

Chapter 11. ICT and International Governance

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11.1 Introduction and Objective

There is general agreement that ICT affects all sectors of society and the economy. Governments have played and continue to play a crucial role in this sphere through their investments in ICT research and development. They will also be influential in shaping the future of ICT—either in fostering or impeding its increasing application—through their national and international policies. Policies aimed at creating an enabling environment for the development and deployment of ICT at the domestic level need to address issues of trade, investment, industry development, and e-business. Many of these policies are necessarily connected to and have to be compatible with ICT arrangements in other countries, and many are negotiated among key international institutions through international agreements.

Governments are not only major players in shaping the future of ICT, they are also strongly affected by it in their efforts to coordinate the development, implementation, and review of agreed policies nationally and internationally. In fact, ICT has been one of the main drivers for major changes in the conduct of governments and in our understanding of the traditional nation state. Over the last decade, the development of a range of principles and mechanisms for “new modes of governance” in policymaking (for example, involving more stakeholders and increasing transparency) has benefited significantly from ICT. On the other hand, ICT tends to undermine the traditional sovereignty and security of the nation state, as ICT communication and transactions frequently transcend national borders. International agreements and international governance arrangements reflect both positive and negative influences in terms of the influence of governments on ICT development and the influence of ICT on the development of international governance.

The governance of the forest sector, through policies, initiatives, and other efforts to promote the sustainable management and use of all types of forests, is both affected by and will profit from ICT. ICT has considerably changed the number of organizations nowadays involved in international deliberations on forest matters [many nongovernmental organizations (NGOs) are now involved] and the way they interact. For example, ICT speeds up the exchange of documents and opinions prior to meetings. It has also made monitoring of forest resources and the flow of goods from forests, as well as the distribution of that information, much more widespread and accurate. ICT will further change international forest governance, a topic that will be taken up in the latter part of this chapter.

The label “governance” at the international level was developed quite recently as a response to the fact that, in an increasingly interdependent world, there are administrative and organizational problems that transcend the boundaries of national sovereignty (Rhodes, 1996). Governance in this context refers to the rules and procedures that states and other involved parties agree to use to order and regularize their treatment of a common issue. It does not mean the same thing as “government”; in fact, the term was chosen specifically to differentiate less binding forms of rule-setting processes and rule implementation from more binding ones. The Commission on Global Governance, composed of a number of influential individuals and funded through the United Nations and other sources, defines governance as “the sum of the many ways individuals and institutions, public and private, manage their common affairs. It is a continuing process through which conflicting or diverse interests may be accommodated and cooperative action may be taken. It includes formal institutions and regimes empowered to enforce compliance, as well as informal arrangements that people and institutions either have agreed to or perceive to be in their interest” (Commission on Global Governance, 1995).

Telecommunication probably started with the first public message sent by Samuel Morse in 1844. Twenty years later there were several regional conventions in place to facilitate interconnection of national networks; by 1865 the first International Telegraph Convention was signed in Paris by 20

founding members and the International Telegraph Union (ITU) was established. More than one hundred years and a multitude of further international agreements later, innovations in several key areas in ICT development, namely, the Internet, mobile telephony, geographic information systems (GIS), and multimedia, have sparked a new “digital revolution.” These developments have reinvigorated debates on ICT-related international agreements. The digital revolution changes the ways businesses are conducted and how goods and services are produced. The rapid development of the Internet has led to the emergence and quick deployment of new services that have contributed de facto to the creation of a global economy in which networks of all kinds and networking have become the salient features. This requires new agreements regulating property rights, safety, coordination of standards, trade in goods and services, and other issues that are geared toward utilizing the full potential of these technologies.

However, the full promise of the new ICT and the Internet has not been realized. ICT poses a “digital challenge” to governments in terms of its proper use in policy and administrative practice and the proper regulation and governance of ICT at the national and international level. Contentious issues range from intellectual property rights to security and taxation. Another challenge is the mastery of opportunities that ICT provides in the field of e-governance on the international level.

A third area is the concern about the widening digital divide between developed and developing countries and regions. The term “digital divide” has been coined specifically to refer to the widening gulf between the haves and the have-nots in the world of information technology. The literature classifies different countries as innovators or leaders, adopters, and excluded or latecomers. However, there is an equally and possibly even more important dimension to the digital divide that essentially runs between rural and urban areas within countries. Although some observers are now suggesting that the ICT gap between countries is closing, the same cannot be said about access to ICT within countries, particularly developing countries (Sadowsky *et al.*, 2004).

The objective of this chapter is to review the effects on international governance of the digital revolution: the status quo, recent developments, and possible future outlooks, both in general and in particular for the forest sector. The chapter will focus on both Internet and ICT governance; it does not, however, aim to provide a comprehensive view of the latter. The focus will rather be on highlighting the key issues and priorities in these areas and their effects on some key aspects of governance.

11.2 International Governance of the Digital Revolution

There is general recognition that the growth and development of new communications technologies have created new policy challenges at both national and international levels and across sectors. Cybercrime, consumer protection, illegal and harmful content, privacy, copyright, trademark, and domain-name disputes are but a few examples. In each case, it is understood that concerted action at a level beyond the nation state is required if the desired ends are to be achieved. Broadly, three key policy layers can be identified at local and global levels: policymaking with regard to a) technology, b) infrastructure, and c) content/service (see *Figure 11.1*).

Technology policy includes the determining of technical standards and protocols. The coordination of technical standards globally is paramount within ICT policymaking to ensure compatibility and access worldwide. Standards are instruments for control, and standardization is a form of regulation as crucial as hierarchies and markets. The aim of infrastructure policy is to achieve interconnection and interoperability, ensuring open and universal access. Competition policy and essential facility rules are often the main policy tools used to ensure access and connectivity. The aims of policy in the areas of “content” and “services” are the broad issues of protection of minors, cybercrime, e-commerce and trust, security and privacy, copyright, trade, and local content creation.

The emergence of new ICT, especially the Internet and wireless networking technologies, has brought forward new issues with global scope. Internet governance, as part of the global ICT governance issue, has perhaps been the most heavily discussed in the last few years.

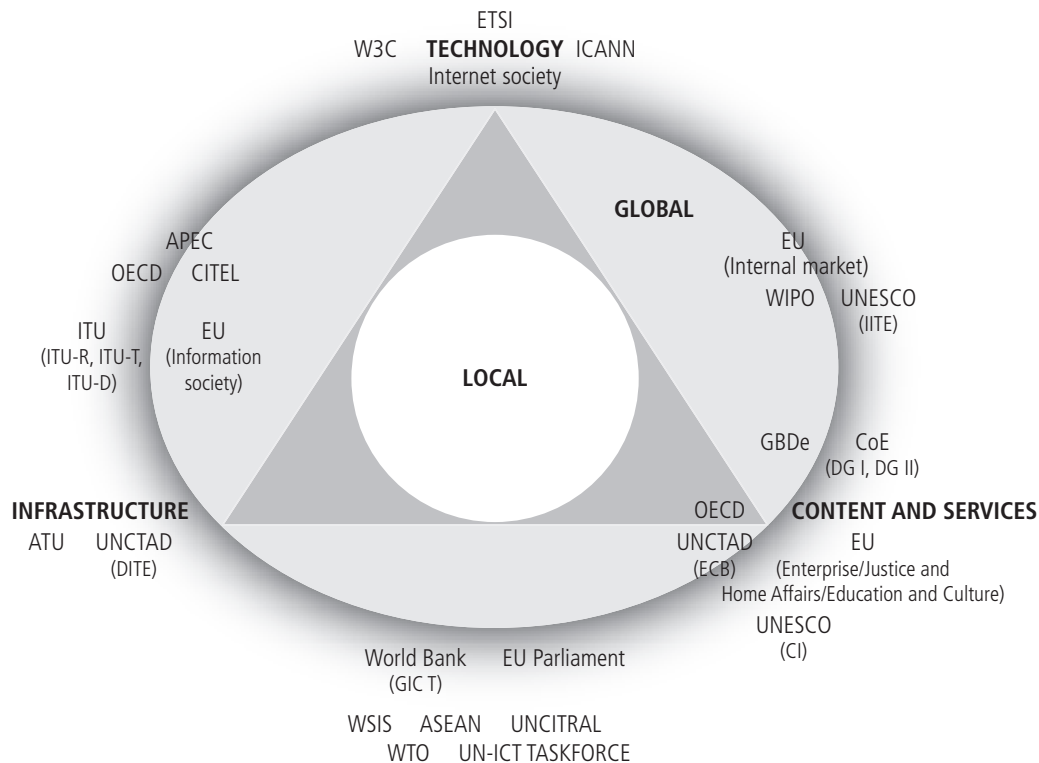


Figure 11.1. Key policy areas and main international players.

