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**ASIA AND THE PACIFIC INTO THE TWENTY-FIRST CENTURY: INFORMATION
TECHNOLOGY, GLOBALIZATION, ECONOMIC SECURITY
AND DEVELOPMENT**

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**ASIA AND THE PACIFIC INTO THE TWENTY-FIRST CENTURY: INFORMATION
TECHNOLOGY, GLOBALIZATION, ECONOMIC SECURITY
AND DEVELOPMENT: SUMMARY**

Note by the secretariat

SUMMARY*

The expanding range of applications of information and communication technology (ICT) which help to increase the efficiency and flexibility of production, marketing, financial and administrative activities for both the private and the public sectors presents new multifaceted and important complications for governments. These applications offer enormous opportunities to enhance the competitiveness of industry, increase the returns from trade, attract foreign direct investment and other forms of external capital, increase the integration of small and medium-sized enterprises into the value chain, and enhance the service provided by the financial sector. There is a very significant threat that countries which do not enter actively into the information age will be increasingly marginalized in the twenty-first century. However, the use of ICT also magnifies the risk of loss of control over a country's economic destiny. Domestic economic policies are forced to become aligned with international ones and trade and investment decisions by both domestic and foreign terms are taken in line with considerations of global competitiveness which may not always be consistent with national interests.

ICT allows trade to become simpler and more streamlined, thus increasing the value and speed of transactions. One major advantage of promoting electronic commerce is that it can provide relatively cheap access to global markets even for small and medium-sized enterprises in remote areas. The globalization of production and componentization of production units through the use of ICT focuses attention on the infrastructural and governance conditions and institutions within a country. This will define the attractiveness of the environment for investment. In the finance sector, the spread of computerization, automated teller machines (ATMs) and telephone and Internet banking is providing better service to customers and permitting them to place investments on a global basis. ICT provides the infrastructure to achieve efficient and transparent capital markets with a wide choice of investment instruments; it gives macroeconomic authorities the institutional capability to manage their economies better and international financial institutions the infrastructure to identify potential financial crises more quickly and to take more effective and timely preventative measures.

The policy framework enabling a country to become an active participant in information technology is multidisciplinary and involves many ministries, and is therefore complex to formulate and implement. The basic requirement is to create a conducive environment for the development of ICT infrastructure and to promote the training of appropriately skilled human resources. The framework also has to include policies for trade (electronic commerce), production and finance, complemented by modern legal and regulatory systems which are able to handle electronic contracts. Given the wide range of application of ICT, representatives of various private sector groups need to be involved in the articulation of policy frameworks. In many cases, a government itself could benefit from increased application of ICT within its own administration. A government can also assist the private sector with demonstration projects.

In order to maximize the benefits of ICT to developing countries and to minimize associated threats, there is an urgent need to negotiate international agreements on the legal/regulatory architecture for electronic commerce, Internet banking and trading of securities, as well as the setting of standards for connectivity and the interoperability of systems. Developing countries can draw considerable value from the technical assistance programmes offered by international and regional agencies, including those of the United Nations.

* This summary is based on part two of the *Economic and Social Survey of Asia and the Pacific 1999*.

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I. GLOBALIZATION, INFORMATION TECHNOLOGY AND DEVELOPMENT

A. ICT and globalization

1. A hallmark of the closing years of the twentieth century is the marked intensification of the process of globalization. The rapid spread of the use of information and communication technology (ICT) is both an outcome and a determinant of this process, which has manifested itself in accelerated movement of goods, services, factors of production and technology across national boundaries. While there are many positive outcomes from the continuing improvements in ICT, there are also escalating risks associated with its use.

