sagasti 2002). The second problem has to do with the range of subjects to be financed by the fund. In a context in which donor countries are tending to demand greater "development effectiveness", their contributions are progressively being allocated to specific funds with quantifiable goals and results. Besides, a

Another different approach is the possibility to apply the innovative concept of International Financial Facility (IFF) to the information society, but on a smaller scale.³¹ Added to this there could be schemes to hedge against risks, to request contributions from bilateral or multilateral sources for insuring debt, seeking for additional contributions from private foundations aimed at debt service guarantees, and to create financial mechanisms to facilitate disbursements (matching grants, guarantees for investment funds, etc.). Likewise, a smaller IFF could be channeled through established multilateral institutions, which would allow to avoid the additional costs involved in setting up a new institution. This fund could begin with a contribution of USD 0.5 to 1 billion from developed countries as part of their contribution to ODA, and it would seek to mobilize a similar amount in capital markets through issuing bonds.

There are many options to design its decision-making mechanisms, including shared management with developing countries, the inclusion of representatives from civil society and the private sector, or disbursement schemes in solidarity with the poorest countries. Unlike the other proposed mechanisms for administering a global tax fund, a smaller version of the IFF would diversify its income sources and take advantage of international capital markets. This scheme is strategically important as financing mechanism for the information society and could be used to test the IFF idea in the field.

Towards a strategy for financing information societies

We have explored some options for feasible and complementary financial mechanisms. However, the financial strategy needs to combine two additional elements to be complete:

- i) The *type of countries*, divided among low-income countries (with low capacity to mobilize domestic and foreign resources), middle income (with middle capacity), and middle-high income (with high capacity); and
- ii) the *components of the information society*, which have diverse characteristics and require different financial mechanisms.

The first element of the strategy is to create and consolidate the mechanisms to internalize externalities, with special emphasis on the infrastructure sector. Densely populated urban areas have experienced an explosion in the use of ICTs in developing countries, and this trend should continue as far as possible. However, there is a wide range of instruments to strengthen regulatory capacities so as to avoid excessive dependence on particular types of technology, on the one hand, and to reinforce current consumption patterns, on the other. This is probably more operative in situations in which a country has a greater capacity to mobilize domestic resources (middle-high income developing countries). Nevertheless, the international community could direct financial resources and technical cooperation (mainly through United Nations

fund that finances so many different areas must have a considerable amount of finance available in order to be effective.

³¹ The basic idea of the IFF is to double ODA issuing bonds in capital markets payable with future contributions of donor countries. This would generate an additional USD 10-15 billion per year between 2006 and 2010, and up to USD 50 billion per year in the 2010-2015 period. These funds would be invested in developing countries to meet the Millennium Development Goals (Reisen 2004; DFID 2003). This proposal has been well received in the world of development because of its simplicity and relevance. However, there are some limitations: technical (Would new funds be considered as a part of fiscal deficit of recipient countries?), administrative (Who would be responsible for issuing bonds, a country or an ad hoc trustee fund?) and political (Would the IFF mean additional funds or would it serve to freeze the contributions of donor countries?).

programs) to strengthen these capacities in countries that have less capacity to mobilize resources.

The second element is to take advantage of the range of financial mechanisms that are currently offered and use them according to the needs of each country and each component of the information society. We believe that access to the information society ought to take place on the terms agreed by each individual country. Middle and middle-high income countries can press for fixed-time investment programs (10 years) through framework agreements with the IMF, proposing connectivity projects with high social return to be financed with private capital resources. In this way the countries would have great freedom to decide what the best strategies for access are, and would depend less on loans from multilateral and bilateral institutions. On the other hand, low-income countries could include more ambitious proposals for connectivity investment programs in their Poverty Reduction Strategic Papers (PRSP) to be able to accede to more debt reduction or debt swaps.

A third element is to exert constant and sustained pressure to create financial mechanisms for the information society (such as global taxes or an IFF in a reduced version) so as to widen financial options and increase resources allocated to developing countries. Initially there has been opposition from developed countries, but there are good arguments, from a GPG perspective, that encourage investment in the information society. This will result in benefits for the whole world, allowing not only better connectivity but also better support for social and educational programs and trade opportunities, among others. Therefore, it is worthwhile innovating on financial options for a big push in investment in developing countries.