Source: Markle Foundation (2003).

Note: See Appendix for key to acronyms used in this table.

11.2.1 International ICT technology/infrastructure governance issues

ICT has long been quite firmly in the hands of state-backed organizations, such as the International Standards Organization (ISO) or the International Telecommunication Union (ITU). The ITU provided early international governance relating to infrastructure networks in the telecommunications sector. A Joint Technical Committee of the ISO and the International Electrotechnical Commission (IEC) is responsible for developing international standards for Information Technology. It is, in fact, the largest body within ISO. However, some ICTs, especially the Internet, have developed at a pace that has outstripped this type of government-backed standards negotiation. Internet specifications were not developed by government-backed standards bodies, leading governments to believe they could not control them very easily. Moreover, legislation in this sphere frequently becomes quickly outdated and incapable of dealing with Internet- or other ICT-regulation issues. The ITU, for instance, refused to recognize the Internet Protocol (IP) until the mid-1990s; the ISO formally backed the “Open Systems Interconnection” Protocol and refused to recognize the Transmission Control Protocol/Internet Protocol (TCP/IP).

Realizing the shortcomings of government-led interoperability standardization, many governments have increasingly supported the concept of self-regulatory approaches by the private sector and the industry, especially among governments of the Organization for Economic Cooperation and Development (OECD) (OECD, 1998). Many governments seem willing to let the Internet community manage its own technical affairs.

One key example highlighting the issues arising in international private self-governance is the Internet Corporation for Assigned Names and Numbers (ICANN), a private body created for the management and coordination of Internet names and numbers (see *Box 11.1*).

Box 11.1. ICANN

At the time of the creation of ICANN, there was a clear global need to establish some sort of entity that could support, manage, and coordinate the domain name system—or otherwise face chaos or the collapse of the network. ICANN was created and is supported by a national government, the United States (U.S.) Department of Commerce. The first ICANN board was chosen by its founder, then appointed by the U.S. government. However, the governance structure of ICANN quickly became one of the main issues, given both its nature and origin. To balance this, it was decided that approximately one-half of the board would be appointed via Internet voting. This procedure is a rare example of a global-level, bottom-up exercise in private-sector governance that made use, perhaps for the first time, of new ICT to involve a variety of stakeholders from many countries through e-voting.

ICANN has a Government Advisory Committee to represent the voice of nations, but this has no decision-making powers. Nonetheless, it is still under U.S. government control and has been facing a range of criticisms vis-à-vis the global governance principles of modern democracies (Sadowsky *et al.*, 2004).

In the eyes of many, the “experiment” of Internet governance carried out under ICANN has had mixed results. ICANN established rules, procedures, and related policies that successfully enabled the smooth operation of Internet space. But ICANN has met quite substantial criticism on some key global ICT-governance issues that are regarded as unresolved and open such as, among others, its legitimacy and accountability to the global community, the imbalance in the participation of developing countries, the true internationalization and legal independence of ICANN from any national government, its openness and transparency, and the vested business interests of powerful players.

While some think that ICANN should be replaced by another organization, preferably under the auspices of the United Nations, others feel that the whole system should stay “as is,” as any change will disrupt the operation of the Internet and lead to instability (“It ain’t broken, so why fix it?”) (ESCWA, 2004). The bottom line of this discussion is whether higher efficiency should be more important than higher legitimacy or if a correction toward more legitimate arrangements is needed.

11.2.2 International content and service management issues

The list of issues related to content and service management issues in international ICT-related matters is long. The recent advance of the Internet and broadband technologies has again accentuated some of these issues.

Content issues may be among the most difficult. Among others, these include spam, illegal, hateful, politically objectionable, libelous, or culturally objectionable content. While it is recognized that different cultures and countries have different standards, there has been a worldwide commitment to freedom of expression. Article 19 of the Universal Declaration of Human Rights provides: “Everyone has the right to freedom of opinion and expression; this right includes freedom to hold opinions without interference and to seek, receive and impart information and ideas through any media and regardless of frontiers.” In the past, content has been regulated physically. While Internet traffic is capable of being filtered, the process of filtering is increasingly much more complex because of the millions of sites and the ability of a site to add or change the address of potentially objectionable material.

Security is another major issue for governments in relation to ICT. The prospect that Internet users, including private individuals and governmental agencies, may hide their identities, coupled with the lack of central control of the Internet, its unaccountability, its ubiquity, and its rapidity in accessing and disseminating information represents a serious challenge to policymakers. Information systems critical to governments are presently susceptible to data interception, data interference (e.g.,

through viruses), system interference, illegal access, financial fraud, and spyware, among others. The traditional approaches of nation states to protecting and policing territory are simply becoming insufficient. Control is a fundamental trait of national sovereignty. Its erosion or loss, through ICT, seriously undermines the capacity of nations to manage their domestic affairs and changes the nature of international relations. International efforts by both private and public actors have dramatically intensified in such diverse fields as intrusion detection, protection through firewalls, encryption, antivirus measures, and biometrics.

Protection of intellectual property is crucial to many aspects of the Information Society, ranging from online e-commerce through IT-enabled outsourcing to software development. The Internet poses special challenges to the protection of intellectual property, especially as broadband services make transfer of large music and video files feasible. The three main branches of intellectual property law are copyright, trademark, and patents. There are more than two dozen international agreements concerning intellectual property. The World Intellectual Property Organization (WIPO) is an international organization under the umbrella of the United Nations (UN), tasked with administering international treaties and assisting governments, organizations, and the private sector with intellectual-property-related issues. Two of the crucial international treaties administered by this organization are the Copyright Treaty and the Performances and Phonograms Treaty, which came into force in 2002. Equally important is the Agreement on Trade-Related Aspects of Intellectual Property Rights, which nations must adopt in order to be part of the World Trade Organization (WTO). These set a minimum standard for intellectual property protection that all signatories must meet and are based on existing property rights conventions (Sadowsky *et al.*, 2004).

Privacy issues are a further concern to governments. Privacy is also widely recognized as a human right. Yet this right is increasingly difficult to enforce, as communication through ICT and data stored on ICT devices can be scanned and read by third persons much more easily and quickly than data stored in paper files. For instance, it is reported that the U.S. National Security Agency, through its Echelon network of stations, can read virtually any global communication transmitted via ICT. In the commercial world, the increasingly widespread use of Radio Frequency Identification Devices (RFIDs) in retailing makes it easier and easier for virtually anyone to identify exactly which products were bought by which consumers—and where such products are located. Some international organizations have developed guidelines or rules that set forth a consistent set of basic consumer privacy protections. The OECD elaborated Guidelines on the Protection of Privacy and Transborder Flows of Personal Data in 1980 and has continued to provide guidance on the issue. The European Union (EU) issued a Data Protection Directive in 1995. Both have had an impact far beyond Europe (Sadowsky *et al.*, 2004).

As commerce moved to the Internet, legal questions arose as to the validity and enforceability of contracts entered into by electronic means. Over time, many legal systems have given special significance to signatures as an expression of intent to be bound by a contract. The United Nations Commission on International Trade Law has addressed these issues, developing model laws on Electronic Commerce and Electronic Signatures and a model law on International Credit Transfers (Sadowsky *et al.*, 2004). The Bank for International Settlements has promulgated a set of Core Principles for Systematically Important Payment Systems. The EU has an extensive body of rules and procedures on electronic funds transfers, including a directive on electronic money institutions. As security and trust issues are the most important obstacle to the development of the Internet as a major trading and property-rights exchange platform for business, this area will be of key interest in developing internationally robust technical and legal governance solutions.

