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Within that context, this report provides essential information on the status of the information society in the ESCWA region, thereby assisting decision makers in their planning and enhancing national capacities for implementing such a society, and providing researchers with reference information for analysis. Moreover, it allows national authorities to compare their current status with that of other countries in the region in order to promote opportunities for cooperation and regional integration in an increasingly knowledge-based global economy.

The report was prepared by a team comprising all staff members of the ICT Division at ESCWA, led by Rami Zaatari under the direct supervision of Nibal Idlebi, Chief, ICT Applications Section, and overall guidance of Yousef Nusseir, Director, ICT Division. A peer review of the report was conducted by Mansour Farah, ICT Consultant.

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Feedback and comments from readers are welcome via e-mail at escwa-ictd@un.org.

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ABBREVIATIONS AND EXPLANATORY NOTES

3G	Third generation
AAG	Arab Advisors Group
AAU	Al-Ahliyya Amman University
ADNS	Arabic Domain Name System
ADSL	Asymmetric digital subscriber line
AECI	Agencia Espanola de Cooperacion Internacional (Spanish Agency for International Cooperation)
AICTO	Arab ICT Organization
AIDS	Acquired immune deficiency syndrome
AITRS	Arab Institute for Training and Research in Statistics
ALECSO	Arab League Educational, Cultural and Scientific Organization
Amanak	Arab Internet Safety Portal
ANCE	Agence Nationale de Certification Electronique
ANODE	Arab Network for Open and Distance Education
AOU	Arab Open University
ARO	Arab Regional Office
ASEZA	Aqaba Special Economic Zone Authority
ASREN	Arab States Research and Educational Network
AT	Assistive technology
ATICM	Arab Telecommunications and Information Council of Ministers
ATM	Automated teller machine
ATN	Apollo Telemedicine Network
B2B	Business to business
B2C	Business to consumer
B2G	Business to Government
BATELCO	Bahrain Telecommunications Company
BBC	British Broadcasting Corporation
BEA	Bahrain eContent Award
BIX	Bahrain Internet Exchange
BOT	Build-operate-transfer
BSA	Business Software Alliance
BWA	Broadband wireless access
CAIT	Central Agency for Information Technology
CBB	Central Bank of Bahrain
CCC	Consolidated Contractors Company

CCII	Cellular Competition Intensity Index
ccTLD	Country code top-level domain
CD	Compact disc
CEI	Cisco Entrepreneur Institute
CERT	Computer emergency response team
CIS	Commonwealth of Independent States
CITC	Communications and Information Technology Commission
CMC	Communications and Media Commission
CMIC	Cairo Microsoft Innovation Centre
CMS	Content management system
CO^2	Carbon dioxide
CoEIA	Centre of Excellence in Information Assurance
CPI	Cyber Peace Initiative
CRC	Community Knowledge Centre
CRI	Computer Research Institute
CRTD-A	Collective for Research and Training on Development – Action
CSTD	Commission on Science and Technology for Development
CTSP	Community Technology Skills Programme
CULTNAT	Centre for Documentation of Cultural and National Heritage
DAC	Digital Arabic Content
DMCM	Data Mining and Computer Modelling Centre of Excellence
DNS	Domain Name System
DSG	Dubai School of Government
DSL	Digital subscriber line
DSP	Data service provider
EBU	European Broadcasting Union
ECA	Economic Commission for Africa
ECE	Economic Commission for Europe
ECLAC	Economic Commission for Latin America and the Caribbean
EDI	Electronic Data Interchange
EDSP	Education Development Strategic Plan
EELU	Egyptian E-Learning University
eGA	eGovernment Authority
EGS	Egyptian Geographic Society

eGSC	e-Government National Steering Committee
ELCC	E-Learning Competence Centre
EMEA	Europe, Middle East and Africa
EMV	Europay International, MasterCard International and Visa International
ePG	ePayment Gateway
EPUB	Electronic publication
ESCAP	Economic and Social Commission for Asia and the Pacific
ESCWA	Economic and Social Commission for Western Asia
ESPISP	Emergency Social Protection Implementation Support Project
ETC	ESCWA Technology Centre
EUN	Egyptian Universities Network
FAJ	Federation of Arab Journalists
FALCON	FLAG and Alcatel Lucent Optical Network
FBWA	Fixed broadband wireless access
FDI	Foreign direct investment
FIRDOS	Fund for Integrated Rural Development of Syria
FLAG	Fibre-optic Link around the Globe
FO	Fibre optic
FOSS	Free and open source software
FTTH	Fibre to the Home
FWA	Fixed wireless access
FWS	Fixed wireless services
G2G	Government to Government
GAID	Global Alliance for ICT and Development
Gbps	Gigabit per second
GBI	Gulf Bridge International
GCC	Gulf Cooperation Council
GDCO	Gedaref Digital City Organization
GDP	Gross domestic product
GE	General Electric
GEI	Global education initiatives
GII	Global Innovation Index
GIP	Graduate Internship Programme
GIS	Geographic information system

GITR	Global Information Technology Report
GNI	Gross national income
GPD	Global Partnership for Development
GRP	Government resource planning
GSD	General Security Directorate
GSM	Global System for Mobile Communications
gTLD	Generic top-level domain
GUST	Gulf University for Science and Technology
HBMeU	Hamdan Bin Mohammed e-University
HCST	Higher Council for Science and Technology
HD	High definition
HDI	Human Development Index
HDR	Human Development Report
HEC	Hourani E-Learning Centre
HIAST	Higher Institute for Applied Sciences and Technology
HID	Health Information Directorate
HIV	Human immunodeficiency virus
HMC	Hamad Medical Corporation
IBM	International Business Machines
ICANN	Internet Corporation for Assigned Names and Numbers
ICDL	International computer driving licence
ICT	Information and communications technology
ICT4D	ICT for Development
ICTAC	ICT Advisory Council
ICTDAR	Information and Communications Technology for Development in the Arab Region
ID	Identity
IDC	International Data Corporation
IDN	Internationalized domain names
IFJ	International Federation of Journalists
IGF	Internet Governance Forum
IJMA3	Union of Arab ICT Associations
ILD	International long distance
ILO	International Labour Organization
IMEWE	India-Middle East-Western Europe

INSEAD	Institut Européen d'Administration des Affaires (European Institute of Business Administration)
INT@J	Information Technology Association of Jordan
INTALEQ	Innovations in Technology-assisted Learning for Educational Quality
IP	Internet protocol
IPB	ICT Price Basket
IPR	Intellectual property right
IPTV	Internet Protocol Television
IPv6	IP version 6
IREX	International Research and Exchanges Board
ISC	Internet Systems Consortium
ISOC	Internet Society
ISP	Internet service provider
ISPER	Information Society Portal for the ESCWA Region
IT	Information technology
ITA	Information Technology Authority
ITI	Information Technology Industry
ITIDA	Information Technology Industry Development Agency
ITU	International Telecommunication Union
JADI	Jeddah-Amman-Damascus-Istanbul
JEI	Jordan Education Initiative
JHI	Joint Health Initiative
KACST	King Abdul Aziz City for Science and Technology
KAM	Knowledge Assessment Methodology
KFUPM	King Fahd University of Petroleum and Minerals
KKU	King Khalid University
KN4DC	Knowledge Networks through ICT Access Points for Disadvantaged Communities
KNet	Knowledge Net Qatar
KPI	Key performance indicators
KSA	Kingdom of Saudi Arabia
KSU	King Saud University
LAN	Local area network
LCMS	Learning content management system
LDG	Lebanon Development Gateway
LLU	Local loop unbundling

LMS	Learning management systems
LTE	Long-term Evolution
Ma3bar	Arab Support Centre for Free and Open Source Software
Mada	Qatar Assistive Technology Centre
Mbps	Megabit per second
MDG	Millennium Development Goal
MEEA	Middle East e-Learning Association
MENA	Middle East and North Africa
MGM	Metro Goldwyn Mayer
MHz	Mega Hertz
MICE	Meetings, incentives, conferences and exhibitions
MiGS	MasterCard Internet Gateway Service
MMS	Multimedia messaging service
MNO	Mobile network operator
MoC	Ministry of Communications
MoCI	Ministry of Communications and Information
MoCIT	Ministry of Communications and Information Technology
MoCT	Ministry of Communications and Technology
MoE	Ministry of Education
MoEHE	Ministry of Education and Higher Education
MoH	Ministry of Health
MoHE	Ministry of Higher Education
MoHP	Ministry of Health and Population
MoICT	Ministry of Information and Communications Technology
MoIM	Ministry of Interior and Municipalities
MoL	Ministry of Labour
MoPH	Ministry of Public Health
MoSA	Ministry of Sports Affairs
MoST	Ministry of Science and Technology
MoU	Memorandum of Understanding
MSAD	Ministry of State for Administrative Development
MSE	Micro and small enterprises
MSI	Media Sustainability Index
MSP	Multisector partnership

MTIT	Ministry of Telecommunication and Information Technology
MVNO	Mobile virtual network operators
N/A	Not applicable
NANS	National Agency for Network Services
NCEL	National Centre of E-learning and Distance Learning
NCITP	National Communications and Information Technology Plan
NFWS	National Fixed Wireless Service
NGO	Non-governmental organization
NHA	National Health Authority
NIC	National Information Centre
NICTP	National Information and Communication Plan
NIS	National ICT Strategy
NITC	National Information Technology Centre
NITTA	National IT Training and Awareness Framework
NPFOSST	Programme for Free Open Software Technologies
NRI	Networked Readiness Index
NTC	National Telecommunication Corporation
NTIP	New Technology Infrastructure Project
NTRA	National Telecommunications Regulatory Authority
OB	Observer
ODLC	Open and Distance Learning Centre
OECD	Organisation for Economic Co-operation and Development
OeGAF	Oman e-Government Architecture Framework
OMSAR	Office of the Minister of State for Administrative Reform
OPEC	Organization of the Petroleum Exporting Countries
OWA	Oman Woman Association
PC	Personal computer
PCT	Patent Cooperation Treaty
PDF	Portable document format
PEI	Palestinian Education Initiative
PFI	Press Freedom Index
PFS/DSP	Public Fixed Services/Data Service Provider
PIN	Personal identification number
PISA	Programme for International Student Assessment

PKI	Public key infrastructure
PLT	Patent Law Treaty
PoS	Points of sale
PPP	Public-private partnership
PRDP	Palestinian Reform and Development Plan
PREMPC	Pre-employment Health Check Automation Project
PTC	Public Telecommunication Corporation
Q-CERT	Qatar - Computer Emergency Response Team
QF	Qatar Foundation
QMDI	Qatar MICE Development Institute
QSTec	Qatar Solar Technologies
QSTP	Qatar Science and Technology Park
RDI	Research, development and innovation
Reefnet	Rural Knowledge Network
RFP	Request for proposals
RPoA	Regional Plan of Action
RSS	Really simple syndication
RWB	Reporters Without Borders
SCH	Supreme Council of Health
SCICT	Supreme Council of Information and Communication Technology
SCS	Syrian Computer Society
SEC	Supreme Education Council
SEA-ME-WE	South East Asia-Middle East-Western Europe
SMC	Salmaniya Medical Complex
SME	Small and medium enterprise
SMS	Short message service
SSL	Secure sockets layer
STC	Saudi Telecom Company
STE	Syrian Telecommunications Establishment
STI	Science, technology and innovation
SVU	Syrian Virtual University

TCCM	Total Country Connectivity Measure
Tbps	Terabit per second
TE	Telecom Egypt
TGN	Tata Global Network
TIEC	Technology Innovation and Entrepreneurship Centre
TLD	Top-level domain
TPD	Teacher Professional Development
TRA	Telecommunications Regulatory Authority
TRC	Telecommunications Regulatory Commission
TRIPS	Trade-related Aspects of Intellectual Property Rights
TSA	Telecommunications Supervisory Authority
TWFS	Transactions and Workflow Management System
UAE	United Arab Emirates
UIS	UNESCO Institute for Statistics
UKS	Universal knowledge solutions
UNCTAD	United Nations Conference on Trade and Development
UN/DESA	United Nations Department of Economic and Social Affairs
UNDP	United Nations Development Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNPAN	United Nations Public Administration Network
UNPSA	United Nations Public Service Award
UNRWA	United Nations Relief and Works Agency for Palestinian Refugees in the Near East
UNU	United Nations University
URL	Universal resource locator
USAID	United States Agency for International Development
USB	Universal serial bus
USPTO	United States Patent and Trademark Office
VC	Venture capital
VoD	Video on demand
VoIP	Voice over Internet protocol
VSAT	Very small aperture terminal
WAN	Wide area network
WBN	Wireless broadband network
WBU	World Broadcasting Unions

WCKC	Women's Community Knowledge Centre
WCT	WIPO Copyright Treaty
WEF	World Economic Forum
WHO	World Health Organization
WHOP	Women Health Outreach Programme
Wi-Fi	Wireless fidelity
WiMAX	Worldwide Interoperability for Microwave Access
WIPO	World Intellectual Property Organization
WIT	Woman in Technology
WITSA	World Information Technology and Services Alliance
WLAN	Wireless local area network
WLAR	World Links Arab Region
WLL	Wireless local loop
WPPT	WIPO Performances and Phonograms Treaty
WSA	World Summit Award
WSIS	World Summit on the Information Society
WTISD	World Telecommunication and Information Society Day
WTO	World Trade Organization

Introduction

Global changes are taking place at the economic, social and cultural levels, with information and knowledge playing a major role in the move towards the information society. The accelerating development in knowledge during the past few decades has modified the principles of economic growth with the move towards a knowledge-based economy affecting all sectors of the economy.

The information society is a society that processes information efficiently in its socio-economic development, including the production, exchange, adaptation and use of information for the purpose of development and the enhancement of the quality of life and work environment for all citizens. In order to realize the information society, information and communications technologies (ICTs) need to be used. While ICTs are necessary, they are not sufficient, given that capacity-building must equally be enhanced in knowledge-related areas covering economic, social, legal, educational and research.

Significant differences exist in the capacity of countries to adapt to changes in technology and knowledge. Consequently, the move towards the information society constitutes a real challenge to developing countries, particularly in view of the expanding digital divide with developed countries, thereby rendering them increasingly vulnerable to reduction in productivity and economic capacity. This leads, in turn, to unemployment, poverty, corruption and marginalization.

In this context, the General Assembly adopted resolution 56/183 in December 2001 to endorse a proposal presented by the International Telecommunication Union (ITU), which aimed at convening the World Summit on the Information Society (WSIS) under the patronage of the Secretary-General of the United Nations. The Summit aimed to reduce the digital divide by increasing awareness regarding the benefits of the information society, and by presenting mechanisms to help developing countries advance towards such a society within the context of the global knowledge-based economy. WSIS was divided into two phases, namely: (a) the first Summit (Geneva, 10-12 December 2003), which resulted in a Declaration of Principles and a Plan of Action; and (b) the second Summit (Tunis, 16-18 November 2005), which focused on the implementation of the Plan of Action, financing mechanisms for using ICTs for development, Internet governance issues, and follow-up to the first Summit.

It is crucial for member countries of the Economic and Social Commission for Western Asia (ESCWA) to build information societies if they aspire to lay the foundations for sustainable economic development and achieve the Millennium Development Goals (MDGs). Accordingly, ESCWA organized the Second Regional Preparatory Conference for WSIS (Damascus, 22-23 November 2004) under the motto "Partnership for Building the Arab Information Society". The Conference resulted in a Regional Plan of Action (RPoA), which dealt with various issues relating to the development of an information society in the region.[1] Additionally, the Conference produced the Damascus Call: Towards Partnership for Building the Arab Information Society, which aimed at providing strategic support to implement regional projects and solid foundations for building this society. Another conference on the Regional Follow-up to the Outcome of the World Summit on the Information Society was held in Damascus, 16-18 June 2009, to provide a forum where various WSIS stakeholders in the ESCWA region were able to meet to present, discuss and review the progress made towards the implementation of the eleven WSIS action lines, as well as the execution of the RPoA for Building the Information Society. The conference resulted in updating the RPoA; launching the Global Alliance for ICT and Development (GAID) Regional Arab Network;[2] and adopting the Damascus Proclamation for the Promotion of the Arab Knowledge Society for Sustainable Economic and Social Development.

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[1] ESCWA. 2004. *Regional Plan of Action for Building the Information Society* (E/ESCWA/ICTD/2004/4).

[2] See: http://www.un-gaid.org/Networks/RegionalNetworks/RegionalArabicNetwork/tabid/1090/language/enUS/Default.aspx.

This report aims to depict the status of information societies in the ESCWA region, measure the progress made in building these societies and evaluate the current status of each member country.[3] With those objectives, comprehensive analysis is provided on the following: (a) role of Governments and all stakeholders in chapter I; (b) ICT infrastructure in chapter II; (c) access to information and knowledge in chapter III; (d) ICT capacity-building in chapter IV; (e) building confidence and security in the use of ICTs in chapter V; (f) enabling environment in chapter VI; (g) ICT applications in chapter VII; (h) cultural diversity and identity, linguistic diversity and local content in chapter VIII; (i) media in chapter IX; (j) regional and international cooperation in chapter X; (k) MDGs in chapter XI; (l) building the ICT sector in chapter XII; and (m) the regional and global comparative analysis and results in chapter XIII.

Following the first phase of WSIS, serious work spearheaded by international and regional organizations has been carried out to develop a methodology for measuring ICT and the information society. The Partnership on Measuring ICT for Development was launched in Geneva 2004 and its continuous work over the past five years has led to the development and adoption of a common list of core ICT indicators covering five main aspects of the information society, namely: ICT infrastructure and access; access to, and use of, ICT by households and individuals; use of ICT by businesses; the ICT sector and trade in ICT goods; and ICT in education.

Aspects of the information society evaluated by this report rely mainly on the WSIS action lines, in addition to other areas of interest to the ESCWA region. Each of chapter one through twelve is thus dedicated to a specific theme, providing a comprehensive analysis, evaluation and recommendations covering all ESCWA member countries.

While the work of the Partnership on Measuring ICT for Development has been the guiding measurement model for this report, such a model is a work in progress and has yet to cover more aspects of the information society. This stems mainly from the difficulties associated with measuring intangible concepts. For instance, there are neither specific indicators for measuring the "role of Governments and all stakeholders in building the information society" nor standard ones for measuring the progress in "building confidence and security in the use of ICTs".

For these reasons, the concept of maturity levels has been adopted for each of the major aspects comprising the information society in order to provide ESCWA member countries with benchmarks for assessing rather than comparing their status in building information societies. Specifically, four maturity levels are used for each aspect of the information society whereby level one indicates the lowest level of maturity and level four indicates the highest level of maturity. As such, the maturity level assessment results should be used by member countries as tools for identifying gaps, and outlining corrective measures rather than becoming the focus of national efforts dedicated to improving one's rank. The four subjective maturity levels cannot be translated into comparable statistical indicators.

Based on these results and recommendations, several initiatives and projects may be launched to reduce the existing digital divide both among ESCWA member countries and between the region and the more developed regions of the world. Within that context, ESCWA is fostering support for important regional projects through its RPoA. The RPoA has been signed by ESCWA member countries, cognizant of the vital need to collaborate and synchronize efforts in order to reduce the digital divide and press forward towards the information society.

[3] Based on the 2011 country profile reports of ESCWA member countries, which were prepared by national consultants and ESCWA staff and are available at: http://www.escwa.un.org/wsis/profiles.html.

I. THE ROLE OF GOVERNMENTS AND ALL STAKEHOLDERS IN BUILDING THE INFORMATION SOCIETY

The effective participation of Governments and all stakeholders is vital in developing the information society, which requires cooperation and partnerships among all of them. The processes of adopting proper policies and formulating strategies are essential for mobilizing all stakeholders from a cross-section of the public and private sectors and disseminating the opportunities created by the information society.

A. COMPARATIVE ANALYSIS

1. *National information society policies and e-strategies*

Almost all ESCWA member countries have realized WSIS recommendations concerning the formulation of national ICT strategies or e-strategies, as a thrust for building the information society. Some countries have taken the initiative to develop and continuously amend their strategy to cope with the economical growth and ICT advancement while others simply followed up on implementing adopted strategies supported by policymakers. The level of development towards an information society in the ESCWA region varies enormously depending on the economic status that each country holds. While some countries have already taken remarkable steps toward ICT development, others are just in their starting phase or are still encountering fundamental challenges due to insufficient ICT infrastructure and such prejudiced environment as political disputes. With the adoption of the national ICT strategy of Yemen in 2011, only Iraq remains without a formal strategy. Despite the efforts deployed in drafting the national ICT strategy of Iraq during 2007 encapsulating a four-year programme, endorsement of the strategy is not forthcoming. However, there is a sincere exertion to have it formally adopted by the end of 2011.[4] The various e-strategies in ESCWA member countries are summarized in table 1 indicating the status of the existing strategy, year of adoption and pace of implementation. Selected initiatives and strategies of some member countries, with highlights on their achievements, are also mentioned below.

TABLE 1. NATIONAL ICT STRATEGIES IN THE ESCWA REGION

Country or territory	Name of the current strategy	Government agency in charge	Year of adoption	Status	Pace of implementation[d/]
Bahrain	The Second National Telecommunications Plan - Decision No. (8) of 2008[a/]	Telecommunication Regulatory Authority	2008[b/]	Adopted[b/]	Excellent
Egypt	ICT Strategy 2007-2010[a/]	Ministry of Communications and Information Technology	2007[b/]	Adopted[b/]	Good
Iraq[c/]	ICT strategies 2007-2010	Ministry of Municipalities and Public Works	N/A	In progress	N/A
Jordan	National ICT Strategy of Jordan 2007-2011[a/]	Ministry of Information and Communications Technology	2007[b/]	Adopted[b/]	Good
Kuwait	National Strategy for Building an Information Society[a/]	Central Agency for Information Technology	2005[b/]	Adopted	Good
Lebanon	National e-strategy for Lebanon[a/]	Office of the Minister of State for Administrative Reform (OMSAR)	2008[b/]	Adopted[b/]	Limited

[4] See: http://www.iraqsecuritysummit.com/.

TABLE 1 (*continued*)

Country or territory	Name of the current strategy	Government agency in charge	Year of adoption	Status	Pace of implementation[d/]
Oman	Digital Oman Government Strategy[a/]	Information Technology Authority (ITA)	2003[b/]	Adopted[b/]	Good
Palestine[f/]	National ICT Strategy	Ministry of Telecom and Information Technology	2004	Adopted	Limited
Qatar	Qatar National ICT Strategy[a/]	Supreme Council of Information and Communication Technology (ictQATAR)	2005[b/]	Adopted[b/]	Excellent
Saudi Arabia	The National Communications and Information Technology Plan (NCITP)[a/]	Ministry of Communications and Information Technology	2007[b/]	Adopted[b/]	Good
The Sudan	The Sudan National Strategy for ICT Industry[a/]	National Centre for Strategic Planning	2007[b/]	Adopted[b/]	Good[b/]
Syrian Arab Republic	ICT Strategy for Economic and Social Development[a/]	Ministry of Communications and Technology	2004[b/]	Adopted[b/]	Average
United Arab Emirates	General Policy for the Telecommunications Sector in the State of the United Arab Emirates (2006-2010)[a/]	The Government of each Emirate	2006	Adopted	Excellent
Yemen	Information Technology Master Plan for Yemen[a/]	National Information Centre (NIC)	2011[b/]	Adopted[b/]	N/A[c/]

N/A: Not applicable.

Notes: a/ Derived from ITU Publication: National e-Strategies for Development Global Status and Perspectives 2010.

b/ Data extracted from the national profiles of the information society in ESCWA member countries for the years 2007-2011.

c/ Still early for evaluation since only adopted in March 2011.

d/ Compiled by ESCWA based on assessments made by consultants appointed by member countries.

e/ See: http://www.iraqsecuritysummit.com/.

f/ See: http://www.mtit.gov.ps/new/index.php?option=com_content&view=article&id=412&Itemid=21.

Bahrain updated its strategy in 2008, Egypt for the period 2007-2010, Jordan for the period 2007-2011,

Lebanon upgraded its strategy in 2008 and Saudi Arabia in 2007.

The Bahraini e-Government strategy for 2007-2010 focused on ensuring effective delivery of Government services to citizens, residents, businesses and visitors (customers). The e-Government strategy is summed up by: delivering customer value through collaborative Government". The concept of collaborative Government goes beyond Government as much as it also includes the private sector and the non-governmental sector. In order to ensure that the success of the vision can be measured and monitored, the strategy clearly defined its expected outcomes and targets. An action plan with strategic priorities has been identified for implementation during 2007-2010 to ensure achieving targets.

Egypt, by fulfilling the expected targets and goals outlined in the previous strategy for 2007-2010, has decided to move to the next level to enhance the global competitiveness position of the country in the ICT sector, becoming the primary regional hub for innovation by 2020. In that context, a new strategy has been developed and published in the Technology Innovation and Entrepreneurship Strategy 2011-2014 document.

It details the strategic plan to positively influence development in Egypt through the growth of a vibrant and innovative ICT sector. This will be achieved by focusing on the following four goals:

- Enabling the establishment of ICT companies to operate and to innovate in Egypt;
- Enticing foreign and local ICT companies to generate, enrich and expand on innovative ideas;
- Building Egypt's brand as a regional hub for innovation;
- Engaging diverse stakeholders in the task of generating, financing, supporting and deploying ICT related innovation.

Apparently, the implementation of such a plan is challenging in light of the new political changes. However, if the political environment is enabled, the plan implementation can boost the ICT sector and industry significantly, and will positively affect the ranking of Egypt in the World Economic Forum (WEF).

In Jordan, since the launch of the National ICT Strategy (NIS) in 2007[5] for a five-year mandate, the ICT sector has progressed towards achieving the designated objectives to promote economy growth and enhance the quality of life of citizens. Three measurable high-level strategic indicators were defined as milestones to be attained by the end of the year 2011, aiming to bridge the digital divide and focusing on four main pillars: connectivity; research and development; labour issues and education; and regulation and investment climate. Table 2 summarizes the status of development for each of the targets from 2007 till 2011. Moreover, the Ministry of Information and Communications Technology is looking forward, in partnership with major stakeholders from the private sector, to revise its strategy and set a relevant action plan to accommodate the local, regional and international ICT market changes.[6]

TABLE 2. ICT-SECTOR ACHIEVEMENT OF THE JORDAN NATIONAL ICT STRATEGY (NIS) STRATEGIC GOALS

Strategic indicator	2007	2009	2010	End of 2011 target
Internet usage penetration (percentage)	11	29	38[a/]	50
ICT-sector revenues (US$ billions)	1.5	2.2	2[b/]	3
ICT-sector employment (jobs)	16 000	22 000	..	35 000

Sources: ESCWA. 2011b. *National Profile of the Information Society in Jordan − 2011*; INT@J at: http://www.intaj.net.

Notes: Two dots (..) indicate that data are not available.

a/ ICT and ITES Industry Statistics and Yearbook, 2010.

b/ According to the Arab Advisors Group (AAG), the ICT sector revenues decreased by 15 per cent compared to 2009.

In Oman, the national digital strategy, known as eOman,[7] is supervised and implemented by ITA, which was established in May 2006 by Royal Decree No. 52/2006 and has played a significant role in complementing Oman's Economic Vision 2020.[8] ITA, as part of its mandate, has strived to improve the efficiency of Government services, enhance the activities of businesses, enrich individuals with competence and direct Oman towards becoming a sustainable knowledge-based economy. Several such infrastructure projects have been implemented to serve the purpose of eOman as launching of the official eGovernment

[5] See: http://www.intaj.net/sites/default/files/National-ICT-Strategy-of-Jordan-2007-2011_0.pdf.

[6] See: http://jordantimes.com/index.php?news=36667.

[7] See: http://www.ita.gov.om/ITAPortal/Info/FAQ_eOman.aspx.

[8] See: http://www.ita.gov.om/ITAPortal/ITA/strategy.aspx?NID=646&PID=2285&LID=113.

services portal[9] and National Data Centre,[10] establishing ePayment Gateway,[11] and connecting schools via very small aperture terminal (VSAT).[12]

The Supreme Council of Information and Communication in Qatar (ictQATAR) developed the National ICT Plan 2015 for Qatar[13] in 2011 under the theme Advancing the Digital Agenda in alignment with the Qatar National Vision 2030,[14] and the National Development Strategy 2011-2016.[15] The five-year plan will drive sustainable development, enhance lives of all members of society through ICT, and promote Qatar as a regional leader in Arab-originated digital content and a nation with leading knowledge-based economy. Five measurable goals to be accomplished by 2015[16] were set by ictQATAR, namely:

(a) ICT sector contribution of US$3 billion to the gross domestic product (GDP);
(b) Employees in the ICT sector to reach 40,000;
(c) 95 per cent high-speed/broadband access for household and the business sector;
(d) 90 per cent Internet penetration in all areas of Qatar;
(e) Attain 160 online governmental services for wide accessibility and effectiveness.

The National Information Centre in Yemen, with the support of ESCWA, formulated its national strategy and successfully adopted it in March 2011.[17] As part of its mandate, the strategy aimed to focus on ICT development that enables the Yemeni society to progress towards the information society by establishing a national information system to ensure the production and provision of information in all areas and communities and be supportive of the digital content industry. Recently, in light of the new political changes in the country, it is unlikely that the strategy will provide a major change in the ICT sector and reduce the digital divide. Nevertheless, if the political environment facilitates the mandates of the national strategy, it will work as a catalyst for ICT development in Yemen.

2. *Public-private partnerships and multisector partnerships*

Public-private partnerships (PPP) and multisector partnerships (MSP) play an important role in the development of the information society and the ICT sector in the ESCWA region. Such partnerships help to employ private-sector experience and resources for the enhancement of the ICT sector, by setting directives to supplement existing national policies and regulations and establishing educational and training institutions for capacity-building that help in business and career development. Although the research and development carried out by the private sector is limited, efforts to utilize innovative technology to support the disabled have been of interest for some countries. Examples of successful PPP implemented in the ESCWA region are addressed below.

ICT Advisory Council (ICTAC), which is a private-public sector committee in Jordan and chaired by the Minister of ICT, has played an important role in smoothing out the main challenges and constraints that

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[9] See: http://www.oman.om.

[10] See: http://www.ameinfo.com/194949.html.

[11] See: http://www.ita.gov.om/ITAPortal/MediaCenter/NewsDetail.aspx?NID=213.

[12] See: http://www.muscatdaily.com/Archive/Stories-Files/Transparent-e-services-the-way-forward.

[13] See: http://www.ictqatar.qa/en/news-events/news/ictqatar-publishes-qatar-s-national-ict-plan-2015.

[14] See: http://www.gsdp.gov.qa/portal/page/portal/GSDP_Vision_Root/GSDP_EN/What%20We%20Do/QNV_2030.

[15] See: http://www.gsdp.gov.qa/portal/page/portal/GSDP_Vision_Root/GSDP_EN/What%20We%20Do/Qatar%20National%20Strategy.

[16] Qatar's National ICT Plan 2015.

[17] ESCWA. 2011c. *National Profile of the Information Society in Yemen − 2011*.

have come across the ICT sector.[18] ICTAC has reflected positively upon the growth and development of ICT in Jordan by giving such directives which have been endorsed by the Jordanian Cabinet[19] as:

- Exempting Worldwide Interoperability for Microwave (WiMAX) companies, which provide broadband telecommunication services from annual frequency fees on condition that these exemptions reflect on the services provided to people either in terms of prices or expansion outside the capital;

- Exempting Fixed Broadband Wireless Access (FBWA) operators from customs for the equipment and element components deployed for WiMAX infrastructure in return for expanding their network in the rural areas;

- Unifying sales tax on Internet connections for households and enterprises to 8 per cent regardless of technology used;

- Exempting revenues generated by IT exports and business outsourcing from income tax.

Another PPP example, in Jordan, are the strategic agreements signed between such international ICT companies as Cisco, Microsoft and Oracle, with the Government of Jordan. These agreements allow the Ministry of ICT to harness the experience and technology of the companies in building the competence of the public-sector employees in addition to providing ICT training and an innovative internship programme for fresh graduates. As a result, Microsoft, as part of the e-Government project, established the national public key infrastructure[20] (PKI) and provided ICT internship opportunities for fresh graduates.

In Lebanon, Cisco, in collaboration with AMIDEAST, which is a leading American educational and training organization, planned to establish the Cisco Entrepreneur Institute (CEI) in May 2010. By the third quarter of 2011, CEI will have commenced its first workshop[21] that teaches entrepreneurs how to maximize the development of their businesses and make the most efficient use of their facilities to benefit themselves and the community.

Around mid-January 2011, ITA partnered with Omantel and several private ICT companies in order to supply Omani citizens with a bundled package, known as the Royal Grant.[22] This is part of the eOman strategy to increase Internet penetration in Oman and provide citizens with means of access to ICT services and the required skills. Each package consisted of a personal computer or laptop with accessories, computer-literacy training voucher and one-year free Internet connection with monthly download bandwidth of one gigabit per second (Gbps).[23] As of January 2011, the grant covered 25,056 beneficiaries form different districts of Oman.[24]

A successful example of PPP is the establishment of the Qatar Assistive Technology for Disabled People, Mada Qatar, in June 2010. ictQATAR partnered with Qtel, Vodafone Qatar, Microsoft, the Shafallah Centre for Children with Special Needs and the Qatar National Bank from the private sector to provide a range of ICT tools to help people with physical and learning disabilities improve their capability to interact with their society. Such partnership empowered Mada with the expertise of ICT leaders and benefited from

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[18] ESCWA. 2011b.

[19] Ibid.

[20] See: http://www.moict.gov.jo/MoICT_StrategicAgreements.aspx.

[21] See: http://www.amideast.org/lebanon/professional-development/cisco-entrepreneur-institute-amideastlebanon.

[22] See: http://main.omanobserver.om/node/37408.

[23] See: http://www.ita.gov.om/ITAPortal/MediaCenter/NewsDetail.aspx?NID=347.

[24] See: http://m.gulfnews.com/news/gulf/oman/date-set-for-distribution-of-oman-royal-grant-1.750379.

the contribution of the Qatar National Strategy. Since 2010, Mada has helped more than 300 disabled people in identifying the adequate assistive technology, hence to provide the right training so as to serve their needs.[25]

Saudi Arabia realizes the importance of engaging PPP in the implementation of several ICT projects to supplement its efforts towards the achievement of its national ICT plan espoused in 2007.[26] Thus, several such projects and programmes as the Electronic Data Interchange (EDI) for e-Trade, SaudiEDI,[27] and the e-Government project YESSER have been launched with the support of the private sector.[28] As a result, Saudi Arabia won the United Nations award for the YESSER project for the improvement of the provision of public services.

3. *Role of non-governmental organizations*

The role of non-governmental organizations (NGOs) in the ESCWA region has focused mainly on establishing ICT community centres, communities of interest and societies to build competence and skills in the field of ICT and increase computer literacy. NGOs also organize regional and international forums that serve as a catalyst for socio-economic growth and development, and to empower women with ICT.

With the support of the United States Agency for International Development (USAID), the Information Technology Association of Jordan (INT@J), which is an NGO founded in the year 2000 to empower the Jordanian ICT sector, has assisted in the development of the 2007-2011 NIS.[29] Recently, INT@J, in coordination with ICTAC, has supported and organized several ICT events to promote Jordan as a leading regional and international ICT hub by providing capacity-building programmes, carrying out local, regional and international marketing events and offering members with value-added services that help them in developing their economy. In 2009, INT@J initiated the Graduate Internship Programme (GIP),[30] aiming to increase employment and provide fresh graduates with the capability needed in the ICT sector. The initiative was then followed by a partnership with Microsoft to launch the Community Technology Skills Programme (CTSP) in 2010.[31] Moreover, INT@J conducted several such forums in Jordan as the Middle East and North Africa (MENA) ICT Forum in 2010,[32] the ICT trade mission to Oman in January 2011[33] and an awareness event entitled ICT in Manufacturing in May 2011.[34]

In Oman, there are six groups of NGOs under the patronage of the Ministry of Social Development that tackled significant social problems and utilized ICT techniques in resolving the situation. For example, Oman Woman Association (OWA), in order to bridge the digital divide, adopted Woman in Technology (WIT) and Community Knowledge Centre (CRC) initiatives, and trained around 5,000 women on basic IT skills. Another group of NGOs have focused on the disabled children community and worked closely with ITA to provide them with ICT skills and tools that will help them to fully integrate in society. For this

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[25] ESCWA. 2011d. *National Profile of the Information Society in Qatar − 2011*.

[26] See: http://www.mcit.gov.sa.

[27] See: http://www.saudiedi.com.

[28] See: http://www.yesser.gov.sa/ar/Pages/default.aspx.

[29] ESCWA. 2011b.

[30] See: http://www.intaj.net/node/389.

[31] See: http://microsoftfeed.com/2010/microsoft-jordan-sponsors-graduate-internship-program-through-intj/.

[32] See: http://www.intaj.net/content/jordan-announces-launch-mena-ict-forum%E2%84%A2-2010.

[33] See: http://www.intaj.net/content/trade-mission-oman.

[34] See: http://www.intaj.net/content/intj-held-awareness-event-entitled-%E2%80%98-ict-manufacturing-%E2%80%99.

purpose, ITA has launched an online donations portal[35] to receive contributions from interested charitable societies. By 2009, a total of 2,624,400 Omani Rials in donations were registered on the portal.[36]

In order to promote ICT relations between Lebanon and the United States with the confidence that ICT will serve as a powerful engine for growth and development in the Middle East, IJMA3, in cooperation with the United States Commercial Service, organized the first US-Lebanon ICT Forum during October 2010.[37] The forum was supported by the American Lebanese Chamber of Commerce and the National US-Arab Chamber of Commerce in order to display the latest trends in the United States in the ICT sector through an exhibit and a series of seminars hosted by specialized ICT international companies.[38]

Many NGOs in the Sudan are active in promoting the use of ICT amongst local communities. For example, the Sudanese Computer Society, together with the Gedaref Digital Organization and the Sudan ICT Organization, carry out computer basic training programmes. Despite the limitations of its beneficiaries, over 4,000 trainees, including teachers, professionals, police personnel and persons with disabilities, benefited from the set of training programmes on basic computer skills. Moreover, youth and women associations, through fixed and portable computer labs, provided training programmes for more than 200,000 trainees.[39]

The Syrian Arab Republic witnessed dynamic increase in the role of NGOs in building the information society especially those promoting ICT for socio-economic development and innovation. Since its establishment in 2007, the Syria Trust for Development pioneered to contribute various programmes and projects that were launched with other institutions in the public and private sectors. The Fund for Integrated Rural Development of Syria (FIRDOS), SHABAB, MASSAR, RAWAFED, and the Syrian Development Research Centre are programmes[40] that focus on rural development, culture and heritage, and education in various areas of the country.

B. Classification and ranking of ESCWA member countries according to maturity level

1. *Maturity level 1: Iraq and Palestine*

This level is characterized by the absence of a clearly articulated vision or a national ICT strategy, limited or no implementation plan, and the scarcity of functioning PPP/MSP. Due to continuing conflicts in both countries, Iraq and Palestine are still in this first level of maturity.

2. *Maturity level 2: Lebanon, the Sudan, Syrian Arab Republic, and Yemen*

Countries in this level are characterized by the existence of a vision and national strategy, albeit with limited or no implementation plan, and limited PPP/MSP. Yemen is classified under this category due to the adoption of its national strategy in 2011. Other countries have not changed their standings since 2009.

3. *Maturity level 3: Egypt, Jordan, Kuwait, Oman and Saudi Arabia*

This level is characterized by the existence of a clearly articulated vision, an advanced national strategy with moderately effective implementation plans, and one functional PPP/MSP. Oman, with its long-term vision endorsed in its updated strategy, has qualified for maturity level 3 in 2011.

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[35] See: http://www.onlinedonations.org.om.

[36] ESCWA. 2011e. *National Profile of the Information Society in Oman − 2011*.

[37] See: http://www.ijma3.org.

[38] ESCWA. 2011f. *National Profile of the Information Society in Lebanon − 2011*.