A fourth element is that countries could take advantage of the implicit division of labour among financial sources. High-income countries could lay greater emphasis on private sources that seek a certain level of profitability in their operations, while countries with lower income levels could lay emphasis on softer financing sources or grants. Likewise, there is a division of labour among components. At higher income levels, emphasis can be placed on activities in the global domain (participation in setting standards, technical assistance to other countries, more investment in research and development to create low cost technologies for developing countries); while at lower income levels finance is most urgently needed to tackle infrastructure and capacity gaps.

Lastly, the strategy must close gaps in the local/national domain. It is clear that there are not only gaps between countries but also within countries. The idea of closing gaps involves identifying these differences within populations and implementing the strategies that are most suitable within the framework of such country's national priorities. In this way, countries with higher capacity to mobilize resources could initiate pilot programs funded by softer financing sources (bilateral and private foundations) on a small scale, so that these could be replicated on a larger scale with domestic resources. Countries with less capacity to mobilize resources could launch programs financed by multilateral loans (and eventually with resources from capital markets through investment funds) for the more profitable layers of connectivity.

Table 4 shows the challenges and financial instruments that are most important and most suitable according to the type of country and GPG component.

TABLE 4. Strategic options for financing the information society in developing countries
Components of the GPG “information society”

		Global aspects	Infrastructure	Capacities
Types of developing countries (by income)	Middle-high	<i>Main challenge. Participation in designing standards, governance and technical assistance to other developing countries (best practices)</i>	<i>Main challenge. Mobilization of resources from the private sector and expansion of domestic investment</i>	<i>Main challenge. Creation of connectivity options more suitable for developing countries (investment in R&D)</i>
		Instruments. Technical cooperation, counseling of private enterprises, support funds for participation (NGOs)	Instruments. Universal access funds with mobilization schemes for foreign and domestic resources, with participation of capital markets	Instruments. Sectoral financing for education-focused programs (multilateral)
	Middle	<i>Main challenge. Support for adopting standards, participation in their design</i>	<i>Main challenge. Minimize private investment risks and provide stable long term investment funds</i>	<i>Main challenge. Investment in education for better insertion of the poorest population sectors</i>
		Instruments. Long term loans to strengthen regulatory schemes (multilateral)	Instruments. Lower IMF public investment ceilings, guarantees against risks (multilaterals), universal access funds	Instruments. Sectoral financing for education (multilateral), grants focused on disadvantaged population
	Low	<i>Main challenge. Support for adopting standards and creating content (inclusion of the population)</i>	<i>Main challenge. Support for the creation and maintenance of infrastructure (big push to cover sunk costs)</i>	<i>Main challenge. Programs to create capacities and to prevent brain drain</i>
		Instruments. Technical cooperation, donations to strengthen regulatory capacities (bilateral)	Instruments. SRI investment funds, guarantees (bilateral and from foundations), long term concessional loans and donations (multilateral banks)	Instruments. Combination of resources for budget support (bilateral, multilateral, private foundations) to strengthen education systems

5. Conclusions and recommendations

The GPG perspective allows to recognize the different elements of the information society (global aspects and regimes, infrastructure and national/local capacities), defined according to a common vision, aims and values. Moreover, this perspective allows to explore a range of possibilities for financing each component, and also to propose financial options for the information society as a whole.

In addition, this approach supports the idea that the international community should collaborate to provide the GPG information society. To declare that something is a GPG is only the first step to deliver it and the negotiations to create a delivery system could be enriched through adopting a systemic vision such as that presented in this paper. Each component has its own challenges, and the negotiation processes under way focus on each of them, but there are solid arguments to adopt a *systemic vision* of the information society to avoid partial discussions and solutions. Civil society representatives should put strong pressure on governments and the different actors in the negotiations that are currently under way.