E-commerce will flourish only if legal systems enforce both commercial and consumer contracts. Special protections are warranted in the case of consumers. For example, the protection of consumers includes laws prohibiting misleading advertisements, regulating consumer financial services and consumer credit, and liability for defective products across national jurisdictions. International bodies that have developed models on the protection of consumers with respect to distance contracts and e-commerce include the European Union and the OECD. A related issue of interest to governments is

the taxation of electronic commerce that crosses national borders. Key principles on taxation of e-commerce were agreed at the OECD Ministerial Conference in Ottawa in 1998.

While the spread of ICT across the globe has been one of the most prominent features of globalization, discussions in the WTO have been limited to electronic commerce and whether to impose customs duties on electronic transmissions over the Internet. At the same time, the use of ICT and the Internet by enterprises has impacted the way global business is carried out; it has created new dynamics in international trade and export competitiveness and in business process outsourcing based on the use of Internet and ICT. ICT is growing rapidly in many countries, creating new export and employment opportunities. To fully grasp the potential of ICT for trade and export competitiveness, governments are asked to put in place an environment favorable to the development of IT-enabled services. A number of multilateral trade agreements are of relevance to the deployment and growth of ICT. They include the WTO Agreement on Basic Telecommunications Services, the moratorium on electronic commerce, the Information Technology Agreement for ICT goods, the General Agreement on Trade of Services for ICT services and the electronic delivery of services, as well as the General Agreement on Tariffs and Trade (GATT) for digitized products. While ICT goods are subject to import liberalization according to WTO rules, ICT services so far are not. For developing countries to increase their export of services by taking advantage of the new technologies and e-commerce, open markets are required in the developed countries that are potential importers of these services. WTO negotiations on trade in services will be one area of key future negotiations spurred by developments in ICT.

11.2.3 A UN-based world platform for coordination and development: WSIS

Much of the past and future work on legislative and regulatory initiatives on the global and regional levels related to ICT were highlighted and discussed in the context of the World Summit on the Information Society (WSIS), held in Geneva in 2003. At the WSIS, representatives of 175 states adopted the Declaration of Principles on Building the Information Society: a global challenge in the new Millennium, as well as a Plan of Action. In addition, WSIS decided to establish a Working Group on Internet Governance. The Declaration of Principles adopted at WSIS, Geneva, in 2003 recognizes that governments, as well as the private sector, civil society, and the United Nations and other international organizations have an important role and responsibility in the development of the Information Society and, as appropriate, in decision-making processes.

The Plan of Action reiterates that international and regional institutions, including international financial institutions, have a role in integrating the use of ICT into the development process and making available necessary resources for building the Information Society and evaluating the progress made. It states as a goal that, by 2005, relevant international organizations and financial institutions should develop their own strategies for the use of ICT for sustainable development. The Plan of Action outlines a range of “action lines” that draw attention to areas of importance or concern in the international context and thus to international agreements with regard to ICT (see *Table 11.1*).

Under action line 11 on international and regional cooperation, the Plan of Action calls for international cooperation in the implementation of the action plan, inter alia, by providing means of implementation and by raising the relative priority of ICT projects in requests for international cooperation and assistance on infrastructure development projects from developed countries and international financial organizations. The plan also calls for public–private partnerships focusing on the use of ICT in development to be built on and accelerated within the context of the UN’s Global Compact and in pursuance of the United Nations Millennium Declaration. It also invites international and regional organizations to mainstream ICT in their work programs and to provide assistance to developing countries so that they too can be involved in the preparation and implementation of their own national action plans.

The issue of governance mechanisms for the ICT sector was one of the more contentious before and at the World Summit, partly because of the widely differing viewpoints of specific sectors, individual countries, and groups of countries. Some recommend a new governance structure with

heavy involvement both from government and an intergovernmental body such as the ITU to coordinate governance of the Internet internationally. Others insist that little or nothing is “broken” about the present structure, which is extensively private-industry-centered under ICANN. Others want to escalate Internet matters to a government and intergovernmental level in the hope of tackling “digital divide questions,” thus ensuring more influence for less-advanced nations at any international Internet governance table (Kummer, 2004). The uniqueness of Internet development, characterized not only by the extraordinary rapidity and success of its diffusion but also by its governance arrangements, is a unique new challenge for UN-based governing processes. The existing governance structures of the Internet were both questioned and defended at the Summit, and consensus was reached only on the fact of the issue being relevant. The Summit decided to set up a Working Group on Internet Governance tasked “to investigate and make proposals for action, as appropriate, on the governance of the Internet.”

Table 11.1: WSIS 2003 Plan of Action: Topics of action lines.

1) The promotion of ICT for development
2) The development of ICT infrastructure
3) ICT and access to information and knowledge
4) The need for capacity building with regard to ICT
5) The building of confidence and security in the use of ICT
6) The creation of an enabling (trustworthy, transparent, nondiscriminatory, legal, regulatory, and policy) environment
7) ICT benefits in all aspects of life (e-government, e-business, e-learning, e-health, e-employment, e-environment, e-agriculture, e-science)
8) Cultural diversity and identity, linguistic diversity, and local content
9) Media (as an important player and contributor to freedom of expression and plurality of information)
10) Ethical dimension of the Information Society
11) International and regional cooperation

11.2.4 The future of international ICT governance

The 2003 World Summit on the Information Society opened a new era of international ICT governance, especially of the Internet, by establishing a UN-based platform for negotiation and exchange on international governance. Two main schools of thought manifested themselves in the WSIS negotiations: that calling for multilateral cooperation within the UN framework, possibly with a UN body or intergovernmental/international organization assuming a key role on Internet governance issues; and that happy with the status quo.

WSIS can be seen as a success by those governments and organizations that see the existing private-based governance structures as inadequate in terms of their legitimacy, transparency, equal access of different groups and countries to them, impartiality (not vested private-business interest), and accountability. In fact, these areas are key components of standards for modern democracies and are promoted as key pillars of good governance. By recognizing some important principles, the Geneva Declaration laid the conceptual groundwork for any future form of Internet governance and set some valid benchmarks for the work ahead. These are based on some of the traditional principles of international cooperation, such as transparency and democracy. They also introduce some Internet-specific aspects, such as the recognition that the Internet is, by now, a global facility. Furthermore, they recognize the multistakeholder character of the Internet.

One important function of the state and of international arrangements is the support of wide public access to technology and the promotion of its wide adoption. What needs to be underlined as a lesson for future governance is that technical and technological change does not necessarily change civil society and policy institutions nearly as much or as quickly—on either an international or national level. Forecasts of a global, open, and transparent world, enabled by ICT and governed by

private institutions, are therefore unrealistic. The true surprise is not likely to be the change that the use of ICT brings but the robustness of social and institutional structures when challenged by such new opportunities.

Social or organizational change is much slower than ICT change, but the long-term social and political implications of technical changes are profound. Those governments now questioning some of the current private-sector-led arrangements of the Internet are addressing core issues of legitimacy and democratic accountability. Nonetheless, it seems that many countries have yet to fully learn the lesson of how profoundly governance philosophies are changing and that network arrangements between public and private institutions will possibly be the standard model in the near future. In other countries that are more concerned with—or, in fact, benefiting from—the efficiency and workability of current arrangements, sensitivity about the importance of legitimacy and the overall democratic responsibility of international arrangements may have been sharpened as a result of the events of recent years.

Currently, the concept of national sovereignty is changing to allow for more complex arrangements. Public–private partnership concepts imply the transfer of public powers into the hands of private actors. However, something that has so far not always worked out well is the simultaneous imposition of the obligations of due process, oversight, and accountability that are the hallmarks of modern governments. What seems to be emerging is a confluence of two different standard models of governance arrangements—one that is purely governmental and the other that is composed of largely or purely private institutions—into a functionally differentiated model of governance. Governments, as repositories of legitimacy and as democratically accountable entities, are ultimately responsible, while private institutions are often supposed to work and manage more efficiently. However, to make this model of legitimate AND efficient international governance operable, all parties involved have considerable work ahead. In a recent analysis Dingwerth (2003) attests that to date global governance has lacked a clear and coherent concept of democratic governance beyond the nation state.