1. Definition of ICT

2. ICT is a generic term covering computers, broadcasting, telecommunications, data networks and smart components which are being increasingly applied in diverse uses. It can be defined as the totality of the electronic means to collect, store, process and present information to the end-users in support of their activities, and consists of computer systems, data communication systems, knowledge systems, office systems and consumer electronics. As new forms of ICT function interdependently, the assembly of ICT is an intelligent information network. For example, the merging of communication, home electronics, broadcasting and publishing into all-in-one computers implies that most personal computers will come with voice and fax facilities, making telephones and fax machines redundant. Similarly, as digitalization makes compression and decompression of images easy, communication and broadcasting are becoming integrated digital devices. This is leading to the information superhighway or an electronic communication network which provides connectivity for any conceivable transaction, including trading, banking and financial transactions, organization of production, delivery of services such as airline tickets, books and newspapers, software and music compact discs (CDs), and home shopping. The Internet is one such network which provides connectivity between more points than any other and at a comparatively low cost. Network service providers are available in many developing economies of the ESCAP region, including Bangladesh; China; Guam; Hong Kong, China; India; Indonesia; Malaysia; Pakistan; Philippines; Republic of Korea; Singapore; Taiwan Province of China; and Thailand.

3. In the 1990s, the commercial dimension of the Internet emerged from growing business networks. The cohabitation of non-commercial and commercial sectors on the Internet is the current reality. This has led to several concerns: there is no governing body or agency; there are no service quality guarantees; there is no security of transactions; information is often unstructured, unsorted and difficult to find; operations are often unstable; and there are no agreed payment schemes for access. These issues will have to be solved before the Internet can become a real information superhighway.

2. Links between globalization and ICT

4. Economic globalization arises out of the interaction between market- and technology-related factors as well as economic policies at the national and international levels. Market-related factors include increased competition for resources and in the production of the same goods and services, greater engagement in international trade and enhanced efforts to attract foreign direct investment (FDI). These have all been assisted by technological and information-related improvements. For example, the growing role of transnational corporations (TNCs) in both the production and service sectors of practically every country has put competitive pressure on home country firms, exerting an inordinate influence on the existing pattern of specialization. Financial innovations have led to lower transaction costs and the development of new financial institutions and instruments, as well as dramatic growth in cross-border financial transactions. In addition, increasing urbanization around the world has resulted in more uniform tastes, preferences and demand, spurring market growth even further.

5. In terms of technology-related factors, the componentization of production, facilitated by advancements in both manufacturing technologies and ICT, has led to lower costs and the dramatic shortening of economic distances. New communication technologies have facilitated the international diffusion of new production, marketing and organization technologies at low costs, allowing faster and cheaper movements of goods and services. At the same time, systematic rationalization of procedures and documentation for international trade, together with a wider and easier dissemination of prices of traded goods, has contributed to the convergence of market prices, resulting in fewer distinct markets.

B. Potential benefits to developing countries from applications of ICT

6. There are four dimensions of the positive impact of ICT on economic growth. First, ICT allows process innovation (new ways of doing old things) which increases productivity and creates new value added. Second, innovative economic activities (new ways of doing new things) may be generated. Third, ICT represents a new factor of production along with land, labour and capital which can lead to economic restructuring. Finally, it represents a new means of organizing activities through its synergies with other technologies. The recent advances to smaller, faster and cheaper ICT had led to a considerable decline in the cost-to-performance ratio of its application, which raises productivity. The potential for growth has been expanded by the use of ICT to promote more efficient utilization of inputs such as energy, raw materials and land. Some new applications of ICT have made production processes more flexible. With the facility to pay closer attention to customer tastes and preferences, producers have increased the value added of their products, and improved their quality.

7. Some new applications of ICT have made it possible to carry out production and service activities efficiently on a small scale. Advances in telecommunications enable enterprises which are geographically separated to communicate both within a country and across borders. The growing decentralization and globalization of many industries provide new opportunities for developing countries to participate in regional and global economic ventures. The organizational changes and decentralization options made possible by ICT can facilitate a better spatial distribution of economic activities, especially those industrial operations which have been centralized in large cities. Timely and detailed information about markets, point-of-sale information, and electronic linkages to clients and distributors have enhanced the capability to provide tailor-made products and services to consumers and create market niches. ICT has revolutionized the marketing systems for widely traded standardized goods through the diffusion of market-determined prices instantaneously around the world. Small and medium-sized enterprises and even smaller-scale producers have the opportunity to become an integral part of the marketing chain as they can have access on a real-time basis through mobile phones, Internet etc. to the prices of their products on national and international markets. This should reduce the potential for the exploitation of these producers and enhance their bargaining position with traders. Local traders have the means to become better equipped to compete with international trading firms, enhancing their competitiveness in marketing products as well.