The WSIS process and its follow-up provide an opportunity to discuss these points of view and to reach conclusions which, within a reasonable time frame, will enable the greatest possible number of people in the world to belong to the information society and take advantage of the benefits it has to offer.

6. Bibliography

- Accuosto, Pablo and Niki Johnson (2004), *Financing the Information Society in the South: A Global Public Goods Perspective*, Prepared for the Association for Progressive Communications (APC) by the Third World Institute, Montevideo, Uruguay.
- American Association of Fundraising Councils (2003), *Giving USA 2003: The Annual Report on Philanthropy for the Year 2002*, Indianapolis, AAFRC Trust for Philanthropy.
- Banca Etica et al. (2001), *Towards a Contractual Global Fund for the Development of Global Public Goods*, Proposal of Italian initiatives for development and social and environmental justice at the International High Level Conference on 'Financing for Development' held in New York, 5 April, 2002.
- Briceño-Garmendia, Cecilia, Antonio Estache and Nemat Shafik (2004), *Infrastructure Services in Developing Countries: Access, Quality, Costs and Policy Reform*, World Bank Policy Research Working Paper 3468, December 2004.
- Bezanson, Keith and Francisco Sagasti (2002), *Perceptions and Perspectives on Overlap and Duplication in the United Nations Development System Specialized Agencies*, paper submitted to the Department for International Development, Institute of Development Studies, Brighton, UK.
- Camdessus, M. (1999), *International financial and monetary stability: A global public good?* Remarks at the IMF/Research Conference Key Issues in Reform of the International Monetary and Financial System, Washington, DC, 28 May.
- CEPAL (2003), *Los caminos hacia una sociedad de la información en América Latina y el Caribe*, report by Jorge Katz and Martin Hilbert for the Preparatory Regional Ministerial Conference of Latin America and the Caribbean for the World Summit on the Information Society (Bávaro, Punta Cana, Dominican Republic, 29 to 31 January 2003).
- Department of Economic and Social Affairs (2001), *Progress towards the Millennium Development Goals 1990 – 2004: Goal 2 “Achieve universal education”* (http://millenniumindicators.un.org/unsd/mi/techgroup/goals_2004/GOAL_2-web_2004_FC4rev.pdf)
- Department for International Development (DFID, 2003), *International Finance Facility—A Technical Note*, London, February.
- Fay, Marianne and Tito Yepes (2003), *Investing in infrastructure: What is needed from 2000 to 2010?*, World Bank Policy Research Working Paper 3102, July.
- Fink, Carsten and Charles J. Kenny (2003), “W(h)ither the digital divide?”, in *Info: The journal of policy, regulation and strategy for telecommunications* volume 5, number 6.
- Griffith-Jones, Stephany and Ana Teresa Fuzzo de Lima (2004), *Alternative loan guarantee mechanisms and project finance for infrastructure in developing countries*, Sussex, Institute of Development Studies.