Overall, the emergence of ICT and the globalization that it drives have had quite a profound effect on a number of international governance networks and on the arrangements needed to coordinate the increasing complexity of the management and coordination of ICT-related issues. The rise of ICT has brought with it a rise in institutions for coordination, rule setting, and enforcement in relation to ICT. They thus make none of the existing international architectures obsolete. On the contrary, they add another dimension in international governance in a wide range of forums. While a new balance between public and private institutions is emerging in relation to technology and infrastructure, content and service issues are likely to be governed through new or better international agreements on some key issues—above all, on security issues.

11.3 ICT Effects on International Governance

11.3.1 ICT changes, structures, and modalities of international governance

The last decades have seen a rise in global governance institutions, for example, UN bodies, international nongovernmental organizations, and technical standardization bodies. The most important change resulted from the emergence of private transnational governance institutions as new key players in global environmental politics. This phenomenon, known as the “institutionalization of private governance,” “governance without government,” or private governance “in the shadow of the hierarchy,” is also becoming more and more institutionalized at the international level. The emergence of private authority has increasingly become a feature of international governance over a wide range of issues. One of the enablers in some issues and the driving force in others has been ICT, either through improved methods, reduced costs, or the pressing need for international coordination. As outlined in the previous chapter, ICT developments have created an existing governance gap on the international level, resulting from transboundary problems and the diminished capacity on the part of the state to cope with these challenges. This creates a demand for private institutions to fill

this functional gap. In many cases, their role is to reduce transaction costs and provide information; in others, they enhance the capacity of some institutions to exercise authority over others.

Research, however, has thus far hardly addressed the effects of ICT on international governance. It is largely unclear how ICT has affected and will change structures and characteristics of international governance, including the density of networks. Because of its nonterritorial logic, ICT impacts on the traditional concept of governmental territorial sovereignty, but it is unclear how. Nor are the effects clear as to how ICT impacts on the number and role of different actors in international governance—governments, interest groups, international organizations—or how power relations change. Woodley (2001), studying the impact of a range of transformative technologies on governance over the last centuries, observes that long-term shifts of power do occur but that existing power structures seem to cope fairly well.

ICT seems to have been highly influential in creating the technical means to reorganize or reengineer national and international governance toward a more network-based development in international policy. Different bodies, including the OECD and the EU, have developed principles of good governance with which changing governments arrangements can be compared. In the following, a range of key aspects of governance are listed, and the role of ICT is indicated.

ICTs are indispensable for conducting a more transparent and open policy, in facilitating the participation of a larger group of stakeholders in international policy deliberations, in higher accountability, and in turn, possibly, for more-effective international policymaking. In some of these areas, the full potential of ICT has not to date been mobilized, especially for enhancing the effectiveness and coherence of different policies. If a government is not open, the Internet will challenge the regime's commitment to restricting information flows because it offers a cheap and easy way for organizations and individuals to circulate information that governors have previously kept within narrow circles. It allows the formation of international advocacy networks and communities that rally behind common causes and that can be very effective in building up political pressure directly and through other governments. Illegal logging is one case in point.

At the UN Millennium Summit in 2000, countries adopted a set of eight independent goals to be achieved globally by 2015. These Millennium Development Goals (MDGs) serve as useful benchmarks and provide a meaningful framework for assessing progress toward human development in the areas of the most urgent priority for developing nations. ICT plays a role in helping progression toward practically all those goals. As regards the goal of eradicating poverty, ICT has given rise to both optimism and pessimism. The use of ICT can give a boost to income and productivity as well as to consumer comforts and the promise of further economic expansion. On the other hand, access to this asset is distributed even more unequally than others because of the unevenness in the availability and quality of infrastructure, language barriers, obstacles to training and capacity building, relevance, and ways of profiting from ICT.

The links between ICT and education have been the source of a growing body of literature. As a social interaction that requires the communication of information and knowledge, education has obvious natural synergies with ICT. ICT increases the effectiveness of education process through cheaper and better multimedia and interactive tools. The potential for gender empowerment through ICT is also important. The argument for leveraging ICT to pursue environmental sustainability is the same as for other MDGs. ICT accords information and knowledge, speed, critical paths, and flexibility that other media do not. One MDG seeks to foster international systems that are generally more sensitized to and supportive of the needs of developing countries. It calls for developing “a global partnership for development.” The indicators used are purely ICT-related—telephone lines and cellular subscribers, personal computers in use, and Internet users.

11.3.2 The emergence of e-governance on the international level

E-governance is a relatively new term. Basically, it is the extension of e-government to the world of governance. E-government can be defined as the application of ICT to transform the efficiency, effectiveness, transparency, and accountability of informational and transactional exchanges within

governments, between governments and government agencies at federal, municipal, and local levels, between citizens and businesses, and to empower citizens through access and use of information (World Bank definition). E-government has emerged as one of the principal tools by which international bodies and national administrations can improve their administrative arrangements both internally, for improved efficiency and effectiveness, and externally, for improved relations with stakeholders. A range of international organizations, including the OECD, have started initiatives to promote e-government at the national and international level.

How ICT is used in governance can be detected by the degree of interaction between two parties—from one-way provision of information to full transactions—and by the complexity of ICT applications—from e-assistance to e-democracy. E-assistance should support general aspects of daily life, such as general information on opening hours. E-administration should support internal and external administrative interaction. E-democracy should support democratic communication, participation, and interaction, as well as legal procedures in democratic elections (e-voting) (see *Figure 11.2*).

Degree of interaction	Transaction	Online reservation	Online tax declaration	E-voting
	Communication	Forms for Feedback Questions Orders	E-mail contact to administration, on-line forms (mail)	Discussion fora for voting and elections
	Information	General information	Information on license procedures	Information on political topics, legal basis
		E-assistance	E-administration	E-democracy
		Application		

Figure 11.2. Components of e-governance.
Source: Brücher and Gisler (2002).

E-governance and e-government bring with them a wide range of changes with the potential to improve the efficiency and equity of governance. Making such information as that connected with government contracts or grant programs more easily available could foster greater equity and efficiency in government purchasing and in the distribution of public resources. E-mails and other Internet facilities can greatly speed the flow of information within and among governments, once all parties are equally able to work with these systems. Likewise, the introduction of the Internet is increasing the quantity and velocity of political information in circulation. However, greater information flows do not increase the time available for processing information. As democratic dialog is all about expressing conflicting opinions regarding what governments ought to do, increasing information flows provide inputs into the political debate by increasingly differentiated interested parties and will increase the range of conflicting views. Political decision makers need to reconcile competing demands on government, and they may find it more difficult to do so because of the greater number of conflicting views. Participation in e-democracy is likely to be received and used differently by different user groups, creating a playing field that is biased in favor of those who are adept enough and sufficiently equipped to take advantage of the opportunities created through e-governance initiatives.

What is technically possible may not be organizationally feasible or socially or politically desirable. These three domains are shaped by considerably different realities. While technological possibilities progress with increasing speed, their uptake by organizations is often very slow, even in

technologically and economically advanced societies. Despite the increasing speed of adoption of new technologies and the increasingly steep learning curves in the last decades, a host of barriers impede the widespread and equal adoption of these technologies worldwide. Nontechnical barriers include difficulties in organizational cooperation, legal issues, lack of funding or of political support, skill and knowledge deficits, risk aversion, suspicion, privacy concerns, social exclusion, and structural and cultural barriers. Matching technological possibilities with political, organizational, and human realities is thus an important future step. Some of the key areas where future development is needed are listed in *Table 11.2*.

Table 11.2. Contribution of ICT to promoting good governance principles.