8. New applications of ICT are profoundly changing the service sector. In particular, the nature and structure of financial, insurance, marketing, distribution and tourism and travel businesses have been transformed by the improvements in the speed, reliability and cost of manipulating vast quantities of information related to financial, inventory and sales transactions. At the same time, providers of services, traditionally small and decentralized, are being linked nationally and globally through the use of communication technology.

9. The application of ICT is being used to improve the economic efficiency of the banking and financial sector, both to provide services to clients more conveniently and rapidly and to permit financial intermediaries to evaluate more correctly the investment preferences of savers while managing more effectively the risks inherent in global investment portfolios. ICT is also integral to a better regulatory system of financial institutions and financial markets, reducing the possibilities for fraud and enhancing credit-risk assessment and supervisory functions.

10. In the medium term there is the potential for enormous economic benefits from a broader and more integrated use of ICT in socio-economic development. With new forms of application becoming available at decreasing costs, there can be a shift from quantitative to qualitative growth and reinforcement of efforts to promote a better distribution of income. The impact is, however, crucially dependent on the capacity to disperse ICT capabilities across a broad range of economic activities and income groups.

II. APPLICATIONS OF ICT IN THE AREAS OF PRODUCTION, TRADE AND FINANCE

A. Status of application in developing countries of the ESCAP region and constraints on wider application

11. Within the ESCAP region, which has witnessed high growth in investment in ICT in the 1990s, there are very significant variations in its diffusion. Much more progress in making ICT applications accessible to economic actors has occurred in the newly industrializing economies (NIEs) and the members of the Association of South East Asian Nations (ASEAN) and in some other larger countries, including China and India. In practically all countries there is still very limited accessibility of ICT components, such as cellular phones and Internet connections, to large segments of the population outside urban areas and to lower-income groups. Therefore the applications currently in use are rather specific to certain sectors, particularly larger enterprises, the trade sector and the financial sector, with large gaps even within these.

12. In the area of production, there has been considerable diffusion of productive units of TNCs throughout the region, particularly in the NIEs and the members of ASEAN and more recently in China, which use ICT to take advantage of country differences in factors of production. There are now quite a number of networks of ICT-linked industrial and marketing units, especially in the automobile, chemistry, electronic and textile sectors, in many cases headquartered in Japan, the Republic of Korea or Singapore. While these usually started with dedicated ICT infrastructures belonging to a company, they now tend to occur mainly in countries where ICT infrastructures are quite developed and there is a conducive policy and institutional/legal framework. The linking of small and medium-sized enterprises within these networks is increasingly discernible, principally as suppliers of inputs through outsourcing. The spread of electronic industries mainly with an export orientation has been especially impressive, and this should lay the basis for further applications within the countries in which this has taken place.

13. A number of countries have developed strategies to attract investment for the development, production and application of ICT in the twenty-first century. These plans emphasize creating a competitive foundation for the future development of information infrastructure. There are also enterprises, both TNCs and large national firms, that are employing ICT to good effect to link the different production, marketing, distribution and administrative/financial units of their firms within a country.

14. In the area of trade, the most progress in the region has been in the automation of customs procedures, applying electronic data interchange processes to exports and imports, with several countries undertaking projects to simplify and harmonize customs procedures, put them on the Internet and connect them with transport and other logistical procedures. Further progress in the customs and transport areas is taking place with the assistance of international organizations, as the benefits from doing so are quite visible. There has also been increasing use of ICT for the promotion of trade and

investment, involving applications to match trade and investment opportunities, especially for small and medium-sized enterprises; advertising over the Internet; and producing electronic catalogues. There have been a few fledgling initiatives in the area of Internet commerce. These have been mainly between trusted parties and only a handful of countries have started to develop and apply laws for electronic commerce to ensure the security of domestic users through regulations concerning the validity of electronic signatures and contracts. However, the awareness of the possibilities of exploiting electronic commerce applications with advantage has increased significantly, and many more countries have indicated their intention to take initiatives in this area.