[39] ESCWA. 2011g. *National Profile of the Information Society in the Sudan − 2011*.

[40] See: http://www.syriatrust.org/.

4. *Maturity level 4: Bahrain, Qatar and United Arab Emirates*

This level is characterized by a clearly articulated vision, a strong political will and concerted efforts to move into knowledge societies. The three countries at maturity level 4 have devised advanced national ICT policies and strategies with effective implementation plans, and implementation is proceeding at a good pace. PPP and MSP are well developed and producing good results.

Table 3 and figure 1 provide a historical evolution of maturity-level rankings of ESCWA member countries over the last three cycles.

TABLE 3. RANKING OF ESCWA MEMBER COUNTRIES BY MATURITY LEVEL IN THE ROLE OF GOVERNMENTS AND ALL STAKEHOLDERS IN BUILDING THE INFORMATION SOCIETY

	Maturity level 1			Maturity level 2			Maturity level 3			Maturity level 4		
Country or territory	2007	2009	2011	2007	2009	2011	2007	2009	2011	2007	2009	2011
Bahrain										✓	✓	✓
Egypt							✓	✓	✓			
Iraq	✓	✓	✓									
Jordan							✓	✓	✓			
Kuwait				✓				✓	✓			
Lebanon				✓	✓	✓						
Oman				✓	✓				✓			
Palestine	✓	✓	✓									
Qatar										✓	✓	✓
Saudi Arabia							✓	✓	✓			
The Sudan[a/]					✓	✓						
Syrian Arab Republic				✓	✓	✓						
United Arab Emirates										✓	✓	✓
Yemen	✓	✓				✓						

Source: Compiled by ESCWA.

Note: a/ No assessment was provided for the Sudan prior to 2009, which only joined ESCWA in 2008.

Figure 1. Maturity levels of ESCWA member countries in the role of Governments and all stakeholders in building the information society

C. SUGGESTIONS AND RECOMMENDATIONS

Building the information society requires efficient governance and widespread partnership with various actors in the private and public sectors. Below are some recommendations to improve the role of Governments and all stakeholders in building the information society:

(a) Strategies are tools for formulation of plans of action and implementation, and should not be considered as stand-alone objects that are shelved on adoption;

(b) Benefit from internationally established templates that can help structuring or updating ICT strategies, without resorting to blindly copying the strategies or plans of action of other countries;

(c) Systematic and periodic monitoring of execution of strategies and plans is essential, thereby ensuring that corrective actions are taken as appropriate;

(d) ICT strategies should be revised periodically based on evidence collected through information society indicators as well as on future national needs of the society and economy, while allocating financial resources needed;

(e) Strategic PPP should be activated at a wider scale in order to involve the private sector and NGOs in developing strategies and plans of action, as well as in implementing, evaluating, revamping and monitoring their execution;

(f) While telecommunications is important, including infrastructure, more importance should be given to IT in devising ICT strategy updates and implementing them, particularly capacity-building, content and knowledge development, software development and building the ICT sector;

(g) Sectoral e-strategies should be formulated, including strategies and implementation plans for e-learning, e-Government and ICT research and development;

(h) Coordination of ICT strategies at the regional level and developing partnerships between ESCWA member countries are essential to strengthen regional integration and complementarity.

II. ICT INFRASTRUCTURE

ICT infrastructure is central in achieving the goal of digital inclusion; enabling universal, sustainable, ubiquitous and affordable access to ICTs by all. It takes into consideration relevant solutions, already existing in developing countries or in countries with economies in transition, to provide sustainable connectivity and access to remote and marginalized areas at national and regional levels.

The remarkable evolution towards a world of innovative products and services based on ICT demands huge efforts to cope with the rapid growth and change in technology. Any effort towards sustainable development leading to a competitive market-structured environment cannot be reached without having a well-established ICT infrastructure; knowing that such achievement cannot be attained without good planning, prolonged efforts and contribution from all stakeholders concerned.

A. OVERVIEW OF THE MARKET STRUCTURE AND REGULATORY LANDSCAPE

The market structure of ICT in the ESCWA region, particularly the telecom components, is growing toward a competitive and liberal environment, albeit slowly. The sector has witnessed notable evolution of new business models in parallel with the advancement of the ICT sector, especially with the vast demand on broadband data services. The public sector, whether in the form of ministries or a regulatory authority, plays a key role in identifying requirement and strategies for the development of ICT infrastructure.

Most ESCWA member countries have dedicated regulatory entities, except for Palestine, the Sudan and Yemen, with the Syrian Arab Republic being the latest country to endorse a regulatory framework for telecommunications.[41] Table 4 shows the various regulators or ministries in ESCWA member countries that regulate the landscape of the telecom sector accompanied with the date of their establishment or reformation.

TABLE 4. LIST OF TELECOMMUNICATIONS REGULATORY ENTITIES IN ESCWA MEMBER COUNTRIES, 2010

Country or territory	Telecom regulator	Established/reformed
Bahrain	Telecommunications Regulatory Authority (TRA)	2002[a/]
Egypt	National Telecommunication Regulatory Authority (NTRA)	2003[b/]
Iraq	Communications and Media Commission (CMC)	2004[c/]
Jordan	Telecommunications Regulatory Commission (TRC)	1995[d/]
Kuwait	Ministry of Communications (MOC)	1962[e/]
Lebanon	Telecommunications Regulatory Authority (TRA)	2002[f/]
Oman	Telecommunications Regulatory Authority (TRA)	2002[g/]
Palestine	N/A	N/A
Qatar	Supreme Council of Information and Communication Technology (ictQATAR)	2004[h/]
Saudi Arabia	Communications and Information Technology Commission (CITC)	2004[i/]
The Sudan	N/A	N/A
Syrian Arab Republic	Telecommunications Supervisory Authority (TSA)	2010[j/]
United Arab Emirates	Telecommunications Regulatory Authority (TRA)	2003[k/]
Yemen	N/A	N/A

Notes: N/A = Not applicable.

a/ See: http://www.tra.org.bh/en/home.asp?dfltlng=1.
b/ See: http://www.tra.gov.eg.
c/ See: http://www.cmc.iq/en/pdfcmc/order65.pdf.
d/ See: http://www.trc.gov.jo/index.php?option=com_content&task=view&id=16&Itemid=138&lang=english.
e/ See: http://www.moc.kw/history.html.
f/ See: http://www.tra.gov.lb/Duties-and-regulatory-principles.
g/ See: http://www.tra.gov.om/newsite1/aboutTRA.aspx?Menu_ID=19.
h/ See: http://www.ictqatar.qa/en/about/faq.
i/ See: http://www.citc.gov.sa/English/AboutUs/Pages/History.aspx.
j/ See: http://www.moct.gov.sy/moct/?q=ar/node/196.
k/ See: http://www.tra.gov.ae/about_tra.php.

[41] See: http://www.syria-today.com/index.php/august-2010/603-business-news/11371-new-law-for-telecoms-sector-splits-ste-and-creates new-market-regulator.

According to the telecom regulatory authorities in ESCWA member countries, the status of the competition varies from monopoly or duopoly to competitive as summarized in table 5. The classification takes into account the number of existing functional operators that provide the service in each member country. When it comes to mobile and Internet services, the market is mostly considered competitive; 70 per cent of the mobile and Internet services in the region are competitive, while 30 per cent of these services follow a duopoly model. As for fixed-line services, monopolies prevail in most countries since these services are still considered a national asset.

TABLE 5. REGULATORY FRAMEWORK COMPETITION IN THE ESCWA REGION, NOVEMBER 2010

Country or territory	Fixed-line services	Mobile services	Internet services
Bahrain	Competitive	Competitive[a/]	Competitive
Egypt	Monopoly[a/]	Competitive	Competitive
Iraq	Competitive	Competitive[a/]	Competitive
Jordan	Competitive	Competitive[a/]	Competitive
Kuwait	Monopoly	Competitive	Competitive
Lebanon	Monopoly	Controlled duopoly[a/]	Competitive
Oman	Duopoly[a]	Competitive[a/]	Duopoly[a/]
Palestine	Monopoly	Competitive[a/]	Competitive[a/]
Qatar	Monopoly[a/]	Duopoly	Duopoly[a/]
Saudi Arabia	Competitive[a/]	Competitive	Competitive
The Sudan	Duopoly	Competitive	Competitive
Syrian Arab Republic	Monopoly	Controlled duopoly	Competitive
United Arab Emirates	Duopoly	Duopoly	Duopoly[a/]
Yemen	Monopoly	Competitive	Duopoly

Source: AAG. 2010. *Strategic Research Service*. November 2010.

Note: a/ For updated news and services offered by these operators, refer to the source above.

Nevertheless, fixed-line services in ESCWA member countries are getting more competitive, albeit much less than mobile and Internet services. Seven countries, or half the ESCWA member countries exercise monopoly over fixed-line services. The operators that enjoy monopoly are: Egypt Telecom in Egypt, MOC in Kuwait, Ogero in Lebanon, Paltel in Palestine, Qatar Telecom (Qtel) in Qatar, Syrian Telecom (STE) in the Syrian Arab Republic, and Public Telecommunication Corporation (PTC) in Yemen. Table 6 summarizes licences available in the ESCWA region as of 2010. Oman was the last country to enjoy duopoly with the launch of Nawras fixed services in 2010.[42] Although NTRA in Egypt determined to go for the second fixed-line licence in September 2010, it decided to postpone the venture till international economic conditions recuperate.[43] In May 2010, Qatar approved a second fixed-line licence, forecasted to be launched in the first quarter of 2012,[44] for Vodafone Qatar, a consortium of Vodafone and Qatar Foundation (QF). Yet, four countries practice a competitive environment for fixed-line operators, namely Bahrain, Iraq, Jordan and Saudi Arabia. Also, two countries have a duopoly, namely the Sudan and United Arab Emirates. As a whole, in the entire region, 47 fixed-line operators have been licensed, but only 29 are operational, as indicated in table 6.

[42] Nawras launched fixed-line services for businesses in May 2010 and for residential subscribers in July 2010.

[43] See: http://www.tra.gov.eg/english/News_NewsDetails.asp?PID=36&ID=146.

[44] See: http://www.arabianbusiness.com/vodafone-qatar-eyes-fixed-line-launch-in-q1-2012-405013.html.

TABLE 6. FIXED-LINE LICENSING LANDSCAPE IN THE ESCWA REGION, DECEMBER 2009

Country or territory	Operational licensees	Licensed but not operational	Total licensees
Bahrain	9	7	16
Egypt	1	0	1
Iraq	3	3	6
Jordan	1	6	7
Kuwait	1	0	1
Lebanon	1	0	1
Oman	2	0	2
Palestine	1	0	1
Qatar	2	0	2
Saudi Arabia	2	2	4
The Sudan	2	0	2
Syrian Arab Republic	1	0	1
United Arab Emirates	2	0	2
Yemen	1	0	1
Total	29	18	47

Source: AAG. 2010. Strategic Research Service. February 2010.

As a means of breaking the monopoly on telecom infrastructure and in order to promote liberalization in the fixed-line sector, telecom regulators, in such member countries as Bahrain[45] and the United Arab Emirates,[46] have imposed local loop unbundling (LLU) aiming to enhance competition in the field. This policy encourages the emergence of new telecom operators that can utilize the existing infrastructure of the incumbent operator and provide innovative and cost-effective services. Another methodology, which has been endorsed by telecom regulators and adopted by mobile operators in Kuwait[47] and Egypt,[48] is site sharing (or collocation) targeting operational efficiency, cost effectiveness and structural integrity.

The competition in the mobile sector prevails all over the region while four countries still experience duopoly. Lebanon and Syrian Arab Republic practice controlled duopoly, with the Government of Lebanon owning the mobile networks infrastructure, while the mobile companies in the Syrian Arab Republic are still under a build-operate-transfer (BOT) contract and should transfer ownership to the Government by 2015. Table 7 depicts the number of operators in each member country in the ESCWA region.

TABLE 7. NUMBER OF MOBILE OPERATORS IN THE ESCWA REGION, 2009-2011

Country or territory	Number of operators, 2009	Number of operators, April 2011
Bahrain	3	3
Egypt	3	3
Iraq[a/]	3	4
Jordan	4	4
Kuwait	3	3
Lebanon	2	2

[45] TRA in Bahrain reached a favourable decision on the framework for the unbundling of Batelco's local loop which was launched commercially starting the second quarter of 2010.

[46] On 3 July 2010, TRA confirmed that both telecom operators in the Unites Arab States, Etisalat and du, are technically ready to open their fixed-line networks for competition.

[47] According to AAG, Strategy Research Service (16 March 2010), by 10 March 2010, Zain Kuwait had 2-3 per cent of its sites shared with Mada Telecom, namely about 55 sites.

[48] According to AAG, in September 2009, Mobinil in Egypt had 210 sites, 5 per cent of its sites were shared with Vodafone Egypt.

TABLE 7 (*continued*)

Country or territory	Number of operators, 2009	Number of operators, April 2011
Oman	2	2
Palestine[b/]	1	2
Qatar	2	2
Saudi Arabia	4	4
The Sudan	3	3
Syrian Arab Republic	2	2
United Arab Emirates	2	2
Yemen[c/]	3	4
Total	37	40

Source: AAG. 2011. Strategic Research Service. May 2011.

Notes: a/ In addition to the three national operators, Mobitel is a regional cellular operator in Iraq and operates in the Kurdistan region only.

b/ Although there are six mobile operators in Palestine, only two operators are licensed by the Palestinian authorities which are Jawwal and Wataniya.

c/ he four operators in Yemen are: MTN Yemen, Sabafone, Yemen Mobile and lately Y-Telecom.

In order to properly assess and rank the intensity level of competition in mobile telephony among ESCWA member countries, AAG formulated the Cellular Competition Intensity Index (CCII), which takes into account the number of running operators, available postpaid and prepaid packages and other such value-added services as availability of third-generation (3G) mobile technology. The ranking of ESCWA member countries using the latest values for CCII is shown in table 8.

TABLE 8. MOBILE CELLULAR COMPETITION INTENSITY INDEX RANKINGS, 2010-2011

Rank, April 2011	Country or territory	CCII score 2011 (*percentage*)	Rank, May 2010	Rank change	Market status by April 2011
1	Saudi Arabia	76.01	2	↑	Competitive (4 operators)
2	Jordan	75.37	1	↓	Competitive (3 operators)
3	Palestine	69.61	3	↔	Competitive (6 operators)[a/]
4	Oman	69.52	4	↔	Competitive (2 operators and 5 MVNOs)[b/]
5	Egypt	68.18	5	↔	Competitive (3 operators)
6	Iraq	64.32	6	↔	Competitive (4 operators)[c/]
7	Bahrain	61.25	7	↑	Competitive (3 operators)
8	Yemen	58.61	8	↓	Competitive (4 operators)
9	The Sudan	55.68	9	↔	Competitive (3 operators)
10	Kuwait	54.58	10	↔	Competitive (3 operators)
11	Qatar	48.24	11	↔	Duopoly
12	United Arab Emirates	47.17	12	↔	Duopoly
13	Syrian Arab Republic	42.18	13	↔	Controlled duopoly[d/]
14	Lebanon	33.8	14	↔	Government-owned duopoly

Source: AAG. 2011. *Strategic Research Service*. May 2011.

Notes: ↑: improved, ↓: declined, ↔: No change.

a/ Jawwal and Wataniya face unlicensed competition from four Israeli operators.

b/ By April 2011, there were five operational mobile virtual network operators (MVNOs) in Oman, namely: FRiENDi Mobile, Mazoon Mobile, Samatel, Renna and Apna Mobile.

c/ In addition to the three national operators, Mobitel is a regional cellular operator in Iraq and operates in the Kurdistan region only.

d/ The Syrian Ministry of Communications and Technology announced the tender for the third mobile licence in the Syrian Arab Republic in September 2010. The deadline for submitting the bids was 30 March 2011. Two companies submitted their bids for the tender, which are: Saudi Telecom Company and Qatar Telecom QSC. The selection process is ongoing.

Saudi Arabia has surpassed Jordan to be in first position after having been second in 2010, scoring 76 per cent. According to AAG, this has been the result of having four competitive mobile operators in the market with diversity and abundance of prepaid and postpaid plans in addition to the availability of smart-phone plans, corporate offers, 3G services and international long-distance (ILD) competition. Accordingly, Saudi subscribers have the opportunity to choose one of the 19 prepaid and 23 postpaid packages that suits their interest. Palestine, Oman, Egypt and Iraq have maintained their positions ranked among the top six in the mobile market.

Bahrain, ranked number seven, surpassed Yemen at rank eight with a score of 61.25 per cent that can be interpreted as a result of the introduction of the third mobile operator in Bahrain in March 2010. Even more so, Bahrain has scored full mark for the availability of smart-phone plans, 3G services and ILD competition while Yemen has lacked all three.

Despite the huge effort of TRA of the United Arab Emirates through putting new regulations in early 2010 to increase competition, the United Arab Emirates still lag behind most of ESCWA member countries, with only the Syrian Arab Republic and Lebanon being less competitive. What is worth noting is that the least competitive in the list are countries with a duopoly market.

The year 2011 witnessed a 10 per cent growth as compared to 2009 in the number of mobile network operators, in addition to an increase of investment in MVNOs to reach a total of six MVNOs in two different countries. The trend of MVNO has continued to receive interest in ESCWA region. Compared to 2009, there were three MVNOs in Oman whereas, today, five MVNOs, namely FRiENDi Mobile, Apna Mobile, Renna, Mazoon Mobile and Samatel, are operational under the incubation of Nawras, one of the two mobile network operators (MNOs) in Oman.[49] Jordan had its first MVNO network under Zain with the brand Friend[50] during the second quarter of 2010. Telecom Egypt is also in serious discussion with NTRA to acquire its first MVNO licence before the end of 2011,[51] becoming the only integrated communication-provider in the country to provide fixed-line, mobile and data services.

As for Internet services, only four countries experience a duopoly market while other members enjoy full competition, with Oman[52] and Qatar[53] being the last countries to get out of monopoly. The increase in demand for Internet and data services, especially broadband, has triggered the need for such high-speed access technologies as 3G, WiMAX and Long-term Evolution (LTE) technologies. Box 1 describes the intention of Etisalat to invest in the latest state-of- the-art technology, namely LTE.

Box 1. Etisalat to launch the first LTE network in the MENA region by the third quarter of 2011

During the first quarter of 2011 and in order to sustain company commitment and to formulate a strategy to provide most advanced Internet services through investing in the latest state-of-the-art technology, Etisalat, an international telecom operator based in the United Arab Emirates, has signed an agreement with Alcatel-Lucent, one of the biggest international telecom supplier in the field of mobile communications, to deploy the first and widest Long-term Evolution (LTE) network in the Emirates and in the Middle East and North Africa (MENA) region. The technology will empower Internet mobile users with a downloading speed close to 150 megabits per second (Mbps).

[49] See: http://www.prepaidmvno.com/mvno-companies/middle-east-mvno-companies/oman-mvno-companies/.

[50] See: http://www.cellular-news.com/story/41513.php.

[51] See: http://www.telegeography.com/products/commsupdate/articles/2011/07/07/telecom-egypt-aims-for-mvno-licence-by-end-2011/.

[52] See: http://www.ameinfo.com/238117.html.

[53] See: http://www.vodafone.com.qa/go/pressrelease/vodafone-launches-broadband-internet-services-at-the-pearl-qatar.

Box 1 (*continued*)

Etisalat conducted its second session of the Third Annual ICT Media Seminar entitled LTE Technology and Its Influence on the Media Industry. During the seminar, Ali al-Ahmad, Chief Corporate Communication Officer at Etisalat, said that the United Arab Emirates was the first country in the Middle East to launch the LTE service. The first phase will cover all key Emirates through 800 base stations. He also emphasized the long-term investment strategy of Etisalat to continue providing the United Arab Emirates with competitive advantage on a global level and propelling the ICT sector of the country, making it one of the most technologically advanced countries in the world. Furthermore, Al-Ahmed highlighted the role of these investments which will pave the way to a new era of communications. Etisalat has recently completed the fiber-optic network deployment covering the Emirate of Abu Dhabi, the first capital city in the world to be fully covered by such an advanced network, along with the launch of LTE technology that will enhance the economic and social development of the country and help in offering services which can meet customer demands. The project has reached its final stage of testing before the commercial launch which is forecasted around the third quarter of 2011.

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Sources: http://www.cellular-news.com/story/47925.php; http://www.itp.net/583933-etisalat-to-deploy-regions-first-lte-network; http://gulfnews.com/business/telecoms/etisalat-gears-up-to-launch-lte-services-in-the-United Arab Emirates-1.819508.

B. Comparative analysis of ICT infrastructure in the ESCWA region by service type

1. *Telephone networks and services infrastructure*

(a) *Fixed-line telephone services dissemination*

Overall, fixed-line services in ESCWA member countries showed negligible growth of 0.18 per cent in 2010 compared to a 4 per cent increase in 2008.[54] However, the mobile sector encountered around 20 per cent growth. Iraq registered by far the highest growth, with 44 per cent, due to coverage expansion of fixed wireless services (FWSs) among various districts in Iraq.[55] Moreover, MoC and CMC started a campaign to revive the fixed-line services in the country.[56] Lebanon came in the second place, at 10.46 per cent, and Palestine came in the third place, with 10.25 per cent, due to launching a campaign in February 2010, which resulted in a gain of 30,000 new fixed lines.[57] Six countries registered negative growth in fixed lines while registering high mobile penetration rate, except for Egypt. The latter witnessed a regression as a consequence of applying a new policy to shorten the grace period tackling bad debts settlement.[58] See table 9 for more details.

TABLE 9. GROWTH RATE OF FIXED-LINE SUBSCRIBERS IN THE ESCWA REGION, 2009-2010
(*Ranked by growth*)

Rank	Country or territory	Fixed-line subscribers 2009	Fixed-line subscribers 2010	Growth rate (percentage)
1	Iraq	1 108 396	1 600 000	44
2	Lebanon	803 740	887 795	10
3	Palestine	368 216	405 947[a/]	10
4	Syrian Arab Republic	3 871 114	4 069 041	5
5	Yemen	997 000	1 046 263	5

[54] ESCWA. 2009a. *Regional Profile of the Information Society in Western Asia (E/ESCWA/ICTD/2009/12)*. According to this report, fixed-line market in the region grew by 4 per cent in 2008.

[55] AAG. 2010. *Strategic Research Service*. 25 April 2010.

[56] AAG. 2011. *Strategic Research Service*. 15 March 2011.

[57] AAG. 2010. *Strategic Research Service*. 5 December 2010.

[58] AAG. 2010. *Strategic Research Service*. 25 November 2010.

TABLE 9 (*continued*)

Rank	Country or territory	Fixed-line subscribers 2009	Fixed-line subscribers 2010	Growth rate (percentage)
6	Qatar	287 942	298 060	4
7	Kuwait	553 500	566 300	2
8	The Sudan	370 423	374 700	1
9	Saudi Arabia	4 171 000	4 165 750	0
10	Jordan	501 238	485 000	-3
11	Bahrain	238 000	228 000	-4
12	Oman	299 826	283 941	-5
13	United Arab Emirates	1 580 148	1 479 485	-6
14	Egypt	10 312 559	9 618 123	-7
	Total/average	25 463 102	25 508 405	0

Source: International Telecommunications Union (ITU). 2011a. *World Telecommunication/ICT Indicators Database − 2011*.

Note: a/ Since this figure was not published by ITU, AAG Strategic Research Group (December 2010) was used as a source indicating that, by September 2010, the number of fixed-line subscribers in the Palestinian Telecommunication Group Paltel was 405,947. AAG and ITU figures differ when computing ICT-services penetration rate since they adopt different sources for the country population.

Lebanon ranked number one in terms of fixed-line penetration rate, followed by Kuwait and Syrian Arab Republic, due to an increase in asymmetric digital subscriber line (ADSL) subscriptions, which is based on copper wire infrastructure. The Syrian Arab Republic continued to show healthy growth because of cost advantages over the mobile sector.[59]

TABLE 10. PENETRATION RATE OF FIXED-LINE SUBSCRIBERS IN THE ESCWA REGION, 2010

Rank	Country or territory	Population	Fixed-line subscribers	Fixed-line penetration rate (*percentage*)
1	Lebanon	4 227 597	887 795	21
2	Kuwait	2 736 732	566 300	21
3	Syrian Arab Republic	20 410 606	4 069 041	20
4	United Arab Emirates	7 511 690	1 479 485	20
5	Bahrain	1 261 835	228 000	18
6	Qatar	1 758 793	298 060	17
7	Saudi Arabia	27 448 086	4 165 750	15
8	Egypt	81 121 077	9 618 123	12
9	Oman	2 782 435	283 941	10
10	Palestine	4 039 192	405 947[a/]	10
11	Jordan	6 187 227	485 000	8
12	Iraq	31 671 591	1 600 000	5
13	Yemen	24 052 514	1 046 263	4
14	The Sudan	43 551 941	374 700	1
	Total/average	258 761 316	25 508 405	10

Source: ITU. 2011a.

Note: a/ Since this figure was not published by ITU, AAG Strategic Research Group (December 2010) was used as a source indicating that, by September 2010, the number of fixed-line subscribers in Paltel was 405,947. AAG and ITU figures differ when computing ICT-services penetration rate since they adopt different sources for the country population.

[59] AAG. 2010. *Strategic Research Service*. 21 October 2010.

(b) *Mobile telephone services dissemination*

The less-developed countries in the ESCWA region revealed the highest growth in mobile services, while Gulf Cooperation Council (GCC) countries sited last in the region with the exception of Qatar, which ranked sixth. The mobile sector in Lebanon showed remarkable development, making it rank fifth in 2010 after being at number thirteen in 2008. This was the result of reduction of mobile-service tariff during the fourth quarter of 2009. Despite the high penetration rate in the mobile sector of Qatar, mobile subscriptions continued their growth to achieve 20 per cent by the end of 2010, around midpoint of the region average growth. This is the result of Qatar getting out from mobile monopoly with the launch of a new mobile operator, Vodafone Qatar, in the first quarter of 2010. See table 11 for more details.

TABLE 11. GROWTH RATE OF MOBILE PHONE SUBSCRIBERS IN THE ESCWA REGION, 2009-2010
(*Ranked by growth*)

Rank	Country or territory	Mobile phone subscribers 2009	Mobile phone subscribers 2010	Growth rate (*percentage*)
1	Palestine	1 800 000	2 437 717	35
2	Yemen	8 313 000	11 085 000	33
3	Egypt	55 352 233	70 661 005	28
4	Iraq	19 722 000	24 000 000	22
5	Lebanon	2 390 317	2 874 766	20
6	Qatar	1 948 770	2 329 255	20
7	Syrian Arab Republic	9 981 861	11 696 212	17
8	Oman	3 970 563	4 606 133	16
9	The Sudan	15 339 895	17 654 230	15
10	Saudi Arabia	44 864 355	51 564 375	15
11	Kuwait	3 876 000	4 400 000	14
12	Bahrain	1 401 974	1 567 000	12
13	Jordan	6 014 366	6 620 000	10
14	United Arab Emirates	10 671 878	10 926 019	2
	Total/average	185 647 212	222 421 712	20

Source: ITU. 2011a.

Almost 86 per cent of the total population in the ESCWA region had mobile phone subscription by 2010 compared to 62 per cent in 2008. All countries of the GCC ranked top six in the ESCWA region with Saudi Arabia ranking first, followed by Oman and Kuwait. Moreover, GCC countries and Jordan exceeded the 100 per cent mobile phone penetration rate as an indication of mobile phone saturation. This phenomenon explains the reason behind low mobile telephone subscription growth in comparison to other ESCWA member countries which are less developed. Yemen and the Sudan ranked last in the region. Although Egypt kept its ranking for mobile penetration from 2008 to 2009, its penetration rate increased by 47 per cent during that period. The increase from 59 per cent in 2008 to 87 per cent in 2010 is the result of competitive market with new packages under affordable, meaning low, prices. It is expected that mobile penetration rate in Egypt will exceed the 100 per cent mark in 2011. See table 12 for more details.

TABLE 12. PENETRATION RATE OF MOBILE PHONE SUBSCRIBERS IN THE ESCWA REGION, 2010

Rank	Country or territory	Population	Mobile phone subscribers	Mobile phone penetration rate (*percentage*)
1	Saudi Arabia	27 448 086	51 564 375	188
2	Oman	2 782 435	4 606 133	166
3	Kuwait	2 736 732	4 400 000	161
4	United Arab Emirates	7 511 690	10 926 019	145
5	Qatar	1 758 793	2 329 255	132

TABLE 12 (*continued*)

Rank	Country or territory	Population	Mobile phone subscribers	Mobile phone penetration rate (*percentage*)
6	Bahrain	1 261 835	1 567 000	124
7	Jordan	6 187 227	6 620 000	107
8	Egypt	81 121 077	70 661 005	87
9	Iraq	31 671 591	24 000 000	76
10	Lebanon	4 227 597	2 874 766	68
11	Palestine	4 039 192	2 437 717	60
12	Syrian Arab Republic	20 410 606	11 696 212	57
13	Yemen	24 052 514	11 085 000	46
14	The Sudan	43 551 941	17 654 230	41
	Total/Average	258 761 316	222 421 712	86

Source: ITU. 2011a.

(c) *Internet services dissemination*

Internet services are increasing rapidly in the ESCWA region, especially with the popularity of such new technologies offering fixed and wireless broadband access as Wireless Local Area Networks (WLANs), 3G and WiMAX. Dial-up subscriptions are being chopped and migrated to broadband connections.

As shown in table 13, the total number of Internet users[60] in the ESCWA region increased by 18 per cent between 2009 and 2010, with Qatar ranking first, followed by the Syrian Arab Republic and Jordan.

TABLE 13. GROWTH RATE OF INTERNET USERS IN THE ESCWA REGION, 2009-2010
(*Ranked by growth*)

Rank	Country or territory	Internet users 2009	Internet users 2010	Growth rate (*percentage*)
1	Qatar	687 039	1 213 567	77
2	Syrian Arab Republic	2 767 417	4 224 995	53
3	Jordan	1 566 654	2 351 146	50
4	Lebanon	993 847	1 310 555	32
5	Iraq	1 382 608	1 773 609	28
6	Oman	1 396 753	1 741 804	25
7	Palestine	1 266 856	1 512 273	19
8	United Arab Emirates	5 204 111	5 859 118	13
9	Yemen	2 323 490	2 609 698	12
10	Egypt	19 355 094	21 691 776	12
11	Bahrain	619 876	694 009	12
12	Saudi Arabia	10 187 460	11 253 715	10
13	Kuwait	975 166	1 046 800	7
14	The Sudan	..	..	..
	Total/average	48 726 370	57 283 067	18

Source: ITU. 2011a.

Note: Two dots (..) indicate that data are not available.

Table 14 shows that GCC countries have the highest Internet user[61] penetration rate in the region, with the United Arab Emirates in the lead followed by Qatar and Oman.

[60] The number of Internet users in a given country is computed by ITU by multiplying the number of Internet subscribers by a variable multiplier value, which might be different for various countries.

[61] Ibid.

TABLE 14. PENETRATION RATE OF INTERNET USERS IN THE ESCWA REGION, 2010
(*Ranked by penetration*)

Rank	Country or territory	Population	Internet users	Internet users penetration rate (*percentage*)
1	United Arab Emirates	7 511 690	5 859 118	78
2	Qatar	1 758 793	1 213 567	69
3	Oman	2 782 435	1 741 804	63
4	Bahrain	1 261 835	694 009	55
5	Saudi Arabia	27 448 086	11 253 715	41
6	Kuwait	2 736 732	1 046 800	38
7	Jordan	6 187 227	2 351 146	38
8	Palestine	4 039 192	1 512 273	37
9	Lebanon	4 227 597	1 310 555	31
10	Egypt	81 121 077	21 691 776	27
11	Syrian Arab Republic	20 410 606	4 224 995	21
12	Yemen	24 052 514	2 609 698	11
13	Iraq	31 671 591	1 773 609	6
14	The Sudan	43 551 941	..	..
	Total/average	215 209 375	57 283 067	27

Source: ITU. 2011a.

Note: Two dots (..) indicate that data are not available.

(d) *Fixed broadband Internet services dissemination*

The total number of fixed broadband Internet subscribers in all ESCWA member countries grew by 60 per cent between 2008 and 2010, while the penetration rate remained very low, at 1.93 per cent by the end of 2010. It is worth noting that the top three countries in growth rate as shown in table 15 have the lowest broadband penetration rate in the region and feature in the bottom of table 16. The Syrian Arab Republic experienced the highest growth, at around 500 per cent compared to penetration rate of 0.33, followed by the Sudan and Yemen with 269 and 205 per cent growth rates, respectively, compared to penetration rates of 0.38 and 0.333, respectively.

TABLE 15. GROWTH RATE OF FIXED BROADBAND INTERNET SUBSCRIBERS IN THE ESCWA REGION, 2008-2010
(*Ranked by growth*)

Rank	Country or territory	Fixed broadband subscribers 2008	Fixed broadband subscribers 2010	Growth rate (*percentage*)
1	Syrian Arab Republic	11 055	67 235	508
2	The Sudan	44 625	164 500	269
3	Yemen	26 000	79 245	205
4	Bahrain	76 595	154 047	101
5	Egypt	769 744	1 476 546	92
6	Oman	32 447	52 630	62
7	Qatar	104 235	161 306	55
8	Palestine	73 000[a/]	107 000[a/]	47
9	Jordan	137 148	196 900	44
10	Iraq	54	77	43
11	Saudi Arabia	1 048 098	1 496 607	43
12	United Arab Emirates	557 577	786 818	41
13	Kuwait	40 000	46 000	15
14	Lebanon	195 000	200 000	3
	Total/average	3 115 578	4 988 911	60

Source: ITU. 2011a.

Note: a/ Since this figure was not published by ITU, AAG Palestine Telecommunications Market Indicators and Projections (May 2011) was used as a source indicating that, by the end of 2010, the number of fixed broadband subscribers in Palestine was 107,000, while that number was 73,000 at the end of 2008. AAG and ITU figures differ when computing ICT-services penetration rates since they adopt different sources for the country population.

Despite the fact that the United Arab Emirates, Qatar and Saudi Arabia exhibited the highest penetration rates, the growth rates in their fixed broadband subscribers were below the ESCWA average of 60 per cent signalling either saturation or a probable surge in their wireless broadband fuelled by high mobile penetration rates.

TABLE 16. PENETRATION RATE OF FIXED BROADBAND SUBSCRIBERS IN THE ESCWA REGION, 2010

Rank	Country or territory	Population	Fixed broadband subscribers	Fixed-line penetration rate (*percentage*)
1	Bahrain	1 261 835	154 047	12.21
2	United Arab Emirates	7 511 690	786 818	10.47
3	Qatar	1 758 793	161 306	9.17
4	Saudi Arabia	27 448 086	1 496 607	5.45
5	Lebanon	4 227 597	200 000	4.73
6	Jordan	6 187 227	196 900	3.18
14	Palestine	4 039 192	107 000[a/]	2.65
7	Oman	2 782 435	52 630	1.89
8	Egypt	81 121 077	1 476 546	1.82
9	Kuwait	2 736 732	46 000	1.68
10	The Sudan	43 551 941	164 500	0.38
11	Syrian Arab Republic	20 410 606	67 235	0.33
12	Yemen	24 052 514	79 245	0.33
13	Iraq	31 671 591	77	0.00
	Total/average	258 761 316	4 988 911	1.93

Source: ITU. 2011a.

Note: a/ Since this figure was not published by ITU, AAG Palestine Telecommunications Market Indicators and Projections (May 2011) was used as a source indicating that by end of 2010, the number of fixed broadband subscribers in Palestine was 107,000. AAG and ITU figures differ when computing ICT services penetration rates since they adopt different sources for the country population.

(e) *Personal computer dissemination*

A different approach is adopted in this sector for analysing the penetration rate of personal computers, which is by linking it to household data and not to population. All ESCWA member countries showed growth in the number of households with a computer to reach 13,240,935 units compared to 11,967,532 in 2009, which represents an approximate overall increase of 11 per cent. Jordan ranked highest in the list with a growth rate of 23 per cent, followed by Qatar and Oman (see table 17).

TABLE 17. GROWTH RATE OF HOUSEHOLDS WITH A COMPUTER IN THE ESCWA REGION, 2009-2010 (*Ranked by growth*)

Rank	Country or territory	Number of households with a computer 2009	Number of households with a computer2010	Growth rate (*percentage*)
1	Jordan	488 910	598 927	23
2	Qatar	103 200	123 648	20
3	Oman	180 177	202 242	12
4	Egypt	5 662 150	6 320 600	12
5	Saudi Arabia	2 169 374	2 399 724	11
6	Palestine	281 487	309 573	10
7	Yemen	126 408	136 580	8
8	Lebanon	276 184	298 109	8
9	Syrian Arab Republic	1 484 561	1 597 037	8
10	The Sudan	321 899	346 205	8
11	Kuwait	202 833	213 921	5
12	United Arab Emirates	557 250	578 360	4
13	Bahrain	113 100	115 710	2
14	Iraq	..	..	..
	Total/average	11 967 532	13 240 635	11

Source: ITU. 2011a.

Note: Two dots (..) indicate that data are not available.

GCC countries surpassed other member countries when addressing the increase in the penetration rate of households with a computer in 2010. Qatar and Bahrain registered the highest penetration rates with impressive 90 per cent and 87 per cent, respectively, while the Sudan and Yemen came last (see table 18).

TABLE 18. PENETRATION RATE OF HOUSEHOLDS WITH A COMPUTER IN THE ESCWA REGION, 2010
(*Ranked by penetration*)

Rank	Country or territory	Number of households	Number of households with a computer	Penetration rate of households with a computer (*percentage*)
1	Qatar	138 000	123 648	90
2	Bahrain	133 000	115 710	87
3	United Arab Emirates	761 000	578 360	76
4	Saudi Arabia	4 188 000	2 399 724	57
5	Palestine	590 000	309 573	52
6	Jordan	1 165 000	598 927	51
7	Oman	444 000	202 242	46
8	Syrian Arab Republic	3 956 000	1 597 037	40
9	Kuwait	570 000	213 921	38
10	Egypt	18 590 000	6 320 600	34
11	Lebanon	941 000	298 109	32
12	The Sudan	6 645 000	346 205	5
13	Yemen	3 449 000	136 580	4
14	Iraq	3 748 000	..	..
	Total/average	41 570 000	13 240 635	32

Source: ITU. 2011a.

Note: Two dots (..) indicate that data are not available.

(f) *ICT Price Basket*

The ICT Price Basket (IPB) is a comprehensive benchmarking tool computed by ITU to monitor the relative price of ICT services and provide an indication on the affordability of ICT services worldwide. Table 19 provides another perspective for comparing and ranking member countries based on the price basket as a percentage of their per capita GNI.[62] The table is self-explanatory wherein highest affordability is enjoyed by GCC countries and least affordability remains a challenge for countries with lowest GNI per capita figures. One interesting case is observed: Egypt ranks modestly higher than Jordan on the global rank despite a comparatively lower per capita GNI.

TABLE 19. RANKING OF SELECTED ESCWA MEMBER COUNTRIES ON THE ICT PRICE BASKET, 2010

Rank	Global rank (165)	Country	GNI per capita[a/] (*US$*)	Sub-baskets			ICT Price Basket value
				Fixed (*% of GNI per capita*)[a/]	Mobile (*% of GNI per capita*)[a/]	Broadband (*% of GNI per capita*)[a/]	
1	5	United Arab Emirates	57 340	0.1	0.2	0.8	0.40
2	18	Bahrain	25 420	0.2	0.7	1.3	0.70
3	36	Saudi Arabia	17 700	0.6	1.0	1.8	1.10
4	39	Oman	17 890	0.9	0.6	2.1	1.20
5	70	Qatar	12 000	0.9	1.8	5.5	2.70
6	72	Lebanon	8 060	1.5	4.1	3.4	3.00
7	78	Egypt	2 070	1.7	4.1	4.6	3.50
8	84	Jordan	3 980	2.9	3.2	5.7	3.90
9	107	Syrian Arab Republic	2 410	0.6	9.9	10.8	7.10
10	144	Yemen	1 060	1.2	9.2	134.9	36.80

Source: ITU. 2011b. *Measuring the Information Society − 2011*.