1) Openness and transparency	ICT is key to making information on decision-making processes and procedural rules more freely and widely available
2) Participation	ICT contributes to wider and more intensive participation and decentralized decision making
3) Accountability	ICT facilitates data collection and report compilation and dissemination to concerned stakeholders and the wider public. ICT allows improved dissemination of information on violations of commitments and thus provides one of the checks and balances in terms of policy conduct
4) Effectiveness and efficiency	ICT enables better and faster compilation of data on the efficiency of policy conduct and effectiveness of policy measures; this can be fed back into policy processes and thus enhance the responsiveness of policies
5) Coherence	ICT provides the technical means for interaction between policymaking communities and the dissemination of information on policies and decisions

Most of the research currently conducted to support governments' application of ICT is focused on technology. However, given the complexity of the environment, the need for government applications to work well in a variety of settings, and the interdependence of many players, technology research alone is insufficient. Other powerful factors shape the ability of a government to adopt and use IT effectively, including the degree to which individuals accept new technologies and the manner in which they learn them and adapt to them. Recent studies about the success of information systems in organizations suggest that more than 80% fail to achieve their objectives or to be implemented at all. The main reason for failure is the lack of involvement by system users in the design and deployment of the systems. Lack of attention to user needs and preferences is a common weakness in the design and deployment of advanced technology (Dawes *et al.*, 1999). Just as human factors circumscribe the use of new technology, organizational design and behavior also figure prominently in the adoption and use of new technology. This process of organizational change is especially difficult in the public sector, as it is bound by civil-service systems, one-year budgetary cycles, and fixed rules and procedures.

Nonetheless, governance systems will gradually adapt to the technical realities that already exist, including networked forms of organizations, the sheer limitlessness of available information, rapid and pervasive broadcasting, and decentralized decision making.

11.4 ICT and Future International Forest Governance

11.4.1 ICT influence on international forest-governance arrangements

ICT has influenced and will profoundly influence international forest-governance arrangements. Many more actors and organizations are involved in global and international forest governance today than in the past. These actors interact on the basis of a vastly increased number of formal and informal arrangements and agreements on forest-related issues. ICT has been influential in this development in a multitude of ways, usually rather invisibly and indirectly.

It is mainly through the use of ICT that the many actors form policy networks of different kinds on a multitude of specific forest-related topics. Nowadays, parties and advocacy coalitions exchange information, opinions, and background material through ICT with increasing speed and mobilize influential groups by ever-more-sophisticated means. The enhanced means of communication and information exchange makes it increasingly easy for a growing group of stakeholders to create international governance or advocacy networks and structures. One example of a private international governance infrastructure that was created by environmental NGOs is forest certification, the first system for which was devised by the Forest Stewardship Council (see *Box 11.2*).

Box 11.2. The Forest Stewardship Council (FSC)

The FSC is an independent, not-for-profit, nongovernmental organization created by a group of private organizations, partly out of frustration over the inability of governments to effectively counter tropical deforestation. The aim of the founders of FSC was to establish a credible system for identifying well-managed forests as acceptable sources of forest products. Founded in 1993, it sparked the development of an influential new international governance infrastructure: forest certification. The speed at which the topic of forest certification became a global issue and globally active private institutions were established—less than five years—is a result *inter alia* of the ability to network and communicate more freely, quickly, and effectively. Moreover, the cost of establishing and maintaining communication among the different bodies involved and with the public has been reduced by ICT to an affordable level. FSC is a prime example of a nongovernmental forest-governance infrastructure on national and international levels that would have been far more difficult to establish without ICT.

It can be expected that the number of internationally active multiactor networks and governance arrangements will further increase and, with it, the need for coordination and communication among those networks. The technical possibilities that ICTs provide and the degree of standardization for exchange between different technical systems will be an important determining factor in the number of actors and the complexity of their interaction.

International forest governance is dominated by governmental bodies and formal agreements among them. Forest-related international (multilateral) agreements among governments fall into two broad categories: multilateral environmental agreements (the majority) and multilateral trade and development agreements (the minority). The first multilateral treaty on an environmental issue was agreed in 1868 (Convention on the Rhine). The United Nations Environment Programme (UNEP) has estimated that since then the number has risen to at least 502 international treaties and other agreements relating to the environment, of which 323 are regional (UNEP, 2001). Over 60% of these 502 agreements have been adopted since the early 1970s (see *Figure 11.3*).

There are a number of legally binding international instruments at the global level that include articles and decisions addressing various aspects of forests or forest resources. These include the Convention on Biological Diversity, the UN Framework Convention on Climate Change and its Kyoto Protocol, the UN Convention to Combat Desertification, and the International Tropical Timber Agreement, to name a few. As international deliberations to establish a forest convention failed in the early 1990s, international deliberation and exchange on the sustainable development and management of forests was carried forward by the Intergovernmental Panel on Forests and the Intergovernmental Forum on Forests, and since 2000 by the United Nations Forum on Forests (UNFF). International governance in forest matters is conducted by the member states that are party to the international agreements; international organizations, such as the Food and Agriculture Organization (FAO), as well as private bodies and NGOs, including lobbying groups and international associations representing forest research, business interests, environmental concerns, or social issues.

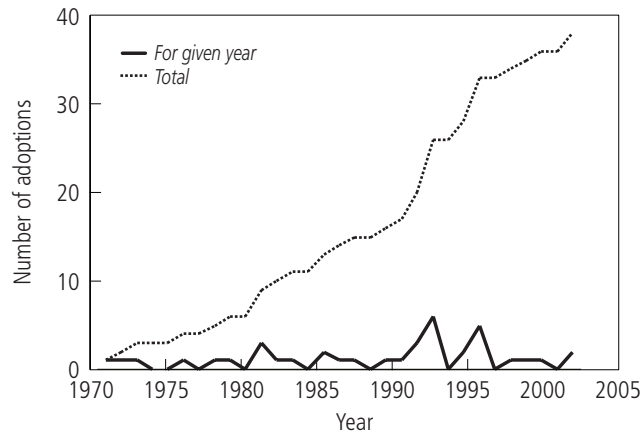


Figure 11.3. Core environmental conventions and related agreements of global significance—Number of adoptions 1971–2001.
Source: UNEP (2001).

In the future, the number of actors and agreements is quite likely to expand further, adding to the sense of congestion felt at times in international policy dialog on forest issues. At the same time, however, this “thickening” of the international governance infrastructure also enhances the influence of international arrangements on the national and subnational levels—and always very efficiently.

11.4.2 ICT changing markets, trade, and consumption: Implications for forest governance

The impact of ICT on consumption patterns for forest products has been an issue of great interest for a long time, especially on the future use and consumption of paper products. The possible impacts of ICT have been most clearly identified and are perhaps most significant for these products. The future prospect of a “paperless office” has already been foreseen for decades (see Chapter 2), even though paper consumption has been constantly on the rise. While the evidence points to ICT developments not having had the effects commonly foreseen by analysts, namely a reduction in paper consumption, the dramatic influence of ICT developments on how information is accessed remains. For instance, access to news, magazines, and books via the Web is still increasing. In December 2004, for example, Google Inc. announced a joint project with a range of important university libraries to digitize around 15 million books and make them available via the Web.

The increasingly easy access to information via the Web tends to increase the number of people downloading and printing information out on to paper. Technology aimed at helping consumers handle this information more conveniently than through the medium of paper could have a dramatic effect on paper consumption. For instance, the ICT industry is continuing to develop electronic paper (e-paper). Electronic paper aims to display electronic text on thin, flexible sheets that look and feel like paper and could be bound together into book or newspaper form. Using wireless technology, content could be downloaded instantly on to the electronic pages. The e-book market, although still very tiny, has changed course and is the strongest-growing segment in the rather static publishing world (Glazer, 2004).

If ICT devices that provide a viable and practical alternative to handling and storing information become more widely available and accepted, governments may play a crucial role in dramatically increasing their use, as long as these technologies are considered more environmentally friendly in terms of resource and energy use. Governments have considerable purchasing power as consumers and users of such devices in administration and have committed themselves to taking a leading role in development toward a sustainable society. Such a development would have quite an impact on the quantity of paper consumption and would support the further improvement of these new technologies for broader use.