15. In the area of finance, the computerization of banks in the ESCAP region has been fairly extensive and is continuing to deepen to enhance customer service, save on costs and improve credit assessment procedures. For example, the number of ATMs is expected to expand from an estimated 700,000 today by at least 50 per cent within five years. Smart cards of various sorts are making their appearance in countries such as the Republic of Korea, Singapore and Thailand. Telebanking has grown, and Internet banking is beginning to emerge but has been slowed by legal limitations.

16. The more developed securities exchanges in the region are increasingly using electronic trading systems with "floorless" markets. However, many such exchanges in the region have yet to fully realize the benefits of ICT for trading, including the use of Internet trading, to widen the participation in their markets and to attract more small local investors. The recent volatility in stock prices in the region has led many exchanges and their regulatory authorities to take a new look at the rules governing supervision of trading and have adjusted them towards more intensive, ICT-based scrutiny processes, such as circuit breakers, to contain problems of unwarranted or extreme volatility. However, many markets remain thin and illiquid.

17. Central banks and monetary authorities have been increasing the use of ICT in undertaking the supervisory functions for the domestic financial system in terms of reporting mechanisms and information flows. The financial crisis in Asia has stimulated them to take this further, which they are doing with the assistance of international financial institutions, and are widening the scope of monitoring to include the flows of investment funds in and out of the country. At the international level, ICT underpins the initiatives of the International Monetary Fund (IMF) and the Asian Development Bank (ADB) to develop early warning systems in which several of the countries of the region are participating.

18. There are several constraints facing developing countries which affect the spread of applications of ICT. Many of the applications are of very recent origin and it will take some time for them to be absorbed by potential users and by regulators. Further, the technologies and possible applications are changing rapidly, which makes it difficult to keep up, especially in less developed economies. There are frequently problems associated with connectivity. These involve lack of infrastructure, problems with

its reliability and relatively high costs of access. This last point is particularly important for micro, small and medium-sized enterprises, where currently the cost of linking up with an ICT application appears to outweigh the potential benefits.

19. There are limitations arising from the underdeveloped state of markets for electronic equipment, both hardware and software – either very limited availability of products or a lack of competition. There are also problems associated with a scarcity of appropriately skilled personnel to handle the operations. These add to the costs of trying to modernize the ways of conducting business. Further, in many countries, there is a lack of software available in the local language, or any standards for terminology, both of which negatively affect the willingness of many to use the applications.

20. There are constraints connected with limitations of existing legal systems which were not designed to cope with ICT-based processes. For ICT to be applied more widely for trade purposes, for example, regulations concerning the validity of electronic signatures and contracts, the role of electronic keys and certification authorities and modalities for the protection of the integrity of messages will have to be adopted. While some countries in the region have started to address these legal issues, most have not, and pilot projects are probably the most appropriate way of starting the process.

B. Risks to economic security associated with applications of ICT

21. The issue of whether the increasing application of ICT threatens the economic security of countries, particularly developing countries, is a serious one. The easier access to real time information worldwide through applications of ICT implies that fewer, if any, countries can isolate themselves from the effects of world economic events and trends, nor can they formulate economic policies without being responsive to outside signals. The distinction between a country's international and domestic economic policies is becoming more and more blurred; all macroeconomic policies have increasingly become international ones.

22. The new applications of ICT have further spurred globalization of production systems, especially through FDI by transnational corporations. The componentization of production, facilitated by ICT, increases the possibilities for a larger number of developing countries to attract such investment. Thus there are new vulnerabilities facing domestic industries in an ICT-intensive world, three of which appear to be of immediate concern. First, as the position of foreign corporations in the production structures of many industries is likely to become more pervasive, there is a risk that it will be more difficult to stimulate the development of local entrepreneurship. Modalities for addressing the stimulation of local enterprises which are compatible with the trade-related investment measures (TRIMs) and trade-related aspects of intellectual property rights (TRIPs) and other relevant agreements under the World Trade Organization (WTO) will need to be strengthened in order for these entrepreneurs to become competitive or be able to develop cooperative relationships with TNCs.