- Haas, E.B. (1980), “Why collaborate?: Issue-linkage and international regimes”, in *World Politics*, Vol. 32 No. 3 (April): 357–405
- Haas, E.B. (1982), “Words can hurt you, who said what to whom about regimes”, in *International Organisation*, Vol. 32 No. 2 (Spring): 207–43
- Hirshleifer, Jack (1983), “From Weakest-Link to Best-Shot: The Voluntary Provision of Public Goods”, in *Public Choice* 41: 371–86.
- Intelecon research (2004), *Introduction: Universal Access vs. Universal Service* (<http://www.inteleconresearch.com/pdf/ua/funds/2004/update.pdf>)
- International Telecommunication Union (2003), *Trends in telecommunication reform 2003 / 2004: Promoting universal access to ICT*.
- International Telecommunication Union (2004), *Trends in telecommunication reform 2004 / 2005: Licensing in an era of convergence*.
- IBM Community Development Foundation (1997), *The Net Result*, IBM Foundation.
- IDC (2004), *Worldwide IT Spending 2004-2008 Forecast Update by Vertical Market: North America, Western Europe, Asia/Pacific, and Rest of World*.
- Kaul, Inge, Grunberg I. and Stem M.A. (eds) (1999), *Global Public Goods: International Cooperation in the 21st Century*, New York: Oxford University Press.
- Kaul, Inge, Pedro Conceicao, Katell Le Goulven, and Ronald U. Mendoza (2003), “How to Improve the Provision of Global Public Goods”, in Kaul, Inge, Pedro Conceicao, Katell Le Goulven and Ronald U. Mendoza (eds.), 2003, *Providing Global Public Goods: Managing Globalization*, UNDP, pp. 26-94.
- Minton, Stephen and David Emberley (2004), *Information society index 2004: Ranking and data*, IDC Document 32161.
- Mistry, P. and N. Olesen (2003), *Mitigating Risks for Foreign Investments in Least Developed Countries*. Ministry for Foreign Affairs, Sweden. Stockholm.
- Nassimberri, M., “The Information Society in South Africa: From Global Origins to Local Vision”, in *South African Journal of Library and Information Science*, Vol. 66 (4), p. 154, cited at <http://cbdd.wsu.edu/kewlcontent/cdoutput/TR501/page8.htm>
- Navas-Sabater, J., A. Dymond, N. Juntunen (2002), *Telecommunications and information services for the poor: Toward a strategy for universal access*, World Bank Discussion Paper 432.

- OECD (1997), *Economic Fiscal Instruments; Taxation (I.E Carbon/Energy)*, OCDE/GD (97) 188, p 6.
- Regional Conference of Latin America and the Caribbean (2003), *Informe de la Conferencia Regional de América Latina y el Caribe*, Document WSIS/PC-2/DOC/7-S, 5 February.
- Reisen, Helmut (2004), *Innovative Approaches to Funding the Millennium Development Goals*, OECD Development Centre - Policy Brief No.24.
- Sachs, J.D. (2001), “What’s good for the poor is good for America”, in *The Economist*, 12 July.
- Sandler, T. (2001), *On Financing Global and International Public Goods*, Policy Research Working Paper 2638, World Bank
- Sandler, Todd (2004), “Demand and institutions for regional public goods”, in Estevadeordal, Antoni, Brian Frantz, Tam Robert Nguyen (eds.), *Regional public goods: From theory to practice*, IADB-AsDB.
- Sagasti, F. and Alcalde, G. (1999), *Development Cooperation in a Fractured Global Order: An Arduous Transition*, Ottawa: International Development Research Centre (IDRC).
- Sagasti, Francisco and Keith Bezanson (2001), *Financing and Providing Global Public Goods: Expectations and Prospects*, Institute of Development Studies, Sussex, United Kingdom-Ministry for Foreign Affairs of Sweden, Stockholm.
- Sagasti, Francisco, Keith Bezanson and Fernando Prada (2005), *The Future of Development Financing: Challenges, Scenarios and Strategic Choices*, UK, Palgrave.
- Sagasti, Francisco, Fernando Prada and Alvaro Espinoza (2004), *Public Finance in a globalizing world: Peruvian case study*, UNDP-Office of Development Studies.
- Samuelson, P. (1954), “The pure theory of public expenditure”, in *Review of Economics and Statistics*, No. 36 (November).
- Samuelson, P. (1955), “Diagrammatic exposition of a theory of public expenditure”, in *Review of Economics and Statistics*, No. 37: 350–6.
- Schmelzer, Ronald and Jason Bloomberg (2004), *Getting ready for the Web services tipping point*. (http://searchwebservices.techtarget.com/originalContent/0,289142,sid26_gci9949_75,00.html)
- Symnetics (2000), *Benefícios de Sistemas ERP (Enterprise resource planning) en Mercosur*. (<http://www.symnetics.com.br>)
- The Economist (2004), *Make it simple: A Survey of Information Technology*, October 30th.
- United Nations General Assembly (2002), *World Summit on the Information Society*, A/RES/56/183, 31 January 2002
- United Nations Development Programme (UNDP, 1999), *Globalization with a Human Face: Human Development Report 1999*, UNDP.
- United Nations Information and Communication Technologies Task Force, UNICTTF, (2004a), *Second annual report*, presented at the Economic and Social Council (E/2004/62), May.