While incentive-driven policies are more likely to be used by governments to achieve sustainable development goals, the case for better legal protection of forests and the environment will also be raised by NGOs and governments, as environmentally superior technology increasingly becomes available. This is particularly likely if the drive for fast-growing plantations, commonly used for pulp and paper production, leads to widely visible environmental and social damage.

Depending on the future availability of forest resources for production purposes, the shift of production capacity and consumption, and related trade patterns, governments will be under further pressure to govern the sustainable development of forest resources and their use in an acceptable way.

11.4.3 ICT in support of good governance principles in forest governance

ICT facilitates more transparent and open policymaking related to forests by encouraging the participation of a larger group of stakeholders in international policy deliberations, thereby increasing accountability and, in turn, possibly increasing the relevance and effectiveness of international policies. Although the full potential of ICT has yet to be realized, ICT has contributed significantly to international forest governance in the ways outlined below.

a) Openness and Transparency

The use of ICT has contributed to a substantial improvement in the transparency of international policymaking compared with only a decade ago. Online bulletins and Web logs allow an almost-immediate stream of information from international meetings, including pictures, videos, and sound files. Web logs allow all interested parties to create or participate in Internet-based discussion forums on current events.

There are two types of information that participants need: 1) about the process, and 2) about the issue being discussed. It is fundamental that the rules of the game (i.e., the rules and procedures) of the international policy process are open and transparent. Information about the issue keeps the public or stakeholder group up-to-date on what the deliberations are about and what the possible outcomes might be. It is vital that the information is of good quality: complete, accurate, up-to-date, easy to understand, and accessible. ICT has been instrumental in the compiling and disseminating of such information. One important example is the Earth Negotiations Bulletin (see *Box 11.3*).

Box 11.3. Earth Negotiations Bulletin (see <http://www.iisd.ca/enbvol/enb-background.htm>)

The Earth Negotiations Bulletin (ENB) began as a joint initiative of individuals from the NGO community who were participating in the preparations for the United Nations Conference on Environment and Development (UNCED). Following the conclusion of UNCED the International Institute for Sustainable Development (IISD) approached the founders with an offer to continue publishing the Bulletin.

The Bulletin is distributed each day to report on the progress of UN negotiations related to environment and development. In the ten years that IISD has published the ENB, electronic mail and the World Wide Web have changed the way that information is gathered and exchanged. Computer-mediated communications and derivative products have expanded the readership of the Earth Negotiations Bulletin to an estimated 35,000 people worldwide.

Transparency is also a key ingredient of responsible government behavior. For example, speaking of Latin America, Kaufmann and Kraay (2002) note that evidence casts doubt on the traditional public-sector-management approach to actions against corruption, which tend to focus uniformly on issues of pay and internal monitoring and supervision. The evidence points rather to the importance of open access to information and effective third-party monitoring in reducing corruption, improving governance, and mitigating state capture (inter alia, through providing public-service users with a voice). ICT is and will continue to be a key tool in ensuring and increasing open access to

information. This information-based approach is taken and used effectively by Transparency International (TI), an international nongovernmental organization devoted to combating corruption. TI analyzes, diagnoses, and fights corruption, for example, by measuring its occurrence through surveys and indices and by other research. In its *Global Corruption Barometer 2004*, Transparency International (2004) reports that the public from 64 countries considers political parties and parliament/legislature to be the most corrupt institutions, well ahead of business and the private sector.

b) Participation in International Policy Deliberation and ICT

ICT has proved to be an extremely effective way of connecting like-minded persons within a region or around the world to rally for a cause. These networked subgroups consist of societies that share a number of common characteristics and where social cooperation bears significantly lower transaction costs within the groups than among them. Lobby groups, such as environmental NGOs, have used ICT very effectively to get their specific issues put on the global agenda, build up political pressure for their causes, and monitor compliance with commitments made.

Over the last two decades, governments have increasingly allowed NGOs to participate in international negotiations. For example, in 1946, there were only four NGOs accredited to the UN Economic and Social Council. By 1992 this had grown to 928, and by the end of 2000 to over 1900 (Dodds, 2001) (see *Figure 11.4* for the period 1946–1998). Public participation, as a principle of good governance, was formally introduced in international agreements in 1992. Principle 10 of the Rio Declaration 1992 states that public access to information, participation in decision making, and access to justice are key principles of environmental governance. Principle 10 stresses the need for citizen participation in environmental issues and for access to environmental information held by public authorities. Increasingly, while maintaining their advocacy role, NGOs espouse UN themes, assisting in implementing plans of action and monitoring programs and declarations adopted by UN member states.

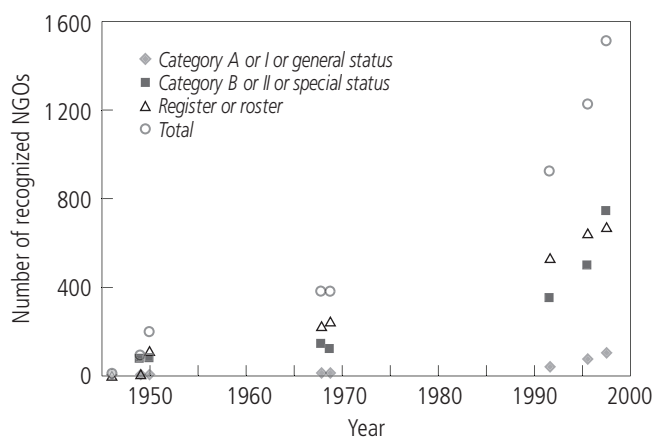


Figure 11.4. Number of NGOs recognized by the United Nations Economic and Social Council, 1946–1998.
Source: Dodds (2001).

While this development resulted from changing policymaking principles at the international and national level, it was also facilitated by the rise of ICT and its broad application. Thanks to ICT, an abundance of information on the procedures to be followed in deliberations, the status of discussions, and the technical means to participate in them is now available, and it is increasingly possible to make one’s voice heard. Further development of procedural standardizations would help solicit a wide range of submissions electronically; these could be analyzed electronically and the results channeled to negotiators for their consideration. Similarly, e-voting or online opinion polling could become a more widespread means of taking the wider public’s views into account. While the

technical means for this already exist, grave concerns still prevail as to the security and trustworthiness of such procedures and their results.

Easier access for a diverse range of stakeholder groups to international policy deliberations has broadened, and this has been beneficial in many respects. This is true also of non-UN institutions concerned with policy, such as the Ministerial Conference on the Protection of Forests in Europe (MCPFE). Many governments have gone through or are undergoing a change from old-style governance (i.e., regulatory, top-down, uniform) to newer modes of governance and policymaking (i.e., more open, consultative, and flexible). While this could have been possible, although more difficult, without ICT, the availability of relevant and up-to-date information has greatly facilitated the involvement of those who want to participate.

The possession and use of information technology to one's advantage is a key competitive asset in international forest governance. For example, ICT is a very effective means of lobbying and putting political pressure on decision makers. A case in point is the issue of "illegal logging." Illegal logging was hardly ever mentioned in international governmental negotiations until the late 1990s. Two years later it was one of the hottest political issues. Several factors were behind its rapid rise on the international governance agenda, but one was undoubtedly interest groups' sophisticated use of ICT and effective information provision to both the broader public and decision makers.

Predictions that ICT technology, such as videoconferencing and virtual meeting rooms, would replace physical meetings have not materialized to the extent foreseen. Electronic communications alone, without face-to-face meetings, are poor vehicles for debate and discussion. Without adequate face-to-face contact, participants do not grow in mutual respect. Moreover, the nature of electronic communication amplifies small differences and makes compromise difficult. Face-to-face interaction is time-consuming and expensive but must occur from time to time, especially in international governance arenas, where the perceptions and objectives of the various stakeholders may be widely divergent. ICT will therefore not be able to replace international meetings completely. The role of ICT lies in complementing, rather than replacing, direct, face-to-face interactions in policymaking processes. Interaction in-between meetings through the use of ICT is also useful for laying the groundwork for more efficient and effective meetings.