Second, there are balance-of-payments risks in that the inflows of capital through FDI or other forms do not necessarily match outflows of remittances of various sorts, and there are likely to be periods of unanticipated deficits on the capital account, and sometimes even prolonged deficits. One way of addressing this is to try to encourage flows more into tradable sectors than non-tradable sectors from which there are no foreign exchange receipts, and to exert some form of stabilizing influence on volatile components of foreign inflows. Third, the use of ICT means that production units become more footloose and a government cannot count on the presence of a TNC or even its domestic firms over the longer term as part of its development strategy unless it maintains the locational attractiveness of its economy. This puts added pressure on governments to ensure that the physical and governance infrastructure in their countries is viewed as competitive. There is even a risk of destructive competition whereby governments offer more and more inducements to enterprises to invest or stay in their country, unless there are some agreed rules of the game.

23. In the financial area there are significant risks that unless the financial sectors and institutions in a country are modernized and supervised in a fashion that takes into account the applications of ICT that allow funds to flow freely around the world, these sectors will continue to be illiquid and volatile. The domestic banking institutions will be hard-pressed to compete with international banks offering the advantages of ICT-based services. Securities markets that are not electronic and allied with other such markets or derivative markets are likely to suffer from stiff competition, and not be an attractive location in which to place funds for both domestic and foreign investors.

24. The broad challenge for governments is to facilitate a new balance between an ICT-dominated global market and local societies: one that will continue to unleash the creative energies of private entrepreneurship without eroding the social basis of cooperation. As ICT is a crucial parameter in this emerging paradigm, it is important that there be an understanding that countries, economies, enterprises and individuals will in fact be more threatened and marginalized by non-participation in the diffusion of ICT than by active participation in its development and its varied applications. ICT is a tool, it is not a threat in itself, but its application will determine whether it is an advantage or a problem. Enlightened policy initiatives can enhance the positive economic impact of ICT, resulting in the reduced marginalization of developing countries and of economically disadvantaged groups within each country.

III. POLICY ISSUES

A. National level

25. The experiences of countries to date indicate that obstacles to becoming an active adopter of ICT and a vigorous participant in the ICT era can be attributed to problems in learning processes, social and cultural barriers, policy-related or institutional limitations, including the legal/regulatory environment, and market imperfections. ICT policies are necessarily multidisciplinary and cut across several ministries. Thus, policy frameworks should clearly set priorities, promote training for the related human skills, improve the conditions of access, develop the infrastructure and construct an appropriate legal basis for operation. Some of these will inevitably involve assisting the development of local ICT markets and encouraging competition, breaking down monopolies and reducing the costs of connectivity. These costs are known to be particularly high in most developing countries and the use of ICT by small and medium-sized enterprises (SMEs), for example, will not be successful unless the costs are low enough. Other measures will have to concentrate on facilitating skills development, both through the basic education system and through more specific training related to ICT development and application.

26. It is important that progress in the application of ICT be driven by needs and national priorities, not by the technology itself, no matter how dazzling it may be. In policy development, therefore, there needs to be active participation by different user groups to incorporate their specific requirements and circumstances in the national information network. Much work is needed at the national level to sort out legal problems related to the concerns of users that business conducted through electronic means, including the Internet, is both secure and legally valid. Efforts are also needed to develop local language content, and to establish standards which facilitate the inter-operability of systems within and outside the country. The government can act as an example by introducing ICT applications in its own administration to good effect. Such uses can help improve efficiency as well as increase information flows with civil society. For this it needs a good ICT policy of its own, as now exists in, for example, Malaysia and Singapore.

27. National policies in the trade area which are crucial include the adoption of electronic data interchange modalities to speed up and simplify customs clearance; to initiate steps towards seamless integrated trade transactions; to use ICT to assist with trade and investment promotion, especially for SMEs; to develop pilot Internet commerce programmes and to work on making the necessary changes or additions to laws and regulations. National policies for the financial sector are varied and include the encouragement of more intensive and wider use of ICT for customer services provided by banks, computerization and linking of offices of banks and interbank operations and development of ICT-based monitoring and reporting mechanisms. The increased application of ICT in securities markets also needs official encouragement through facilitating the necessary legal and regulatory changes, assisting

with instituting modern measures to counter extreme volatility, and encouraging the expansion of the access of small local investors to these markets via ICT.