- Ver Eecke, W. (1999), "Public goods: An ideal concept", in *Journal of Socio-Economics*, Vol. 28: 139–56.
- Vierboom, Francis (2004), *Distributed Identity Case Studies -Part 2: The Microsoft/IBM Web Services (WS) Security Framework and Privacy*, Galexia Consulting.
(<http://consult.galexia.com>)
- World Summit on the Information Society (2003), *Declaration of Principles. Building the Information Society: a global challenge in the new Millennium*, WSIS-03/GENEVA/4-S
(<http://www.itu.int/wsis/docs/geneva/official/dop.html>)
- World Summit on the Information Society (2004), *Plan of Action*, WSIS-03/GENEVA/5-S
(<http://www.itu.int/wsis/docs/geneva/official/poa.html>)
- WSIS Civil Society Plenary (2003), *Constructing information societies that meet human needs*, Civil society Declaration at the World Summit about the Information Society, adopted unanimously on 8 December, Geneva.
- Zongo, Gastón (2004), *ICT in poverty reduction strategies and the PRSPs*, presentation at the Workshop on Policy Tools to support ICT Use for Poverty Reduction & the Achievement of the MDGs, UNDP Dakar SURF, 2-3 November.

7. Annex 1

Summary of financial instruments for the information society

Financial instruments	Sub-types of financial instruments
1. Bilateral sources	
Regular and concessional loans	Programs, project and sector loans (direct or through official financial intermediaries, such as in the case of revolving funds)
Grants for public and civil society organizations	Pre-investment of public or private projects and technical cooperation Fiscal support to cover the costs of maintaining infrastructure Grants to ensure access to multilateral or private investment funds
Debt management	Exchanging debt for specific investment (education, infrastructure)
Funds to promote foreign investment (FDI)	Loans, shares and joint ventures guaranteed by bilateral agencies against political, regulatory and exchange rate risks (e.g. OPIC)
2. International organizations (UN system and regional organizations)	
Grants	Technical cooperation; grants for institutional development (regulation)
3. Multilateral development banks (World Bank, regional and sub-regional banks)	
Regular and concessional loans	Program, project and sector loans to the public or private sector Pilot programs to build capacity (learning and innovation loans)
Grant (mainly public institutions)	Technical assistance and capacity building grants Pre-investment grants
Risk mitigation and risk management instruments (primarily for the private sector)	Guarantees against political, contractual, regulatory, credit and exchange rate risks Financing of hedging operations (exchange rate and interest rate swaps) Securitization, syndicated loans, leasing Equity (direct, quasi-equity, preferential shares)
Debt reduction	Debt for investment swaps
Additional instruments	Resources mobilization from other bilateral and multilateral sources (catalytic financing) Local currency bonds to strengthen domestic markets
4. Private sector	
<i>a. Corporations</i>	
Foreign direct investment	FDI: subsidiaries, equity investment, joint-ventures, privatization Participation in the private provision of public services (concessions)
Donations and social responsibility activities	Corporative donations to public and civil society institutions Social responsibility activities
<i>b. Commercial and investment banks</i>	
Loans	Investment programs and specific projects
Risk management instruments	Derivatives, options, futures, swaps, hedging instruments Guarantees and provision of insurance
Portfolio investment	Purchase of bonds and shares (standard, performance linked bonds, convertible bonds, subordinate, among others) Investment on developing country capital markets and socially responsible investment (SRI)
<i>c. Private foundations, non-profit and non-governmental institutions, individuals</i>	
Donations	Funds for specific projects
Financial remittances	Workers' funds to guarantee investment in rural areas
5. International taxes (single fund for a specific purpose)	
Institutional arrangements for taxes	Global tax on information transmission (Bit Tax) Global tax on computer inputs (e.g. production of chips or Chip tax)
6. Partnerships	
Multi-donor funds	Information society fund (e.g. Digital Divide Fund) Ad-hoc version of the International Finance Facility (IFF)

Adapted from Sagasti, Bezanson y Prada (2005)