Relevant and up-to-date information is vital for effective participation, which in turn is vital for democracy. Well-designed ICT-based support services for effective information transfer are crucial for the effective participation of both governments and nongovernmental stakeholders in international policy deliberations and the subsequent implementation of international agreements. The technical challenge in terms of ICT and data management for assisting in participatory processes is the development of expert systems and decision support systems in close cooperation with well-defined user groups so that specific and concrete issues can be discussed in ongoing international policy deliberations. What is important here, however, is not so much the development of the technical components but a better understanding of the actual needs of key information users.

c) Accountability

Accountability in international governance means that individual institutions that are part of the governance arrangements take the responsibility for an activity—or some inactivity—despite commitments made previously. Accountability is judged *ex post* (in contrast with transparency, which allows judgments before or during action). This judgment crucially depends on the availability and quality of data and other forms of information. The forest-related information reported by countries to international instruments and organizations falls into two broad categories: 1) actions taken to implement international commitments and situation, and 2) trends in ecological, social, and economic aspects of forests.

ICT plays an important role in monitoring, assessing, and reporting on the implementation of international commitments and thus in the accountability of governments regarding their international commitments. The most relevant international conventions and agreements related to forests request follow-up reporting on the implementation of commitments taken by signatory

countries. The periodicity and content of national reports to be submitted to the various processes vary considerably (see Braatz, 2001 and 2002). Currently, reporting on measures taken to implement commitments under the instrument consists mainly of qualitative or descriptive information on activities and means of implementation, such as policy, legislative, or institutional measures. In a few cases, however, biophysical and socioeconomic data on forest resources or resource use is required, usually in quantitative form. Most instruments also have provisions for information collection, analysis, and exchange, and for monitoring and assessment of information. In recognition of the need for quantitative data to assess the impact of the measures taken, many of the instruments are working to develop impact indicators. So far, it is primarily governments and international governmental organizations that are held accountable by the public. Given the increasing role and participation of nongovernmental organizations in more complex international forest-governance arrangements today and in the future, more calls for these organizations to be more open and accountable to the public are likely.

It is important to recognize that monitoring, assessment, and reporting is not an end in itself but intended to improve planning and decision making. However, concern has been widely expressed about the proliferation of requests for national reports on forests and whether the information is fully used. Each of the forest-related conventions and processes has, in the recent past, highlighted the need to streamline requirements in order to make data and information more easily and widely available. Questions have also been raised as to whether the information provided is indeed used effectively. The secretariats of the conventions and other processes need to compile and use country information as an integral part of the progress reports they prepare for their governing bodies (e.g., UNFF). However, the flow of information between countries and secretariats seems to be more active than among the countries themselves. Different UN bodies have taken initiatives to address the situation, especially in streamlining reporting and disseminating information electronically and via the Web. However, the long-term decisions on reporting procedures in certain processes, the range of topics covered by the commitments made by countries in relation to forests, as well as the range of other forest information needs, has made progress on joint reporting formats or data collection mechanisms difficult.

In June 2002 the Collaborative Partnership on Forests (CPF)¹ established a Task Force on Streamlining Forest-Related Reporting. The CPF Task Force was created to propose ways of reducing the forest-related reporting burden, for example, through reducing and streamlining reporting requests, synchronizing reporting cycles, harmonizing data collection methods and increasing data comparability and compatibility, and facilitating the accessibility and flows of existing information. It also seeks to guide ongoing international processes by sharing experiences and lessons learned on different reporting frameworks and by seeking possibilities for common approaches to data and information collection, storage, and reporting by international organizations. In the longer term, CPF believes that the work could contribute to better information management system(s), whereby data and information will be more easily accessible and widely available, and in which the information could eventually be inserted and updated by countries themselves.

CPF's work on developing a joint information framework for country reporting and for improving the information management of international organizations and secretariats has considerable potential in the future for providing better and more coordinated information on forests and reducing countries' reporting burdens. This, however, is a long-term task that involves confidence building among the partners, use of modern technologies and existing information systems, and the acquisition of adequate resources to carry out the project (see *Box 11.4*).

¹ CPF is composed of 14 international organizations and institutions (with a secretariat) that deal with forests. One of its main objectives is to enhance collaboration and coordination on forest issues among its members at all levels.

Box 11.4. A global market place for forest information: GFIS

Many international organizations and initiatives attempt to compile and provide better access to existing information. One such initiative is the Global Forest Information Service (GFIS), led by the International Union of Forest Research Organizations (IUFRO) as a CPF joint initiative. GFIS is being developed to provide an Internet gateway to forest information resources from around the world. Users can locate maps, data sets, Web resources, journal articles, books, and other resources relevant to their forest information needs. Such metadata and access-facilitation systems are highly useful once established and widely used. However, they are difficult to develop, and it is equally challenging to maintain them properly.

d) Enhancing the Effectiveness of International Agreements

Ultimately, what counts is whether international forest governance efforts have an effect on conditions on the ground, for example, through improved forest management, forest conservation, use of forest goods and services, and the distribution of related costs and benefits. To assess the impact of international agreements and related efforts to implement agreed actions, ground data on forests are needed. One of the major difficulties of international deliberations and agreements on forests is the diffuse nature of the underlying concept of “sustainable development” or “sustainable forest management.” This means very different things to different interest groups, including “the North,” more interested in biodiversity protection, and “the South,” which insists on a fair opportunity for sustainable economic development.

It took more than a decade for a set of seven “thematic elements” of sustainable forest management (SFM) to be politically acknowledged by UNFF in 2004; these were based on related indicators developed through regional and international criteria and indicator processes. They should facilitate the sharing of information and demonstrate progress toward sustainable forest management. These common thematic elements, as they are called at the international policy level, represent a very concrete pivot point around which policy-level efforts for harmonization of information and data needs regarding forests can be focused. The CPF members are developing a joint information framework for forest reporting to further improve access to and coordination of information, ultimately with a view to reducing the burdens on countries with regard to future reporting. In this pool, information will be available in line with the seven thematic elements of sustainable forest management. Some forest monitoring systems are gradually being reoriented so that they can deliver data related to this increasingly widely shared framework. The global Forest Resources Assessment undertaken by the FAO, which is structuring its reporting according to the six (of seven) thematic elements of SFM, is one example.

ICT can play a key role in the collection, storage, analysis, and exchange of information on implementation efforts and on the status of and trends in forest resources. A tremendous amount of information on forests is collected by local, national, regional, and international organizations. International organizations, such as the FAO, organizations associated with the United Nations Environmental Programme, the UN Economic Commission for Europe (UNECE), and others currently host the main repositories of global data sets on forests. The international policy process will need to consider their real information needs carefully. In most cases, information requested from countries and other entities already exists. Furthermore, better coordination and sharing of information is needed, to make better use of existing data banks, reports, and analyses. ICT provides all or most of the tools to organize data pools and expert networks, for example by FAO FORIS, and open-access meta information services, such as intended by GFIS (see *Box 11.5*).

It seems essential to further develop information-management systems, such as GFIS or FORIS, that are able to supply customer-specific information. Further initiatives in this direction are the European Forest Information and Communication System (EFICS) and related projects, as well as efforts to further develop the compatibility of forest-information systems in North America.

Box 11.5. FAO FORIS

FORIS is the FAO knowledge-management system on forests and the largest repository of forest-related information in the UN system. It integrates several general modules for entering, storing, and dissemination of forest-related information. It covers themes, statistics, contact references, meetings, and free text. The database side of the system is seamlessly integrated with a content-management system that caters for the publication of stored information on the Web.

Many existing multilateral environmental agreements involve factors that could be assessed remotely, such as wetlands preservation, deforestation, and marine and atmospheric pollution emissions. GIS-referenced data and RS (remote sensing) are able to provide countries with additional data not only about the effects of implementation efforts but also about existing environmental or social factors that interact with implementation efforts, such as land-use changes or demographic patterns. By increasing the ability to monitor the impacts of treaty-relevant behavior, ICT can encourage improved compliance. Just as important, however, are the potential cooperative uses of monitoring data. ICT-derived data, such as from GIS and RS, may help developing-country contracting parties with limited capacity to address treaty-related concerns to better target their resources.