Note: a/ The GNI per capita is based on the Atlas method by the World Bank.

[62] The ICT Price Basket (IPB) is a composite basket that includes three tariff sets, referred to as sub-baskets: fixed telephone, mobile and fixed broadband Internet services. Its value is calculated by adding the value of the price of each sub-basket as a percentage of a country's monthly GNI per capita, divided by three.

2. *ICT connectivity*

Several approaches and techniques have been established in order to measure ICT connectivity in a country. According to AAG, ICT connectivity can be explicitly measured by Total Country Connectivity Measure (TCCM), which is a composite indicator that takes into account the percentage of penetration of fixed and mobile lines in addition to Internet use in a specific country. TCCM is calculated by the summation of household fixed-line services penetration, mobile services penetration, and Internet user penetration rates in each country. Table 20 provides rankings of ESCWA member countries with a comparison of previous figures to show substantial progress in the region according to ICT connectivity.

TABLE 20. RANKING OF ESCWA COUNTRIES BY THE TOTAL COUNTRY CONNECTIVITY MEASURE, 2008-2009

	Rank		Household mainlines penetration 2009 (*percentage*)	Mobile penetration 2009 (*percentage*)	Internet users penetration 2009[d/] (*percentage*)	TCCM	
Country or territory	2008	2009				2008	2009
United Arab Emirates	1	1	95.4[c/]	205.5[a/]	51.3[b/]	321.7	352.2
Saudi Arabia	3	2	68.1	178.2	39.9[c/]	248.9	286.2
Qatar	4	3	76.7[c/]	151.5	25.6	205.2	253.8
Bahrain	2	4	85.1[c/]	128.1	36.3[c/]	249.3	249.6
Kuwait	5	5	46.7[c/]	114.1	40[c/]	184.3	200.9
Oman	6	6	42.8[c/]	132.9	13.1	170.6	188.7
Lebanon	10	7	67[c/]	59.8	28[c/]	125.2	154.9
Jordan	7	8	29.4[c/]	101.4	17.4	141.1	148.2
Syrian Arab Republic	8	9	77.6[c/]	48.2	16.3	129.9	142.1
Egypt	9	10	51.3	79.5	8.8	128.9	139.6
Palestine	12	11	44.1	53.2	11.5	95.9	108.8
Iraq	11	12	15.4[c/]	71.1	13[c/]	100.2	99.5
Yemen	13	13	20[c/]	35.9	9.9	55.9	65.8
The Sudan	14	14	7.9[c/]	41.7	1.6[c/]	34.1	51.2

Sources: AAG, Strategic Research Service, 26 August 2010, and Strategic Research Service, 26 July 2009.

Notes: a/ Since telecom operator du reported cellular lines both on active on the switch and 90 days activity rule, AAG has leveraged this disclosure to estimate total cellular lines in United Arab Emirates for 2009 based on the 90 days activity rule and hence the cellular penetration rate for 2009.

b/ Etisalat offers a free dial-up account with every digital subscriber line (DSL) account as a backup, consequently resulting in over-reporting the dial-up accounts in its total Internet accounts. AAG deducts the number of DSLs from the total Internet accounts to filter out the free dial-up accounts bundled with the ADSL accounts and included in the total reported Internet accounts of Etisalat.

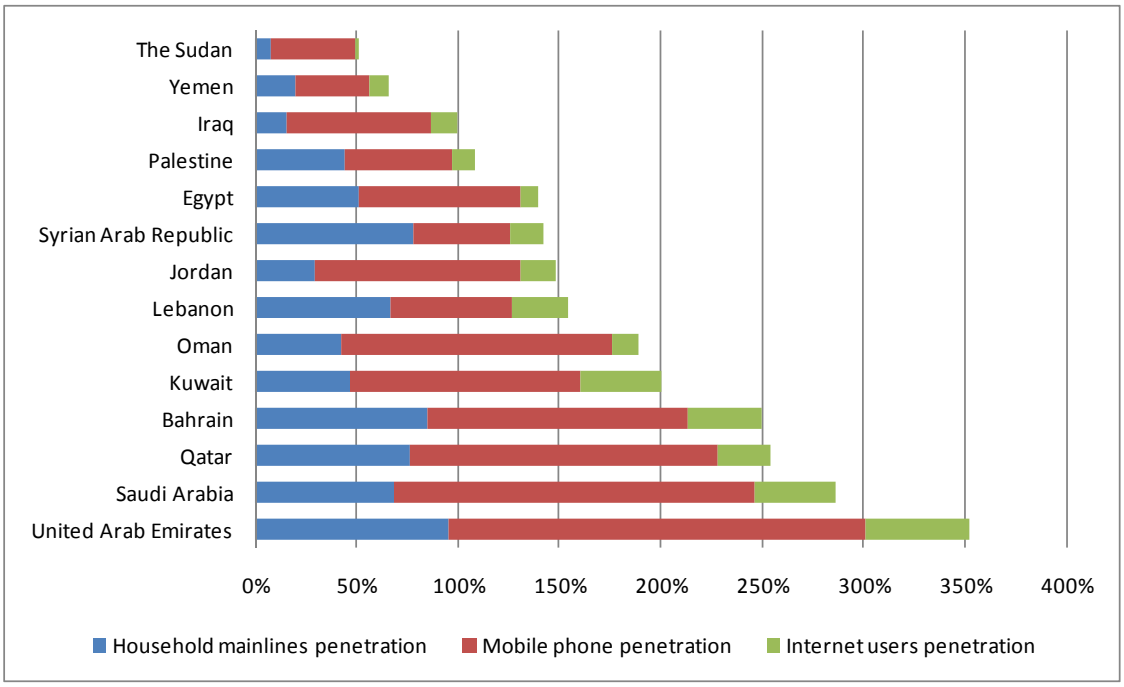
c/ Estimates.

d/ AAG estimates Internet users based on an account usage multiplier for each country. The Internet users figure is calculated by multiplying the account usage multiplier of each country by its reported Internet accounts. Internet user penetration figures labeled as estimates are based on estimated total Internet accounts.

A continuous growth and progress has been noticed for most of the countries. The GCC countries are on top of the list, with the United Arab Emirates again being in the lead. Saudi Arabia and Qatar have shown significant improvement, ranking up ahead of Bahrain, whose TCCM growth is 0.1 per cent compared to 15 per cent and 23.7 per cent for Saudi Arabia and Qatar, respectively. Without any doubt, the latter values are the result of continuous investment and effort on the ICT infrastructure whereby both countries started to experience the added value of Fibre to the Home (FTTH) and expanding such Internet backbone projects as satellite communication and undersea fiber network.

Lebanon has leaped to the seventh position having been ranked tenth in 2008. This improvement is noticed mainly in the mobile penetration increase (from 37.1 per cent in 2008 to 59.8 per cent in 2009) as a result of reduction in tariffs as of the second quarter of 2009.

Figure 2. Total Country Connectivity Measure (TCCM), 2009



Source: Compiled by ESCWA from data provided by AAG. 2010. *Strategic Research Service.* 26 August 2010.

Figure 2 shows that the top six countries in TCCM are all GCC countries, suggesting that such countries with higher GNI levels as GCC countries exhibited higher penetration rates of ICT services than other countries in the region.

C. INTERNET INFRASTRUCTURE

Recently, various developments regarding the Internet infrastructure have taken place in the region, whether through establishing new satellite communications, new national and terrestrial fiber optic networks, FWS systems or Internet hosts. Such development is essential to cater for the increase in international Internet traffic, due to the huge demand for broadband services and applications, and to provide the required capacity and bandwidth.

1. *National fiber optic – Fiber to the Home*

With the development of such services that demand faster connectivity and larger bandwidth as triple play service,[63] FTTH is a main requirement in order to have the pipeline capacity needed. FTTH investment in the ESCWA region is progressing slowly and is still in the establishment phase. Although ten countries have ongoing FTTH projects, so far only United Arab Emirates is forecasted to have full FTTH in the region.[64] The MOC in Kuwait has declared completion of FTTH Phase I, which covered 30 new residential areas, in addition to some commercial districts.[65] In August 2010, the Saudi Telecom Company (STC)

[63] This is a marketing term for the provisioning of two bandwidth-intensive services, high-speed Internet access and television, and a less bandwidth-demanding (but more latency-sensitive) service, telephone, over a single broadband connection.

[64] AAG. 2010a. Global Expertise - Regional Focus. December 2010.

[65] Ibid.

launched triple-play Internet Protocol Television (IPTV) service over its FTTH network that plastered some districts in Riyadh, Jeddah and Dammam.[66] Box 2 shows that Qatar enjoys high-speed Internet services as a consequence of serious investment in FTTH infrastructure.

Box 2. Qtel infrastructure can provide 100 Mbps Internet speed access

Qtel in Qatar has successfully achieved a major milestone in providing high-speed Internet access. On 18 May 2011, Qtel became the first company in Qatar, and one of the first communications providers in the region, to reach Internet trial speeds of up to 100 Mbps, thus enabling customers within the company's trial Fibre-to-the-Home (FTTH) footprint to receive home Internet broadband at such speed. The achievement is the outcome of sincere development in its optical fiber network. Qtel is willing to extend the high Internet speed footprint coverage to Doha and other urban areas in the second half of 2011.

Qtel customers will enjoy the treat to download high definition (HD) movies, share hundreds of photos and video streaming in a matter of minutes, rather than hours, using a 100 Mbps speed access. According to the online business information provider AmeInfo news, this new technological milestone will propel Qatar into the top ten countries with the fastest Internet in the world.

_____

Source: http://www.ameinfo.com/265503.html.

2. *Regional fiber-optic network*

The increase in demand on international traffic and the impact of submarine cable[67] disruption have driven the need to establish additional and alternative routes so as to secure and sustain international voice and data transit. Such increase in Internet traffic, excluding the Sudan and Palestine, has registered a growth of 1,133 per cent between 2007 and 2010, with Saudi Arabia registering a massive 2,480 per cent figure, the highest score in the ESCWA region as shown in table 21.

TABLE 21. GROWTH RATE OF INTERNATIONAL INTERNET BANDWIDTH IN THE ESCWA REGION, 2007-2010
(*Ranked by growth*)

Rank	Country or territory	International Internet bandwidth (Mbps), 2007	International Internet bandwidth (Mbps), 2010	Growth rate (*percentage*)
1	Saudi Arabia	12 325	317 944	2 480
2	Jordan	936	15 000	1 503
3	United Arab Emirates	19 703	200 000	915
4	Egypt	14 911	142 964	859
5	Oman	1 250	8 537	583
6	Yemen	470	3 200	581
7	Qatar	4 185	24 502	485
8	Syrian Arab Republic	1 056	5 735	443
9	Bahrain	1 915	10 000	422
10	Kuwait	2 319	10 000	331
11	Lebanon	930	2 500	169
12	Iraq	32	80	150
13	Palestine	..	..	..
14	The Sudan	..	..	..
	Total	60 032	740 462	1 133

Source: ITU. 2011a.

Note: Two dots (..) indicate that data are not available.

[66] Ibid.

[67] See: http://www.arabianbusiness.com/internet-problems-continue-with-fourth-cable-break-121812.html.

The ESCWA region is currently served by a substantial number of submarine cables that vary in their potential capacity. Three major cables link the MENA region to Asia and Europe, namely, South East Asia-Middle East-Western Europe (SEA-ME-WE) 3, SEA-ME-WE 4, and Fibre-optic Link around the Globe (FLAG) and Alcatel Lucent Optical Network (FALCON). Recently, namely in December 2010, the India-Middle East-Western Europe (IMEWE) submarine cable was officially launched to provide additional initial capacity of 3.84 terabit per second (Tbps). Egypt, Lebanon, Saudi Arabia and the United Arab Emirates, from the ESCWA region, will benefit from the 13,000 km of optical fiber cable between Asia, the Middle East and Europe, which constitutes an alternate route for secure broadband telecommunications carried by the SEA-ME-WE 4 cable linking Southeast Asia to Western Europe.[68] Since July 2010, Lebanon has finally been able to utilize the services of IMEWE, which has been delayed due to political reasons.[69]

Further submarine cable projects are in the establishment phase, and will promote additional bandwidth capacity in the region. In July 2010, three ESCWA member countries, namely, Jordan, Saudi Arabia and the Syrian Arab Republic, agreed with Turkey to establish the JADI link, a 2,530 km fiber-optic cable between the Middle East, South Asia and the Far East, connecting Jeddah, Amman, Damascus and Istanbul.[70] Upon completion of the project, each partnered member will have gained a capacity bandwidth of 200 Gbps.

In October 2009, such key telecommunications business firms in the Middle East and GCC as the Bahrain Internet Exchange (BIX), Nawras, Qtel, Mobily and Etisalat, have partnered with Tata, the world's largest integrated wholesale carrier, to establish a new submarine cable known as Tata Global Network (TGN), which will provide the hosting countries with an additional capacity of 1.28 Tbps.[71] In June 2011, Qtel has announced the successful beaching of TGN in Doha, Qatar.[72] Also, Gulf Bridge International (GBI) link, which is considered to be the first Middle East-owned submarine cable, will initially contribute 2.56 Tbps.[73]

Table 22 presents the capacity of each of the mentioned cables. It is estimated that with the launch of the new planned undersea networks, the capacity between Europe and Egypt will boost from 2,110 Gbps to 28,350 Gbps.[74]

TABLE 22. EXECUTIVE INFORMATION ON SUBMARINE CABLES SERVING THE ESCWA REGION

Submarine cable	Length (km)	Date of commissioning	Capacity
SEA-ME-WE 1	13 500	June 1985 (decommissioned June 1999)	12 MHz
SEA-ME-WE 2	18 000	October 1994 (decommissioned October 2006)	2x560 Mbps
SEA-ME-WE 3	39 000	August 1999	20 Gbps
SEA-ME-WE 4	20 000	December 2005	1 280 Gbps
FLAG	28 000	September 1997	80 Gbps
IMEWE	12 091	December 2010	3 840 Gbps
TGN	3 691	Not yet launched, planned for 2011	1 280 Gbps
GBI	4 750	Not yet launched, planned for 2011	2 560 Gbps
JADI	2 530	Not yet launched, planned for 2013	800 Gbps

Sources: http://www.undersea.net, http://www.cmcnetworks.net, http://www.imewecable.com, and AAG.

[68] See: http://www.ameinfo.com/251780.html.

[69] See: http://www.itp.net/585338-imewe-cable-goes-live-in-lebanon.

[70] AAG. 2010. Strategic Research Service. 6 July 2010.

[71] See: http://gulfnews.com/business/technology/tata-s-gulf-submarine-cable-to-be-ready-in-2011-.587681?localLinksEnabled=false.

[72] See: http://www.telegeography.com/products/commsupdate/articles/2011/06/03/qtel-lands-whopper-tgn-beached-in-qatar.

[73] See: http://www.ameinfo.com/200313.html.

[74] See: http://www.telegeography.com.

3. *Satellite communication*

The United Arab Emirates and Qatar have allocated a remarkable share of investments for satellite communication to attain a global position in satellite broadband services through launching state-of-the-art satellites, enhancing and expanding digital capacity and connectivity. Table 23 summarizes the satellite communication networks in the region.

TABLE 23. SATELLITE COMMUNICATION NETWORKS IN THE ESCWA REGION, MAY 2011

Satellite	Ownership	Services	Headquarter	Launching date
Yahsat - Y1A	Mubadala Development Company	Satellite broadcast "YahLive" Broadband and cellular backhaul "YahSecure"; Corporate data networks, Internet trunking and GSM backhauling "Yahink"	United Arab Emirates	April 2011
Yahsat - Y1B	Mubadala Development Company	Satellite broadband "YahClick"	United Arab Emirates	3rd/4th quarter 2011[a/]
ES'HAIL	ictQATAR and Eutelsat	Satellite broadcast Enterprise and Government communication	Qatar	End of 2012[a/]

Source: AAG. 2011. Strategy Research Group. 17 May 2011.

Note: GSM stands for Global System for Mobile Communications.

a/ Estimated launch date.

4. *Fixed wireless services*

FWSs have innovatively helped in resolving one of the major challenges that the region suffered in terms of network coverage and accessibility, especially in poor and rural areas. The lack of copper wire or fiber-optic (FO) network is not a hindrance any more for customers to get voice and data services. FWS, in such various technology patterns as WiMAX, has significantly penetrated the telecom business in the ESCWA region, and several licences have been allocated for the establishment of such networks. As of June 2010, the region licensed 36 operators, out of which only 19 operators were operational. Table 24 shows the number of licensed operators to provide FWS in its country indicating the technology used.

TABLE 24. OFFERED VERSUS OPERATIONAL FWS LICENCES PROVIDED IN THE ESCWA REGION, JUNE 2010

Countries or territory	Operator licensed to provide FWS	Operational	Licences which allow the operator to provide services over WiMAX
Bahrain	2	2	NFWS
Egypt	0	0	NA
Iraq	7	2	WLL/WiMAX
Jordan	5	5	FBWA
Kuwait	3	2	FBWA
Lebanon	7	4	BWA
Oman	1	0	FWS
Palestine	0	0	NA
Qatar	2	0	FWA
Saudi Arabia	6	3	PFS/DSP
The Sudan	..	..	..
Syrian Arab Republic	0	0	NA
United Arab Emirates	2	1	WiMAX
Yemen	1	0	WiMAX
Total	36	19	

Source: AAG. 2010b. WiMAX in the Arab World. June 2010.

Notes: Two dots (..) indicate that data are not available.

(NA) indicates not applicable.

5. *Internet hosts*

Measuring Internet hosts per capita is indicative of Internet presence and infrastructure development in the country. Actually, according to the United Nations Conference on Trade and Development (UNCTAD), ICT connectivity is measured by relying on several such indices as the number of Internet hosts per capita.[75] Table 25 shows the rank of the ESCWA member countries according to the number of hosts per 10,000 inhabitants. As the table below indicates, the United Arab Emirates and Bahrain position themselves on top of other countries in the region in terms of Internet host per capita, followed by Saudi Arabia, Lebanon and Jordan.

TABLE 25. NUMBER OF INTERNET HOSTS IN THE ESCWA REGION, 2010

Rank	Country or territory	Population	Total number of hosts	Number of hosts per 10 000 inhabitants
1	United Arab Emirates	7 511 690	372 403	495.76
2	Bahrain	1 261 835	55 384	438.92
3	Saudi Arabia	27 448 086	481 880	175.56
4	Lebanon	4 227 597	56 410	133.43
5	Jordan	6 187 227	45 337	73.28
6	Oman	2 782 435	10 825	38.90
7	Palestine	4 039 192	14 922	36.94
8	Egypt	81 121 077	195 447	24.09
9	Yemen	24 052 514	25 927	10.78
10	Kuwait	2 736 732	2 648	9.68
11	Qatar	1 758 793	837	4.76
12	Syrian Arab Republic	20 410 606	7 848	3.85
13	The Sudan	43 551 941	75	0.02
14	Iraq	31 671 591	11	0.00
	Total/average	258 761 316	1 269 954	49.08

Source: http://www.isc.org.

D. CLASSIFICATION AND RANKING OF ESCWA MEMBER COUNTRIES ACCORDING TO MATURITY LEVEL

1. *Maturity level 1: Iraq, the Sudan and Yemen*

This lowest level of maturity is characterized by the following: (a) low ICT density rates and unattractive telecom market conditions that discourage personal and corporate users; (b) scarce international links for telephony and to the Internet backbone; and (c) poor Internet dissemination, inadequate national backbone and limited number of Internet players in the market. No change in the ESCWA member countries in this group can be noted from 2009.

2. *Maturity level 2: Egypt, Lebanon, Palestine and Syrian Arab Republic*

This level of maturity is characterized by the following: (a) average ICT density rates and increasingly attractive telecom market conditions for personal and corporate users; (b) developing international links for telephony and to the Internet backbone; and (c) improving Internet dissemination, national backbone and active Internet players market. All ESCWA member countries classified in this group in 2009 remain, except for Oman.

3. *Maturity level 3: Jordan, Kuwait, Oman, and Saudi Arabia*

This level of maturity is characterized by the following: (a) above-average ICT density rates and attractive telecom market conditions for personal and corporate users; (b) solid international links for

[75] See: http://www.unctad.org/en/docs/iteipc20065_en.pdf.

telephony and to the Internet backbone; and (c) comparatively strong Internet dissemination, adequate national backbone and active Internet players market. Oman stepped forward to this level since 2009 by achieving average position in fixed-line penetration, ranking better in mobile phone and Internet penetration, reaching second and third rank, respectively and revealing notable growth in international Internet usage.

4. *Maturity level 4: Bahrain, Qatar and United Arab Emirates*

This level of maturity is characterized by the following: (a) world-class ICT density rates and very attractive telecom market conditions for personal and corporate users; (b) highly developed international links for telephony and to the Internet backbone; and (c) strong Internet dissemination, world-class national backbone and recognized Internet players. No change in ESCWA member countries in this group can be noted since 2009.

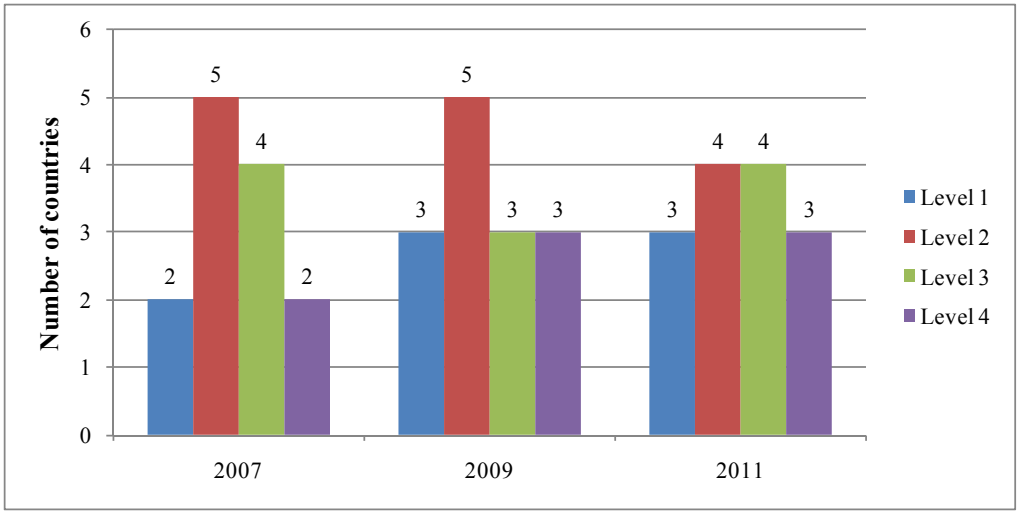
TABLE 26. RANKING OF ESCWA MEMBER COUNTRIES BY MATURITY LEVEL IN ICT INFRASTRUCTURE

	Maturity level 1			Maturity level 2			Maturity level 3			Maturity level 4		
Country or territory	2007	2009	2011	2007	2009	2011	2007	2009	2011	2007	2009	2011
Bahrain										✓	✓	✓
Egypt				✓	✓	✓						
Iraq	✓	✓	✓									
Jordan							✓	✓	✓			
Kuwait							✓	✓	✓			
Lebanon				✓	✓	✓						
Oman				✓	✓				✓			
Palestine				✓	✓	✓						
Qatar							✓				✓	✓
Saudi Arabia							✓	✓	✓			
The Sudan[a/]		✓	✓									
Syrian Arab Republic				✓	✓	✓						
United Arab Emirates										✓	✓	✓
Yemen	✓	✓	✓									

Source: Compiled by ESCWA.

Note: a/ No assessment was provided for the Sudan prior to 2009, since it only joined ESCWA in 2008.

Figure 3. Maturity levels of ESCWA member countries in ICT infrastructure



E. SUGGESTIONS AND RECOMMENDATIONS

(a) It is absolutely essential to set up an effective and transparent telecom regulatory commission/authority, which should function independently and fairly. Without this, there are strong possibilities of exploitation of subscribers through unaffordable tariffs and corruption;

(b) It is important to continue the liberalization of the telecom sector and instigate competition, given that it has a significant impact on increasing dissemination of telecom services to different areas;

(c) New licensing schemes and regulatory frameworks should be developed to cater for the introduction of new telecommunication technologies, especially wireless, in order to bridge the digital divide between urban and rural/remote areas, particularly when fixed-line deployment is not economically feasible;

(d) Efforts should be directed towards the regional dimension to profit from: economies of scale (for instance bandwidth); harmonization of the regional telecom interconnectivity (for instance regional telecom backbone); and ICT manufacturing/software development and ICT content;

(e) Significant attention should be directed towards increased connectivity of such sectors as education and health given their long-term impact on socio-economic development, launching infrastructure development initiatives for specific segments based on best practices from other countries in the region and beyond;

(f) Liberalization of broadband services, unbundling local loops and availing applications and content should be promoted in order to harness the benefits of broadband technologies for development;

(g) Given the importance of promoting universal access through funding disadvantaged sectors of the community and rural areas, the regulatory authority should provide incentives to develop telecommunications in marginalized areas, including packaging urban projects with rural/remote area projects.

III. ACCESS TO INFORMATION AND KNOWLEDGE

Today, ICT allows people anywhere and anytime to access information quickly and develop knowledge even in remote places. However, ubiquitous access can only be achieved when appropriate infrastructure is in place and connection cost is affordable. Furthermore, widespread use cannot be guaranteed without the existence of legislations to facilitate access to information and the preservation of public data, while providing confidence and trust through security measures and privacy for personal data. The development of local content and the building of a digital public library and national archives as recommended by the WSIS Plan of Action[76] should increase access by making it more useful and attractive.

A. COMPARATIVE ANALYSIS

ESCWA member countries have continued their efforts to improve access to information and knowledge. While progress has been noted in most countries, the level of information availability and access divide remain evident between and within countries. Modest Internet penetration rates, low broadband penetration rates, especially when compared to the penetration rates of mobile phones, unaffordable access costs, the dearth of ICT public-access centres, especially in rural and remote areas, and weak political will to make ICT a basic commodity are all major reasons leading to access disparities.

The Networked Readiness Index (NRI)[77] measures the propensity of countries to exploit the opportunities offered by ICTs to better comprehend their impact on the competitiveness of nations. This composite index has three components or sub-indices, namely: the friendliness of the environment of a country to innovation and ICT development; the readiness of the key stakeholders of the community, namely, individuals, businesses and Governments, to use ICT, and the usage of ICT among these three categories of stakeholders.

Tables 27 and 28 examine the current situation in ten ESCWA member countries covered by the GITR in 2010-2011, in addition to 128 other countries. They permit to analyse the disparities between readiness and usage components of the NRI for the three categories of stakeholders involved, namely individuals, businesses and Governments.

TABLE 27. READINESS SUB-INDEX COMPONENT OF THE NETWORKED READINESS INDEX (NRI), 2009-2010

	Readiness sub-index		Individual readiness		Business readiness		Government readiness	
Country	Rank	Score	Rank	Score	Rank	Score	Rank	Score
Qatar	4	5.47	10	5.70	21	4.84	2	5.88
United Arab Emirates	6	5.37	5	5.77	24	4.75	3	5.57
Saudi Arabia	24	4.91	34	5.26	38	4.39	12	5.09
Bahrain	30	4.86	15	5.59	67	3.94	14	5.07
Oman	34	4.81	40	5.19	52	4.16	13	5.08
Jordan	52	4.37	35	5.25	119	3.37	43	4.50
Egypt	74	4.13	70	4.85	112	3.43	68	4.12
Lebanon	85	4.03	32	5.29	44	4.32	138	2.48
Kuwait	95	3.95	45	5.15	128	3.13	105	3.57
Syrian Arab Republic	117	3.74	81	4.73	133	3.10	120	3.39
Average		4.56		5.28		3.94		4.47

Source: World Economic Forum (WEF). 2011a. *The Global Information Technology Report 2010-2011*.

[76] See: http://www.itu.int/wsis/docs/geneva/official/poa.html#c3.

[77] World Economic Forum (WEF). 2011a. *The Global Information Technology Report 2010-2011*. More information is available at: http://www3.weforum.org/docs/WEF_GITR_Report_2011.pdf.

Analysing the contrast between readiness and usage patterns in the region helps in highlighting impediments hindering access to information and knowledge. The readiness sub-index component of the NRI detailed in table 27 shows the extent to which the main stakeholders in selected ESCWA member countries are prepared and willing to use technology, notably ICT, in their daily activities. This table further indicates that, for most ESCWA member countries, individuals scored better, and by a large margin, on the readiness sub-index, than both businesses and Governments, with a regional average of 5.28 points for individuals compared to 3.94 for businesses and 4.47 points for Governments. This indicates that individuals in the region, with different educational levels, are being prepared to use ICTs more than businesses and Governments, and thus are positioned to reap the benefits of technology in their daily lives better than the other two categories of businesses and Government.

TABLE 28. USAGE SUB-INDEX COMPONENT OF THE NETWORKED READINESS INDEX (NRI), 2009-2010

	Usage sub-index		Individual usage		Business usage		Government usage	
Country	Rank	Score	Rank	Score	Rank	Score	Rank	Score
Bahrain	27	4.45	29	4.90	58	3.15	8	5.31
United Arab Emirates	30	4.27	21	5.22	39	3.50	40	4.08
Qatar	34	4.16	28	4.91	42	3.47	37	4.11
Saudi Arabia	39	3.88	40	4.54	44	3.38	52	3.71
Oman	43	3.76	48	4.20	56	3.16	45	3.91
Jordan	53	3.57	62	3.55	71	2.96	33	4.20
Egypt	65	3.37	79	3.16	83	2.85	39	4.09
Kuwait	72	3.27	57	3.71	94	2.75	69	3.35
Lebanon	100	2.82	88	3.01	91	2.79	125	2.65
Syrian Arab Republic	131	2.35	113	2.45	135	2.24	134	2.36
Average		3.59		3.96		3.02		3.78

Source: WEF. 2011a.

The usage sub-index component of the NRI, shown in table 28 for ten ESCWA member countries, gauges the actual usage of ICT by the main stakeholders in a given country, with a particular focus on the impact of ICT in terms of efficiency and productivity gains. This table points out that individuals in selected ESCWA member countries scored slightly higher on the usage sub-index than both businesses and Governments, namely, 3.96 points compared to 3.02 and 3.78 points, respectively. Thus, additional efforts should be exerted by the business sector to exploit the latest technologies, especially the use of the Internet for such business activities as buying and selling goods, and interacting with customers and suppliers.

When comparing the averages of both the readiness and usage sub-indices, it becomes evident that the region fared better on the former sub-index by almost one full point, at 4.56 compared to 3.59, signalling that member countries should exert more efforts to boost the usage of ICTs. However, a quick look at the world averages for both these sub-indices reveals a similar global trend. The average of the readiness sub-index for the 138 countries covered by the 2010-2011 GITR was 4.3 points compared to 3.5 for the usage sub-index.

A closer look at the readiness and usage categories for individuals reveals an even wider gap for the region, as it scored an average of 5.28 points for readiness compared to 3.96 points for usage. The 1.32 point imbalance between readiness and usage for individuals could be attributed to, among others, low ICT penetration rates, especially for broadband Internet services; the low level of information and digital content in Arabic; and the restrictions that some countries are still imposing on free access to information and knowledge.

Countries of the GCC ranked better than other ESCWA member countries on both sub-indices, with the exception of Jordan, which has been making noticeable progress. The small population sizes in GCC countries, coupled with a high GDP, as well as a high standard of living equally contribute to this higher ranking. On average, Bahrain, Qatar and the United Arab Emirates ranked better than Saudi Arabia, Oman

and Kuwait. In Qatar and the United Arab Emirates, the continuous push by the Government for ICT diffusion has been impressive in recent years, as reflected by their ranking at places four and six globally in the Government readiness sub-index, respectively. The same was noticed for Saudi Arabia, Bahrain and Oman, whose Government readiness scores were all in the top twenty globally.

Bahrain has been exerting tremendous efforts to get its governmental sector ready to incorporate ICTs in their business processes and improve the efficiency and effectiveness of Government usage. The kingdom achieved rank eight globally in the Government usage component, followed by Jordan (at 33) and Qatar (at 37). The impressive score of Bahrain is partly due to its developed e-Government strategy and successful implementation, the quality of delivery of online services by the Government, and the relevance, usefulness, and willingness of Government websites for providing online information and tools which guarantee citizen participation and engagement.

While most ESCWA member countries have demonstrated increased readiness and usage levels, serious efforts are still required in order to bridge the gap between readiness and use patterns. Primarily, the ICT access costs should be further reduced, the availability of digital Arabic content increased, and capacities of citizens to use ICT built.

1. *Public domain information*

Digital technologies, the computerization of services, Web technologies and the Internet allow for information to be easily created, published, shared and accessed. An essential element for the growth of the information society and its transformation to a knowledge society is the availability of information, which is publicly accessible free of charge, and without requiring access permissions.

Realizing the tremendous opportunities offered by information availability and exchange, most ESCWA member countries have embarked on projects and initiatives providing a wealth of official public information, especially through the implementation of e-Government programmes and related portals serving a variety of public e-Government services. As of August 2011, all ESCWA member countries had functional online Government portals aimed at combining in one location all e-Government services targeting different beneficiaries, including citizens, businesses and other Government agencies. These portals vary in their level of development and the type of services provided. In addition, other technologies are being used to deliver such public information as dedicated portal mobile versions which ensure wider access using smartphone devices, coupled with the use of such social networking tools as Facebook and Twitter to update and engage citizens. Chapter 7 section A offers an in-depth analysis of e-Government portals in the ESCWA region and the type of information and services they provide.

In an effort to provide culture-related public information online, the Centre for Documentation of Cultural and Natural Heritage (CULTNAT) in Egypt runs an array of projects and programmes for the documentation of both tangible and intangible aspects of Egyptian cultural and natural heritage, and is a good example of availing information of such kind for access by citizens through such channels as a dedicated Web portal,[78] CDs and printed books. During 2010, CULTNAT issued ten books and CDs and was visited by 5,200 people from around the world.[79]

In the United Arab Emirates, the Arab Library (Maktabat al Arab) is a comprehensive e-library comprising of numerous digital books, poems, biographies, periodicals, and articles which can be easily accessed by Arab users through a dedicated Web portal. This project was developed as part of the publishing strategy of the Mohammed bin Rashid al Maktoum Foundation. The portal[80] currently avails around 2,000

[78] See: http://www.cultnat.org.

[79] MCIT Yearbook 2010, February 2011.

[80] See: http://www.maktabatalarab.com.

books, 5,000 biographies of Arab literary figures, seven complete dictionaries, and a collection of reviews of 500 Arabic and foreign recently published books.[81]

Bahrain places great emphasis on developing public domain information. In this regard, its e-Government portal is a key service delivery channel of public information to individuals, businesses, and visitors. The well-designed, bilingual portal is aligned with the Bahrain Strategic Vision 2030 to provide informational, interactive, and transactional services. It includes online payment facilities and provides a platform for the engagement of users by allowing them to give their feedback and participate in framing Government policies and enhancing service delivery. Since its launch in May 2007 and up until September 2011, the total number of visitors reached nearly 32 million; these visitors conducted about 400,000 financial transactions with a total value of more than US$75 million.[82]

2. *Access to information and knowledge*

The opportunities offered by information and knowledge exchange are tremendous, especially when it is inclusive, encompassing all members of society without marginalizing persons with disabilities or rural areas. ICT is an assistive technology that plays an ever increasing role in enabling access to digital content and overcoming impediments to access, be it physical, cultural, linguistic and/or social. While the region has made progress in developing and sharing public information, efforts are still needed to enhance accessibility of digital content.

The NRI captures such accessibility in selected ESCWA member countries (see table 29); recent data show that GCC countries scored higher than other ESCWA member countries, with the exception of Jordan, which came in fourth position. While all member countries exhibited better scores in 2010 compared to previous years, Saudi Arabia recorded the best improvement in 2009-2010, increasing its score from 4.76 to 5.14 points, taking it twelve positions closer to the top on the global ranking.

The ESCWA region slightly improved its accessibility score to digital content in 2009-2010, with an average score of 4.84 compared to 4.75. However, this modest improvement can mostly be attributed to such factors as the limited digital Arabic content, the scarcity of laws that protect information access rights of citizens within a framework of freedom and transparency, the relatively low penetration of broadband and high subscription costs.

TABLE 29. ACCESSIBILITY OF DIGITAL CONTENT IN SELECTED ESCWA MEMBER COUNTRIES, 2008-2010

Country	Score[a/] 2008-2009	Ranking (133) 2008-2009	Score[a/] 2009-2010	Ranking (138) 2009-2010
Qatar	6.01	19	6.04	21
United Arab Emirates	5.85	22	5.91	26
Bahrain	5.57	31	5.86	28
Jordan	5.20	43	5.21	45
Saudi Arabia	4.76	64	5.14	52
Oman	4.79	61	5.09	56
Lebanon	NA	NA	4.83	71
Kuwait	4.41	90	4.70	79
Egypt	4.50	85	4.62	84
Syrian Arab Republic	3.18	127	3.33	130
Average (ESCWA/world)	4.92	4.75	5.07	4.84

Sources: WEF. 2010a. *The Global Information Technology Report 2009-2010*; and WEF. 2011a.

Note: a/ This is based on a seven-point total score whereby 1 = not accessible at all; and 7 = widely accessible.

[81] United Arab Emirates National WSIS Committee. 2011. *United Arab Emirates WSIS Committee Report 2010-2011*.

[82] Portal stats are available at: http://www.bahrain.bh.

Table 30 highlights broadband penetration rates and monthly subscription costs for ESCWA member countries. Great disparities in broadband costs are noted, not only in absolute value but also as a percentage of GNI per capita. Unfortunately, while the contrary situation would be hoped for, charges for broadband access in the less-developed countries are invariably higher than charges in the more-developed countries. The table further indicates that broadband access rates are inversely proportional to the penetration rate of fixed broadband subscriptions. In 2010, the cost of monthly broadband access constituted 0.8 per cent of the monthly GNI per capita of the United Arab Emirates and 1.3 per cent of the monthly GNI per capita of Bahrain, while in the Syrian Arab Republic, it reached around 11 per cent of the monthly GNI per capita. Unfortunately, in Yemen, the cost of monthly broadband access reached 135 per cent of the monthly GNI per capita.

TABLE 30. FIXED BROADBAND PENETRATION AND COST IN SELECTED ESCWA MEMBER COUNTRIES, 2010

Country or territory	Fixed broadband Internet subscriptions per 100 inhabitants, 2008	Fixed broadband Internet subscriptions per 100 inhabitants, 2010	Broadband sub-basket (*US$*)	Broadband sub-basket (*% of GNI capita*)
Bahrain	7.3	12.2	26.6	1.3
Egypt	1.0	1.8	8.0	4.6
Jordan	2.3	3.2	18.9	5.7
Lebanon	4.7	4.7	23.0	3.4
Oman	1.2	1.9	31.0	2.1
Palestine	..		..	..
Qatar	7.5	9.2	54.9	5.5
Saudi Arabia	4.0	5.5	26.6	1.8
Syrian Arab Republic	0.1	0.3	21.6	10.8
United Arab Emirates	9.0	10.5	40.60	0.8
Yemen	0.1	0.3	119.2	134.9

Source: ITU. 2011b.

Notes: The rest of ESCWA member countries were not featured in the table due to data unavailability.

Two dots (..) indicate that data are not available.

While most member countries have increased their fixed broadband Internet subscriptions rates between 2008 and 2010, such GCC countries as Bahrain, Qatar and the United Arab Emirates exhibited higher fixed broadband Internet penetration rates in 2010, hovering around 10 per cent. In addition to enjoying world-class infrastructure, competitive telecommunication sectors, and high GNI per capita, Governments in these countries have provided free access to the Internet in public places, including public libraries. Additionally, private sector cafés and shopping malls are also attracting customers by providing free access to the Internet through Wi-Fi technology.