28. National policies in the ICT area are closely tied to globalization issues and so have to be in tune with international actions if an economy is to derive maximum benefits.

B. International and regional levels

29. The development of international policies related to ICT has been addressed to date in a rather piecemeal fashion, dominated by the more advanced countries and market-leading firms. It is recognized, however, that there is a need for an international policy framework to provide, *inter alia*, universally accepted codes of conduct, so that the use of ICT can be supportive of the development efforts of developing countries. In this area, there is simultaneously a need for competition and for coordination. The framework has to cover both aspects and include the broad issues of transborder data flows, international trade in information services, standards of both a technical and a regulatory nature, access to information technology know-how and markets, intellectual property rights, and donor coordination in ICT-related assistance. It has to address problems of trade barriers and inadequate internationally accepted legal structures as well as problems with the global technical infrastructure.

30. In terms of areas of cooperation, one of the most important is coordination of standards and regulations on the use of the Internet. Without agreements in these areas, connectivity between countries and inter-operability among systems cannot be assured. Breaks in the system may negate the advantages of diffusion of information and of rapid communication. Cooperation is also important in the area of transparency and transborder data flows so that access to information is not blocked at national borders. This is vital if trade and financial markets are actually to be global in nature. Information on regulations of all sorts, market requirements and product information etc. must be accessible to all parties, as must price information and stock/bond values. Since Internet commerce relies to a large extent on trust among the parties, international agreements on modalities for the recognition of the legal validity of electronic signatures and contracts are essential. As doing business over the Internet is new and still extremely limited, it might be preferable to start with some regional agreements to facilitate trade deals and gain experience and confidence. This might help overcome some of the technical problems in a substantive and iterative manner.

31. International cooperation on financial markets and the global financial architecture is under discussion in several forums. Most of the proposals emanating from those forums would rely heavily on the use of ICT as a monitoring and regulatory tool. However, no proposal suggests going back to non-electronic markets. Therefore one item which should be on the agenda is more cooperation between supervisory authorities on the implications of Internet-based, off-exchange trading, use of networks, the new alliances among stock and derivative exchanges across countries, and the blurring of distinctions

between financial markets of various types. There is a need to set some international modalities for the regulation of these new global cyberspace markets, as they may easily fall between jurisdictions.

32. One proposal for addressing the volatility and uncertainty in country-level financial markets, given their lack of breath and depth, is to develop a regional integrated electronic financial market that can provide sufficient volume of business and number of listings etc. to counterbalance, at least partially, the power of institutional investors. A first step towards this which would also help alleviate speculative attacks and enhance market efficiency would be to develop for the region standards for rules and regulations on stock markets and for supervisory authorities which are ICT-based.

33. Regional cooperation holds promise in several areas, such as common training facilities; standards for inter-operability issue; infrastructure; legal approaches; and regional software development for common problems or languages. There is scope for regional efforts in developing cooperation in technology capability, transfer and innovation. In addition, efforts to implement ICT-related trade and finance practices could start from regional or subregional exercises and exchange of experience.

34. Of particular importance to developing countries is the issue of access to ICT, as technology-exporting countries may attempt to restrict the flow of advanced technologies to the developing countries on security or competitive grounds. Developing countries may thus have to take an active role in the WTO negotiations on trade in information services and to be well briefed on the possible implications of the decisions for their own development efforts.

35. International and regional agencies have an important role to play as advisers, referees or supervisors in assisting developing countries. As advisers, they can help in articulating interests and concerns in various international forums, and in shaping their national responses to these issues. Through this role, they can also accelerate the learning process, within and among countries, and help diffuse the lessons of experience and best practices in the acquisition and use of ICT. As referees, they can provide information and influence to strengthen the negotiating capabilities of developing countries in technology acquisition in a supplier-dominated market. In addition, international agencies can be assigned the role of international supervisors and enforcers of agreed codes of conduct.