ICT techniques such as GIS and remote sensing have potential, but their actual application is restricted. For instance, highly sensitive satellite observation instruments, such as ENVISAT ASAR that can detect movements of the Earth's surface of as little as 1mm per year are not able to produce truly accurate data on forests, as it is difficult to spot "newborn" forests or forest degradation (ENVISAT, 2004). National onground forest inventories tend to provide more accurate estimates that can and should be complemented by remote sensing. To make better use of RS in the context of international environmental agreements, changes need to occur in at least three areas (SEDAC, 2000):

1. The perception of environmental issues—sovereignty has made most contracting parties unwilling to accept third-party monitoring of compliance with international agreements. Until global or regional threats from environmental change are perceived to significantly affect national interests, states are unlikely to accept strict enforcement of treaties by third parties.
2. The technology—many treaty-specific, remote-sensing applications are still rather experimental; these applications need to be further refined before they have the credibility necessary to be used in compliance verification. In quite a few applications it is likely that they will not be able to replace but only complement other forms of data collection.
3. Data access—issues such as guaranteed access to data by all parties, documentation of methodologies, and long-term data archiving need to be addressed.

11.4.4 Bridging the digital divide: ICT in forest-related technology transfer agreements

Over 80 international instruments and numerous subregional and bilateral agreements contain measures related to transfer of technology and capacity building. About 30 multilateral agreements that cover issues of technology transfer are listed in the Compendium of International Instruments on Technology Transfer (UNCTAD, 2001). Around one-third of these instruments are related to forest matters. These agreements note that effective technology transfer will be essential to meet global challenges and to enable collaboration between developing and developed countries.

Regarding an enabling environment for technology transfer, the independent consulting company Indufor (2003) observes that most existing barriers are not specific to technologies for the forest sector. Instead, they result from international agreements (e.g., WTO agreements) or from national policy or macroeconomic frameworks (e.g., import tariffs for technology) that are designed outside

the forest sector. There can also be fundamental bottlenecks impeding technology adoption, the most important of which are insufficient knowledge and capacity within the recipient country.

International reviews on technology transfer in the forest sector undertaken in recent years, such as those cited above, have not highlighted the role of ICT in any particular way. In fact, much of the debate on technology transfer centers on financing knowledge transfer, capacity building on the receiver's end, and the issue of intellectual property rights and related trade. One major issue of discussion in international forest-related policy circles is lack of access to information and lack of capacity to adapt and apply the related knowledge to a local situation. Indufor (2003) is more explicit than most when it writes: "The key problem does not appear to be the distribution of information at the international level, but having the capacity at the country level to use the available technology-related information in a systematic manner and being able reach out to those who are unable to access it. Training of local intermediaries is a key activity." Not a single line of policy recommendations is directed at ICT hardware or software. While it is a widely shared view in the IT community that hardware does not matter, software does matter, especially software that is adapted to the specific low-tech context within which most work is undertaken.

11.4.5 International forest-related e-governance: Opportunities and challenges

It is clear that international forest governance will continue to evolve, but it could move in various directions. One possible scenario is that a formal and rather powerful forest-governance structure is established that consists of one or very few well-coordinated bodies and related implementing agencies, private or public. Such an arrangement is likely to develop only if the changing climate requires more drastic globally coordinated action. Another situation is a looser but well-coordinated network of public and private institutions. Such an arrangement is not necessarily the most efficient, but it is likely to be more resilient and flexible. A third possibility would be the strengthening of regional policy processes and institutions that would, in effect, replace global governance arrangements. Yet another is the breakdown of all efforts to create meaningful international governance arrangements and a resulting strong reliance on local governance arrangements.

ICT is one key asset for setting up and managing any type of structure; it is especially useful for international forest governance of a network type. This, however, requires the adaptation and changing of network concepts, the support of multimodal interactions on the basis of standardized data-exchange protocols—the technical and informational infrastructure that enables participation and interaction of relevant existing and emerging actors with as few transaction costs as possible. Many of the e-administration activities and concepts now being explored and tested at the national level will increasingly be applied at the international level.

One of the key needs for enhanced use of ICT in international forest governance is the improvement of ICT quality, user-friendliness, and cost-effectiveness, as well as the coordination of international information needs. Efficient use of ICT to facilitate monitoring, assessment, and reporting (MAR) will require the various processes to 1) harmonize formats, 2) harmonize concepts, terms and definitions, and 3) standardize or harmonize technical infrastructures and/or languages so that interoperable systems and user-friendly interfaces, such as customer-convenient "one-stop shops" can be built up. The challenge ahead is how to overcome the multiple difficulties faced in the international harmonization or standardization of well-established national rules.

A further major challenge for international forest-related governance is how to take the local-level and rural settings appropriately into account. International forest arrangements that are not focused on or driven by a common global threat, such as climate change, tend to be quite ineffective, as they are disconnected from the issues on the ground. These often need to be resolved on a local basis rather than at the international level. The principle of subsidiarity has yet to be firmly established and implemented in international forest governance. ICT can nonetheless support good governance principles just as well on the local as on the international level.

11.5 Concluding Remarks

In the past few years, ICT has profoundly altered our ability to obtain and utilize information, data, and knowledge. The speed of change in information technologies is far outpacing our understanding of their impacts on relationships among individuals, societies, and states. In particular, attempts to understand the impacts these technologies have on political interaction and international policymaking processes have not yet been analyzed in detail.

The use of ICT has helped drive the shift from top-down government concepts to more open-network “governance,” which in turn has enabled ICT to influence international governance. An increasingly complex and networked world requires an equally dense institutional infrastructure to facilitate international coordination. ICT provides many of the essential tools; however, it does not reduce the multiplicity of values and conflicts of interests that international governance arrangements have to accommodate and manage. Technologies, moreover, evolve only when embedded in a social context and not independently. As organizational arrangements evolve considerably more slowly than technologies, it will take quite some time for the technical possibilities of today to become fully integrated into international or national governance arrangements. Nonetheless, future international governance arrangements are likely to evolve along the paths that have emerged over the last decade: governmental and private institutions acting complementarily but with different roles and responsibilities.

To build an international governance arrangement that makes best use of ICT, a range of talents and resources must be assembled to tackle the many open questions that this technology brings with it in relation not only to technical but especially to political, institutional, and organizational response and adaptation.

Appendix

List of Acronyms

APEC	Asia Pacific Economic Conference
ASEAN	Association of Southeast Asian Nations
ATU	African Telecommunications Union
CITEL	Comisión Interamericana de Telecomunicaciones (Inter-American Telecommunications Commission)
CoE	Council of Europe
DGI	Directorate General I (Legal Affairs)
DGII	Directorate General II (Human Rights)
ECB	European Central Bank
ETSI	European Telecommunications Standards Institute
EU	European Union
GBDe	Global Business Dialog on Electronic Commerce
GIC T	Global Information and Communication Technologies (Division of the World Bank)
ICANN	Internet Corporation for Assigned Names and Numbers
IITE	Institute for Information Technologies in Education
ITU	International Telecommunication Union
ITU-D	ITU Telecommunication Development Sector
ITU-R	ITU Radiocommunication Sector
ITU-T	ITU Telecommunication Sector
OECD	Organization for Economic Co-operation and Development
UN	United Nations
UNCITRAL	United Nations Commission on International Trade Law
UNCTAD (DITE)	United Nations Conference on Trade & Development (Division on Investment, Technology and Enterprise Development)
UNCTAD (ECB)	United Nations Conference on Trade & Development (Electronic Commerce Branch)
UNESCO (CI)	United Nations Educational, Scientific and Cultural Organization (Communication and Information)
UN-ICT Taskforce	United Nations Information and Communication Technologies Task Force
W3C	World Wide Web Consortium
WIPO	World Intellectual Property Organization
WSIS	World Summit on the Information Society
WTO	World Trade Organization

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