Launched in 2004 and managed by the United Nations Development Programme (UNDP), the project entitled ICT to Foster Egypt's Sustainable Human Development built a community-development portal (Kenanaonline.com) that enables and encourages users to build an online knowledge base and provide their communities with information and consultancy in their respective fields of expertise. Specialized content is provided by and for communities, with contributions from NGOs, research institutions and local companies. The project promotes sustainable human development, supports the integration of rural and urban communities in a single-knowledge society, and empowers communities by providing easy access to the information they need. Since its launch, the portal has grown tremendously in both scope and popularity; it now has 750,000 pages online and has received over 39,000,000 hits. The number of articles stored on the portal reached 50,000 up from 15,000 in early 2007. The success of the portal led to regional and

international recognition, having clenched a number of prestigious awards, including the Stockholm Challenge, E-India, the Pan-Arab Web Awards, the Arab e-Content Award, and the World Summit Award.[83]

Realizing its vision for a world with ICT for all, the Qatar Assistive Technology Centre (Mada), a non-profit organization that strives to empower and enable people with disabilities through ICT, launched a new initiative in December 2010 to connect people with disabilities to ICTs. Named Connected, the initiative aims to provide nation-wide accessibility to people with disabilities; this includes assistive-technology (AT) software and accessories, specialized handsets, and website accessibility. In addition, Mada partnered with Bookshare.org in January 2011 to provide digital content for people with print disabilities. Over 85,000 books in accessible electronic format will be made available for free to people whose disabilities make it very difficult or impossible for them to read standard print.[84]

The Rural Knowledge Network (Reefnet)[85] is an online portal launched as part of a larger ICT-for-development project by the Ministry of Communications and Technology (MoCT) in the Syrian Arab Republic and UNDP, which includes the establishment of rural-community access centres. The project, which initially called for launching a local-community portal for every established rural-community access centre, shifted at a later stage to having local community portals for rural villages, irrespective if they had corresponding access centres. Reefnet portal, which is a unified gateway to around 97 dedicated websites for rural villages all over the country, provides a networking platform for communities in the rural areas of the Syrian Arab Republic to learn, share information and build knowledge repositories. It essentially aims at giving the communities tools for flexible and active contributions to building their capacities and improving their livelihoods. With its considerable Arabic content, the portal is a success story for sharing and building knowledge societies in the region. In 2010, the main portal attracted more than 10,000 hits per day; users visit the portal primarily to access its various forums, health encyclopaedia, and educational content, especially the one related to Arabic language and its grammar.

3. *Multi-purpose community public access points*

Multi-purpose community public access points are vital for establishing comprehensive and affordable access to information, especially in rural areas. They serve to bridge the digital divide among individuals in communities and allow residents of rural and remote areas the opportunity to benefit from ICT as a tool for communications and information access. Public ICT access points can provide services either for free or at a nominal fee. Some countries use public facilities, including libraries, schools and post offices, to provide such access to the general public.

A number of ESCWA member countries have established, or are in the process of establishing, community public access points in rural areas, in collaboration with national, regional, and international organizations as well as NGOs. These centres especially span the least-developed member countries and non-GCC countries where the issues of low Internet penetration rates and ICT affordability are still evident. An overview of these achievements in selected ESCWA member countries is set forth below.

Box 3 highlights a project led by ESCWA which aims at improving the living standards of selected communities in the region, by providing, developing, organizing, sharing and disseminating knowledge in areas of sustainable development that include employment, education, gender and health.

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[83] See: http://www.mcit.gov.eg/MediaPressSer_Details.aspx?ID=1902&TypeID=3.

[84] See: http://mada.org.qa/en/.

[85] See: http://www.reefnet.gov.sy.

Box 3. Knowledge Networks through ICT Access Points for Disadvantaged Communities Project

Launched in mid-2006 and completed by the end of 2010, the United Nations Development Account project entitled Knowledge Networks through ICT Access Points for Disadvantaged Communities (KN4DC) was led by the Economic and Social Commission for Western Asia (ESCWA) and co-jointly managed with the Economic Commission for Africa (ECA), the Economic Commission for Europe (ECE), the Economic Commission for Latin America and the Caribbean (ECLAC) and the Economic and Social Commission for Asia and the Pacific (ESCAP). Its main objective was to empower disadvantaged communities by transforming selected ICT access points/telecentres into networked knowledge hubs. By providing, developing, organizing, sharing and disseminating knowledge in areas of sustainable development that include employment, education, gender and health, the project aimed at improving the living standards of the targeted communities.

Project activities carried out at a regional level have included: (a) review and assessment of ICT access points/telecentres; (b) selection of ICT access points/telecentres to be included as knowledge hubs in the pilot phase of the project; (c) development of regional knowledge strategies; (d) design and implementation of regional knowledge network portals; and (e) workshops aimed at sharing knowledge, strengthening the networking process and building the capacities of telecentre managers. On a global level, project activities have included: (a) a global inception meeting that assembled all United Nations regional commissions and that included discussions about and recommendations on project activities; (b) preparation of a global strategy covering the various processes needed for the transformation of ICT access points into knowledge hubs; (c) development of a global knowledge portal that aims at facilitating the networking process between participating ICT access points/telecentres from various regions; and (d) a global assessment meeting that gathered all regional commissions and concluded the project.

These activities were completed globally by the end of 2010, with each United Nations regional commission implementing agreed activities in its selected access points. In the ESCWA region, four out of fourteen participating access points have been completely transformed into knowledge hubs, while the rest shared and contributed knowledge via an online regional/global network. This network targeted over 500,000 beneficiaries out of which 60 per cent were women located in poor areas and in disadvantaged communities.

Overall, this pilot project had a positive impact on all communities where it was implemented. Many of the initially chosen ICT access points were transformed into knowledge hubs that are interconnected via an online regional/global knowledge portal. Knowledge-hub leaders received several training sessions on knowledge management, marketing, managing small businesses and most importantly sustaining their knowledge hubs. Many participating telecentres introduced new services that provide them with additional revenue, which is necessary for self-sustainability.

In order to sustain regional and global knowledge networks, every regional commission has put together a steering committee for each regional network that will handle the strategic planning necessary to activate this network. Alongside the steering committee is a secretariat that coordinates between the latter and knowledge hubs in the region. The chairpersons for each regional steering committee form the global steering committee, which handles planning for the global knowledge network. The actual work of those committees should be reflected on the networks in the year following the end of the project.

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See: http://www.knowledgenets.net.

In Egypt, the IT Clubs model offers a communal solution to problems of affordability, accessibility and awareness. They are the outcome of a purchasing-power-parity (PPP) initiative, spearheaded by the MoCIT, and involving the private sector, individuals and local communities. The IT Club centres are essential components of the national plan to familiarize citizens with technology and promote ICT awareness, allowing for affordable Internet access, which costs approximately US$0.20 per hour. In December 2010, the number of IT clubs reached 2,164, up from 1,807 at the end of 2008. These centres, which house 25,919 computers and peripherals, have served more than one million users, and have generated more than 8,000 job opportunities.[86] With almost 300 new clubs established every year, MoCIT intends to

[86] MCIT Yearbook 2010, February 2011.

reach every area of the country. The expansion is not only in the number of clubs but also in the activities and target groups within each club which will soon include activities targeting people with special needs.[87]

In Jordan, knowledge stations continue to play an important role in providing a variety of services to a broad segment of the society.[88] By the end of 2010, the total number of stations operating in the country reached 176, out of which 28 were available in very poor areas in different parts of the country. These stations contribute to bridging the digital divide and harnessing the use of ICT in various fields. From its inception in 2001 until the end of 2010, the number of beneficiaries exceeded 1,096,922 citizens, and the number of ICT-based training sessions offered reached 20,362, while the number of citizens who completed these sessions reached 142,860, including both men and women. Moreover, some 3,000 people were offered employment opportunities through direct training at the knowledge stations. See table 31 for more details on a yearly basis by gender.

TABLE 31. KNOWLEDGE STATIONS ICT TRAINEES BY GENDER, 2001-2010

Year	Number of trainees	Females (*percentage*)	Males (*percentage*)
2001	13 829	56	44
2002	8 626	57	43
2003	14 045	57	43
2004	21 280	54	46
2005	15 207	52	48
2006	9 463	55	45
2007	9 175	56	44
2008	10 699	60	40
2009	19 403	61	39
2010	21 476	64	36
Total/average	142 860	57	43

Source: Knowledge Stations, available at: http://www.ks.gov.jo.

In 2010, Oman launched its first exclusive ICT-based knowledge centre for women in Shinas in the Batinah region. The Women's Community Knowledge Centre (WCKC) was launched in collaboration with the Omani Women's Association; as part of the National IT Training and Awareness Framework (NITTA) initiative,[89] a Government-sponsored nationwide eOman initiative. Four community knowledge centres open to both men and women are already functioning in Muscat, Salalah, Sur and Sohar. These centres seek to develop and build the ICT literacy and digital skills of all segments of the society by conducting free ICT training programmes. The ultimate goal of the centres is to prepare and enable citizen to better use ICTs and reap its benefit through the use of e-services provided by the Government.[90]

The endeavour of ictQATAR to connect all citizens and provide them with affordable Internet access lead to the development of the iParks initiative, launched in 2007 in collaboration with the Ministry of Municipality and Urban Planning. As of 2011, the provision of free wireless Internet service has been extended from three to five parks thought the country. According to a series of user surveys conducted between 2009 and 2010, the average number of users per month for the initial three parks topped 10,000, and the total number of users for the entire first year exceeded 100,000 users.[91]

[87] ESCWA. 2011h. *National Profile of the Information Society in Egypt − 2011*.

[88] See: http://www.ks.gov.jo.

[89] See: http://www.ita.gov.om/ITAPortal/eServices/Popular_Projects.aspx?NID=84.

[90] See: http://www.ita.gov.om/ITAPortal/MediaCenter/NewsDetail.aspx?NID=326.

[91] See:http://www.ictqatar.qa/en/news-events/news/qatar%E2%80%99s-iparks-initiative-expanded-two-new-parks-services-upgraded.

Initiated in 2002 as a partnership between MoCT and UNDP, the community access-centres project, as part of the Reefnet project, in the Syrian Arab Republic aims to promote the use of ICTs by all social and demographic groups, particularly in rural areas. In September 2009, the Syrian Computer Society (SCS)[92] took over the management of the 40 centres which had been established – 35 fixed and 5 mobile – and equipped with between six and fourty computers as well as communication and printing equipment. Current plans call for establishing 45 additional centres within three years to reach a total of 85 by 2012. The centres have been promoted as cultural community centres undertaking a multitude of capacity-building and awareness-raising activities, not merely confined to ICT. Training courses include basic ICT literacy, international computer driving licence (ICDL) and specialized courses on first aid, health, accounting, small-and-medium-enterprise (SME) management and foreign-language learning, among others. By 2009, over 24,500 individuals had participated in various training activities, out of which 48 per cent were females, a considerable percentage given the conservative culture governing rural areas of the Syrian Arab Republic. In addition, the centres also cater to disadvantaged members of the community as 556 students with special needs received various training/services provided by the centres.[93]

4. *Using different software models*

The adoption and use of Free and open-source software (FOSS) and its related tools are positioned to improve access to information and knowledge. Nowadays, a large variety of operating systems, databases, Web servers, content management systems (CMS), learning management systems (LMS), software development tools, word processors, photo editors and others are all available in open-source versions enabling citizens, students, teachers, communities, and Governments to easily generate and access a wealth of information and knowledge without having to purchase application software and or pay royalty fees. FOSS provides a viable alternative to proprietary and commercially-licensed software, especially for big organizations and Governments with limited budget spending on ICTs, or countries facing an ICT trade embargo. However, the region has witnessed mixed reactions to FOSS, despite some limited activities spearheaded by national technology groups, volunteers and, in a few cases, by private institutions and associations. The main reasons are lack of trust in FOSS suppliers, shortage of qualified IT experts needed for its localization and development, and lack of available support for applications developed with FOSS.

Nevertheless, the past two years have witnessed promising changes. Despite the significant differences in the needs and developmental challenges of ESCWA member countries, the importance of FOSS has been gaining ground for many decision makers and ICT developers in the region as evident by the national and regional initiatives highlighted in box 4.

Box 4. Main free and open-source software (FOSS) initiatives in the ESCWA and Arab regions

Ma3bar (معبر) is the Arab support centre for the free and open-source software (FOSS), launched in 2009 by the United Nations Development Programme (UNDP)-(ICT for Development in the Arab Region (ICTDAR), the United Nations Educational and Scientific and Cultural Organization (UNESCO), and the University of Balamand. The centre strives to disseminate free and open-source software as a philosophy and culture in academia and Arab societies. Ma3bar is committed to contributing to social and economic development in the Arab region by promoting the use and development of free and open-source software, and by developing and conducting training programmes on such software, to ensure that more Arab communities have affordable access to information technologies.

Motah (متاح) is an initiative launched by the National Programme for Free Open Software Technologies (NPFOSST) at King Abdulaziz City for Science and Technology (KACST) in Saudi Arabia. The initiative aims at promoting FOSS which helps in building local ICT skills, promoting economic development and enabling knowledge transfer.

[92] See: http://scs-net.org.

[93] ESCWA. 2011i. *National Profile of the Information Society in the Syrian Arab Republic − 2011*.

Box 4 (*continued*)

Badeel (بديل) is another project launched by the Centre of Excellence in Information Assurance (CoEIA) at King Saud University (KSU). The project aims to raise awareness of the importance of FOSS. Moreover, it encourages users of such software to respect the intellectual property rights of commercial software by providing open-source alternatives.

Miftaah (مفتاح) is a set of such open-source, frequently-used applications and tools as word processing, worksheets, presentations, communication, and multimedia. Most applications have been Arabized, and are presented in three languages (Arabic/English/French) in a customized interface. The project was led by the UNESCO office in Rabat and ICTDAR and targets the entire Arab region. The FOSS package, which can be run directly from a universal-serial-bus (USB) key, was localized, developed and translated through collaboration between three universities in the Arab region based in Algeria, Morocco and Palestine.

ArabOpenCD (القرص المفتوح) is another collection of FOSS Arabic applications and tools which include Arabized office utilities, programming, Internet and graphic applications. It is supported by KuwaitNET.

Arab Eyes is another project that aims at fully supporting the Arabic language in the Unix/Linux environment. Through its Web portal, it aspires to standardize the Arabization process by relying on the voluntary contributions and expertise of computer professionals and enthusiasts all over the world.

Sources: http://www.ma3bar.org, http://www.motah.org.sa, http://badeel.coeia.edu.sa, http://ma3bar.org/miftaah, http://arabicopencd.org, and http://projects.arabeyes.org.

At the Government level, ITA of Oman and a number of higher-education institutions in the Sultanate joined forces in the support of FOSS. In this regard, a national initiative has been developed by ITA to promote and support the use of FOSS owing to its potential value in comparison with proprietary software. The initiative is aligned with the strategic direction of eOman, which encourages the use of different technologies.[94]

In Jordan, the Ministry of Information and Communications Technology (MoICT) signed in January 2010 a memorandum of understanding (MoU) with Ingress which will assist the Government in launching a project that aims to promote and drive open-source adoption in the kingdom. The agreement includes a range of such activities as providing software and support for a laboratory in one of the leading universities in Jordan, training a group of specialists to implement a specific Government-service project, supporting the ministry to promote open source through workshops and academic initiatives, and promoting Jordan as a hub for open-source technology in the region.[95]

While Egypt has a thriving community of open-source contributors and practitioners, the use of open-source software in the public and private sectors is still in its infancy. In 2011, the number of software companies specialized in open source reached 47, and the number of employees working in the field was around 1000. Such commercial software vendors as Microsoft, Oracle and IBM dominate the Government and large enterprise markets with their products; however, MoCIT is weighing the possibility of initiating a pilot project to promote FOSS. In this regard, a case study and an action plan will be prepared in collaboration with the Information Technology Institute (ITI) and the Technology Innovation and Entrepreneurship Centre (TIEC).[96]

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[94] See: http://www.ita.gov.om/ITAPortal/MediaCenter/NewsDetail.aspx?NID=302.

[95] See: http://www.ingres.com/about/newsroom/press/20100112-government-of-jordan-selects-ingres-to-drive-open-source-adoption-across-the-country.

[96] See: http://www.mcit.gov.eg/MediaPressSer_Details.aspx?Type_ID=3&ID=2025.

While a number of ESCWA member countries have realized the importance of using FOSS and its numerous advantages, the adoption rate of open source is still minimal. This can mainly be attributed to the inadequacy of open source in addressing the particularity of the Arabic language, especially at the level of its different alphabetical representations. In addition, most available FOSS lack the native support of interface localization into Arabic, and does not provide Arabic spell checker functionality.[97]

B. CLASSIFICATION AND RANKING OF ESCWA MEMBER COUNTRIES ACCORDING TO MATURITY LEVEL

In order to rank ESCWA member countries according to maturity level in access to information and knowledge, a number of factors were considered, including Internet penetration rates, broadband subscription costs as a percentage of income, availability of community public-access centres, free flow of information and the quantity of information available on the Internet. In 2011, Bahrain and Qatar achieved maturity level 4, while Palestine was elevated to maturity level 2.

1. *Maturity level 1: The Sudan and Yemen*

This maturity level is characterized by low Internet penetration rates and high Internet costs as a percentage of income, as well as inexistence or very limited existence of public/community ICT access centres, in rural and remote areas; with limited digital public-domain information that is accessible to the citizens.

2. *Maturity level 2: Iraq, Jordan, Lebanon, Palestine, Saudi Arabia and Syrian Arab Republic*

This maturity level is characterized by an average Internet penetration rate, reasonable Internet costs and availability of digital public-domain information albeit with some limitations due to censorship. The existence of few public/community ICT access centres in rural areas is also a characteristic of this level of maturity. Palestine attained this maturity level in 2011 owing to its e-Government project which promotes public-domain information. Saudi Arabia could have been ranked in a higher maturity level had it not been for the strict censorship and filtering policies in the country.

3. *Maturity level 3: Egypt, Kuwait, Oman, and United Arab Emirates*

This maturity level is characterized by good Internet penetration rates, widespread broadband Internet usage and low-cost Internet services. Public/community ICT access centres catering to the needs of low-income individuals have been established in disadvantaged areas.

4. *Maturity level 4: Bahrain and Qatar*

This maturity level is characterized by high Internet penetration rates with affordable subscription costs, extensive broadband usage, availability of large public-domain digital information bases and public ICT access centres for the disadvantaged. Bahrain and Qatar attained this maturity level in 2011. Both countries enjoyed high Internet penetration rates, low and affordable Internet subscription costs, free and open access to a wealth of public-domain information, and the availability of public access centres catering to the needs of low-income individuals.

[97] Tawileh, A. *Open Source Software and the Arabic Language* (in Arabic).

TABLE 32. RANKING OF ESCWA MEMBER COUNTRIES BY MATURITY LEVEL IN ACCESS TO INFORMATION AND KNOWLEDGE

	Maturity level 1			Maturity level 2			Maturity level 3			Maturity level 4		
Country or territory	2007	2009	2011	2007	2009	2011	2007	2009	2011	2007	2009	2011
Bahrain							✓	✓				✓
Egypt				✓				✓	✓			
Iraq	✓				✓	✓						
Jordan				✓	✓	✓						
Kuwait							✓	✓	✓			
Lebanon				✓	✓	✓						
Oman				✓				✓	✓			
Palestine	✓	✓				✓						
Qatar							✓	✓				✓
Saudi Arabia				✓	✓	✓						
The Sudan[a/]		✓	✓									
Syrian Arab Republic	✓				✓	✓						
United Arab Emirates							✓	✓	✓			
Yemen	✓	✓	✓									

Source: Compiled by ESCWA.

Note: a/ No assessment was provided for the Sudan prior to 2009, which only joined ESCWA in 2008.

Figure 4. Maturity levels of ESCWA member countries in access to information and knowledge

C. SUGGESTIONS AND RECOMMENDATIONS

Access to information and knowledge requires a reasonably priced and advanced ICT infrastructure, ICT literacy, the availability of public domain digital content in Arabic and widespread community/public ICT access points. Recommendations are as follows:

(a) Accelerate the implementation of ICT infrastructure projects, especially for broadband technologies and reduce Internet-subscription costs to a level affordable by a wider section of the community;

(b) Increase the number of public/community ICT access centres in rural/disadvantaged areas in all ESCWA member countries, particularly those with modest or low GDP per capita;

(c) Continue the development of a competitive telecommunication sector to lower connectivity costs and rates;

(d) Reduce censorship, filtering and blockage of websites to a minimum;

(e) Increase the availability of digital Arabic content in order to encourage usage by large segments of the population and provide free access to online content on the Internet in order to encourage knowledge creation and sharing;

(f) Accelerate the implementation of the Arabic Domain Name System (ADNS) and encourage its use by the public and private sectors for promoting access to information of a large segment of the population that is literate only in Arabic;

(g) Promote the use of open-source software, benefit from regional success stories, and collaborate with national, regional and international organizations working in the field, in order to address limitations facing the adoption of open source in the region.

IV. ICT CAPACITY-BUILDING

Capacity-building is of vital importance to ESCWA member countries. The last decade has seen progress in literacy, interconnectedness and GDP, while gender equity has seen notable advances, particularly in the area of basic literacy. As these quality-of-life indicators have improved, more and more countries are finding themselves entering a stage of globalized competition.

In this new paradigm, the definition of success has changed. No longer is basic literacy a defining measure. Instead, computer literacy, tertiary education and the quality of research and innovation have become more important. The commodity-dependent economies in the region have demonstrated more momentum in this area as economic diversification has been given higher priority. In order to successfully compete, the new targets of success include innovation and a globally competitive economy.

Together with continuing efforts to promote literacy among those who are economically or socially marginalized, these efforts represent the front lines of economic development in the region.

A. COMPARATIVE ANALYSIS

1. *Basic literacy, employment and ICT capacity-building*

While the statistical picture is somewhat incomplete, literacy rates appear to have shown consistent improvement in the region (see table 33). At the national level, several ESCWA member countries have achieved functionally full literacy. Due to data-collection issues, it is difficult to make accurate conclusions at the per-capita level, as survey data is unavailable for the majority of the people in the region. When measurements are supplemented by projection and estimation, it becomes clear the literacy rates closely track the overall development status in the region.

TABLE 33. ADULT LITERACY RATES IN THE ESCWA REGION BY GENDER, 2009 OR MOST RECENT

Country or territory	Women (*percentage*)	Men (*percentage*)	Gender parity − ratio of female-to-male literacy rate
United Arab Emirates[a/]	91.47	89.48	102.23
Bahrain	90.17	92.16	97.84
Qatar	92.91	95.12	97.68
Kuwait[d/]	91.79	95.02	96.60
Palestine	91.70	97.43	94.12
Jordan[c/]	88.90	95.49	93.10
Lebanon[c/]	85.97	93.38	92.06
Saudi Arabia	81.08	89.96	90.13
Oman[d/]	80.87	90.00	89.86
Syrian Arab Republic	77.98	90.37	86.29
Egypt[b/]	57.81	74.62	77.47
The Sudan	60.82	79.62	76.39
Yemen	44.68	79.90	55.92

Source: UNESCO Institute for Statistics, Data Centre, which is available at: http://stats.uis.unesco.org.

Notes: a/ 2005.
b/ 2006.
c/ 2007.
d/ 2008.

One particular success case has been the achievement of high literacy levels in Palestine. Under difficult economic and social circumstances, a national literacy rate of 94.5 per cent has been achieved. In particular, the consistent, steady growth seen in this area, which started at 92.3 per cent in 2004, is largely

attributable to improvements in the literacy rate among women. When disaggregated by gender, the literacy rate for women has improved from 87.9 per cent in 2004 to 91.7 per cent at present. This represents significant progress in closing the gender-parity gap over a consistent period of time.

With few exceptions, basic literacy rates in the region are no longer a significant impediment to progress. This reality reflects the progress being made as countries develop to higher levels of maturity and more effectively invest in their social capital. As will be highlighted in later sections of this document, while basic literacy is showing significant progress, new goals are needed to accurately assess the ability of the region to compete on a global level in the educational realm. An adequate education to prepare the citizens of the region to compete globally encompasses many more criteria than literacy.

Even in ESCWA member countries with comparatively low literacy, at 60-70 per cent, policymakers must consider these figures in the context of the total economic picture. For example, even in a population with a low literacy rate, the unemployment rate is simultaneously so high that a large labour pool of literate but unutilized labour exists. In this regard, the existing social capital already exceeds the capacity of the economy to utilize the worker base. Therefore, from a macro-social perspective, resources should be focused on resolving the bottlenecks which are preventing the economy from using the existing supply of literate workers. Of course, this is not to suggest that literacy campaigns should not be pursued as a matter of general policy, but it does illustrate that literacy is not likely to be the proximate cause of the high unemployment rates observed. Economic opportunity and broader educational adequacy are more likely to be relevant in these cases.

In this regard, the promotion of literacy must proceed in conjunction with the reforms necessary to resolve the economic bottlenecks which are preventing improvement in standards of living. As these countries progress from lower- to middle-income developing country classification, these bottlenecks will increasingly be found in areas of innovation, entrepreneurship and research and development on a globally competitive scale. While literacy is obviously a requirement for competition at this level, it is certainly not the ultimate measure. For these reasons, it is necessary to begin transitioning measurement efforts to standards more reflective of the progress these countries have made in transitioning to a more developed status, making literacy measures more obsolete and innovation measures more relevant.

2. *ICT in education and training*

As with basic literacy skills, the maturity level of IT skills in most ESCWA member countries has improved substantively. At the same time, penetration rates of Internet services, mobile phones and PCs continue to increase. As such, consumer-level IT skills have risen as well. Particularly within the last few years, and as recent political events in the region clearly illustrate, a large number of citizens in the ESCWA region are quite comfortable sending e-mail, using social media and mobile-phone technology. Such quantitative metrics as the rise of Facebook use help support these observations with measurable proxy data. In this regard, Facebook usage in the broader Arab region increased by 30 per cent in the first three months of 2011.[98]

Because of the increasing social capital seen in these progressively sophisticated usages of modern technology, such previous measurement tools as the ICDL take on less significance. As this credential certifies functionality in skill sets which are becoming increasingly common with the youth, the number of individuals holding this certificate becomes less relevant to measuring the true state of ICT skills in the society. While ICDL training programmes are comparatively less expensive and easier to implement, they are more useful to skill attainment at lower maturity levels, or in dealing with marginalized communities. As such, it can still have utility, but takes on less value at the macro-economic level.

[98] Dubai School of Government. 2011. *Arab Social Media Report*. Vol. 1 No. 2. P. 23. May 2011,

Furthermore, the rise of mobile applications has resulted in a shift in ICTs away from traditional desktop applications and towards mobile phones. Smart phones in particular are a good example of this type of effect. However, even comparatively simple technology is taking on an ever more significant impact in regional economies and societies. The use of short-message-service (SMS) technology and mobile payments illustrate the degree to which even simple ICTs can play an important role. None of these applications require the types of skills typically seen in an ICDL training programme. For these reasons, the deployment of ICDL training has taken on less significance in educational strategies.

In order to illustrate how well ESCWA member countries are utilizing ICT in their educational systems, more refined measurements are needed. To address this need, new indicators, inspired by WSIS have been proposed for tracking ICT adoption in education. These indicators are intended to focus on e-readiness issues by illustrating the degree to which basic ICT components are present.

Previous measures tended to evaluate the success of ICT integration into education as a function of the existence of computers and connectivity in the classroom. While it is intuitively obvious that computers which do not exist cannot be well integrated, it does not hold that the existence of a computer is, in fact, well integrated. What is going into the classroom must be considered in context with what is coming out of the classroom. Improved educational quality as measured by performance on internationally standardized testing instruments represents the best available measurement mechanism presently available. The Programme for International Student Assessment (PISA) administered by the Organisation for Economic Co-operation and Development (OECD) represents the current state-of-the-art in international academic metrics. By evaluating the raw resource inputs in terms of funding, compared to academic outputs in terms of performance, we can gain insight into how effectively the educational system is utilizing resources to produce academic results.

TABLE 34. EDUCATION-SECTOR RESOURCE INPUTS AND RESULTS OBTAINED FOR SELECTED COUNTRIES, 2009

Country	Qatar		United Arab Emirates		France	
Indicator	Actual	Normalized	Actual	Normalized	Actual	Normalized
Public spending on education as % of GDP 2007	3	0.75	1	0.25	6	8.84
Quality of science and math education (1-7) 2008	5.3	7.73	4.6	3.64	5.7	9.76
PISA Math Scale 2009	368	Below ave.	453	Below ave.	497	Average
PISA Science Scale 2009	379	Below ave.	466	Below ave.	498	Average

Sources: The World Bank Knowledge Assessment Methodology (KAM 2010); and OECD. PISA 2009 Profiles by Country/Economy.

Because the established research consensus strongly suggests that, in order for ICT investments to meaningfully impact education, a well-rounded programme must be undertaken. Generally speaking, the teacher makes the most difference in the impact of the technology. As such, teacher training and educational reform is likely to be the most critical factor in the absorptive capacity of the school system to effectively use ICTs to create improved educational results. While the correlation is not perfect, a school system that is otherwise performing well on a resource-to-results analysis is more likely to be in a position to have the human capital necessary to benefit from the traditional measures of computer and connectivity in the classroom.

The baseline assessment level (table 34) shows that, while both Qatar and Dubai (in the United Arab Emirates) are spending significantly less than France on education, their individual levels of outcome are significantly different. It should also be noted that, while spending data is not available for Jordan, its students achieved scores of 387 on the math scale and 415 on the science scale. This suggests that, while countries in the region are spending a significantly smaller percentage of their GDPs on education generally,

outcomes as a function of financial resources input are, in some cases, highly variable. In most cases, ESCWA member countries are spending less as a proportion of GDP while also achieving lower results. The exceptions to this trend underscore the impact of non-financial elements on educational outcome, with teacher effectiveness as an instinctive candidate to account for these differences. Such ESCWA member countries as the United Arab Emirates, in particular Dubai, and Qatar have begun participating in the PISA exercise, making quantitative and transnational comparisons possible. Given their recent enrolment in the programme, time-series data is not available.

Anecdotal research indicates that many of the resources dedicated to bringing technology into the classroom have been undertaken on a "parachuting" strategy, wherein the computers are simply dropped into the classroom environment. Extensive analysis has shown that this strategy is rarely effective in improving learning outcomes, with most of the observed benefits coming from the enhanced creativity of students using the computers at their own initiative. Particularly in countries where the home PC penetration is fairly high, this does not reflect a compelling value for an educational system, given the expense of the resources. Based on the capacities of school systems generally together with the traditional data on the availability of ICT resources, ESCWA member countries will likely gain greater benefits by combining their efforts to put technology in classrooms with enhanced teacher effectiveness, generally, and appropriate use of ICTs, specifically.

3. *Training programmes for capacity-building in the use of ICT*

National capacity-building programmes must be sensitive to the baseline level of development in the country. Economic maturity provides a rough measure by which to assess the general level of capacity-building needed. In light of the recent development progress in the region, the nature and scope of necessary training programmes for the regional labour force has changed significantly in the last several years. The same global factors which have changed the landscape for literacy and education have also impacted capacity-building. At earlier stages of development, many countries in the region lacked backing ICT literacy. However, given the increasing global interconnectedness of the knowledge economy, greater ICT literacy is required. As demonstrated in table 35 by the economic-maturity rankings provided by the WEF, all ranked ESCWA member countries have now matured out of the foundational level of growth and are either transitioning to or progressing out of the efficiency-driven level. While the basic factor-driven level is characterized by effective primary education, the innovation-driven level requires success in higher education and innovation. For these reasons, educational efforts should focus on higher levels of ICT-literacy sophistication than it has been seen in the past.

TABLE 35. STAGE OF DEVELOPMENT OF THE ECONOMY IN SELECTED ESCWA MEMBER COUNTRIES, 2009-2011

Country	2009-2010	2010-2011
Bahrain	2.5	2.5
Egypt	1	1.5
Jordan	1.5	2
Kuwait	1.5	1.5
Lebanon	..	2
Oman	1.5	2.5
Qatar	2.5	1.5
Saudi Arabia	1.5	1.5
Syrian Arab Republic	1	1.5
United Arab Emirates	3	3

Sources: WEF. 2010a; and WEF. 2011a.

Notes: Two dots (..) indicate that data are not available.

Development-stage values: 1 = factor-driven, 1.5 = transitioning from stage 1 to stage 2, 2 = efficiency-driven, 2.5 = transitioning from stage 2 to stage 3, 3= innovation-driven.

Reflective of the obsolescence of the ICDL as a programme for providing the training presently needed in the region, new measurement methodologies are necessary. As shown in table 34, while typically assessed at the 15-year old level, the PISA reading indicator, which focuses on accessing and retrieving information, is a useful candidate for determining how well the cohort eligible for tertiary education is able to obtain and utilize knowledge. While only three ESCWA member countries presently participate in his measurement, namely Jordan, Qatar and the United Arab Emirates, other options are available. The WEF-survey rankings provide insight into the opinions of the respondents about certain aspects of the local environments. While this is not as useful as a direct measurement, it is likely to be the best internationally comparable data on educational performance outcomes for the time being.

TABLE 36. RANKING AND SCORE OF HIGHER EDUCATION AND TRAINING PILLAR OF SELECTED ESCWA MEMBER COUNTRIES, 2009-2010

Country	Global ranking (out of 139 countries)	Higher-education and training-pillar score (1-7)
Qatar	32	4.84
United Arab Emirates	36	4.80
Bahrain	44	4.64
Lebanon	48	4.57
Saudi Arabia	51	4.55
Jordan	57	4.32
Oman	63	4.22
Kuwait	83	3.87
Egypt	97	3.59
Syrian Arab Republic	107	3.31

Source: WEF. 2011a.

Consistent with this reality, it bears notice that rankings in higher education and training (table 36) closely track the overall level of development of a country. In addition to this data, the WEF-survey respondents were also asked to rank obstacles that were most significantly impacting global competitiveness at the national level. As can be seen in table 37, independent of maturity level, perceived inadequacy in the education of the workforce is listed within the top-three criteria in most cases. Based on this data, it is reasonable to infer that many people remain under-educated and ill-equipped to compete on a global level. This implies the need for regional Governments to increase their investments to improve the quality of and accessibility to tertiary educational options available to their citizens in order to foster continued development away from commodity and labour-depended economies and toward innovation and knowledge-based economies.

TABLE 37. PRIORITY RANKING OF WORKFORCE EDUCATIONAL ADEQUACY AS AN OBSTACLE TO COMPETITIVENESS IN SELECTED ESCWA MEMBER COUNTRIES, 2009-2010

Country	Inadequately educated workforce
Bahrain	Ranked 3rd
Egypt	Ranked 3rd
Jordan	Ranked 4th
Kuwait	Ranked 4th
Lebanon	Ranked 7th
Oman	Ranked 2nd
Qatar	Ranked 3rd
Saudi Arabia	Ranked 3rd
Syrian Arab Republic	Ranked 1st
United Arab Emirates	Ranked 2nd

Source: WEF.2011a.

4. *Innovation and patents*

As discussed in the chapter on Building the ICT Sector, total spending on research and development as a percentage of GDP remains significantly lower than in high-income countries. While there is an implied link between research-and-development spending and innovation, the capacity to transform invested capital into monetizable innovation is not uniformly distributed. Other than corporate performance indicators, which would only measure a limited scope of total innovation, direct measurement of this trait is difficult. With this in mind, composite indices have been created to help analysts assess innovation in the region.

Even though innovative and creative solutions to business problems are discovered on a daily basis in the ESCWA region, much of these activities are centred around the realities of life in a developing country. While recent scholarship has begun to focus more on the social capital represented by the innovation among the "bottom billion", these activities are poorly understood and valued. In this context, the natural human capacity to find innovative solutions can often be subsumed by the countervailing forces of corruption, constrained resources, ineffective rule of law and so forth. The interplay of these factors makes it difficult to understand and measure the nature of the innovation taking place in these developing economies.

From a commercialization perspective, the innovative activity within the ESCWA region is not producing economic growth as quickly as the innovative activities in the developed world. In this regard, particularly for countries transitioning out of factor-driven status and towards efficiency-driven and innovation-driven economies, these issues will become increasingly important. All too often, developing countries experience stagnation as they face challenges in implementing the economic restructuring necessary to compete on the basis of knowledge and innovation.

Therefore, in order to create an innovation-driven economy, it is important to ensure that investments in the ICT sector result in high-quality research institutions, and that the economy itself is competitive in transforming those innovations into economically relevant products. A classic policymaking mistake in this regard can be seen in countries which invest in knowledge parks, high-tech incubators and research stations, but do not address the factors in the economic environment which promote competitive business growth. In some cases, this strategy is justified by a desire to avoid disruptions to existing market players. In nearly all of these cases, the innovation which results from these investments will not have the proportional capacity for economic benefit as would have been seen in a more competitive environment.

TABLE 38. QUALITY OF SCIENTIFIC RESEARCH INSTITUTIONS IN THE ARAB REGION, 2009-2010

Country	Score[a/]	Ranking among 139 countries
Qatar	5.1	22
Saudi Arabia	4.4	37
Tunisia	4.3	38
United Arab Emirates	4.1	45
Oman	3.9	57
Kuwait	3.5	75
Morocco	3.1	93
Algeria	3.1	96
Jordan	3.1	98
Egypt	2.9	110
Bahrain	2.8	117
Libya	2.6	125
Syrian Arab Republic	2.5	127
Lebanon	2.4	130
Israel	6.2	1
Malaysia	4.7	32
Turkey	3.3	89
World average	3.8	

Source: WEF. 2011a.

Note: a/ This is based on a seven-point total score, whereby 1 = very poor and 7 = the best in their field internationally.

These factors, among others, have led to a serious problem in efforts to increase innovation in the region. Emigration of highly-trained, talented and innovative individuals disadvantages the development of local human resources and can lead to a dangerous spiral effect, wherein the people with the greatest talent and highest potential are also the ones most likely to have a vested interest in leaving an inefficient workplace. Particularly damaging in these cases is that the loss for the region is a gain for another country, as these talented individuals then contribute their labour at an even more effective rate to the growth of a competing economy. While direct measurement of the movements among talented individuals is extremely difficult to undertake, the WEF does provide data tracking the perception of brain drain within an economy. As can be seen in table 39, this data strongly suggests that the outflow of talented individuals is a significant problem for countries in the region.

TABLE 39. BRAIN DRAIN IN SELECTED ESCWA MEMBER COUNTRIES, 2009-2010

Country	Score[a/]	Ranking among 139 countries
Qatar	6.0	2
United Arab Emirates	5.5	5
Saudi Arabia	5.5	14
Bahrain	5.5	15
Oman	4.8	24
Kuwait	4.1	43
Jordan	3.4	66
Lebanon	2.5	113
Egypt	2.5	114
Syrian Arab Republic	2.4	118
World average	3.5	

Source: WEF. 2011a.

Note: a/ This is based on a seven-point total score, whereby 1 = no, the best and brightest normally leave to pursue opportunities in other countries; and 7 = yes, there are many opportunities for talented people within the country.

Patenting activity is also a popular measure of innovation output. While this data is comparatively easy to come by, it should be understood that patenting activity tends to be seen in countries with a robust intellectual-property environment and business culture in favour of patenting. These factors tend to be present in mature economies, but less so in middle-income developing nations. This reality underscores that high levels of patent applications tend to correlate to levels of development, but not necessarily to levels of innovation. For the purposes of macro-economic analysis, it is important to review patent numbers in the complete context of research and development, tertiary enrolment, and other such factors. Furthermore, it bears noting that significant variances can be seen among and between highly-developed, innovative and competitive economies, further underscoring that, while patent information is useful, it is not likely to be the proximate cause of development, but rather an outcome of a particular type of developed country. Determining the right level of patent activity is a difficult notion indeed.

TABLE 40. AVERAGE PATENTS PER PERSON: ESCWA REGION AND SELECTED COUNTRIES, 1999-2010

Rank	Country or region	Average number of registered patents (*per annum*)	Patents granted per million people (*per annum*)
1	Kuwait	8.58	3.15
2	United Arab Emirates	5.00	1.12
3	Saudi Arabia	21.25	0.86
4	Lebanon	3.00	0.72
5	Qatar	0.58	0.46
6	Oman	0.75	0.27
7	Bahrain	0.17	0.22

TABLE 40 (*continued*)

Rank	Country or region	Average number of registered patents (*per annum*)	Patents granted per million people (*per annum*)
8	Jordan	1.00	0.17
9	Egypt	6.67	0.08
10	Syrian Arab Republic	1.08	0.05
11	Yemen	0.08	0.00
12	Iraq	0.08	0.00
13	Palestine	..	..
14	The Sudan	0.00	0.00
	Arab average	50.92	0.15
	GCC average	36.33	0.99
	ESCWA average	48.25	0.20
	World average	170,548.42	25.14
	USA	87,784.25	288.71
	Israel	1,134.50	155.24
	Turkey	17.75	0.24
	India	1,211.58	1.06
	Japan	35,047.58	274.44
	Germany	10,441.83	127.12
	Malaysia	101.00	3.74

Source: United States Patent and Trademark Office (USPTO).

Note: Two dots (..) indicate that data are not available.

B. CLASSIFICATION AND RANKING OF ESCWA MEMBERS COUNTRIES ACCORDING TO MATURITY LEVEL

1. *Maturity level 1: Iraq, the Sudan and Yemen*

This maturity level is characterized by limited use of ICT in education, weak technical-training programmes and a comparative lack of research and innovation programmes. It can be noted that countries classified at level 1 are those struggling with low levels of economic development and difficult security situations.

2. *Maturity level 2: Oman, Palestine and Syrian Arab Republic*

This maturity level is characterized by relatively significant IT use in education, existence of ICT training programmes for public-sector employees and the development of clear plans for research, development and innovation (RDI).

Oman, Palestine and the Syrian Arab Republic are generally showing positive forward momentum although at this stage their performance was not enough to take them to the next level. They can be fairly classified as transitioning, although outstanding issues in the political and economic environment are risk factors for future progress.

3. *Maturity level 3: Bahrain, Egypt, Jordan, Kuwait, Lebanon, Qatar and Saudi Arabia*

This maturity level is characterized by widespread use of ICT in schools and universities, extensive IT literacy programmes and progress in RDI. Several of the countries which entered this category in the last assessment have retained their status, with only Bahrain counting as a new entrant. This reflects the progressive difficulty in undertaking the systemic reforms needed to achieve an innovative, knowledge economy.

4. *Maturity level 4: United Arab Emirates*

This maturity level is characterized by a strong and mature use of ICT in education, especially e-learning applications, dedicated IT-literacy programmes both for the public sector and for citizens, an advanced progress in science and technology, and adequate funding for research and development leading to innovation. The United Arab Emirates has built national capacity in ICT through a well-performing educational system, the ability to attract and retain qualified workers and generally competitive economy. These steps have helped enable the transition to a more innovation-driven economy, solidifying its status at maturity level 4 in the region.

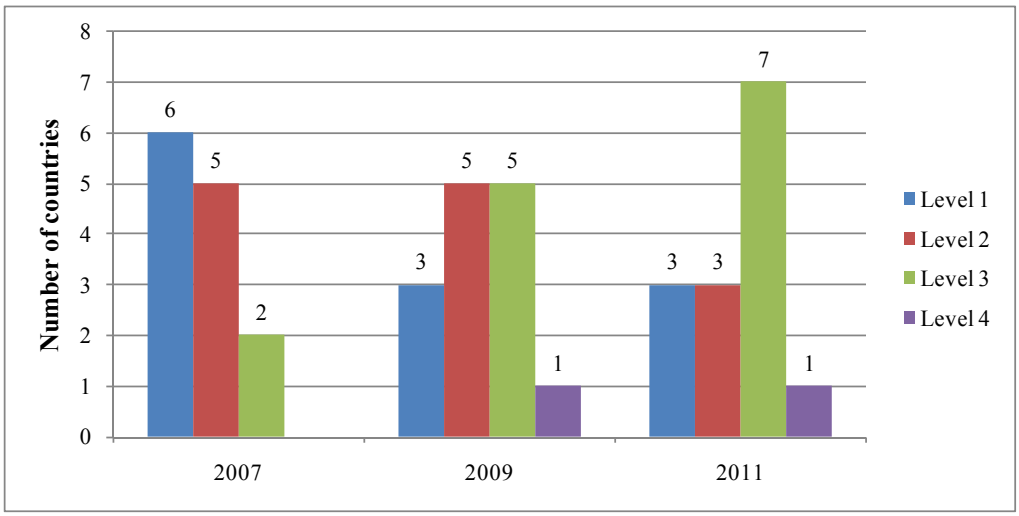
TABLE 41. RANKING OF ESCWA MEMBER COUNTRIES BY MATURITY LEVEL IN ICT CAPACITY-BUILDING

	Maturity level 1			Maturity level 2			Maturity level 3			Maturity level 4		
Country or territory	2007	2009	2011	2007	2009	2011	2007	2009	2011	2007	2009	2011
Bahrain	✓				✓				✓			
Egypt				✓				✓	✓			
Iraq	✓	✓	✓									
Jordan							✓	✓	✓			
Kuwait	✓							✓	✓			
Lebanon				✓				✓	✓			
Oman	✓				✓	✓						
Palestine	✓				✓	✓						
Qatar				✓				✓	✓			
Saudi Arabia				✓				✓	✓			
The Sudan[a/]		✓	✓									
Syrian Arab Republic	✓				✓	✓						
United Arab Emirates							✓				✓	✓
Yemen	✓	✓	✓									

Source: Compiled by ESCWA.

Note: a/ No assessment was provided for the Sudan prior to 2009, which only joined ESCWA in 2008.

Figure 5. Maturity levels of ESCWA member countries in ICT capacity-building



C. SUGGESTIONS AND RECOMMENDATIONS

While ESCWA member countries have advanced meaningfully in their ICT capacity-building, this higher maturity level suggests that a change in measurements of success and priorities will be needed in the future. Whereas success was previously defined in terms of basic literacy, an increasing number of ESCWA member countries are now in competitive environments which require competition at the tertiary level. Re-normalization of the maturity-level criteria in future profiles will be needed to reflect this improvement.

As such, greater investment in research and development, creating a hospitable business environment and investing in capacity-building are increasingly needed.

The following recommendations can be used as guidelines to be developed further, in line with the specificities and circumstances of each country in the region:

(a) Prioritize expenditures on higher education, with investments carefully assessed against outcome measurements to insure that resources are producing optimal results;

(b) Adopt policies to promote research and development, with particular emphasis on creating an environment which can attract highly-educated professionals;

(c) Update and modernize educational systems, including integrating ICT in education and training, equipping schools, training teachers, incorporating ICT, and fostering the use of the Internet and online research as subjects in school curricula;

(d) Invest in teacher-training programmes to ensure that technology is appropriately used in classrooms to promote the needed educational improvements systemically;

(e) Promote an enabling business environment which values and monetizes globally competitive innovation.

V. BUILDING CONFIDENCE AND SECURITY IN THE USE OF ICTS

In the last few years, a significant increase could be noted around the world in the number of cybersecurity threats reported, breach of high-profile security systems and online dissemination of sensitive information. Many of these activities have had a considerable global, political and economic impact on various countries, institutions and organizations. The rise in online personal data that is shared and stored in social networking sites adds to the complexity of responsibly managing information. The shift to cloud computing, electronic contactless payment systems and mobile technologies to provide seamless transactional experiences to users highlights a key concern in information sharing amongst institutions, particularly when linking different user accounts. The acquisition of personal data as well as their management and protection have become the source of revenue and primary functionality for many organizations today.

As institutions use personal data while deterring and protecting against their misuse, individuals are increasingly having more of a stake in how their data are being used, and are naturally demanding more transparency and accountability as a result of sharing more personal data. The challenge still remains in achieving an acceptable level of confidence and security, which organizations and individuals feel, in order to build the information society as laid out in the WSIS action lines. The following sections in this chapter highlight advances and remaining challenges for ESCWA member countries in the field, including: use of electronic transactions and documents; online and network security; privacy and data protection; and countering the misuse of ICTs.

A. COMPARATIVE ANALYSIS OF SUCCESSES IN BUILDING CONFIDENCE AND SECURITY IN THE USE OF ICTS IN THE ESCWA REGION

At a regional level, confidence in security is still of great concern. For example, in Saudi Arabia, 65 per cent of IT and security experts questioned believe that the current national laws are inadequate in the fight against cyberattacks,[99] according to a report commissioned by McAfee, entitled In the Crossfire: Critical Infrastructure in the Age of Cyber War. Building confidence and security in the use of ICTs, at a regional level, was considered one of the main axes of the Arab ICT strategy "Building the Information Society 2007-2012, which was approved by the Arab Telecommunications and Information Council of Ministers (ATICM) in 2007.[100] Despite a positive intention towards building confidence and security in the use of ICTs and various advances within ESCWA member countries, challenges still remain. While online and network security have been given much more emphasis than in previous years, privacy and data protection remain significantly under-developed in ESCWA member countries.

1. *Use of electronic transactions and documents*

The main confidence-building measures for electronic transactions are: to give electronic documents equal legal validity as their counterpart paper documents; to regulate their reliability; and to protect consumer rights. Also the use of digital signature requires confirmation of the identity of the signing party and guaranteeing the authenticity and integrity of digitally signed documents through certification. Electronic transactions and digital signatures are both tools to be used within trusted frameworks that allow citizens to ensure the security of the transactions and documents, their authenticity and legality in a regulated environment. These tools should allow the promotion of e-business at large, for instance e-commerce and e-Government, and the implementation of appropriate information society policies.

The use of electronic transactions and digital signatures has yet to be fully developed in the ESCWA region, together with e-banking. Corporate and multinational segments are responding favourably to ICT. By building transactional and e-commerce platforms, several Arab central banks are laying the groundwork for

[99] See: http://www.mcafee.com/us/resources/reports/rp-in-crossfire-critical-infrastructure-cyber-war.pdf.

[100] See: http://www.aticm.org.eg.

operational e-banking and online payment. Despite low levels of readiness in credit card penetration in the area, regulations are being designed for online payment. Good examples can be found in Saudi Arabia, the United Arab Emirates, Lebanon, and Jordan. More than one-fifth of banks operating in the area now offer online services, from simple banking services to payment schemes. For example, by moving some documentary credit procedures online, Lebanese banks now offer escrow services to facilitate and guarantee e-commerce procedures. The United Arab Emirates Central Bank has introduced secure-socket layer (SSL), PKI, and smart-card technology to foster online banking, and payment gateways are being implemented by some of the large national players.

In the ESCWA region, Egypt, Qatar, Saudi Arabia and the United Arab Emirates are still considered the most-developed countries with regards to e-transactions, e-documents and e-signature. Iraq, Kuwait, Lebanon, Palestine and Yemen still have challenges remaining in order to reach maturity in this field, some of these countries have, however, been working towards draft laws and frameworks to facilitate maturity and development. The example of Egypt is detailed in box 5.

Box 5. Digital signature in Egypt

Digital signatures have been issued in Egypt since late 2009. The Information Technology Industry Development Agency (ITIDA) has successfully laid down the infrastructure necessary for this process, encouraging organizations licensed to issue signatures (so far three organizations) to comply with this infrastructure. In addition, ITIDA has assisted in creating a secure environment for the process, which has established the Egyptian model as the most successful in the Middle East and Africa. This model requires an official copy of the digital signature to be kept with ITIDA to guarantee consumer protection, in the event that any organization issuing signatures goes out of business. This progress in issuing digital signatures may trigger new political developments within Egypt, as national dialogue is taking place to discuss the possibility of using digital signatures in e-voting in the coming elections.

Source: http://www.itida.gov.eg.

In Jordan, the use of e-transactions, e-documents and e-signatures are legally recognized and regulated through the Electronic Transactions Law No. 85 of 2001. MoICT, in cooperation with various stakeholders, including the Central Bank of Jordan and TRC revised their Electronic Transactions Law during the year 2010, proposing various amendments and expecting cabinet approval in 2011. Amendments to the Electronic Transactions Law are being proposed with a view to:

- Strengthen the confidence of the public in the integrity and reliability of electronic records and electronic commerce;
- Expand the use of electronic transactions to include all civil, commercial and governmental transactions;
- Clarify and enhance the principles and general conditions essential for the recognition of electronic signatures.

In addition, a national public-private-key infrastructure project is planned in Jordan for 2011.

In Oman, the use of electronic documents and transactions is limited pending complete implementation of the Official E-Government Services Portal and the development of more e-Government applications. Oman's ITA, through the Memorandum of Understanding with the National Digital Certification Agency of Tunisia,[101] will establish the digital certification system in order to enhance the use of electronic transactions and documents. Digital certification aims at enabling citizens to have online access to administrative services from their own homes with full confidence, strong authentication and digital-signature solutions.

[101] Agence Nationale de Certification Electronique (ANCE).

During 2011, the Syrian Arab Republic hopes to introduce and adopt a package of laws regarding e-transaction, e-payment and e-commerce, including consumer protection. A pilot project has been started for e-signature between MoCT and the National Agency for Network Services (NANS). Preparation is also underway for two laws, tackling cybercrime and protection of personal data with an expected adoption by the end of 2011.

Despite efforts by ESCWA member countries, in recent years, to establish e-transaction and digital signature laws, there are still many challenges which remain in order to fully mature in this regard. Taking successful models from more developed countries within the region, underdeveloped countries can adapt these models to rapidly create and implement consistent national frameworks.

TABLE 42. AVAILABILITY OF E-TRANSACTION LAW, E-SIGNATURE LAW AND INFRASTRUCTURE FOR THE MANAGEMENT OF PUBLIC-KEY INFRASTRUCTURE (PKI) IN THE ESCWA REGION, 2011

Country or territory	E-transaction law	E-signature law	Management of PKI
Bahrain	✓	✓	×
Egypt	×	✓	✓
Iraq	×	×	×
Jordan	✓	✓	×
Kuwait	×	×	×
Lebanon	×	×	×
Oman	✓	✓	×
Palestine	×	×	×
Qatar	✓	✓	×
Saudi Arabia	✓	✓	✓
The Sudan	✓	✓	×
Syrian Arab Republic	×	✓	✓
United Arab Emirates	✓	✓	×
Yemen	×	×	×

Source: Compiled by ESCWA.

Table 42 provides a summary of the status of e-transaction and e-signature laws in addition to management of PKIs implemented in ESCWA member countries. The majority of these countries have implemented e-transaction and e-signature laws. However, the implementation of appropriate infrastructure for the management of security keys is needed to achieve information confidentiality, data integrity, and user authentication. The use of digital signatures through PKI remains very weak. Only Egypt, Saudi Arabia and, lately, the Syrian Arab Republic have implemented PKIs. Despite various countries working towards PKIs and amending their e-transaction and e-signature laws, they are yet to fully implement them.

2. *Online and network security and safety*

Cybersecurity has never been of such great concern as in recent years. Many countries are entirely reviewing their national cybersecurity plans, while some are even handing over this responsibility to military technicians and drawing parallels between virtual cyberattacks as so-called acts of war similar to physical attacks on their sovereignty and citizens. Organizations are under increasing pressure to protect customer details, particularly with the ongoing dialogues for better privacy and freedom of information. The WikiLeaks episode has demonstrated the vulnerability and embarrassment caused by the unwarranted dissemination of nationally sensitive information. More importantly, it marked a significant crossroad for both cybersecurity and freedom of information. This has empowered many activists, organizations and regulatory bodies to reassess their transparency and accountability expectations, while Governments and institutions had to reassess their worst-case scenarios in terms of information security and contingency planning.

The annual report on Internet security threats in Europe, Middle East and Africa (EMEA) 2010[102] of Symantec, the biggest computer security-software producer, identifies some very alarming trends within the EMEA region. Saudi Arabia was ranked tenth place, up from twelfth in 2009, in the area of Malicious Activity by Country, the majority of activities were centred on phishing hosts. Saudi Arabia was also tenth place, and 17th globally, in the area of Countries of Botnet Spam Origin, highlighting a major challenge of containing the source of such attacks. The absence of other ESCWA member countries from the high-level rankings within this report suggests either a lack of malicious cyberactivity and low relative rate of broadband penetration, or the absence of more in-depth reporting on cybersecurity issues. Previously in the 2008 Symantec report, the top-ranked country for potential virus infections in the EMEA region was Egypt. In the current report, Egypt was not in the top ten for any of the groupings. This achievement can be directly related to significant efforts by Egypt in ensuring cybersecurity.

To deal with these threats and cybersecurity issues, some ESCWA member countries have a lightweight, non-institutional approach in place, while others try to have a consistent approach through an institutional framework, for instance through a national computer emergency response team (CERT). In addition to the CERTs that are already established in various ESCWA member countries, namely Egypt, Oman, Qatar, Saudi Arabia and United Arab Emirates, the Sudan is the latest country to implement a national CERT. Egypt is yet to implement its CERT but the domain name remains registered by the national TRA, with the intention of establishing a CERT. Jordan and the Syrian Arab Republic have made progress in establishing a national CERT but have yet to implement it. Table 43 below lists ESCWA member countries that have implemented CERTs and their respective names and websites.

TABLE 43. AVAILABILITY OF NATIONAL COMPUTER EMERGENCY RESPONSE TEAMS IN THE ESCWA REGION, 2011

Country	CERT name	Website
Egypt	Egypt-CERT[a/]	http://egypt-cert.net
Oman	Oman National CERT	http://www.cert.gov.om
Qatar	Q-CERT	http://www.qcert.org
Saudi Arabia	CERT-SA	http://cert.gov.sa
The Sudan	Sudan CERT	http://www.cert.sd
United Arab Emirates	aeCERT	http://www.aecert.ae

Source: Compiled by ESCWA.

Note: a/ While Egypt-CER is still under development, the domain has been registered by NTRA.

In the same context and in addition to the activities undertaken by the CERT-SA, Saudi Arabia has established the Centre of Excellence in Information Assurance (CoEIA), the purpose, objectives and mission of the centre are explained in box 6.

Box 6. Saudi Arabia's Centre for Excellence in Information Assurance (CoEIA)

CoEIA has been established by King Saud University (KSU), as part of its faculties with an identified need for high-quality research and education in information assurance. The Centre is the first of its kind in the region, catering to national and international experts in the field. It is the vision of the centre to conduct world-class research in collaboration with internationally recognized centres, expert researchers and professionals in information assurance. Technology transfer and knowledge sharing are also part of CoEIA's strategic mission. CoEIA is at a progressive stage of maturity and has recognized that it has a long way to go in terms of credibility as an internationally recognized centre of excellence. CoEIA's goals are aligned with the National Information and Communication Plan (NICTP). It is the intention of the centre to solve national problems, develop products and services with a view to transferring knowledge and expertise. The centre holds public events and specialized graduate studies through collaboration with other academic institutions in Saudi Arabia as well as international research centres, universities, and companies.

Source: http://coeia.edu.sa/en.

[102] See: http://www.symantec.com/business/threatreport/topic.jsp?id=emea.

ITA in Oman has put in place a legislative framework to combat abuse of ICT. Upon the approval of the Council of Ministers and in cooperation with some experts at the Ministry of Legal Affairs, the ITA prepared this special draft law to address the abuse of ICT. The draft has been referred to the concerned authorities for final review and will be called anti-cybercrime law. This draft law aims at assisting in realizing cybersecurity.[103]

NIC in Yemen finished the preparation of a national strategy for information security, which will be discussed by the Council of Ministers in 2011 with a view to its finalization and adoption.

In recent years, the ESCWA region has witnessed a significant amount of activities with regards to the issue of protecting children over the Internet. Events at the global level have no doubt provided impetus and motivation to further develop this area. Egypt has the best example of conceptualizing and implementing an online resource which focuses on safety, called the Arab Internet Safety Portal (Amanak). This initiative is explained in box 7. In Oman, ITA celebrated, in May 2009, the World Telecommunication and Information Society Day (WTISD) under the theme Protecting Children in Cyberspace. It aimed at laying the foundation for a safe cyberworld in the near future; and to ensure safe Internet access for children. ITA also launched a national awareness campaign entitled Towards a Safe Online Environment, targeting children, students, parents and other social groups concerned with ICT, through the use of educational software, tools, technologies and training to raise awareness.

Box 7. The Arab Internet Safety Portal (Amanak)

The Egyptian initiative, the Arab Internet Safety Portal (Amanak), is a comprehensive portal focusing on online child safety and protection in the Arab region. This portal was developed to provide resources and materials on Internet-safety issues in the Arabic language, and provide an arena for dialogue amongst users of various age groups, as well as a platform for local initiatives in Arab countries to share experiences and knowledge. Amanak has five target groups, children and teenagers, youth, parents, educators, and law enforcement entities. Its content focuses on the digital citizenship, including safety, security and ethics. Amanak includes interactive content through such resources as movies, games, printouts, activities, and books. In addition, it offers a platform for communication within the Arab community by providing services like inquiries, complaints, and suggestions. In addition to online training, Arab countries can participate in Amanak through an interactive platform to share relevant information, best practices, concerns and resources.

Source: http://www.amanak.org.

The third annual meeting of the Cyber Peace Initiative (CPI) was held in July 2010, in Egypt. The meeting was in line with the efforts of the Women's International Peace Movement to secure the safety of children and families on the Internet. The meeting witnessed a key step forward towards the development of the child-safety agenda, with the signing of a letter of commitment by Egyptian Internet service providers (ISPs) to combat, through self-regulatory measures, inappropriate images of children and other forms of child exploitation on the Internet.

3. *Privacy and data protection*

Within the ESCWA region, privacy and data protection is among the least-developed areas for building confidence and security in the use of ICT. Several draft laws are still being studied and discussed but very few laws have been adopted and implemented in order to tackle this issue. Currently, Bahrain has no separate law addressing privacy and data protection. However, there are several draft laws that have been tabled in the parliament, including: a freedom-of-information law; a data-protection law; and a computer-crime law. These draft laws have been prepared in response to incidents which required appropriate attention

[103] ITA. 2009. *Annual Report 2009*. Pp. 47-48.

by way of legislation. The draft computer-crime law was prepared in 2004, the draft freedom-of-information law was proposed in 2005 and the draft data-protection law was put forward recently to balance the anticipated effect of the introduction of the freedom-of-information law. Furthermore, Bahrain has recently introduced Chip-and-Pin technology throughout the country, this initiative is explained in further detail in box 8.

Box 8. Bahrain's Europay International, MasterCard International and Visa International (EMV) Compliance

During 2009, the Central Bank of Bahrain (CBB)[104] worked with retail banks to successfully introduce EMV Chip-and-Pin technology for all credit and debit card transactions. EMV technology provides customers with improved security when using their cards, combining an advanced configuration of the embedded smart chip, linked with a personal identification number (PIN). Customers are advised to use their PIN to authorize all point-of-sales transactions, including those at automatic teller machines (ATMs) and customer-present merchant-based transactions. In addition, the point-of-sale terminals throughout Bahrain have been upgraded to provide customers with the facility to use a PIN number, rather than the previous method of a card swipe supported by a signature. This security technology is considered as a best practice in the financial industry, and is used in many other countries. All banks have already introduced the new cards, and these have been distributed to customers.

In Jordan, the proposed amendments to the Electronic Transaction Law of 2010 tackle privacy and data protection by specifying the need to issue a by-law that includes procedures for protecting data and information, including personal information to ensure confidence in e-transactions. Thus, MoICT will start working with all concerned stakeholders to draft this by-law upon passing the proposed amendments of the e-transaction law. In addition, the Computer Crime Department at the General Security Directorate participates in television awareness programmes and conducts awareness sessions at schools to educate people about cybercrime, providing them with advice on how to protect their privacy in cyberspace.

4. *Countering misuse of ICTs*

The growing threat of cybercrime goes hand-in-hand with the misuse of ICTs. Countering such misuse is not only necessary for recovering from cyberattack, but more importantly for preventing and discouraging it in the first place. The demand for electronic security products has surged in the ESCWA region, with most countries spending more than half of their total IT budget on security-software products.[105]

In this context, TRA in Bahrain conducted a study in 2010 called Roadmap for the Future in order to ensure a safer online environment. The main components of this study are detailed in box 9.

Box 9. Telecommunications Regulatory Authority (TRA) of Bahrain: main components of the Roadmap for the Future 2010

- Setting a child e-safety strategy with an adapted legislative child-protection framework;
- Training programmes for police officers and prosecutors to ensure effective implementation of the new legislation;
- Implementation of cybercrime legislation;
- Encouraging Internet service providers (ISPs) and TRA playing an active role in providing safety and technical advice on computer protection to adult Internet users;

[104] See: http://www.cbb.gov.bh.

[105] Middle East ICT Market Analysis, Market Publishers, April 2010, available at: http://marketpublishers.com/report/technologies_electronics/telecommunications/middle_east_ict_market_analysis.html.

Box 9 (*continued*)

- A comprehensive Internet-safety training programme to be developed for both the private and public-school sectors as part of the curriculum;
- Consulting with young people on the most appropriate and effective means of designing and delivering the programme;
- Introduction in schools of a designated e-safety staff function to ensure that programmes are delivered on a rolling basis in each school, and that outreach safety-advice work is undertaken with parents;
- Schools and non-governmental organizations (NGOs) playing an active role in working with parents to raise awareness about Internet safety and about the nature of online behaviour of young people;
- A far-reaching media campaign to be organized to deliver safety messages that appeal to different audiences.

As part of the commitment of the Government of Jordan towards providing a secured environment for e-Government and e-commerce services to ensure confidence of users and investors in ICT, an information systems' crime law was adopted in August 2010 as Law No. 30, which took effect after 30 days of issuance. The law identifies the elements of information-systems crimes and addresses gaps in existing legislations in terms of handling information systems and cybercrimes. Ultimately, the law aims at ensuring trust and confidence in the use of information technologies.

As an example of the nature of cyberattacks, the table below shows the distribution of cybercrimes reported in Lebanon, in 2010, according to TRA.

TABLE 44. CYBERCRIME REPORTED IN LEBANON
(*Ranked by number of incidents*)

Nature of attack	Number of incidents	Percentage
Threat of reputation abuse, extortion and defamation via Internet/phone	285	56.2
Theft of electronic account and its use for criminal purposes	92	18.2
Online fraud and impersonating IDs	48	9.8
Disturbing and bullying over the Internet/phone	27	5.4
Sexual exploitation of children online	14	2.8
Online gambling games	11	2.2
Theft and use of stolen e-mail	8	1.6
Credit card fraud	8	1.6
Falsification of touristic sites and their dissemination via Internet	4	0.8
Money embezzlement and bank accounts fraud	4	0.8
Fraud of telephone calls	2	0.4
Software piracy and theft of programmes and designs	1	0.2
Total	504	100

Source: TRA. 2011. Presentation in Haigazian University, ICT Security. 13 January 2011.

The establishment of CERTs within the region has been an essential step in countering the misuse of ICTs. In 2009, Oman CERT handled a total of 155 incidents involving cybersecurity and successfully resolved 151 incidents, monitored a total of 461 sites and published a total of 219 threat notifications. Despite having no CERT in Yemen, the interior ministry created a new unit in 2009 for electronic crime investigation.

B. CLASSIFICATION AND RANKING OF ESCWA MEMBER COUNTRIES ACCORDING TO MATURITY LEVEL

All ESCWA member countries remain at the same maturity levels in 2011 as in 2009 with regards to building confidence and security in the use of ICTs. However, there has been some exceptional progress

made in various fields, particularly by Jordan, the Sudan and the Syrian Arab Republic, much of these initiatives are yet to be implemented. Hence, this has not changed their overall maturity level. None of the ESCWA member countries has achieved maturity levels 3 or 4.

1. *Maturity level 1: Bahrain, Iraq, Jordan, Kuwait, Lebanon, Oman, Palestine, the Sudan, Syrian Arab Republic and Yemen*

Countries ranked at this maturity level lack national and legislative frameworks in relation to security, privacy and protection from ICT misuse. Despite much progress made by some countries, namely Jordan, the Syrian Arab Republic and the Sudan, the non-adoption or implementation of many such initiatives deems these countries at the same maturity level as previous years. Many countries at this stage have conceptualized such important initiatives as e-transaction and e-signature laws, the management of PKIs and legal and practical consideration for a secure and accountable ICT environment. However, concrete implementation of these concepts is still required to progress to a more developed and mature environment. Despite the establishment of a CERT in the Sudan, the lack of other well-established practical frameworks has contributed to its classification at maturity level 1. This can very easily change with slight developments.

2. *Maturity level 2: Egypt, Qatar, Saudi Arabia and United Arab Emirates*

Countries at this level have basic laws in place to counter the misuse of ICTs and ensure a secure environment for e-transactions. The challenge for ESCWA member countries in this maturity level still remains in adopting better mechanisms that are able to properly detect, report and combat cybercrimes. Such countries can use their relatively developed ICT environments as an example to be followed by other member countries wishing to adopt similar initiatives by sharing best practices, lessons learned and building on this potential position. In order to progress to the next level of maturity, all member countries at this level must pay greater interest to improving privacy laws for users, data protection as well as strengthening overall policies currently in place.

3. *Maturity level 3: None*

4. *Maturity level 4: None*

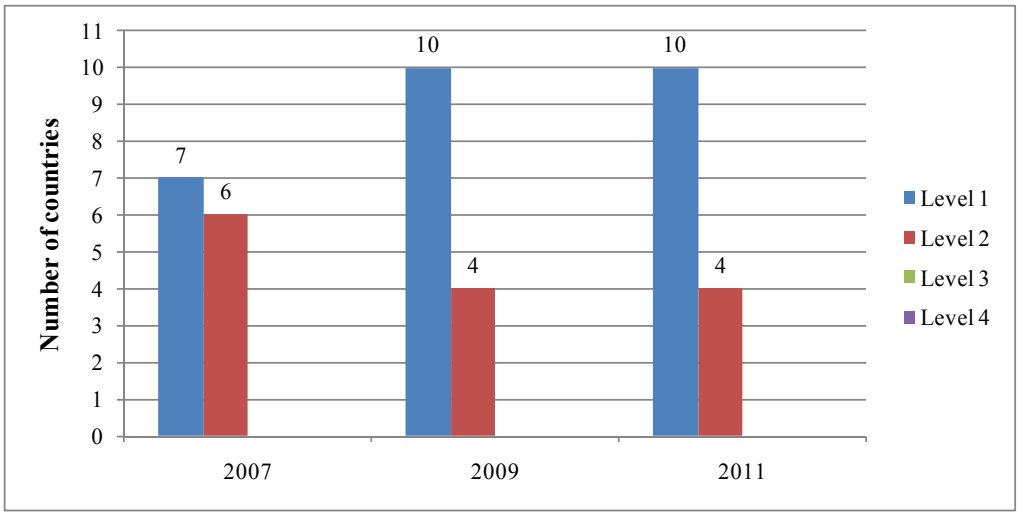
TABLE 45. RANKING OF ESCWA MEMBER COUNTRIES BY MATURITY LEVEL IN BUILDING CONFIDENCE AND SECURITY IN THE USE OF ICTS

	Maturity level 1			Maturity level 2			Maturity level 3			Maturity level 4		
Country	2007	2009	2011	2007	2009	2011	2007	2009	2011	2007	2009	2011
Bahrain	✓	✓	✓									
Egypt				✓	✓	✓						
Iraq		✓	✓	✓								
Jordan	✓	✓	✓									
Kuwait		✓	✓	✓								
Lebanon	✓	✓	✓									
Oman	✓	✓	✓									
Palestine	✓	✓	✓									
Qatar				✓	✓	✓						
Saudi Arabia				✓	✓	✓						
The Sudan[a/]		✓	✓									
Syrian Arab Republic	✓	✓	✓									
United Arab Emirates				✓	✓	✓						
Yemen	✓	✓	✓									

Source: Compiled by ESCWA.

Note: a/ No assessment was provided for the Sudan prior to 2009, which only joined ESCWA in 2008.

Figure 6. Maturity levels of ESCWA member countries in building confidence and security in the use of ICTs



C. SUGGESTIONS AND RECOMMENDATIONS

The following recommendations can be used as a benchmark for maturity and development within each ESCWA member country. Some of these recommendations have been collectively agreed on during discussions held at the workshop on Building Trust in the Use of e-Services in the ESCWA Region in May 2010:

(a) Develop a national security strategy with a clear plan of action, including the establishment of an adequate national regulatory structure or institution responsible for implementation;

(b) Identify critical resources, infrastructures and key priorities that Governments should address at the national level and for which adequate policies need to be formulated to ensure online security and safety;

(c) Develop comprehensive cyberlegislations in line with international treaties to cover all topics related to cyberspace, in particular those related to cybercrime, privacy and confidentiality of personal information, and train judges and lawyers on their application;

(d) Use all means available to raise awareness amongst decision makers on the importance of protecting cyberspace and building trust and security in the use of ICTs;

(e) Equally raise awareness amongst public-sector workers, business owners, individuals, households and children on protection mechanisms in the digital environment and safe, secure and ethical interaction;

(f) Outline standards and adopt novel and innovative methodologies for developing safe and reliable e-services and applications resilient to external risks and threats, including mechanisms necessary to maintain the privacy and confidentiality of personal information;

(g) Share best practices from existing CERTs among ESCWA member countries for promoting the establishment of an incident management capability with national responsibilities;

(h) Support the activities of CERTs by providing them with the latest technological solutions and standards in the field of security and protection of cyberspace, and making them the national points of reference in all technical matters related to the protection of ICTs;

(i) Encourage cooperation between public and private sectors in order to maintain the protection and security of networks and information systems and that of the national cyberspace, including the application of the tightest security measures for local networks and computer systems connected to the Internet, which are firewalls, anti-virus applications and spyware;

(j) Stimulate regional and international cooperation to share experiences and best practices, and to ensure a secure global cyberspace.

VI. ENABLING ENVIRONMENT

Information society does not develop and prosper without a proactive and favourable enabling environment supported by the establishment of an appropriate legal and regulatory framework that evolves with the technology and the needs of various applications. This framework encourages the use of the cyberspace and necessitates the adoption of consistent technical measures that enhance the interoperability and openness of ICT applications and facilitate their dissemination. In addition, the prosperity of the information society needs special supportive actions from the Government to drive investment, mobilize resources and create a climate conducive to the creation of startup companies and SMEs.

A. COMPARATIVE ANALYSIS

Although there are various definitions for the enabling environment of the information society, common components among these definitions include legal and regulatory framework and the investment climate. In the WEF definition, infrastructure is introduced as a main component of the enabling environment. In that context, the environment sub-index of the NRI used in the GITR and published by the WEF estimates the openness of the environment in a country for ICT development by taking into consideration three main pillars, namely:[106] (a) the market environment; (b) the political and regulatory environment; and (c) the infrastructure environment. Table 46 shows the global ranking of ten of the ESCWA member countries benchmarked by GITR for the environment sub-index.

TABLE 46. RANKING OF SELECTED ESCWA MEMBER COUNTRIES ON THE NETWORKED READINESS INDEX (NRI) ENVIRONMENT SUB-INDEX, 2010-2011

Environment sub-index			Market environment		Political and regulatory framework		Infrastructure environment	
Country	Rank	Score	Rank	Score	Rank	Score	Rank	Score
United Arab Emirates	25	4.77	18	4.98	34	4.82	28	4.51
Qatar	26	4.73	10	5.14	30	4.89	35	4.15
Bahrain	30	4.59	9	5.15	38	4.73	41	3.90
Saudi Arabia	32	4.53	19	4.95	25	4.97	54	3.68
Oman	43	4.17	31	4.73	45	4.50	71	3.28
Jordan	49	4.04	57	4.20	43	4.55	65	3.37
Kuwait	52	3.99	44	4.40	78	3.83	49	3.75
Egypt	71	3.79	65	4.13	66	4.03	75	3.20
Lebanon	81	3.62	45	4.37	126	3.12	66	3.37
Syrian Arab Republic	121	3.09	129	3.31	130	3.06	95	2.90

Source: WEF. 2011a.

Six ESCWA member countries figure among the top 50 countries with regard to the environment sub-index component globally.[107] In 2008-2009, Kuwait was among the top 50, but its score decreased from 4.02 to 3.99 and it is ranked 52 in 2010-2011 (see table 46). The United Arab Emirates leads the ESCWA member countries according to this sub-index given its advanced infrastructure environment, while Qatar, which is ranked immediately after the United Arab Emirates, has a better market and regulatory framework compared to the United Arab Emirates. Additionally, while Bahrain is ranked very high in market environment (9/138), its regulatory framework as well as its infrastructure environment are less advanced than those of the United Arab Emirates and Qatar. The relatively high ranking of Jordan is owed to the political and regulatory framework, while its infrastructure is less developed than the GCC countries, with the exception of Oman.

[106] WEF. 2011a.

[107] The number of countries considered by GITR in the 2010-2011 report is 138.

According to this sub-index, the weak infrastructure is impacting negatively the overall score of Saudi Arabia, Oman, Jordan and Egypt, while the political and regulatory framework decreased the overall score of Kuwait, Lebanon and the Syrian Arab Republic.

By comparing the environment sub-index of 2010-2011 to that of 2008-2009 (table 47), we can observe that there is an increase in the score of all the GCC countries, with the exception of Kuwait, which implies better positioning of these countries at the global level. In contrast, there is a decrease in the scoring of three ESCWA member countries, namely Kuwait, Egypt and the Syrian Arab Republic. For Jordan, there is an increase in its environment sub-index score, while its global positioning has regressed.

TABLE 47. RANKING OF SELECTED ESCWA MEMBER COUNTRIES ON THE ENVIRONMENT SUB-INDEX COMPONENT OF THE NETWORKED READINESS INDEX (NRI), 2008-2011

	Environment sub-index 2010-2011		Environment sub-index 2008-2009	
Country	Rank	Score	Rank	Score
United Arab Emirates	25	4.77	32	4.29
Qatar	26	4.73	29	4.41
Bahrain	30	4.59	37	4.12
Saudi Arabia	32	4.53	38	4.11
Oman	43	4.17	51	3.84
Jordan	49	4.04	48	3.94
Egypt	71	3.79	64	3.63
Kuwait	52	3.99	44	4.02
Lebanon	81	3.62	..	..
Syrian Arab Republic	121	3.09	101	3.18

Source: WEF. 2011a.

Note: Two dots (..) indicate that data are not available.

1. *Legal and regulatory environment*

The legal and regulatory framework is the most important driver for the promotion of ICT use in governmental, economic, social and cultural activities and for the development of the ICT sector. Government remains the main player for ensuring the adoption of an appropriate legal and regulatory framework that maintains fair competition, attracts investment, enhances the development of the ICT infrastructure and maximizes the economic and social benefits nationally and globally. Other such stakeholders as the private sector and NGOs also have a role for ensuring the good implementation of rules and laws related to the information society.

ESCWA member countries have started the modernization of their legal systems, especially those related to the liberalization of the telecom sector, and the adoption of selected cyberlaws. Nevertheless, there is still a need for enhancing and developing the regulatory framework, particularly for the promotion of intellectual property rights, fighting piracy, developing cyberlegislation, encouraging ICT investment and supporting entrepreneurship and innovation.

(a) *National intellectual property laws, regulations and international agreements*

The adoption of intellectual property rights (IPRs) and international conventions should improve the investment environment in the ICT sector and foster its growth. Numerous laws and international conventions and treaties exist, for instance the Patent Cooperation Treaty (PCT), World Intellectual Property Organization (WIPO) Copyright Treaty (WCT) and Patent Law Treaty (PLT), on which ICT legislations and regulations have been based.

As ESCWA member countries join the World Trade Organization (WTO), they have been adapting their legal and regulatory systems to accommodate trademark, patent and IPR agreements. Eight of the ESCWA member countries are members of the WTO, and four others are observers. Twelve among fourteen ESCWA member countries joined the Paris Convention for the Protection of Industrial Property. ESCWA member countries participation in interim treaties is uneven: only six have signed the PCT and five signed the WCT. The joint WTO-WIPOTRIPS (Trade-related Aspects of Intellectual Property Rights) Agreement revisits the entire IPR protection system, standardizing definitions, affirming and enforcing national treatment and most-favoured nation principles through a series of procedures. Eight ESCWA member countries have enacted this agreement, with Bahrain and Oman being most aligned with international conventions related to IPR among ESCWA member countries. Egypt and United Arab Emirates are at an advanced level compared to other ESCWA member countries as shown in table 48.

TABLE 48. STATUS OF INTERNATIONAL AGREEMENTS IN THE ESCWA REGION

Country or territory	WTO	Paris Convention	PCT	WCT	Madrid Agreement	Hague Agreement	PLT	TRIPS
Bahrain	1995 ☑	1997 ☑	2007 ☑	2005 ☑	2005 Protocol ☑	×	2005 ☑	1995 ☑
Egypt	☑	1951 ☑	2003 ☑	×	1952 Agreement ☑	1952 ☑	×	1952 ☑
Iraq	OB	1976 ☑	×	×	×	×	×	×
Jordan	☑	1972 ☑	×	2004 ☑	×	×	×	2000 ☑
Kuwait	☑	×	×	×	×	×	×	1995 ☑
Lebanon	OB	1924 ☑	×	×	×	×	2000 □	×
Oman	☑	1999 ☑	2001 ☑	2005 ☑	2007 Protocol ☑	2009 ☑	2007 ☑	2000 ☑
Palestine	×	×	×	×	×	×	×	×
Qatar	1996 ☑	2000 ☑	×	2005 ☑	×	×	×	1996 ☑
Saudi Arabia	☑	2004 ☑	×	×	×	×	×	2005 ☑
The Sudan	OB	1984 ☑	1984 ☑	×	1984 Agreement ☑	×	2000 □	×
Syrian Arab Republic	×	1924 ☑	2003 ☑	×	2004 Protocol Agreement ☑	×	×	×
United Arab Emirates	☑	1996 ☑	1999 ☑	2004 ☑	×	×	×	1996 ☑
Yemen	OB	2007 ☑	×	×	×	×	×	×

Source: WIPO, see: www.wipo.int.

Notes: ☑ denotes member country, □ denotes signatory country, × denotes non-member country and OB denotes observer status.

The dates shown indicate the years of joining a treaty.

At the national level, the situation has not changed compared to 2008-2009, with almost all ESCWA member countries rectifying their national IPR laws to include ICT-related issues.[108] While these national laws do mention the protection granted for computer software and databases, digital trademark, Internet domain names and digital-content copyright issues are not expressly defined. The Sudan is the first country among ESCWA member countries to include integrated circuits copyrights[109] in its copyright law in 2000. Bahrain has enacted numerous national laws and amendments since 2003 related to trademark, patent, trade

[108] ESCWA. 2007. *Models for Cyber Legislation in ESCWA Member Countries* (E/ESCWA/ICTD/2007/8).

[109] ESCWA, DA Cyber Legislation Project, available at: http://isper.escwa.un.org/FocusAreas/CyberLegislation/Projects/tabid/161/language/en-US/Default.aspx.

secrets and the Protection of Geographical Indicators,[110] and Yemen has enacted in 2010 Law No. 23 related to trademark and geographical indicators and Law No. 28 for industrial design. In 2011, Yemen enacted Law No. 2 for patent and integrated circuits design.[111]

PCT is one of the most important patent treaties, entering into effect in 1978. Although six ESCWA member countries are PCT members, the contribution of these countries is very limited compared to other developed or developing countries. In the ESCWA region, Saudi Arabia had the highest number of PCT applications filed in 2010 (81 applications) followed by Egypt (49 applications). The United Arab Emirates with 30 PCT applications and the Syrian Arab Republic with 12 PCT applications are ranked third and fourth, respectively, at the regional level in 2010. It should be noted that the United States is ranked first worldwide with 44,890 PCT applications in 2010, and this constitutes a share of 27.3 per cent worldwide.

(b) *Software piracy*

Software piracy, which is the illegal use and/or distribution of software protected under intellectual property laws, affects negatively the growth of software development and deprives the economy from enormous opportunities. The software piracy rate in the ESCWA region[112] reached 61.5 per cent in 2010, which is high considering that the worldwide average is 42 per cent (see table 49). Other regions have higher average than the ESCWA region, namely, Central Asia, Latin America and the Asia Pacific. Only the United Arab Emirates has a lower rate, with 36 per cent, than the worldwide average in 2010, while Yemen has the highest piracy rate among ESCWA member countries. The comparison of piracy rates in 2010 and 2008 shows that this rate has decreased by 1 per cent in Bahrain, Jordan and Kuwait and 2 per cent in Qatar and Lebanon, while it has increased by 1 per cent in both Egypt and Yemen.

TABLE 49. PIRACY RATES AND LOSSES IN SELECTED ESCWA MEMBER COUNTRIES, 2008-2010

	Piracy rates (*percentage*)			Commercial value of unlicensed software (*million US$*)		
Country	2010	2009	2008	2010	2009	2008
Bahrain	54	54	55	22	21	27
Egypt	60	59	59	196	146	158
Iraq	85	85	85	147	129	205
Jordan	57	57	58	28	26	22
Kuwait	60	60	61	68	62	69
Lebanon	72	72	74	49	46	49
Oman	62	63	62	33	39	26
Qatar	49	51	51	52	50	26
Saudi Arabia	52	51	52	414	304	272
United Arab Emirates	36	36	36	173	155	170
Yemen	90	90	89	12	10	14
ESCWA average	61.5	61.6	62	108.5	89.9	94.3
World average	42	43	41	58 754	51 443	52 998

Source: Business Software Alliance (BSA) and International Data Corporation (IDC). 2011. *The Eighth Annual BSA and IDC Global Software Piracy Study*.

Note: a/ Average piracy rates relate to the Middle East/Africa region; other ESCWA member countries were not covered by the study.

[110] ESCWA. 2011. *National Profile of the Information Society in Bahrain − 2011*.

[111] ESCWA. 2011c.

[112] In the eleven countries considered by the BSA-IDC study, which are those figuring in table 49.

The International Data Corporation (IDC) developed an analytical model[113] factoring the relationship between spending on software development and spending on related IT services and distribution using current country-market data. This model forecasts the number of companies and employees, the taxes they pay and the rate of PC software piracy and its commercial value. Using this model, IDC estimates that lowering piracy by 10 per cent in four years would deliver a number of positive economic benefits globally and, most importantly, locally because IT distribution and services are local country-specific activities. Table 50 shows how the reduction of piracy by 10 per cent might affect four ESCWA member countries, namely Egypt, Jordan, Saudi Arabia and the United Arab Emirates.

TABLE 50. ECONOMIC IMPACT OF REDUCING SOFTWARE PIRACY BY TEN PERCENTAGE POINTS IN SELECTED ESCWA MEMBER COUNTRIES

Country	Piracy rate 2009 (*percentage*)	10 points reduction	10 points in first 2 of 4 years (*million US$*)		10 points spread over 4 years (*million US$*)		Rapid-reduction dividend 2 of 4 years (*percentage*)	
		New jobs	Added GDP	Extra tax revenues	Added GDP	Extra tax revenues	Added GDP	Extra tax revenues
Egypt	59	1 978	338	44	254	33	33	34
Jordan	57	375	71	19	52	14	35	34
Saudi Arabia	51	1 420	1 041	25	786	19	32	33
United Arab Emirates	36	841	566	23	425	17	33	31

Source: BSA and IDC. 2010a.

(c) *Cyberlegislations*

Cyberlegislations, as stated in a previous ESCWA study,[114] cover electronic communication and electronic transactions, including e-signature and e-proof, e-commerce and consumer protection, intellectual property rights, data protection and data privacy, cybercrimes as well as censorship and freedom of expression. As stated in various studies carried out by ESCWA in the field of cyberlegislation, all member countries in the ESCWA region recognize the importance of cyberlegislation for the advancement of the information society[115] and for the effective and ethical use of cyberspace. However, most countries lack a full and homogenous package of cyberlaws, and disparities still exist among member countries in the level of enactment and implementation of these laws.

Since 2009, some ESCWA member countries have enacted new such cyberlaws as the e-signature and network-services law enacted in the Syrian Arab Republic in 2009, e-transaction and e-commerce law enacted in Qatar in 2010, cybercrime law enacted in Jordan in 2010 and cybercrime law enacted in Oman in 2011.

Additionally, in the framework of its regional project entitled Regional Harmonization of Cyber Legislation to Promote the Knowledge Society in the Arab World,[116] ESCWA has completed the formulation of six directives for the regional harmonization of cyberlegislation covering six areas, namely personal data protection; freedom of expression and e-communication; e-signature and e-transactions; e-commerce and consumer protection; intellectual property rights; and cybercrimes. These directives will assist the ESCWA member countries in developing and reviewing their national set of cyberlaw, promoting the use of ICT

[113] BSA and IDC. 2010a. *Piracy Impact Study. The Economic Benefits of Reducing Software Piracy*. Available at: www.BSA.org/piracyimpact.

[114] ESCWA, 2007.

[115] ESCWA. 2009a; and ESCWA. 2007.

[116] See: http://isper.escwa.un.org/FocusAreas/CyberLegislation/Projects/tabid/161/language/en-US/Default.aspx.

applications in the Government sector and in economic and social activities and bridging the gaps in legal and regulatory framework among Arab countries and between Arab countries and developed countries.

(i) *E-transaction and e-commerce laws*

E-signature and e-transaction laws in the ESCWA region are more widespread than other cyberlaws. As shown in table 50, nine ESCWA member countries have e-signature laws, while 7 have e-transaction laws. In fact, with the exception of Egypt and the Syrian Arab Republic, seven ESCWA member countries have adopted e-transaction laws that cover e-signature. In almost all ESCWA member countries that have e-signature laws, the e-signature certification responsibility is assigned to a national authority, with Jordan being the only exception as such authority does not exist. Palestine has also drafted its e-signature and e-transaction law, which is under public consultation and should be enacted during 2011.

TABLE 51. STATUS OF E-TRANSACTION AND E-COMMERCE LAWS IN THE ESCWA REGION

Country/law	E-signature	E-transaction	E-commerce
Bahrain	Yes, Law 28, 2002	Yes, Law 28, 2002	Yes, Law 28, 2002
Egypt	Yes, Law 15, 2004	Expected in 2011	Expected in 2011
Iraq	..	..	..
Jordan	Yes, Law 85, 2001	Yes, Law 85, 2001	..
Kuwait	..	..	..
Lebanon	..	..	..
Oman	Yes, Law 69, 2008	Yes, Law 69, 2008	..
Palestine	Expected in 2011	Expected in 2011	..
Qatar	Yes, Law 16, 2010	Yes, Law 16, 2010	Yes, Law 16, 2010
Saudi Arabia	Yes, 2007	Yes, 2007	..
The Sudan	Yes, 2007	Yes, 2007	Yes, 2007
Syrian Arab Republic	Yes, Law 4, 2009	Expected in 2011	Expected in 2011
United Arab Emirates	Yes, Law 1, 2006	Yes, Law 1, 2006	Yes, Law 1, 2006
Yemen	..	..	..

Source: Reports of the ESCWA project on cyberlegislation.

Note: Two dots (..) indicate that data are not available.

Four ESCWA member countries, namely Bahrain, Qatar, the Sudan and the United Arab Emirates, have e-commerce laws, which are at the same time e-signature, e-transaction and e-commerce laws. Unfortunately these laws do not cover comprehensively issues related to consumer protection in the cyberspace. An e-transaction and e-commerce law has been drafted in the Syrian Arab Republic and its adoption is expected by the end of 2011. Egypt is also preparing its e-transaction and e-commerce law.

It is worth noting that almost all the e-commerce laws enacted in ESCWA member countries do not include articles related to e-payment or to items related to banking services on the cyberspace. Moreover, two ESCWA member countries have rules and/or laws regulating banking services on the cyberspace, namely Lebanon and Yemen. Law No. 40 enacted in 2006 in Yemen is regulating e-payment, financial transactions and electronic banking in Yemen. In Lebanon, the central bank has published numerous rules regulating e-banking and e-payment in Lebanon since 2000.

(ii) *Personal data protection and cybercrime*

The status of data protection and cybercrime has not changed much since 2009. Data protection laws are still lacking in most ESCWA member countries. Dubai adopted a data protection law in January 2007. In other countries, there are articles in e-communication and e-transaction laws or in the penal code, which protect the privacy and personal data of users online. The right of access to information is also, intentionally or unintentionally, ignored in some member countries for national security or political reasons.

Four ESCWA member countries adopted specific laws for cybercrime, namely Jordan, Saudi Arabia, the Sudan and the United Arab Emirates. Jordan adopted it in 2010, while other ESCWA member countries, namely Bahrain, Egypt, Oman and the Syrian Arab Republic, are preparing draft laws covering cybercrime, and their adoption is expected in 2011 for Oman and the Syrian Arab Republic.

(d) *Telecommunication and Internet regulation*

Independent regulatory authorities are important national bodies to oversee the liberalization and competition in the telecom sector in line with national policies. Chapter 2 of this report on ICT infrastructure details the telecom and Internet market structure and regulatory landscape in the ESCWA region.

By the end of 2010, eleven out of the fourteen ESCWA members had independent regulatory bodies. Kuwait, Palestine, and Yemen are the only three members without dedicated regulatory bodies. The Syrian Arab Republic was the last ESCWA member country to establish the Telecommunications Supervisory Authority in 2010. The fixed-line services are still under Government monopoly in seven ESCWA member countries, while the mobile and Internet services are provided either competitively or in the form of a duopoly.[117]

2. *Domain name management*

The management of the national Internet domains in the ESCWA member countries is assigned either to a regulatory authority, a telecom operator, the Government or an academic institution. Table 52 provides a list of all entities in charge of managing the country code top-level domain (ccTLD). Since 2009, there was a shift of this responsibility from telecom operators to national authorities in two ESCWA member countries, namely Qatar and the Syrian Arab Republic.

In the Syrian Arab Republic, management and registration of the Syria domain name were assigned to the Syrian Telecommunication Establishment, the national incumbent, till 2009, and they were shifted to NANS upon its establishment in February 2009. In Qatar, the independent telecommunications regulator ictQATAR is designated to oversee the management of the country code top-level domain name. Qtel, the incumbent telecommunications operator, had managed it for the previous 14 years. ictQATAR received approval from the Internet Corporation for Assigned Names and Numbers (ICANN) for the re-delegation in October 2011 and is finalizing the migration of this management from Qtel.

The adoption of an Arabic domain name system as part of the internationalized domain names (IDNs) is an important expansion of the domain names in the Arab world. Seven ESCWA member countries registered an Arabic ccTLD in 2010-2011, namely Egypt, Jordan, Palestine, Qatar, Saudi Arabia, Syrian Arab Republic and the United Arab Emirates. This initiative is seen as a significant step towards the development of Internet services in the ESCWA region as it will encourage Internet use among those who have limited skills in foreign languages.

In Bahrain, the registration of domain names under the ".bh" TLD is managed by the Office of the Domain Name Registration, which is part of the TRA, as per Order No. 3 issued by the Ministry of Cabinet Affairs in 2008. In Egypt, three Egyptian companies, namely TE Data, Vodafone Data and Intouch (owner of Link), have been licensed by NTRA as registrars for the Egyptian ccTLD (.مصر) in addition to ".eg". For the private sector, registration of Egyptian domain names can be carried out through any of these companies. NTRA will also be granting the Egyptian Universities Network (EUN) a licence to provide governmental, academic and educational entities Arabic domain name registration services.

[117] Refer to chapter II. A, for details.

TABLE 52. ENTITIES IN CHARGE OF MANAGING THE COUNTRY CODE TOP-LEVEL DOMAIN (CCTLD) OF ESCWA MEMBER COUNTRIES

Country or territory	ccTLD	Entity in charge of managing ccTLD	Entity type
Bahrain	.bh	Telecommunication Regulatory Authority (TRA)	Regulatory authority
Egypt	.eg	Egyptian Universities Network (EUN)	Educational
Iraq	.iq	Communications and Media Commission (CMC)	Regulatory authority
Jordan	.jo	National Information Technology Centre (NITC)	National authority
Kuwait	.kw	Ministry of Communications (MOC)	Government
Lebanon	.lb	America University of Beirut Computing Services	Educational
Oman	.om	Oman Telecommunications Company (Omantel)	Telecom operator
Palestine	.ps	Ministry of Telecommunication and Information Technology	Government
Qatar	.qa	Supreme Council of ICT (ictQatar)	Government
Saudi Arabia	.sa	Communications and IT Commission (CITC)	Regulatory Authority
The Sudan	.sd	Sudan Internet Society	Private sector
Syrian Arab Republic	.sy	National Agency for Network Services (NANS)	National authority
United Arab Emirates	.ae	Telecom Regulatory Authority (TRA)	Regulatory authority
Yemen	.ye	TeleYemen	Telecom operator

Source: The Internet Assigned Number Authority, as of July 2011.

In Jordan, ccTLD under ".jo" and IDN ccTLD under (.الأردن) in Arabic is managed by the National Information Technology Centre (NITC). While ".jo" domain names have been in circulation since 1995, NITC got (.الأردن) delegated at the root level in August 2010. NITC is the registry as well as the registrar for ".jo" and (.الأردن) top-level domains. NITC abides by strict, yet flexible, policies in registering domain names. The core of these policies is to preserve the Jordanian identity on the Internet while assuring the stability and resiliency of the top-level domains.

In Saudi Arabia, Saudi Network Information Centre (SaudiNIC) is in charge of administering the country code ccTLD under ".sa" and (.السعودية) according to the Ministerial Council Decree No. 229 of the year 2005. Since 2006, the ccTLD has been managed by the Communications and Information Technology Commission (CITC). At the end of 2010, the number of registered domain names in Saudi Arabia reached 21,560.

The National Telecommunication Corporation (NTC) in Sudan is in charge of licence provision to ISPs and the administration of ccTLD. The Sudan Internet Society, under the supervision of the NTC, is the responsible authority for the ccTLD registration under ".sd".

In the Syrian Arab Republic, NANS, which was established in 2009, is responsible of the registration service on Syrian Arab top-level domains (".sy" and .سورية) so that establishments, companies and individuals could get Arabic titles for their websites and could preserve their Arabic identity. The sub-domain names registered by NANS under (.سورية) reached 171 by May 201,1 while the domain name under ".sy" is expected to have 3,000 sub-domain names by May 2011.

3. *Standardization in ICT*

Standards are important for ensuring the interoperability of systems and applications, and for the harmonization of processes and practices within a country or region. Standards usually support the development of open and competitive markets for the benefit of both the consumer and industry. ESCWA member countries are still at an early stage in the formulation or adoption or ICT standards, but the overall status has advanced slightly during 2009-2011.

In fact, a number of ESCWA member countries have taken proactive steps towards ICT standardization; some countries focused on standards for ensuring the interoperability between e-Government applications, while others are focusing on the standards for ICT equipment and software development. Bahrain and Saudi Arabia are also interested by regulation and standardization to ensure a minimum quality of service provided by the ICT-services providers.

Jordan, Oman and Qatar focused their standardization efforts on ensuring the interoperability of e-Government applications. ictQATAR encourages the use and promotion of open, interoperable and non-discriminatory demand-driven standards as part of its e-Government programme. The Oman e-Government Architecture Framework (OeGAF) was developed by the ITA and includes four main components: business design, solutions design, data design and technical design. The NITC in Jordan issued the technical and operational mandatory interoperability standards for connecting Government entities. It also issued other ICT specifications for the optimization of IT resources in Government.

In Saudi Arabia, the CITC is responsible for standardization, particularly for matters related to import and export procedures for the authorization of telecommunications and IT equipment, as well as for issuing technical specifications for ICT equipments. In addition, the CITC plays an advisory and supporting role on issues related to technical standards.

The objective of standardization in the Syrian Arab Republic is twofold, namely: improving the interoperability between the ICT applications in the public sector, and supporting the IT software industry. Thus, the Ministry Information Security Programme was adopted in 2008, and a capacity-building awareness programme targeting employees in the private sector was launched recently for a period of three years. This programme will be implemented in collaboration between MoCT and SCS.

By considering the international standards, NIC in Sudan made important efforts in standardization for better deployment of ICT in the public sector. NIC adopted standards for software, web design, ICT equipment, network and security.

4. *ICT investments and Government-supported facilitation measures*

(a) *Venture capital funds*

Venture capital (VC) is identified as one of the most important financing alternative for startups and SMEs in the ICT sector, especially given that the ICT sector is a major investment vehicle for the development market. VC is still limited in the ESCWA region as shown in table 53;[118] however, all six GCC countries are rated in the top 25 among the 133 countries considered in the Global Competitiveness Report 2010-2011. The comparison of the rankings of ESCWA member countries between 2009-2011 shows that only four countries have improved their ranking in VC availability.

The Global Competitiveness Report 2010-2011 covers ten ESCWA member countries. Table 53 highlights the ranking of ESCWA member countries under two indices: the first is foreign direct investment (FDI) and technology transfer; and the second is the availability of VC for innovators and entrepreneurs. Qatar and Saudi Arabia have progressed the most since the previous report, with Qatar moving from 40th place to 6th place in the world rankings for venture capital availability. In terms of FDI and technology transfer, Qatar and the United Arab Emirates are in the second and sixth places, respectively. In addition, Qatar remains the most competitive country in the MENA region and is cited as the fastest growing economy in the world. It is worth noting that three ESCWA member countries figure among the top ten in FDI and technology transfer.

[118] WEF. 2011b. *The Global Competitiveness Report 2010-2011*.

The Qatar Foundation adopted investment promotion strategies, incubator plans, and joint venture opportunities to support the fast-evolving society and address emerging gaps in the country. Under the joint venture model, new companies are established in Qatar that operate on a commercial basis, sharing ownership rights with Qatar Foundation and its partners. Some of these joint ventures include FITCH Qatar, Qatar MICE Development Institute (QMDI),[119] Qatar Solar Technologies (QSTec), the private joint venture MEEZA, Qatar National Convention Centre and Vodafone Qatar. These joint ventures are recruiting and training increasing numbers of talented Qataris, thus improving ICT skills among the local population.[120]

TABLE 53. VENTURE CAPITAL AVAILABILITY AND FOREIGN DIRECT INVESTMENT (FDI) TECHNOLOGY TRANSFER IN SELECTED ESCWA MEMBER COUNTRIES, 2009-2011

	Venture capital availability[a/] 2010-2011		Venture capital availability 2009-2010		FDI and technology transfer score[b/] 2010-2011		FDI and technology transfer score 2009-2010	
Country	Score	Ranking (138)	Score	Ranking (133)	Score	Ranking (138)	Score	Ranking (133)
Bahrain	3.7	19	3.9	11	5.4	11	5.4	15
Egypt	3.0	41	3.4	34	4.9	53	5.1	30
Jordan	2.7	54	3.1	46	5.0	36	5.0	52
Kuwait	3.4	22	3.4	32	3.4	134	3.8	123
Lebanon	2.5	67	..	..	3.9	117	..	..
Oman	3.8	15	3.7	20	4.9	52	5.0	46
Qatar	4.1	6	3.2	40	6.0	2	5.7	5
Saudi Arabia	3.8	14	3.5	27	5.5	9	5.4	13
Syrian Arab Republic	2.1	113	2.3	100	3.8	121	3.9	117
United Arab Emirates	3.7	16	3.9	13	5.7	6	5.7	6

Source: WEF. 2010b. *The Global Competitiveness Report 2009-2010*; WEF. 2011b.

Notes: Two dots (..) indicate that data are not available.

a/ This is based on a seven-point total score, whereby 1 = very difficult, and 7 = very easy.

b/ This is based on a seven-point total score, whereby 1 = brings little new technology, and 7 = is an important source of new technology.

(b) *Entrepreneurship, innovation and incubators*

Innovation is a central driver of economic growth, development and better jobs. It is also the key that enables firms to successfully compete in the global marketplace, and the process by which solutions are found to social and economic challenges. The Global Innovation Index (GII)[121] is one of the best-known indices for measuring innovation. Table 54 shows the level of innovation in twelve ESCWA member countries according to the GII. Qatar and the United Arab Emirates are leading the ESCWA member countries in the GII, and the comparison of GII in 2011 and 2010 demonstrates that four ESCWA member countries made progress in their ranking in 2011, namely Jordan, Oman, Qatar, and the Syrian Arab Republic.

[119] MICE stands for meetings, incentives, conferences and exhibitions.

[120] See: http://www.qf.org.qa.

[121] INSEAD. 2011. *The Global Innovation Index 2011.*

TABLE 54. RANKING OF SELECTED ESCWA MEMBER COUNTRIES ON THE GLOBAL INNOVATION INDEX, 2009-2011

Country	Score (0-100) 2011	Rank (125) 2011	Rank (132) 2010	Rank (130) 2009
Qatar	47.74	26	35	24
United Arab Emirates	41.99	34	24	26
Jordan	38.43	41	58	55
Bahrain	37.80	46	40	34
Lebanon	37.11	49	..	..
Kuwait	36.64	52	33	30
Saudi Arabia	36.44	54	54	32
Oman	35.51	57	65	52
Egypt	29.21	87	74	76
Syrian Arab Republic	24.82	115	132	94
Yemen	20.72	123	..	..
The Sudan	20.36	124	..	..

Source: INSEAD. 2011. *The Global Innovation Index 2011.*

Note: Two dots (..) indicate that data are not available.

As it is demonstrated in various developed and developing countries, business incubation is one of the most important measures for promoting startups and SMEs and encouraging entrepreneurship, especially in such fields as ICT, where innovation plays an important role. In recent years, activities related to entrepreneurship and incubation increased in the ESCWA region and incubation schemes expanded and the allocated funds increased.

Egypt, Jordan, Lebanon, Palestine, Qatar, Saudi Arabia, the Sudan, the Syrian Arab Republic and Yemen have ICT incubators, some of which have been operational for several years. Other such countries as Bahrain and Oman host business or technology incubators rather than mere ICT incubators. However, the full circle of the incubation process is not complete in ESCWA member countries, owing either to a missing link between the incubators and research and development institutions, or to non-existent funding mechanisms.

Qatar aims at fostering the development of new domestic companies by widely expanding incubation resources available to fledgling startups. Thus, the ictQATAR created the Digital Content Incubation Centre[122] and the Qatar Foundation established the Qatar Science and Technology Park (QSTP). QSTP focuses on four major areas: energy, health, environment, and ICT. Its members include Cisco, ExxonMobil, General Electric (GE), Microsoft, Shell, and Total.[123]

In addition to Knowledge Oasis, the Government in Oman established the Industrial Innovation Centre and Information Technology Service Centre, to promote innovation and encourage the development of high-level industrial and IT products.

Badir, the ICT incubator founded by King Abdulaziz City for Science and Technology (KACST) in Saudi Arabia, incubated 26 scientific ideas based on research results and has currently more than 95 incubation requests.[124] Six of those 26 projects received financial support from banks for the creation of SMEs.

[122] See: http://www.ict.gov.qa.

[123] See: http://www.qstp.org.qa.

[124] ESCWA. 2011k. *National Profile of the Information Society in Saudi Arabia − 2011.*

SCS in Syria created two ICT incubators in two distinct cities (Homs and Lattakia) during 2010-2011, in addition to the ICT incubator that was created in 2006 in Damascus.[125]The SCS incubators organize periodical competitions for young entrepreneurs, the most famous one being Fikra (Idea), and collaborate with such business incubators in the Syrian Arab Republic as the incubator created by the Syrian Enterprise and Business Centre in 2007.

In Jordan, Oasis 500 is one of the successful funds launched in 2010 to support young nascent entrepreneurs in the ICT field. By November 2011, Oasis 500 funded five startups from its first wave of accepted entrepreneurs. These five have been given an average of US$15,000 each, plus free incubation and intensive mentorship by seasoned entrepreneurs and business leaders.[126] In addition, eight incubators were established in different parts of the kingdom to leverage innovative startups and projects with commercial potential, [127] one of which is iPark, a major IT incubator in Jordan established in 2003 by the Higher Council for Science and Technology (HCST). Thirty-five companies have been incubated between the establishment of iPark and the end of 2010, of which 19 have already graduated.[128]

The Governments in selected ESCWA member countries have launched initiatives to encourage IT export or to develop free zones to develop the ICT market. Bahrain, for example, has ratified a fre-trade agreement with the United States which facilitates the exchange of technology expertise. Within the agreement, each Government commits to non-discriminatory treatment of digital products and agrees not to impose customs duties on digital products.

Egypt launched the Export IT programme in February 2010, which is an export-rebate programme to help Egyptian companies increase their exports of IT products. Rebates provided through this programme are 10 per cent on IT services and software products/services, and are granted on the value-added component only.

B. CLASSIFICATION AND RANKING OF ESCWA MEMBER COUNTRIES ACCORDING TO MATURITY LEVEL

1. *Maturity level 1: Iraq, Palestine and Yemen*

ESCWA members at this maturity level do not have legal and regulatory frameworks that are adequate for the ICT sector and consumer needs, as well as poor enforcement of existing laws. They are still experiencing very high software piracy rates, and lack initiatives for ICT standardization. In addition, investment funds and entrepreneurship are still limited.

2. *Maturity level 2: Kuwait, Lebanon, the Sudan and Syrian Arab Republic*

Countries at this maturity level have signed a fair number of international agreements or treaties related to IPR and patents. They have few laws regulating cyberspace, with modest progress achieved in the enforcement of cyberlaws. High software piracy rate is common. Some initiatives for standardization have been launched, investment in ICT applications and services is somewhat attractive and the promotion of entrepreneurship is visible.

3. *Maturity level 3: Bahrain, Egypt, Jordan, Oman and Saudi Arabia*

These countries have signed a relatively large number of international agreements and treaties on IPR and patents, and made considerable progress in adapting ICT-related laws and regulations. They were able to lower software piracy rates and had successes with initiatives for ICT standardization, attracting investments and promoting entrepreneurship.

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[125] ESCWA. 2011i.

[126] See: http://www.oasis500.com/en/newsDetails/78.

[127] ESCWA. 2011b.

[128] See: http://www.ipark.jo/Statistics.htm.

4. *Maturity level 4: Qatar and United Arab Emirates*

This level indicates sustainable maturity in ICT-related laws and regulations. Countries at this level participate in most international agreements and treaties on IPR and patents, have low piracy rates in software, and have adopted either international or national standards related to ICTs. Initiatives for attracting investments and the promotion of entrepreneurship are widely available.

Table 55 and figure 5 provide a summary of maturity-level evolution regarding the enabling environment.

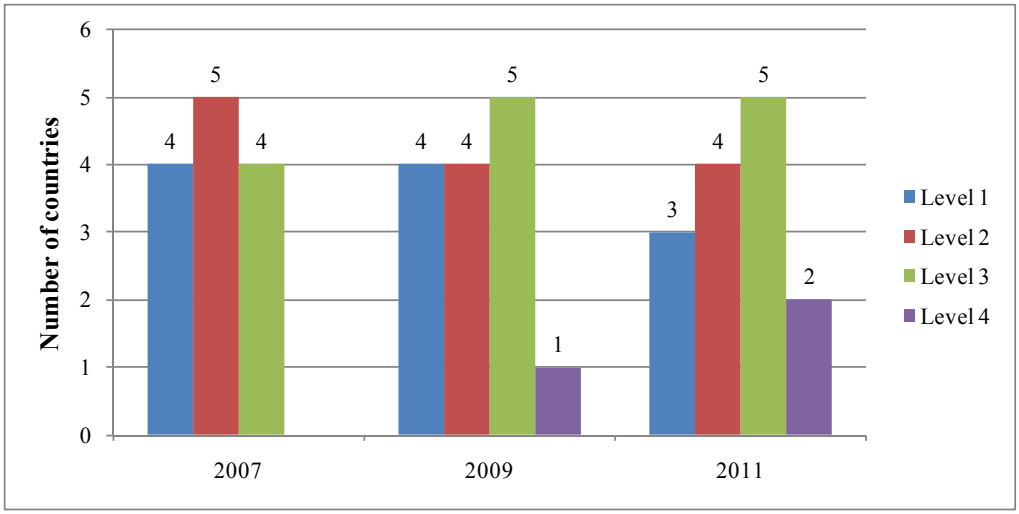
TABLE 55. RANKING OF ESCWA MEMBER COUNTRIES BY MATURITY LEVEL IN ESTABLISHING AN ENABLING ENVIRONMENT

	Maturity level 1			Maturity level 2			Maturity level 3			Maturity level 4		
Country or territory	2007	2009	2011	2007	2009	2011	2007	2009	2011	2007	2009	2011
Bahrain							✓	✓	✓			
Egypt							✓	✓	✓			
Iraq	✓	✓	✓									
Jordan							✓	✓	✓			
Kuwait				✓	✓	✓						
Lebanon				✓	✓	✓						
Oman				✓	✓				✓			
Palestine	✓	✓	✓									
Qatar				✓				✓				✓
Saudi Arabia				✓				✓	✓			
The Sudan[a/]		✓				✓						
Syrian Arab Republic	✓				✓	✓						
United Arab Emirates							✓				✓	✓
Yemen	✓	✓	✓									

Source: Compiled by ESCWA.

Note: a/ No assessment was provided for the Sudan prior to 2009, which only joined ESCWA in 2008.

Figure 7. Maturity levels of ESCWA member countries in establishing an enabling environment



C. SUGGESTIONS AND RECOMMENDATIONS

The following recommendations address the challenges and limitations that prevent the establishment of a mature enabling environment in the ESCWA region:

(a) Accelerate the process of signing, ratifying and joining international agreements on IPR and ensure their synergy with national laws;

(b) Accelerate the issuance and implementation of cyberlaws, especially cybercrime laws, personal data protection laws and e-commerce laws, including consumer protection, and build the capacity of various institutions for the implementation of these legislations, starting with awareness campaigns;

(c) Put in place mechanisms and procedures for the implementation of cyberlegislations at the national level and for the enhancement of legal framework efficiency;

(d) Harmonize cyberlegislations in the ESCWA region in order to improve regional integration and promote e-transactions and e-commerce in the region;

(e) Define national ICT standards in line with the international ones to ensure interoperability between different ICT applications and e-services, while promoting and building institutional capacity for the applications of these ICT standards;

(f) Proceed with the liberalization of the telecommunication sector, especially fixed-line telephony and Internet services;

(g) Set up supporting measures that encourage the creation of new ICT businesses and facilitate the interaction between Government and private sector to promote ICT products for export;

(h) Establish venture capital and investment funds to support the creation of startups and SMEs in the ICT sector, in cooperation with all stakeholders in the information society, and take measures that encourage national and foreign investment in the ICT sector;

(i) Develop the spirit of innovation and entrepreneurship in the ICT sector through the creation of incubators and science and technology parks and establishing appropriate linkage between research and development institutions, industry and incubators.

VII. ICT APPLICATIONS

A. COMPARATIVE ANALYSIS OF ICT APPLICATIONS IN GOVERNMENTS

1. *ICT in public administration*

By 2011, all ESCWA member countries have initiated, in one way or another, programmes, projects or initiatives for the introduction of ICT to public administration and the computerization of related processes and services. However, the political will, financial and human resources, and security situation are the main causes of variations in the degree of their implementation. While the financially-able and security-stable GCC countries had all the recourses required to embark on such task, other countries have sought the assistance and cooperation of regional and international development agencies and organizations.

To measure the extent of ICT usage by Governments and improved efficiency of their services, the WEF computes a score for selected countries worldwide in its annual Global Information Technology Report. In its latest report, namely of 2011, it ranks ten of the ESCWA member countries (see table 56), five of which are GCC countries and are ranked in the top 20 worldwide. This achievement reflects the high priority that GCC countries have assigned to modernizing their public administrations and related services. Ranked first globally for 2010-2011, Qatar's score of 6.16 is an impressive result of the Government's i-Gov Master Plan under which several ICT initiatives are being deployed with the aim of enhancing the provision of Government services. In addition, the 2010-2011 fiscal year budget saw the allocation of US$9.72 billion for spending on ICT-related infrastructure projects in the country.[129]

In second position, and fourth globally, the United Arab Emirates has been aggressive in automating its public services and moving them to a paperless eco-friendly process. Tas'heel is an online Government service designed to simplify all labour-related processes, allowing companies to conduct online employment-related transactions, and make payments to the Ministry of Labour (MOL) through a dedicated web portal. This service encourages a paperless environment, whereby employers do not have to worry about physically submitting payments or documents.[130]

TABLE 56. THE EXTENT OF ICT USAGE BY GOVERNMENTS AND IMPROVED EFFICIENCY OF THEIR SERVICES IN SELECTED ESCWA MEMBER COUNTRIES, 2009-2011

Country	Score[a/] 2010-2011	Ranking (138) 2010-2011	Score[a/] 2009-2010	Ranking (133) 2009-2010
Qatar	6.06	1	5.93	3
United Arab Emirates	5.99	4	6.05	2
Bahrain	5.52	12	5.42	15
Saudi Arabia	5.30	17	5.08	28
Oman	5.29	18	5.01	32
Jordan	4.71	40	5.01	31
Egypt	4.43	59	4.61	53
Kuwait	3.66	105	3.69	106
Syrian Arab Republic	3.25	127	3.64	109
Lebanon	2.72	136	..	..

Sources: WEF. 2010a; and WEF. 2011a.

Note: a/ This is based on a seven-point total score, whereby 1 = no effect, and 7 = has generated considerable improvements.

[129] Supreme Council of Information and Communication Technology (ictQATAR). 2011. *Qatar's ICT Landscape Report.*

[130] See: http://www.tasheel.ae.

Egypt ranked 59 globally and has achieved substantial progress in governmental resource planning. During 2010, the third phase of the Automation of Notarization Offices project, which started in 2009 and is scheduled to end in 2011, included the computerization of 50 new offices, bringing the number of offices that have been computerized to 100. Another computerization project is the National Land Registration System, which aims at simplifying and computerizing procedures and services for electronic transfer of ownership of agricultural lands, hence improving services to citizens, and raising the efficiency and accuracy of reports and statistics on the performance of the registry offices.[131]

In the Syrian Arab Republic, the Ministry of Local Administration is implementing a five-year project entitled Improving Municipal Services, which was launched in 2007 in collaboration with UNDP and the Spanish Agency for International Cooperation (AECI). The project aims at improving the quality and effectiveness of municipal services through the implementation of a simple and effective municipal automated system which includes computerization of relevant processes. The finalization and launch of a one-window stop-shop in eight municipalities is expected to be completed before the end of 2011.[132]

In Oman, the Ministry of Commerce and Industry (MoCI) offers one-stop-shop e-services, enabling investors to set up companies in Oman while minimizing paperwork, thus saving on costs and time. In fact, by mid-2011, the portal of the Ministry has processed about 650,000 applications electronically.[133]

Most ministries and Government agencies in Lebanon are currently working on establishing or enhancing their Web presence and trying to provide interactive and transactional services. For example, the Ministry of Finance announced in February 2011 the launching of its e-taxation service together with its revamped portal, which allows citizen to interact with the Ministry, declare their income and fill their tax forms, all electronically.[134]

Several Government agencies in Yemen have adopted computerized systems and applications for effective management. A lot of effort is exerted to try to upgrade to efficient and modern applications, yet the absence of unified standards in the adoption of technologies causes difficulties in integrating governmental services properly.

In the Sudan, the Ministry of Finance and Economic Planning launched a project with the aim of computerizing all activities at the Ministry. A Government resource planning (GRP) application has been deployed in 2008, comprising modules for budget preparation and control, internal communications, document management, decision support, and procurement.[135]

All ESCWA member countries have assigned authorities in charge of introducing ICT in public administration or carrying out and implementing e-Government initiatives. The recent incumbent is the Sudan which allocated this task to MoCIT in 2011. While some member countries have added the mandate for establishing ICT in public administration and/or e-Government to such current public organizations as ministries of ICTs, ministries of telecommunications, or offices of public reform, others have opted to form new higher authorities for this task, which report directly to the Cabinet or Council of Ministers. This structural choice ensures political support to such initiatives and increases the chances for improved results. Box 10 provides a list of authorities in charge of implementing ICT in public administration and/or e-Government initiatives in the ESCWA countries.

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[131] See: http://www.mcit.gov.eg/Content.aspx?Cat=1&SubCat=4.

[132] See: http://www.undp.org.sy/index.php/our-work/capacity-and-institutional-development-/395-improving-municipal-services.

[133] See: http://www.mocioman.gov.om.

[134] See: http://www.finance.gov.lb.

[135] See: http://www.narisonline.co.

Box 10. Authorities in charge of ICT in public administration and/or e-Government in ESCWA member countries

Bahrain	Supreme Council of Information and Communication Technology (SCICT) eGovernment Authority (eGA)
Egypt	Ministry of State for Administrative Development Ministry of Communication and Information Technology (MoCIT)
Iraq	E-Governance Ministerial Steering Committee, Ministry of Science and Technology
Jordan	E-Government National Steering Committee (eGSC), Ministry of Information and Communications Technology (MoICT).
Kuwait	Central Agency for Information Technology (CAIT)
Lebanon	Office of the Minister of State for Administrative Reform (OMSAR)
Oman	Information Technology Authority (ITA)
Palestine	E-Government General Directorate
Qatar	The Supreme Council of Information and Communications Technology (ictQATAR)
Saudi Arabia	Ministry of Communications and Information Technology (MoCIT) in collaboration with the Ministry of Finance and Communications and Information Technology Commission (CITC)
The Sudan	Ministry of Communication and Information Technology (MoCIT)
Syrian Arab Republic	Ministry of Communications and Technology
United Arab Emirates	Ministry of Finance and local Government entities in every emirate
Yemen	Council of Ministers Ministry of Telecommunications and Information Technology

2. *E-Government implementation*

The adoption and use of ICTs in public administration in the ESCWA region have enabled the transformation of the functions and core business processes used by Governments, thus improving public-sector efficiency, transparency, accountability, and allowing for considerable cost savings across all Government administrations.

The years 2010 and 2011 have witnessed a turning point in e-Government initiatives in the ESCWA region. Almost all Governments have realized the significance of endorsing and encouraging national efforts in developing an e-Government strategy in the shortest possible delays. One of the main enabling factors of this progress is the competition for international recognition made possible through the biannual launch of the global United Nations E-Government Survey Report. The report has been one significant reason for politicians to lobby around for more funding for the implementation of e-Government services. Another equally important factor is the availability of resources. The rich GCC countries have placed a high priority for such development, and have mobilized adequate and efficient human and financial resources to implement related action plans. Finally, the adoption and use of ICTs in both Government operations and the delivery of public services have proven to be a good incentive for practicing good governance and transparency, thus enhancing citizen-Government trust. In this spirit, the desire of policy makers in the region to encourage implementing e-governance and e-Government applications has been increasing lately.

According to the United Nations Department of Economic and Social Affairs (UN/DESA) e-Government Survey 2010, the concept of e-Government has evolved, placing the citizen at the centre of the process. E-Government is not merely about computerization of services and re-engineering of internal processes, it is mainly concerned with creating a favourable environment that empowers citizens to be more involved in governance, promoting a citizen-centric and participatory approach, whereby citizens have a voice in decision-making, which affects their future. As a result, an increasing number of Governments are striving to meet the needs of their citizens by creating a process of online dialogue that was not in place a few years ago. Today, Governments are putting more emphasis on networking with citizens, while engaging and empowering them to take part in the governance process. This is achieved through the use of Web 2.0 social networking tools on Government websites, allowing to gather feedback and opinions and to drum support for public policies.

Countries in the ESCWA region, like many others across the world, have started their e-Government initiatives with a focus on providing information and services to their citizens through advanced delivery platforms, namely, dedicated Government web portals. These online services went through different stages of development at different speeds and are now at varying points of development within the four stages defined by UN/DESA in the 2010 E-Government Survey. The different stages are shown in box 11.

Box 11. Stages of online service development

In its United Nations E-Government Survey 2010, the United Nations Department of Economic and Social Affairs (DESA) measures the level of sophistication of the online presence and service delivery of a Government based on a four-stage model, namely:

(a) Stage 1 - Emerging information services: Governments provide static information and links to ministries, departments and other branches of Government through their websites;

(b) Stage 2 - Enhanced information services: Governments deliver such one-way or two-way e-communication to their citizens as downloadable forms and applications;

(c) Stage 3 - Transactional information services: Governments engage in two-way communication with their citizens, including electronic authentication citizens' identity to complete such services as processing online payments, participating in e-voting, filing taxes online, and applying for certificates, licences and permits;

(d) Stage 4 - Connected information services: Governments are proactive in requesting information and opinions from citizens using Web 2.0 technologies and other interactive tools, empowering citizens to be more involved in Government activities and have a voice in decision-making.

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Source: DESA. 2010. *United Nations E-Government Survey 2010: Leveraging e-Government at a time of financial and economic crisis*.

In developed countries and some GCC countries, the focus of e-Government initiatives started to shift from the provision of services through integrated one-stop-shop portals to actively soliciting the views of citizens that can be used to devise public services and shape public policies.

The 2010 E-Government Survey measured the level of sophistication of the online presence and service delivery of a Government as a percentage of the maximum number of services defined for each stage for all United Nations member States, including those in the ESCWA region, with the exception of Palestine. Table 57 provides percentages of implementation of online Government services of ESCWA member countries for the four stages. The score of a country in online service provision correlates positively with its adoption and use of emerging social networking tools. As such, the 2010 Survey puts greater emphasis on networking with citizens.

TABLE 57. RANKING OF ESCWA MEMBER COUNTRIES BY TOTAL PERCENTAGE OF IMPLEMENTATION OF ONLINE GOVERNMENT SERVICES

Country	Stage 1: Emerging	Stage 2: Enhanced	Stage 3: Transactional	Stage 4: Connected	Total
Bahrain	93	62	43	46	57
Jordan	74	38	34	34	42
Egypt	81	44	29	24	41
Kuwait	60	34	34	14	36
Oman	69	28	15	20	29
Saudi Arabia	68	22	13	10	24
Qatar	40	18	22	6	22
Lebanon	47	25	9	14	21
United Arab Emirates	68	22	1	10	20
The Sudan	34	14	1	16	12
Iraq	35	11	3	12	12
Yemen	13	3	0	4	4
Syrian Arab Republic	10	4	0	2	3

Source: DESA. 2010.

Note: The total percentage was calculated by assigning different weights to each stage, whereby stage 1was multiplied by 0.169, stage 2 by 0.288, stage 3 by 0.419, and stage 4 by 0.124.

By 2010, almost all ESCWA member countries had a good percentage of implementation of online Government services at the emerging stage (stage 1), and a fair implementation of services at the enhanced stage (stage 2). However, most countries in the region recorded low percentages of implementation at the transactional and connected stages (stages 3 and 4, respectively), with the exception of Bahrain. It is worth noting here that the low percentage scored by the United Arab Emirates, at 20 per cent, was due to the absence of a unified federal e-Government portal at the time of conducting the survey.

The progress witnessed in the region in 2010-2011 was highlighted by DESA through its Public Service Awards (UNPSA) programme. In 2010, Bahrain and Lebanon collected two public service awards for Western Asia. Under category 1 on improving transparency, accountability and responsiveness in the public service, the national e-Government portal of Bahrain was a first-place winner. The success of the portal was mainly attributed to a strategy of listening to and addressing the needs of citizens, and a well-defined, focused programme and framework for project governance.[136] Under category 3 on fostering participation in public policy-making decisions through innovative mechanisms, the new management approach to parliamentary elections in Lebanon by the Ministry of Interior and Municipalities (MoIM) was a first-place winner. MoIM devised a comprehensive master plan for administering parliamentary elections, increasing integrity in the electoral process, expanding participation and increasing the credibility of the processes used.[137]

In 2011, Saudi Arabia and Oman won additional awards for Western Asia. Under category 2 on improving the delivery of public services, MoCIT in Saudi Arabia won second place for its initiative to accelerate access to e-Government services to all citizens. The e-Government programme Yesser, which integrates 300 Government agencies through the national portal, offered more than 1000 e-services in 2011, with a growth rate of 250 services per year.[138] The Omani initiative on transforming the society through the

[136] DESA. 2011. *Good Practices and Innovations in Public Governance: United Nations Public Service Awards Winners, 2003-2011*.

[137] Ibid.

[138] Ibid.

eOman strategy was a first-place winner under category 4 on advancing knowledge management in Government. By rolling out innovative e-services, the Government has been successful in engaging and interacting with its citizens from any location including access from mobile devices.[139]

Similar efforts in the region to recognize excellence in e-Government has led to the development of a number of award programmes reflecting the attempts of Governments in the ESCWA region to encourage and recognize innovation. The most notable of such programmes are the E-Government Excellence Award in Bahrain,[140] the Saudi E-Government Achievement Award,[141] and the Sultan Qaboos Award for Excellence in eGovernment.[142]

In Palestine, the E-Government Strategic Plan, that was developed in July 2005, did not see much implementation progress due to financial, technical, political, and security-related hurdles. However, the Ministry of Telecom and Information Technology (MTIT) partnered with the Estonian Government in 2009 and developed a practical action plan for moving forward e-Government development.

Although efforts have been dedicated to developing an Iraqi e-Government initiative since 2009, and in addition to holding a specialized e-Government conference in Erbil in May 2011,[143] little progress has been achieved. Currently, very little focus is targeted towards specific e-Government initiatives, the greatest attention being placed on developing infrastructure and resources that are necessary for it.

The e-Government strategy in the Syrian Arab Republic was finally approved in October 2010 spanning the period 2008-2020, divided into three developmental stages. The focus of the strategy is on the provision of distinguished e-services which improve efficiency, productivity and transparency, to be delivered through multiple channels while preserving the privacy of users.

The e-Government[144] initiative of Kuwait went through rich development stages; in spite of encountering many obstacles, it managed to achieve success in the context of e-services. The citizen-centric approach was a high priority; in this regard, several such e-services geared towards citizens were implemented as issuance and renewal of civil identity (ID) cards. Some of the implemented services have a high level of interaction, but all of them have at least an enhanced maturity level, whereby citizens could get detailed information on the process, download the necessary forms and submit the request.

3. *E-Government Development Index*

DESA conducts a biannual e-Government survey that includes a section on measuring e-Government. It is a comparative analysis and ranking of all member States according to the status of their e-Government development and is based on an assessment of online presence of Governments, their telecommunication infrastructure, and the skills and knowledge of their citizens. The report argues that reliable e-Government measurement and sound assessment provide crucial indication to policy makers and practitioners in order to update and fine-tune their strategies and action plans.

Compared to that of 2008, the 2010 Survey focuses more on how Governments are using web portals to deliver public services and engage citizens to participate in decision-making. As a result of these changes, the ESCWA average in 2010, along with the world average of the E-Government Development Index,

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[139] Ibid.

[140] See: http://www.egovawards.bh.

[141] See: http://www.yesser.gov.sa/en/Award/Pages/about_eAward.aspx.

[142] See: http://www.ita.gov.om/hmaward/english/index.htm.

[143] See: http://www.cmc.iq/en/morenews/index211.html.

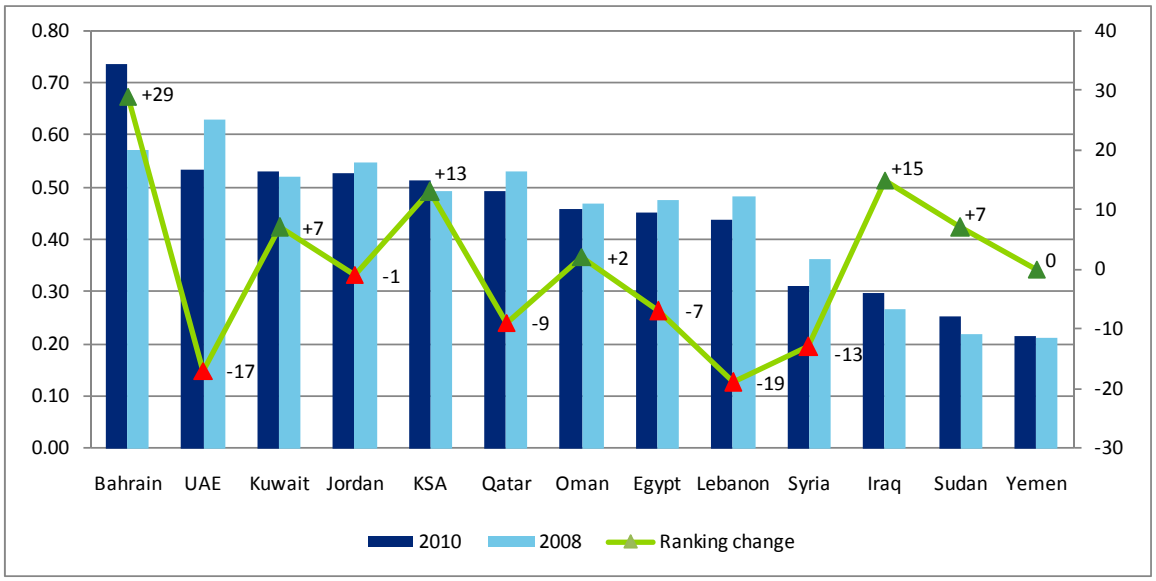
[144] See: http://www.e.gov.kw.

slightly decreased. This decline should not be interpreted as deterioration in e-Government since the Index measures e-Government development of countries relative to one another within a given year.

According to the 2010 survey, most ESCWA member countries have witnessed a noticeable change in their respective rankings and E-Government Development Indices (see figure 8) in 2010. Leading the way is Bahrain, with a global rank of 13 in 2010 and an Index of 0.7363, which represents an increase of 29 positions from its previous rank of 42 in 2008. The increase owes mainly to the impressive Bahraini e-Government portal which provides citizens with a wealth of information and tools that facilitate citizen participation and engagement.

The United Arab Emirates came second in the region, with an Index of 0.5349; however, its global ranking dropped 17 positions as compared to 2008. Although a new federal e-Government portal was launched in late 2010, the main reason behind this decline in ranking was the absence of a unified federal e-Government platform at the time of conducting the survey.[145] It is worth noting here that successful e-Government initiatives and related online portals have long been operational in the United Arab Emirates, but restricted to such emirates as Dubai and Abu Dhabi.

Figure 8. E-Government Development Index scores of ESCWA member countries, 2008-2010



Source: DESA. 2010.

Bahrain, the United Arab Emirates and Kuwait ranked among the top 50 countries globally, at 13, 49 and 50, respectively. Clearly, these three high-income GCC countries have the financial resources to develop and roll out advanced e-Government initiatives, as well as to create a favourable environment for engaging and empowering citizens. In addition to Bahrain, Saudi Arabia and Iraq witnessed impressive improvements between 2008 and 2010 in terms of world ranking, moving up 13 positions and 20 positions, respectively.

Egypt, Lebanon and Qatar saw a decline in their world ranking with Lebanon dropping down 19 positions due to an outdated e-Government strategy and stagnation in related action plans. It is worth noting here that a drop in the ranking of a country may serve as a reminder of the need to allocate adequate resources for improving or establishing citizen-centric online services and expanding access to ICT infrastructure.

[145] See: http://www.emirates247.com/news/government/federal-e-government-portal-launched-at-gitex-2010-10-18-1.305489.

Iraq, the Sudan, Syrian Arab Republic and Yemen are still lagging behind, both regionally and globally. The unstable security situation in both Iraq and Yemen has been a hindrance to all types of development and rapid technological advancement. In the Syrian Arab Republic, the e-Government portal is still an experimental version; and Yemen did formulate and approve an e-Government strategy in 2008, but not much has been achieved; a review of the strategy and policy is well underway.

Efforts in Palestine for computerizing public administration services have allowed the Government to accelerate work on deploying applications for Government ministries, paving the way for Government-to-Government (G2G) services and applications supporting the e-Government initiative.

4. *E-Government portals in the ESCWA region*

A glance at e-Government portals in the ESCWA region portrays the level and sophistication of e-Government implementation and the availability of related e-services. A preliminary assessment of these portals was based on the services depicted in the DESA four-stage model of online services development discussed earlier. In order to ensure consistency, the same number of services and functionalities were assessed during the same period, namely, August 2011.

As of August 2011, all ESCWA member countries have functional online Government portals aimed at combining in one location all e-Government services and at addressing different beneficiaries, including citizens, businesses and other Government agencies. The portals vary in their level of development and the type of services they provide. Table 58 lists e-Government portals of all ESCWA member countries and highlights the type of services delivered and type of information and functionalities available.

TABLE 58. ASSESSMENT OF NATIONAL E-GOVERNMENT PORTALS OF ESCWA MEMBER COUNTRIES

Country or territory	Portal address	Information			Services			Online account	Bilingual	Mobile version	Citizen participation			Additional services		
		General static info	Laws	Directories	Downloadable forms	Interactive	E-payment				Social networking	Blogs	Polls	RSS	Web statistics	Search
Bahrain	www.bahrain.bh	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Egypt	www.egypt.gov.eg	✓	✓	✓	✓	✓	✓	✓	✓	×	×	✓	✓	×	×	✓
Iraq	www.egov.most.gov.iq	✓	✓	✓	×	×	×	✓	✓	×	×	✓	✓	×	×	✓
Jordan	www.jordan.gov.jo	✓	✓	✓	✓	✓	×	×	✓	✓	×	×	×	×	×	✓
Kuwait	www.e.gov.kw	✓	✓	✓	✓	✓	✓	×	✓	×	×	×	✓	✓	×	✓
Lebanon	www.informs.gov.lb	✓	×	✓	✓	×	×	×	✓[a/]	×	×	×	×	×	×	✓
Oman	www.oman.om	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	×	✓	✓	✓	✓
Palestine	eportal.gov.ps	✓	✓	✓	✓	×	×	×	×	×	×	×	×	×	×	✓
Qatar	www.gov.qa	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	×	×	✓
Saudi Arabia	www.saudi.gov.sa	✓	✓	✓	✓	✓	✓	✓	✓	×	✓	✓	✓	×	✓	✓
The Sudan	www.sudan.sd	✓	×	✓	×	×	×	×	✓	×	✓	×	×	✓	×	✓
Syrian Arab Republic[b/]	www.egov.sy	✓	✓	✓	×	×	✓	×	×	×	×	×	×	×	×	×
United Arab Emirates	www.government.ae	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	×	✓
Yemen	www.yemen.gov.ye	✓	×	✓	✓	×	✓	✓	×	×	×	×	×	×	×	✓

Source: Compiled by ESCWA, as of August 2011.

Notes: a/ The portal of Lebanon is trilingual, with Arabic, English and French versions.
b/ Experimental version.

While e-Government services are often thought of as traditional web-based services, many other applications and technologies are being used in the region to deliver Government information and novel services to citizens. For instance, Bahrain,Egypt, Jordan, Oman, Qatar, and the United Arab Emirates have dedicated mobile versions of their web portal ensuring a wider accesses for their services using mobile devices; and Bahrain, Oman, Qatar, Saudi Arabia, the Sudan and the United Arab Emirates use social networking tools to update and engage citizens. Moreover, Bahrain, Egypt, Kuwait, Oman, Qatar, Saudi Arabia, the Syrian Arab Republic, the United Arab Emirates and Yemen provide e-payment services to allow for the payment of services, utility bills, and/or fines.

The years 2010-2011 saw the launch of three new portals for the countries of Iraq, Palestine and the United Arab Emirates, in addition, most member countries have updated and, sometimes, revamped their Government portals. The following highlights some of the latest updates.

The Government Services E-portal in Palestine, launched in July 2011, is a first step towards the computerization of Government services. It was developed within the framework of support to the e-Government project, and provides citizens with downloadable forms for around 309 Government services and details the administrative process required to obtain them.[146]

The Iraqi e-Government portal, which was launched by the Ministry of Science and Technology (MoST) in July 2011, is the main component of the e-Government programme in Iraq and the official site of the Government on the Internet. The interactive, one-stop-shop portal creates a central point of access to information about Government services offered, and provides such information necessary to obtain the service as the administrative procedure involved, location of service, associated fees, and average time of completion.[147]

As the core of its federal e-Government programme, and in an effort to provide better services to citizens and improve its global ranking in the global United Nations E-Government Survey, the United Arab Emirates launched its federal e-Government portal in October 2010 and revamped it in May 2011. The comprehensive portal combines all offered Government services under one umbrella and adopts a number of Web 2.0 features and e-participation tools enabling direct communication between citizens and their Government. Moreover it is accessible through several such smartphones as BlackBerry, Android and iPhone mobile devices.[148]

Launched in 2001 and later improved in 2008, the Qatari online Government portal Hukoomi, which offers more than 300 information services and 70 transaction services, processed more than 1.4 million transactions in 2010. However, a recent usage survey revealed that the portal has not been fully embraced by residents; two-thirds of them are aware of its availability, but only one-quarter have ever used its services. The portal has been revamped in 2010 with a number of such improvements as a user-friendly navigation, a mobile version, and presence on various social media networks.[149]

For the purpose of assessing the level of sophistication of official online Government portals of ESCWA member countries, the DESA four-stage model highlighted in box 11 was used to evaluate their characteristics, as shown in table 58.

Accordingly, the portals of ESCWA member countries can be grouped into for categories. Portals at stage 1 (emerging) include the official websites of the Sudan and Syrian Arab Republic. The portals of Iraq,

[146] See: http://www.mtit.gov.ps/new/index.php?option=com_content&view=article&id=492:2011-07-20-11-48-37&catid=1:2011-03-30-09-48-14.

[147] See: http://www.synisys.com/egov-iraq/index.jsp?&lng=en.

[148] See: http://www.ameinfo.com/265099.html.

[149] ictQATAR. 2010. *Annual Report*; and ictQATAR. 2011.

Lebanon, Palestine and Yemen achieved stage 2 (enhanced). The portals of Egypt, Jordan, Kuwait and Saudi Arabia are classified at stage 3 (transactional), while the portals of Bahrain, Oman, Qatar and United Arab Emirates achieved stage 4 (connected).

5. *E-participation in the ESCWA region*

E-participation is a term which highlights the area of Government online services that opens up proper channels to its citizens for online participation in public affairs. It is one of the main components of the DESA E-Government Survey, and reflects how well Governments are consulting with citizens by obtaining their feedback and opinion, keeping them at the centre of e-services.

As previously described, the interaction of citizens and their participation has been integrated into some ESCWA e-Government portals using such popular Web 2.0 tools as blogs, chats, and discussion forums, as well as such social networking tools as Facebook, Twitter and others.

Table 59, which highlights the E-Participation Index values and global ranking of ESCWA member countries, clearly shows that there is a disconnection between e-services offered and their actual use. Countries in the region that have been actively developing participatory features, for instance Bahrain, fared better in e-participation rankings than all others. However, even on a global scale, only 11 per cent of the countries covered by the 2010 Survey have E-Participation Index values over 0.50. By contrast, only one ESCWA member country, namely Bahrain, has an E-Participation Index value over 0.50, at 0.6714.

TABLE 59. E-PARTICIPATION INDEX VALUES AND RANKINGS FOR ESCWA MEMBER COUNTRIES, 2010

Country or territory	Index value	Ranking (157)	Grouping
Bahrain	0.6714	11	High
Egypt	0.2857	42	Low
Jordan	0.2857	42	
Lebanon	0.2714	45	
Kuwait	0.2286	53	
Oman	0.1571	76	Very low
Qatar	0.1286	86	
United Arab Emirates	0.1286	86	
Saudi Arabia	0.1000	102	
The Sudan	0.1000	102	
Iraq	0.0429	135	Non-Existent
Yemen	0.0429	135	
Syrian Arab Republic	0.0143	157	
Palestine	..	..	

Source: DESA. 2010.

This clearly shows that there is a lack of genuine e-participation in most ESCWA member countries. Surprisingly, although GCC countries scored better than most member countries on the E-Government Development Index, Egypt, Jordan and Lebanon outscored most GCC countries on the E-Participation Index. Some of the possible reasons for this phenomenon are that some citizens in GCC countries may not be aware of the existence of e-Government services, prefer not to use them or even lack the proper skills for using them. In this regard, Governments must act quickly to develop an efficient strategy to increase the participation of their citizen. This implies the need for raising awareness and improving performance of online services, increasing information security and privacy, and enhancing trust and Government openness.

B. COMPARATIVE ANALYSIS OF ICT APPLICATIONS IN BUSINESS AND COMMERCE

During 2010-2011, the ESCWA region has increasingly adopted ICT applications in business and commerce, albeit to varying degrees. While in most countries, the mainstream use of ICT in business and commerce is mostly limited to financial applications, ATMs, online banking, and such communication as e-mail and SMS, other countries feature more developed uses, including business-to-business (B2B) and business-to-consumer (B2C) e-commerce, e-procurement, e-payments, and many other advanced e-business applications.

1. *Availability and quality of e-banking*

E-banking services continue to increase in number and quality throughout the ESCWA region. The financially strong GCC sub-region lead the way in terms of quality and diversity of such e-services provided as account statements, bill and credit card payments, and money transfer services between different accounts either within the same bank or in other banks in the same country. Access to some of these services is also offered through mobile phones and mobile devices. In this regard, the Kuwait Finance House based in Bahrain snapped the Bahrain eContent Award 2011 in the e-banking category for its iPhone and BlackBerry-based applications.[150]

By contrast, an increasing number of commercial banks in Egypt, Jordan, Lebanon and Syrian Arab Republic provide e-banking services with varying levels of sophistication and quality. As of 2011, e-banking services were available in all ESCWA member countries, though they are still limited in Iraq, Palestine, the Sudan, and Yemen.

In Iraq, Warka Bank for Investment and Finance was the first to introduce a slew of e-banking services in 2009, including Internet banking, SMS banking, phone banking, and e-trading.[151] While, in Palestine, although the banking sector is still nascent, signs of growth are encouraging in the infrastructure of ATMs and points of sale (PoS). This growth is expected to be sustained by the ubiquitous access to mobile phones in Palestine, providing more opportunities for the future.[152]

SUDAPAN is the network through which electronic payments are processed in the Sudan. It connects all ATM and PoS machines in the country with the national switch, enabling card holders to use any ATM or PoS machine, regardless of whether the used card has been issued by the same bank.[153]

2. *B2B and B2C e-commerce*

There are no exact statistics on the value of the e-commerce market in the ESCWA region. However, e-commerce is growing in the region at a pace of roughly 15 per cent per year, driven by such oil-rich GCC countries as Saudi Arabia and the United Arab Emirates.[154] But the availability and sophistication of these services still lags behind those available in most developed countries.

Countries with higher GNI and greater Internet penetration rates, particularly those in the GCC region, have adopted e-commerce faster than other ESCWA member counties. A recent research surveying MENA Internet users revealed that around 30 per cent of Internet users in the ESCWA region buy products and services online.[155]

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[150] See: http://www.kfh.bh/en/media-center/news/kfh-bahrain-wins-bahrain-econtent-award-2011-for-its-iphone-and-blackberry-application.html.

[151] See: http://www.warka-bank.com.

[152] See: http://www.opml.co.uk/sites/opml/files/ESAF%20Report_Palestine%20E-banking%20Feb%202011_formatted_1_0.pdf.

[153] See: http://www.ebs-sd.com/English/Sudapan.php.

[154] See: http://www.nordic-industries.com/Downloads/NID%20newsletter%20ICT%20Middle%20East.pdf.

[155] Effective Measure and Spot On Public Relations, Media Consumption and Habits of MENA Internet Users, September 2010.

Table60 shows that 43 per cent of Internet users in the GCC region were also e-commerce users in 2010. This figure was dramatically lower for the Levant countries covered by the survey, which included Jordan and Lebanon, at around 20 per cent, while, in Egypt, 18 per cent of Internet users were also e-commerce users. Despite the fact that the level of e-commerce penetration among Internet users in the region is relatively low, at 30 per cent, compared to 62 per cent in the United Kingdom, e-commerce still represents a market of around 15 million online shoppers across most of the region.

As for the amount spent by the e-commerce users in the region, a series of country surveys conducted by AAG during 2010-2011 showed that B2C e-commerce in the ESCWA region is very promising. The surveys revealed that Saudi Arabia leads the region in terms of total e-commerce transactions value, with 4.3 million users spending around US$3 billion.[156] In Egypt, a slightly smaller e-commerce population of 3.9 million spent around US$2.1 billion in 2009.[157] This constituted, on average, a 30 per cent increase in spending per e-commerce user in Saudi Arabia, which has witnessed higher internet penetration rates and a solid Government support for the sector.

TABLE 60. E-COMMERCE USERS AND PENETRATION RATIOS IN SELECTED AREAS OF THE ESCWA REGION, 2010

Region or country	Population	Internet users	Internet penetration rate (*percentage*)	E-commerce users	E-commerce penetration per Internet users (*percentage*)	E-commerce penetration per inhabitant (*percentage*)
GCC	43 499 571	21 809 014	63.60	9 377 876	43	21.56
Levant[a/]	30 825 430	7 886 697	25.60	1 577 339	20	5.12
Egypt	81 121 077	21 691 776	26.74	3 904 520	18	4.81
Total/average	155 446 078	51 387 487	33.05	14 859 735	28.92	9.56

Sources: ITU. 2011a; and Effective Measure and Spot-on Public Relations.

Note: a/ The Levant countries covered by this research included Jordan, Lebanon and Syrian Arab Republic.

Leading products and services purchased through e-commerce in the ESCWA region were predominantly related to ticketing and reservations. Within that context, most Arab airline websites offer electronic ticketing and e-payment options, in addition to such major travel and tourism sites as Hoojoozat.com. Other products and services purchased electronically were bill payment, electronic equipment, stock market trading, books, flowers, clothing items and accessories, food products and food delivery services.

Following a growing worldwide trend, group buying websites have emerged as a major player in B2C e-commerce in the ESCWA region. Group buying, which is also known as collective buying, offers products and services at significantly reduced prices on the condition that a minimum number of buyers would make the purchase.[158] According to a research conducted in the region in 2011,[159] group buying has shown to be a catalyst for e-commerce in the Middle East. Results of the research showed that two thirds of e-commerce users in Jordan, Kuwait, Lebanon and the United Arab Emirates, who are overwhelmingly positive towards online shopping, are more likely to use e-commerce if better deals are available to them through group buying sites.[160] The success of group-buying model in the region has prompted United States-based

[156] AAG. 2011. Saudi Arabia Internet Users and E-commerce Survey 2011. January 2011.

[157] AAG. 2010c. Egypt Internet Users and E-commerce Survey 2010. April 2010.

[158] See: http://en.wikipedia.org/wiki/Group_buying.

[159] Conducted by GoNabit.com and YouGovSiraj.com.

[160] See: http://www.smeadvisor.com/2011/03/group-buying-a-catalyst-for-e-commerce-in-the-middle-east.

LivingSocial to acquire the startup GoNabit, in what is considered as the first large-scale acquisition of an e-commerce company in the Middle East, signalling that the sector is heading towards more growth and high potential.[161] Box 12 highlights selected group buying e-commerce sites operating in the ESCWA region.

Box 12. Selected group-buying e-commerce sites in the ESCWA region

GoNabit (www.gonabit.com) is a Dubai-based marketing business, formed in January 2010, and dedicated to providing group-buying online deals in several cities across the region through its website. In addition to being the first group-buying website in the Middle East, the company is the first to offer deals in Arabic on its website, covering Dubai, Abu Dhabi, Lebanon, Jordan, Kuwait and Cairo. The provided group-buying service works by leveraging the shopping power of a large online user-base in order to provide them with discounted products and services from local businesses. The company is backed by initial funding from Bayt.com, and was acquired in June 2011 by the United States-based company LivingSocial.[a/]

Cobone.com (www.cobone.com) is another Dubai-based marketing company, launched in July 2010 as part of the Jabbar Internet Group. Its group-discount portal offers one deal every day for users located in Dubai, Abu Dhabi, Sharjah, Doha, Manama, Kuwait, Riyadh, Jeddah, Dammam, Amman, Beirut, Cairo, and Alexandria. The deal becomes active when enough users sign up for it. An offered deal is only valid for a period of 24 hours, during which interested users are urged to share it with their friends in order to close the deal.[b/]

a/ See: http://www.gonabit.com.
b/ See: http://www.cobone.com.

3. *Enabling e-commerce in the ESCWA region*

Building confidence in the online environment is one of the most important factors that facilitate the use and proliferation of e-commerce services among all stakeholders. To that effect, most ESCWA member countries are undertaking proactive steps towards the formulation and enactment of e-commerce and e-signature laws. Bahrain, the Sudan and the United Arab Emirates have previously enacted such laws, while Jordan, Oman, and Saudi Arabia have opted to issue e-transactions laws covering e-commerce or at least facilitating its activities. On the other hand, Egypt and the Syrian Arab Republic have adopted e-signature laws. Recent additions to this list include Qatar with its e-commerce and e-transactions law which was enacted in August 2010.[162] Table 51 of chapter VI provides an updated snapshot on the availability of e-signature, e-transactions and e-commerce laws in ESCWA member countries.

It is noteworthy that the laws for e-signature and e-transactions have been drafted and are in the process of approval for enactment in Iraq, Kuwait, and Lebanon. In the Syrian Arab Republic, the law for e-transactions, including e-commerce, is progressing towards approval.

In spite of these efforts, the e-commerce sector in the region has not realized its full potential, with several obstacles hindering its growth. The main constraints for the development of e-commerce in the region include lack of laws covering e-commerce, e-transactions or e-signature; limited availability of e-payment options; social and cultural resistance to using and adopting technology; and low levels of ICT penetration and ICT literacy.

Additionally, the lack of Government support was identified as a key factor that limits the growth of e-commerce in the region. Most laws in the region have still to be developed and updated to tackle the many challenges associated with using technology for conducting business and commerce. For instance, some of the enacted e-commerce laws have stopped short of addressing consumer protection and dispute resolution, and more effective measures are still required for the protection of IPRs.[163]

[161] See: http://www.zawya.com/story.cfm/sidGN_27062011_280651.

[162] See: http://ict.gulfstaging.net/files/images/e-Commerce_law_EN.pdf.

[163] See chapter V for a number of initiatives in the region aimed at developing e-commerce legal framework.

From the consumer point of view, the issues of trust, online security, privacy and convenient payment methods topped the list of concerns of most e-commerce users, especially those settling their payments electronically through credit or debit cards. While e-commerce users in the region are generally wary about using their credit cards for settling payments online, a recent study analysing e-commerce portals in the Arab world found out that using credit and/or debit cards was the most accepted method of payment in 63 per cent of these portals.[164] In addition, a recent report by MasterCard released in September 2010 revealed a 38 per cent year-on-year growth in the number of transactions in the Asia Pacific, Middle East and Africa region, processed through its e-commerce platform, the MasterCard Internet Gateway Service (MiGS).[165]

Catering to users in the region with no access to a credit card or who prefer not to use them online, a number of merchants and banks operating in the ESCWA region have introduced pre-paid Internet credit and debit cards designed for online shopping. Other financial companies have also developed novel online payment and such alternatives as the payment services provided by CashU,[166] OneCard,[167] and fawry.[168]

4. *E-payment solutions and services*

The main impediments hindering the growth of e-commerce in the region remain the shortage of e-payment solutions and the lack of confidence and trust in using e-payment systems. Hence, Governments and the private sector have taken considerable steps towards addressing these issues as illustrated in the following examples.

SADAD Payment System,[169] the Saudi Arabian national payment platform for bills presentment and payment through banks, continues to make stride and gain momentum. The number of bills paid via SADAD grew exponentially from 4.8 million bills in 2007 to reach 27.9 million bills paid in the fourth quarter of 2010 with a total transactions value of US$5.85 billion.[170] In recognition of its success, SADAD won the Saudi e-Government Achievement Award in 2010,[171] and snatched an e-Payment Excellence Award during the 16th Middle-East eGovernment and eServices Excellence Awards, held in Dubai, in May 2011.[172]

The National ePayment Gateway (ePG) in Oman provides services to Government ministries and private merchants who offer online shopping or e-commerce services on their websites. The gateway which was rolled out in August 2008 plays a major role in the implementation of e-Government services in the sultanate by allowing secure online payments to be processed. The implementation of the system enables online e-Government services to be paid for electronically using credit/debit cards and other electronic payment methods.[173]

Capitalizing on an increase in e-payments to Government services, the Government of Qatar announced, in March 2011, its plan to roll out a dedicated e-payment platform to facilitate financial transactions between citizens and the Government. Dubbed QPay, the new online payment system will be

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[164] AAG. 2010. Strategic Research Service, E-commerce Portals in the MENA Region. December 2010.

[165] See: http://newsroom.mastercard.com/press-releases/mastercard-reports-growth-in-its-e-processing-business-in-asiapacific-middle-east-africa/.

[166] See: http://www.cashu.com.

[167] See: http://www.onecard.net.

[168] See: http://www.fawry.com.

[169] See: http://www.sadad.com.

[170] SADAD Payment System. Presentation by Mohsen Alzahrani. March 2011.

[171] See: http://www.yesser.gov.sa/en/mediacenter/news/Pages/news11.aspx.

[172] See: http://www.meawards.com/newsview.asp?id=1348.

[173] See: http://www.ita.gov.om/ITAPortal/Businesses/Businesses_Projects.aspx?NID=20.

hosted under the main Government portal Hukoomi, which, in 2010, witnessed a sizable increase in online Government payments made using its services, totaling US$302 million, compared to US$123 million in 2007.[174]

Other notable payment solutions in the ESCWA region are: Dubai eGovernment's ePay, a payment gateway which generated US$465 million in the first half of 2011;[175] the e-Dirham payment tool devised by the Ministry of Finance in the United Arab Emirates in order to facilitate the collection of revenues;[176] Tasdid by STE in Syria, which allows subscribers to use prepaid cards to pay bills online or through mobile phones;[177] and e-Rial by the Yemen Post which is a virtual currency allowing citizens to shop online through various Yemeni shopping sites.[178]

5. *E-procurement applications*

Despite their role in increasing transparency, speeding up purchasing processes and eliminating or reducing corruption, e-procurement applications are obviously not among top Government priorities in the ESCWA region, and some of the regional Government initiatives have not even considered e-procurement as a priority. However, some ESCWA member countries have already developed and launched e-procurement applications, particularly in Egypt and the United Arab Emirates. Other such countries as Jordan are still in the implementation phases of e-procurement systems; and some use them partially by publishing information on tenders and bids on Government websites as in the case of Bahrain and Qatar.

In the United Arab Emirates, the Government of Dubai issues procurement of local departments on the nationwide Tejari.com website.[179] While Tejari.com is a private company, it continues to be a leading online B2B marketplace for emerging markets, providing e-procurement services to several Government organizations across the region (Egypt, Kuwait and Oman) as well as countries in Asia. For instance, Tejari's B2B services have helped the Dubai Police realize measurable value savings on public purchases made during 2010. Around 91 per cent of Dubai's Police total procurements in 2010 were carried out using Tejari.com, up from 86 per cent in 2009.[180]

In Egypt, the Ministry of State for Administrative Development (MSAD) completed, in 2007, the first implementation phase of a Government procurement portal project.[181] The portal delivers solutions for Government tenders, auctions and purchasing in Egypt, while providing transparency and ease of use. The portal also offers a number of services to suppliers and purchasers in various Government agencies who are responsible for creating tenders and auctions, and evaluating suppliers' offers. The success of this solution was recognized in 2011 by the UNPSA programme; the portal won second place under category 1 on preventing and combating corruption in the public sector.[182]

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[174] See: http://www.mypaymentsolutions.com/2011/03/qatar-govt-launch-epay-portal.

[175] See: http://www.ameinfo.com/270261.html.

[176] See: http://www.e-dirham.gov.ae.

[177] See: http://epay.ste.gov.sy.

[178] See: http://www.e-rial.post.ye.

[179] See: http://www.tejari.com.

[180] See: http://www.khaleejtimes.com/biz/inside.asp?xfile=/data/uaebusiness/2011/January/uaebusiness_January25.xml&section=Uaebusiness.

[181] See: http://www.etenders.gov.eg.

[182] See: http://unpan1.un.org/intradoc/groups/public/documents/un-dpadm/unpan045542.pdf.

C. COMPARATIVE ANALYSIS OF ICT APPLICATIONS IN EDUCATION

Education is considered one of the main pillars of human development and a key enabler of social and economic development. It has also become a major force providing a competitive advantage to national economies, creating jobs and leading to economic growth. Most ESCWA member countries have realized that improving education helps in reducing poverty and improving the economic conditions of their societies.

ICT applications and the Internet are leading a transformation in the learning process and in the organization and management of educational institutions. ICTs can be used to improve the delivery of education while lowering costs and contributing to achieving universal education, while offering improved conditions for lifelong learning. ICT applications in education can also encompass people that are outside the formal education process, improving and updating professional skills and the capabilities of the workforce.

Realizing the benefits that public investment in education can bring, most member countries have seriously been engaged in overhauling their education systems and increasing public spending on education. Public expenditure on education as a percentage of GDP gives an indication of how a country prioritizes education in relation to its overall allocation of resources and its commitment to improving the sector. As Governments increase their spending on education, it is expected that modern technologies, mainly ICTs, will be employed as tools to facilitate the learning process and transforming it from teacher-centred to learning-centred process. Table 61 shows available data on public expenditure regarding education in the region.

As a percentage of total Government expenditure, Oman and the United Arab Emirates have the highest values, followed by Jordan and Saudi Arabia. Lebanon comes at the bottom of this list owing mainly to the higher demand placed on private education. While ESCWA member countries' spending on education has increased in recent years, the region still lags behind more developed regions of the world. Between 2005 and 2010, the region spent around 3.74 per cent of its GDP on education; by comparison, OECD countries spent, on average, around 4.6 per cent of their GDP on education in 2010.[183]

TABLE 61. PUBLIC EXPENDITURE ON EDUCATION IN ESCWA MEMBER COUNTRIES, 2005-2009

Country or territory	Year	GDP (current US$) *(billions of US$)*	Public expenditure on education	
			As a percentage of GDP	As a percentage of total Government expenditure
Bahrain	2008	21.9	2.93	11.7
Egypt	2008	162.8	3.76	11.9
Iraq	2009	65.8	..	..
Jordan	2005	12.6	4.90	20.6
Kuwait	2006	101.6	3.76	12.9
Lebanon	2009	34.5	1.81	7.2
Oman	2006	36.8	3.90	31.1
Palestine	2005	4.0	..	..
Qatar	2005	43.0	3.30	..
Saudi Arabia	2008	476.3	5.62	19.3
The Sudan	2009	54.7	..	..
Syrian Arab Republic	2007	40.5	4.85	16.7
United Arab Emirates	2009	230.2	1.17	23.4
Yemen	2009	26.9	5.15	16.0

Sources: UNDP. 2009a. *Arab Human Development Report 2009*; and World Bank. 2011. *World Development Indicators 2010.*

Notes: Where public expenditure values are not available, the most recent GDP value is included.
Two dots (..) indicate that data are not available.

[183] See: http://www.oecd.org/dataoecd/45/48/37864432.pdf.

To maximize benefits and ensure cost effectiveness of increased Government expenditure on education, an adequate amount must be directed towards acquiring those ICT tools and applications that aid in the education process, reducing costs and improving efficiency. Suggested and available modes for using ICTs in education range from the availability of computers and the Internet in the classroom, to teacher-and-student ICT training, support to in-class teaching, improved teacher-student communication, school management systems, course planning, e-content, e-curricula, digital libraries, online learning or e-learning, and distance education.

Several member countries have launched initiatives for reforming their education systems. The WEF, through its Global Education Initiatives (GEI),[184] has been a partner to the Governments of Egypt, Jordan and Palestine through a multi-stakeholder partnership model for education, which aims at developing sustainable and scalable national education sector plans. Jordan is considered a success story in the ESCWA region in that context, exerting significant efforts to improve its education system, particularly through its Jordan Education Initiative (JEI). This model has been replicated by the Palestinian Authority as explained in box 13, which highlights the Palestinian Education Initiative (PEI).

The use of ICT in education is not limited to primary, secondary and higher education; it plays a major role in lifelong learning and skills development as well. This is discussed in the following sections.

Box 13. The Palestinian Education Initiative (PEI) at a glance

Building on the success of the Jordan Education Initiative (JEI), the World Economic Forum decided, in 2005, to replicate this private-public partnership (PPP) model in other areas. The Palestinian Education Initiative (PEI) was initially launched then but soon fell victim to political strife which took place in the Palestinian territories over the following three years.

The PEI was re-launched in 2009 in collaboration with the Ministry of Education and Higher Education (MoEHE) in Palestine. To guarantee its sustainability and success, it was aligned with the Palestinian Reform and Development Plan 2008-2010 (PRDP) and the Education Development Strategic Plan 2008-2012 (EDSP), and drew additional international donors and partners such as the Government of Belgium, the United Nations Relief and Works Agency for Palestinian Refugees in the Near East (UNWRA), and the United States Agency for International Development (USAID).

The overall objective of PEI is to enhance education in Palestine through the deployment of ICT infrastructure, the development of curricula, building the capacity of students and teachers, and the employment of the latest in educational technology, all of which are hoped to bring about substantial improvements in the quality of teaching and learning processes.

Concrete steps currently undertaken by PEI include: deploying e-mail accounts for all students and teachers using Microsoft Live@edu; building a Palestinian schools website; upgrading the competencies of teachers, principals and educational managers; providing schools and university students with laptops; and connecting all schools to the Internet.

Source: WEF. 2011c. *Global Education Initiative: Annual Report 2010*; available at: http://www3.weforum.org/docs/WEF_GEI_AnnualReport_2010.pdf.

1. *ICT in primary and secondary education*

The availability of basic ICT hardware, namely, computers, and good Internet connectivity are key to the success of ICT-assisted education. Table 62 highlights the student-to-computer ratio and proportion of schools with Internet access in selected ESCWA member countries. Such oil-rich GCC countries as Bahrain, Qatar and Oman came ahead of other ESCWA member countries. In the Levant, the commitment of Jordan

[184] See: http://www.weforum.org/en/initiatives/gei/index.htm.

to introducing ICTs in all education levels propelled it ahead of the United Arab Emirates in terms of student-to-computer ratio. The Syrian Arab Republic, Yemen, and the Sudan allocated fewer computers to their students, and exhibited lower percentages in terms of schools with Internet access.

TABLE 62. ICT INDICATORS IN EDUCATION FOR SELECTED ESCWA MEMBER COUNTRIES, 2010

Country	Student-to-computer ratio *(ratio)*	Proportion of schools with Internet access *(percentage)*
Bahrain[a/]	6:1	100
Egypt	45:1	66
Jordan[a/]	16:1	72
Kuwait	..	100
Oman	12:1	87
Qatar	8:1	98
Saudi Arabia[b/]	30:1	56
Syrian Arab Republic	50:1	15
United Arab Emirates[a/]	17:1	93
Yemen	53:1	60
The Sudan	40:1	55

Source: ESCWA. 2011. National Profile of the Information Society for each member country.

Notes: a/ Data for 2008.
b/ Data for Saudi Arabia are estimated for 2010.
Two dots (..) indicate that data are not available.

In its Global Competitiveness Report 2010-2011, WEF evaluates Internet access in schools in selected countries. Qatar, the United Arab Emirates, and Bahrain topped other countries of the region, followed by Oman and Jordan (see table 63). This is the result of efforts by these countries aimed at building knowledge-based advanced economies, starting with a highly supported school system. Only Kuwait, Lebanon, Egypt and the Syrian Arab Republic scored below the world average at 4.06 points.

TABLE 63. AVAILABILITY OF INTERNET ACCESS IN SCHOOLS IN SELECTED ESCWA MEMBER COUNTRIES, 2008-2010

Country	Score[a/] 2008-2009	Ranking (133) 2008-2009	Score[a/] 2009-2010	Ranking (138) 2009-2010
Qatar	5.77	15	6.32	4
United Arab Emirates	5.28	26	5.42	29
Bahrain	5.15	28	5.34	32
Oman	4.26	48	4.55	46
Jordan	4.33	45	4.43	51
Saudi Arabia	3.49	69	4.43	52
Kuwait	3.38	79	3.92	67
Lebanon	..	..	3.65	79
Egypt	2.87	95	3.27	95
Syrian Arab Republic	2.05	126	2.15	130

Sources: WEF. 2010a; and WEF. 2011a.

Notes: a/ This is based on a seven-point total score, whereby 1 = very limited access, and 7 = extensive.
Two dots (..) indicate that data are not available.

Following its success in connecting all schools in Bahrain to the Internet, the Ministry of Education (MoE) launched its eConsultation[185] service on its web portal. This service provides a set of tools offering all stakeholders the ability to communicate, interact and share their ideas on issues of common interest, using such tools as blogs, forums, chat rooms, polls and the ability to file eComplaints.

[185] See: http://www.moe.gov.bh/en/eConsultation.aspx.

To raise the level and quality of education in Kuwait, the Ministry of Education (MoE) announced in December 2010 the launch of its New Technology Infrastructure Project (NTIP) in coordination with Microsoft.[186] The project is expected to serve more than 350 schools in Kuwait by introducing the latest ICT infrastructure and tools into the education process, a pretext for e-learning and smart school technology.

In Egypt, the MoE continued its efforts to introduce ICTs to the classroom and raise computer literacy among schoolchildren. In July 2010, the Ministry awarded a tender to the innovative technology company AMD to deploy 10,000 PCs in 1,400 public elementary schools across all 29 governorates in the country.[187]

The Government of Saudi Arabia has made tremendous efforts to develop its education system, when it launched the King Abdullah Project for the Development of Public Education"[188] in 2007. The US$3.1 billion project which is being implemented over a period of five years focuses on improving the quality of the education system by allocating funds for improving public education, training male and female teachers, developing curricula and instilling ICTs in education to stimulate learning.

In the Syrian Arab Republic, MoCT, along with UNDP and the energy company Total E&P partnered together to introduce ICTs in schools. Launched in 2008, the Interactive Schools project was implemented in 15 schools targeting the poorest regions of the country. By 2010, this number grew to 20 schools which were equipped with dedicated websites, networked computers, broadband Internet connection, and a school information system. As a result of the increased ICT capacity-building in targeted communities, the MoE is considering to roll out the programme to all Syrian schools as of 2011.[189]

Yemen lags behind in the use of ICT in education. One exception is the Innovations in Technology-assisted Learning for Educational Quality (INTALEQ) project, a PPP initiative which includes MoE, MTIT, USAID, Intel and other partners. The project aims at improving the educational process in Yemeni high schools through the use of ICT. In 2009, a dedicated learning portal was set up to host 115 localized multimedia learning objects covering four subject areas.[190] An impact assessment conducted following this launch revealed that students benefiting from the project outperformed their counterparts by eight to nine points and demonstrated perceptible learning gains.[191]

In education, as in other such sectors as Government, online learning portals are emerging as valuable tools, in this case supporting the educational process. These portals provide management features and online learning in addition to other services targeting the stakeholders, namely, students, teachers and parents. Portals are usually deployed at a national level from which all schools are able to benefit. The portals are usually built using LMS, thereby providing alternative modes of delivery for learners in different countries.

Following its launch in 2007, the Omani Educational Portal[192] became the de-facto platform for communication between teachers, administrators, parents, and students in Oman. As of December 2010, 16,500 teachers, 2,729 administrators, 128,791 parents, and 210,642 students in 300 schools were already using the portal to carry out daily transactions. An additional 8,950 grade 1 students have already been registered during the academic year 2011-2012. This achievement was recognized by the 2011 UNPSA programme, whereby the portal won first place under category 2 on improving the delivery of public services in Western Asia.[193]

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[186] See: http://www.ameinfo.com/250469.html.

[187] See: http://www.itp.net/581256-egypt-schools-to-deploy-10000-amd-based-pcs.

[188] See: http://www.tatweer.edu.sa/En/Pages/default.aspx.

[189] See: http://www.undp.org.sy/index.php/stories/58-social-development-for-poverty-reduction-/562-interactive-schools.

[190] See: http://www.skooolyemen.com.

[191] See: http://www.educationalrc.org/oldconf/old/pdf/Gerard%20smith.pdf.

[192] See: http://www.moe.gov.om/portal/sitebuilder/sites/eps/english/home.aspx.

[193] See: http://unpan1.un.org/intradoc/groups/public/documents/un-dpadm/unpan045542.pdf.

Knowledge Net Qatar (KNet) is an LMS-based school knowledge network providing portal services for sharing educational resources and student data.[194] It allows for three-way communication between students, teachers and parents. In 2009, KNet was implemented in 37 independent schools with more than 40,000 users; it is expected to reach all 300 independent schools by the end of 2011. Recognizing KNet's innovation, the Qatari Supreme Education Council (SEC)[195] and ictQATAR were presented with the Best-Education-Implementation-of-the-Year award in October 2009 at the annual ACN award ceremony.[196]

2. *E-learning for higher and adult education*

ICTs and related applications have been recognized as major enabling tools for reforming and enhancing the education process while raising the overall quality of education. PCs and the Internet can broaden the reach and expand access to education, while e-learning applications are able to bring the classroom experience into the workplace, enabling more employees to pursue new skills or update existing ones. Teachers could free precious time spent on administrative takes and use it to make teaching and learning more engaging. However, realizing these benefits could not only be achieved by instilling ICTs in education. Most ESCWA member countries have invested heavily in technology but not in overhauling their curricula, improving the competencies of teachers and enhancing pedagogical practices.

In this regard, Saudi Arabia has emerged as a leader in the field of e-learning and distance education in the region. As a result of the commitment of the Government to employing e-learning for higher education, a National Centre of E-learning and Distance Learning (NCEL)[197] was established in 2005. It is a branch of the Ministry of Higher Education (MoHE) dedicated to assisting the higher-education institutions in the country to develop digital educational content and enrich national curricula. In addition, the NCEL has been active in the e-learning development arena; box 14 highlights JUSUR and MAKNAZ, two e-learning services spearheaded by this centre.

Box 14. Main services provided by the National Centre of E-learning and Distance Learning (NCEL) in Saudi Arabia

MAKNAZ is an electronic national repository set up to facilitate the process of developing, archiving, retrieving, reusing and sharing of learning objects. The repository aims at supporting the efforts of Saudi universities by providing the building blocks for developing a quality digital curriculum at reduced cost, in accordance with state-of-the-art international standards. The repository is currently home to more than one million learning objects, and is linked to 35 other digital repositories worldwide, including: HARVARD, MERLOT, ARIADNE, and GLOBE.

JUSUR is a learning management system (LMS) designed by NCEL in order to manage the e-learning process in Saudi Arabia. Registered users can log in and access a variety of training courses. As the user completes a course, related scores are stored and reports generated. Managers, educators and/or administrators can then access the LMS to produce reports which track the progress of users. The system avails a learning content management system (LCMS), which provides subject matter experts the ability to design, create, and deliver e-learning courses rapidly.

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Sources: National Centre of E-learning and Distance Learning in Saudi Arabia, which is available at: http://maknaz.elc.edu.sa and http://www.elc.edu.sa/jusur/english/jusur_advanced.php.

[194] See: http://www.knet.edu.qa.

[195] See: http://www.english.education.gov.qa.

[196] See: http://www.ameinfo.com/213358.html.

[197] See: http://www.elc.edu.sa/portal.

In Bahrain, the Zain E-learning Centre[198] aims at improving the quality of education by employing ICT in teaching and learning processes at universities and academic institution. The centre offers around 160 college-level online courses in several areas tracked by an LMS. It also assists various university colleges to transform regular text-based courses into electronic multimedia-rich ones. The success of the centre earned it the Bahrain eContent Award (BEA)[199] for 2011 under the e-education category.[200]

In Egypt, the E-Learning Competence Centre (ELCC)[201] is dedicated to enhancing workforce skills and competencies by utilizing the latest in e-learning and human resource development tools. Founded in 2004 by MoCIT in cooperation with Cisco Systems, the centre develops and delivers a wide variety of e-learning courses; sets the standards and best practices in e-learning; and builds the capacity of facilitators and e-trainers. The centre has so far delivered training courses to around 60,000 trainees and 3,000 instructors and administrative assistants.[202] In April 2010, ELCC received the Cisco Networking Academy Award for its large-scale deployment of a national delivery network for e-learning in the Middle East and Africa.

Other member countries have also embarked on e-learning initiatives for higher and adult education; EduWave, the Jordanian e-learning platform for public schools, is a successful example, however, the initiatives discussed above were the most comprehensive ones in the region. Nevertheless, the ESCWA region is still facing numerous barriers to e-learning adoption and development. Apart from the inadequacy of ICT infrastructure in some countries, the region does not fair well in the development of comprehensive e-learning policies and strategies, suffers from a shortage of Arabic language learning objects and educational materials, and lacks the presence of quality standards for e-learning.

One initiative which is trying to address these shortcomings is the Middle East e-Learning Association (MEEA).[203] It is an independent, non-profit association, supported by the United Nations Educational, Scientific and Cultural Organization (UNESCO), and dedicated to growing the understanding, practice and knowledge transfer of e-learning in the region. Its members, representing various public and private-sector organizations involved in e-learning, constitute a dynamic network which actively contributes to the development of e-learning policies and strategies.

3. *Virtual universities and distance education*

The ESCWA region has witnessed an impressive growth in the establishment of virtual and open universities spanning most countries in the region; however, the majority of these universities are categorized as being national, that is, serving a particular country in the region where they are geographically located. Nevertheless, established university are still facing a number of such key challenges as the lack of reliable ICT infrastructure and/or high costs associated with ICT-access fees in some member countries; the concentration of degrees offered in the fields of technology and business; high attrition rates due to a lack of a pan-Arab accreditation board for distance and online learning; the shortage of online content developed in Arabic; and the absence of standards ensuring the quality of online and distance education. As a result, The Arab Network for Open and Distance Education (ANODE)[204] was established in 1996 in Jordan. It is a non-profit Arab educational NGO which aims to support the development and growth of open education and distance learning through cooperation and coordination among institutions, networks and organizations working in the field.

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[198] See: http://www.elearning.uob.edu.bh/.

[199] See: http://www.bea.bh.

[200] See: http://twentyfoursevennews.com/gcc/headline/24x7-news-scoops-bahrain-e-content-award-2011/.

[201] See: http://www.elcc.gov.eg.

[202] See: http://www.mcit.gov.eg/MediaPressSer_Details.aspx?ID=750&TypeID=3.

[203] See: http://www.me-ea.org.

[204] See: http://www.anode1996.org.

Among the most prominent regional virtual universities is the Arab Open University (AOU)[205] headquartered in Kuwait and supported by UNESCO. It was launched in 2002 and has since expanded to cover Bahrain, Egypt, Jordan, Kuwait, Lebanon, Oman and Saudi Arabia, with plans to establish two new branches in Palestine and Yemen. AOU adopts a pattern of blended learning, relying on the latest in technology to facilitate the delivery of courses to registered students. Most of the course content is provided by the Open University[206] in the United Kingdom which also accredits AOU programmes. In 2010, the total number of students registered at AOU reached 40,000, up from 17,000 in 2003. It is worth noting that out of 30,548 enrolled students in April 2009, there were 14,510 females, or 47.5 per cent.[207]

In the United Arab Emirates, the Hamdan Bin Mohammed e-University (HBMeU),[208] launched in February 2009 in Dubai, is the first online institution to be licensed and recognized by the national Ministry of Higher Education and Scientific Research.[209] Through the concepts of e-learning and lifelong learning, HBMeU provides access to courses leading to accredited undergraduate and graduate degree programmes spanning such disciplines as business, education, e-learning, health care and environment.[210]

The Syrian Virtual University (SVU) is a successful institution of e-learning and distance education in the ESCWA region.[211] It deploys an LMS for the delivery of locally-developed online courses, and others acquired through partnership agreements with universities in North America and Europe. In 2010, the number of registered students reached 9,000, using the services of 18 university telecentres scattered in the Syrian Arab Republic, ten in Saudi Arabia and one in Dubai.

The Egyptian E-Learning University (EELU) is a private non-profit university that was inaugurated in August 2008 to provide access to education through blended and asynchronous modes of learning.[212] EELU gives educational opportunity to learners who cannot attend a campus university. Through its online system, EELU provides students with the ability to access courses, lectures and other relevant information.

Al-Quds Open University is a Palestinian university which adopts the concept of open education and distance learning to cater to the plight of students scattered in the Palestinian territories. Launched in Jerusalem in 1991, the university had over 60,000 registered students in 2010-2011, out of which 62 per cent are females, studying in 24 different regions and centres distributed all over the West Bank and Gaza Strip.[213] An Open and Distance Learning Centre (ODLC) was established in 2008 in order to take advantage of the latest in e-learning and blended learning concepts.[214]

In addition to the previously mentioned learning institutions, the region is also home to several universities which have adopted e-learning at various stages to improve their educational systems, expand their outreach and take advantage of the latest advances brought forth by ICTs. In this regard, it is worth mentioning the Hourani e-Learning Centre (HEC)[215] at the Al-Ahliyya Amman University (AAU) in Jordan,

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[205] See: http://www.arabou.org.

[206] See: http://www.open.ac.uk.

[207] See: http://www.agfund.org/en/about/flagships/Pages/thearabopenuniversity.aspx.

[208] See: http://www.hbmeu.ac.ae.

[209] See: https://www.mohesr.gov.ae/en/.

[210] See: http://www.hbmeu.ac.ae/content/affiliations-partnerships.

[211] See: http://www.svuonline.org.

[212] See: http://www.eelu.edu.eg.

[213] See: http://www.qou.edu.

[214] See: http://www.qou.edu/english/index.jsp?pageId=103.

[215] See: http://vclass.ammanu.edu.jo.

the E-Learning Centre[216] at the King Fahd University of Petroleum and Minerals (KFUPM) in Dahran, Saudi Arabia, the King Khalid University (KKU) eLearning Centre,[217] in Abha, Saudi Arabia, the E-Learning Centre of Excellence[218] at the Gulf University for Science and Technology (GUST) in Kuwait, as well as the e-learning initiatives at the Open University of Sudan[219] and the University of Science and Technology in Yemen.[220]

D. COMPARATIVE ANALYSIS OF ICT APPLICATIONS IN HEALTH CARE

Traditionally, SMS services have been utilized in the region for improving health-related communication between rural and urban areas, for instance, information on seasonal vaccination campaigns, pandemic and epidemic infectious diseases. However, the past two years saw more innovative approaches which took advantage of new technologies and the holistic use of mobile services. Despite these improvements, such barriers to implementing ICT applications in health care remain as the lack of legal policies and regulations, underdeveloped ICT infrastructure in least-developed member countries, shortage of financing, cultural barriers in the adoption of technologies, and lack of technical expertise for health-care professionals.

Nevertheless, the region has witnessed an increased interest in the use of ICT in the health sector; the subsections set forth below provide a few examples.

1. *Telemedicine and innovative e-health applications*

Telemedicine is available in such member countries as Bahrain, Jordan, Lebanon, Oman, Qatar and Saudi Arabia. In Jordan, the use of telemedicine, namely videoconferencing sessions, for diagnosis between the King Hussein Cancer Centre and the Hospital for Sick Children in Toronto, Canada, led to a positive impact on patient care.[221]

In Bahrain, a telemedicine project has been set up in 2010 linking the Salmaniya Medical Complex (SMC) with the Austrian Wound Association in Vienna. In order to get a better diagnosis, specialists from SMC use telemedicine applications to upload pictures of wounds and medical reports to get expert opinion.[222] A telemedicine programme was established at the King Faisal Specialist Hospital and Research Centre in Jeddah, Saudi Arabia, supporting both national and international medical needs. Its services include such applications as videoconferencing, telepathology and teleradiology.[223] Oman achieved a new milestone in health-care services when it joined the Apollo Telemedicine Network (ATN) in 2007, one of the largest private health-care providers in Asia.[224]

Other member countries have also resorted to innovative e-health solutions, including the Women's Health Outreach Programme (WHOP) in Egypt, which is a joint collaboration between the Ministry of Health and Population (MoHP) and the Ministry of Communications and Information Technology (MoCIT). Launched in 2008 for a period of five years, the programme employs medically-equipped mobile vans to

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[216] See: http://www.kfupm.edu.sa/dad/elearn.

[217] See: http://elc.kku.edu.sa.

[218] See: http://www.gust.edu.kw/elearning.

[219] See: http://www.ous.edu.sd.

[220] See: http://www.ust.edu.

[221] See: http://onlinelibrary.wiley.com/doi/10.1002/pbc.21085/abstract.

[222] See: http://www.gulf-daily-news.com/NewsDetails.aspx?srch=1&storyid=290401.

[223] See: http://www.ihrcanada.com/index.php?option=com_content&view=article&id=231&Itemid=178.

[224] See: http://gulfnews.com/news/gulf/oman/oman-sets-up-first-telemedicine-centre-1.194488.

roam through different areas of the country in order to provide mammography scans for women aged 45 and above as well as screening for diabetes, hypertension and obesity. Since mid-2011, 77,000 women have been screened, out of which 335 were operated upon following a positive diagnosis. The programme won first place in 2011 at the UNPSA under category 5 on promoting gender-responsive delivery of public services in Western Asia.[225]

Other innovative services include the sharing of medical information, awareness campaigns, updates and vaccination reminders via e-mail and SMS. The Ministry of Public Health (MoPH) in Lebanon provides some of this e-service on its web portal.[226] See box 15 for additional initiatives in the region.

Box 15. E-health initiatives and strategies in selected ESCWA member countries

Governments have come to realize the importance of using ICT as a cross-cutting tool capable of sustaining most economic and social sectors, including the health sector. A number of ESCWA member countries have improved their e-health initiatives, while some are even developing specific e-health strategies or incorporating e-health into their existing wider ICT and health strategies.

In Egypt, the Ministry of Health and Population (MoHP) and the Information Technology Institute (ITI) launched a joint Health Informatics Fellowship programme in 2009 which aims at educating and training health-care professionals and caregivers on health informatics concepts and best practices. It is hoped that the programme will bridge the gap between health-care needs and ICT capabilities.

The Minister of Health in Jordan launched the Jordan Health Initiative (JHI) in 2010, which seeks to improve medical services and health care through the utilization and integration of modern ICTs, and enhance the quality and efficiency of the health-care system while cutting costs. Through a public-private partnership between the Ministry and Cisco, JHI includes the development of a databank containing the medical records of all patients, including test results, procedures and surgeries performed, diseases and allergies suffered from, in addition to medications taken routinely.

ictQATAR collaborated with the National Health Authority (NHA) and Hamad Medical Corporation (HMC) to draft an e-health strategy for Qatar. Much of the work now sits with the Supreme Council of Health (SCH) with ictQATAR providing assistance to leverage ICTs for enhancing health-care services. Key initiatives on this strategy include deployment of a health information system, development of a national health-care network, ICT health regulations and standards, electronic health record, health-care knowledge management, and ICT capacity-building for health-care professionals.

In 2010, the Ministry of Health (MoH) in Saudi Arabia unveiled its plans to transform health-care delivery in the Kingdom through a five-year e-health technology programme. Initial plans call for studying and understanding failed initiatives in some countries and build on the e-health advancements from many developed countries. The programme is set to incorporate elements addressing quality of care, cost containment, health-system management and research needs while addressing barriers to the adoption of technology using change-management techniques.

Sources: http://www.imia-medinfo.org/new2/node/178; http://jordantimes.com/index.php?news=30819; ESCWA. 2011d; and http://www.sahi.org.sa/article_details.php?article_id=5.

2. *Health records and health information systems*

Many ESCWA member countries, especially GCC countries, have established national health information systems, while others have initiated plans and/or programmes to establish such systems. These initiatives were spearheaded, in principle, by the ministries of health and supported, at times, by the ministries of ICTs. For instance, the Pre-Employment Health Check Automation Project (PREMPC) in

[225] See: http://thedailynewsegypt.com/health/egyptian-ministry-of-health-initiative-wins-un-public-service-award.html.

[226] See: http://www.moph.gov.lb.

Bahrain, the Integrated Health Record System in Egypt and the National Health Statistical Information System in Lebanon, have been designed to gather information for follow-up, provide decision support, and ensure transparency and accountability at all levels.

In the United Arab Emirates, Wareed[227] is the most comprehensive health information system, launched by the Ministry of Health (MoH) in 2010. The system creates and maintains medical records for patients across the Emirates by linking14 MoH hospitals and 76 primary health-care facilities. In addition, Wareed allows records of patients, including medical history, lab results, x-rays, treatment and medication to be stored in a centralized database accessible to physicians from affiliated hospitals and clinics across the country.[228]

Oman also has an advanced health information management system, which was developed by MoH and is referred to as Al Shifa. Developed starting in 1997 and enhanced continuously, the system maintains an audit trail of the medical histories of patients. Using Al Shifa has created transparency in health-care delivery in Oman while reducing duplication of work and inefficiency, thereby improving health care while reducing cost. The system won first place in Western Asia under the Advancing Knowledge Management in Government category at the 2010 UNPSA.[229]

In Lebanon, MoPH is in the process of implementing the Emergency Social Protection Implementation Support Project II (ESPISP II), part of the World Bank Trust Fund for Lebanon. The main objective of the project is to improve the administration, delivery, and financial sustainability of social services through the implementation of a new electronic system. The new system includes the design of modern hospital contracts based on key performance indicators (KPIs) and the automation of pre-authorization and claims processing processes.[230]

3. *Health-care management systems*

Health-care management systems are intended to improve the administration process of hospitals, clinics and health centres. These systems have been deployed in public and private health-care providers in such ESCWA member countries as Bahrain, Egypt, Kuwait and Lebanon.

In Bahrain, the Document Management System is one of the completed projects in the administration offices of the Health Information Directorate (HID). The project electronically archived huge amounts of paper documents, resulting in a reduced number of physical documents, while providing more security for electronic medical records.[231]

The National Network for Citizen Health Treatment, in Egypt, is a joint project between MoCIT and MoH. The first phase, completed in May 2010, saw the computerization of administrative processes related to free medical care, and the development of a central management system linked to 75 remote sites spread across the country. As a result, delays in treatment authorization and payment have been minimized. The second phase of the project started in August 2010; it involves building a data mining system that can be accessed from 130 remote sites.[232]

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[227] See: http://www.wareed.ae.

[228] See: http://www.menafn.com/qn_news_story_s.asp?StoryId=1093301022.

[229] See: http://unpan1.un.org/intradoc/groups/public/documents/un-dpadm/unpan039018.pdf.

[230] See: http://www.moph.gov.lb/AboutUs/Projects/ESPISP-II/Pages/ESPISPII.aspx.

[231] ESCWA. 2011j.

[232] ESCWA. 2011h.

MoPH in Lebanon has extended its Transactions and Workflow Management System (TWFS), a digital record keeping system, to allow physicians and health-care professionals to check their available funds with the Ministry. The second version of TWFS enables this access through a secure login to the site of the Ministry using a username and a password.[233]

4. *Online access to medical knowledge and services*

As part of their access to medical services, all ministries of health in ESCWA member countries have web portals offering varying levels of related services from static information to more elaborate e-services. For example, the portal of MoH[234] in Saudi Arabia provides a number of such valuable e-services as an electronic directory of Government health centres, hospitals, and private facilities; latest health-awareness campaigns, a wealth of educational content related to first aid, health tips and diseases; a medical library of images and videos; a number of such health tools as body mass index and calories calculators; and the ability to subscribe to mobile services to stay updated on latest health issues and news.

My Medical Directory[235] in the United Arab Emirates is a comprehensive medical directory for all health providers in the Emirates. The portal avails a database of health practitioners, hospitals, medical centres, clinics, pharmacies and laboratories. My Medical Directory was one of the winning initiatives at the 2011 Arab eContent Award under the E-Health and Environment category.[236]

The portal of MoH in Bahrain offers access to a wealth of such e-services as birth registration, viewing vaccination records, scheduling appointments at MoH clinics, checking drug prices and the ability to ask anonymously medical-related questions. The portal also features such e-participation tools as chat, forum, blog, e-voting, e-suggestions and e-complains. Such social networks as Twitter, Facebook and YouTube have been integrated into the site, which was also a winner at the 2011 Arab eContent Award under the E-Health and Environment category.[237]

Finally, the Kuwaiti MoH Diabetes Home Care Team[238] is a portal dedicated to diabetes-related health issues providing indispensible information about the disease in Arabic. The website also offers nutritional information about Kuwaiti cuisine, in an effort to help diabetic patients avoid certain ingredients or substitute them with healthy alternatives. The portal was also a winner at the 2011 Arab eContent Award under the E-Health and Environment category.[239]

E. COMPARATIVE ANALYSIS OF ICT APPLICATIONS IN EMPLOYMENT

The ESCWA region has witnessed considerable progress in the use and adoption of ICT in recruitment and job search, driven by a strong demand of highly-skilled ICT-trained workforce. Employment portals have proliferated and became the medium of choice used to advertise job opportunities and receive jobseeker applications online. Additionally, other means have proven successful in the recruitment process, for example, social media applications are being used as an aid in the selection process. Facebook is being used by recruiters and hiring employers in the region to check the social profile of potential job applicants. LinkedIn, a social networking site for professionals, is also being used for recruitment and job hunting.

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[233] ESCWA. 2011f.

[234] See: http://www.moh.gov.sa.

[235] See: http://www.mymd.ae.

[236] See: http://www.bea.bh/aea/eng/e-Health-Environment2011.asp.

[237] Ibid.

[238] See: http://www.sokary.org.

[239] See: http://www.bea.bh/aea/eng/e-Health-Environment2011.asp.

From the public-sector perspective, many Government institutions have opted to advertise their job openings online, while the private sector has seen a shift whereby job openings are not only being posted on the website of the employer, but are also posted on dedicated national and regional employment portals. As a result, online recruitment agencies and job marketplaces have gained considerable success, offering job opportunities to graduates and jobseekers from various fields.

1. *National employment offices and job databases*

In GCC countries as well as Egypt, Jordan, and Lebanon, public and private institutions are increasingly using online portals that offer e-recruitment services.

The Ministry of Civil Service[240] in Oman is responsible for recruiting job seekers for the 35 ministries and Government units. In order to enhance the transparency and shorten the recruitment process, a central recruiting system[241] was established allowing job seekers to apply for employment opportunities within the civil service by means of an online system using a computer or mobile phone. The success of the system led to its winning the second place in 2011 at the UNPSA under category 1 on Combating Corruption in the Public Service in Western Asia.

MOL in Bahrain provides employment opportunity in the public sector on its portal.[242] Job seekers accessing the site benefit from a number of available e-services, including job seeker registration, job vacancies registration in addition to a number of training services.

In Saudi Arabia, the Ministry of Civil Service provides an online recruitment site dubbed Jadarah,[243] through which citizens can apply for jobs in the Government sector, track the progress of their applications and view the results. Government job vacancies in Egypt are also provided on a dedicated web portal.[244]

Tanmia[245] is the federal Government recruitment portal in the United Arab Emirates managed by the National Human Resource Development and Employment Authority. At the Emirate level, Jobs Abu Dhabi is an e-Government supported portal[246] that provides job seekers and employers online access to comprehensive job listings. In Dubai, local Government employment opportunities are provided on the eJob portal.

2. *Employment portals*

The ESCWA region is home to many employment portals developed and supported by specialized recruitment agencies that advertise job opportunities on behalf of employers and receive job applications online. These employment websites provide services to the public at the national and regional levels. Most of these sites do not charge employers or job seekers any fees. However, some do require a service fee from employers in order to provide a proper list of registered job seekers and even to assist employers in selecting appropriate candidates. A prominent example in the region is bayt.com, which acts as an online marketplace for employers and job seekers. Table 64 provides a selected list of employment portals serving the ESCWA region.

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[240] See: http://www.mocs.gov.om.

[241] See: http://85.154.255.94:6514.

[242] See: http://www.mol.gov.bh.

[243] See: http://www.mcs.gov.sa/Pages/Gadarah.aspx.

[244] See: http://jobs.gov.eg.

[245] See: http://www.tanmia.ae.

[246] See: http://jobs.abudhabi.ae.

It is noteworthy that most advertised jobs on these portals are located in the economically developed GCC region, especially in the United Arab Emirates, followed by Saudi Arabia and Qatar. In addition, the majority of available employment opportunities are in the fields of banking and finance, followed by IT and telecommunication.

TABLE 64. LIST OF SELECTED EMPLOYMENT PORTALS IN THE ESCWA REGION

Country/region		Website
Regional	Bayt.com is one of the most prominent job portals in the Middle East covering all ESCWA member countries.	http://www.bayt.com
	Akhtaboot is an online career network currently serving Egypt, Jordan, Qatar, Saudi Arabia and the United Arab Emirates.	http://www.akhtaboot.com/jobs
	GulfTalent.com is an online recruitment portal, with a database of over 2,000,000 experienced professionals. Its services cover the GCC sub-region in addition to Egypt, Jordan, and Lebanon.	http://www.gulftalent.com
Gulf sub-region	The portal provides all advanced job search and resume management features which are available at monster.com, but specifically tailored to the region.	http://www.monstergulf.com
	Established in 2006, the portal allows job seekers to browse through listed jobs, apply online and self-register to be contacted by recruiters for relevant opportunities.	http://www.naukrigulf.com
	The portal provides job search for job seekers and allows recruiters and employers to place their vacancies online and search for a match from its database of registered candidates.	http://gulfjobseekers.com
Egypt	The portal avails a comprehensive suite of career-building tools in order to find a job in Egypt.	http://www.jobsinegypt.com
Lebanon	The portal is dedicated to finding potential Lebanese job seekers for employment opportunities in Lebanon and elsewhere.	http://www.hirelebanese.com
Kuwait	The portal provides jobs and employment search in Kuwait.	http://www.aywaa.net
Jordan	The portal provides recruitment services and career advice. Moreover, it assists students in choosing a specialization.	http://www.almanar.jo
Saudi Arabia	Glowork is the first portal in the region dedicated to providing career guidance for women. The site currently serves Saudi Arabia but will expand to other countries in the region as demand increases.	http://www.glowork.net
The Sudan	The portal offers the job seekers and employers in the Sudan to connect with each other in an online environment.	http://www.sudanjob.net

Source: Compiled by ESCWA from respective sites.

3. *Teleworking and increasing employment opportunities*

As a result of the widespread availability and use of ICT in the workplace, the concept of teleworking has emerged in the ESCWA region during the past few years, allowing citizens to work from their homes. This work mode will have a direct impact on the labour market in terms of increasing employment opportunities, especially for individuals located in rural areas, women, and those with special needs.

Despite the absence of accurate numbers measuring the actual extent of this practice, the current economic boom in the Gulf sub-region, especially in such business activities that do not require employees to be physically located at the workplace as media, research, translation, web design and consulting has paved the way for individuals and companies to opt for this mode of work. Several companies in the GCC countries, particularly the United Arab Emirates, are outsourcing part of their business to individuals or companies located abroad in such countries as Egypt, Jordan, Lebanon, and the Syrian Arab Republic, where work tasks are being carried out over the Internet. In this regard, the ICT sector in Egypt is accepted to get a large number of employment opportunities, particularly in the outsourcing and off-shoring industry. According to MoCIT, outsourcing activities could create 300,000-450,000 indirect jobs for Egypt and 800,000-1,200,000 indirect jobs by the year 2017.[247]

ESCWA, along with other United Nations organizations in the region, has resorted to teleworking as a result of a broader business strategy in response to worsening situations, including civil unrest, war and security threats, particularly in the case of Iraq, Lebanon and Palestine. For example, ESCWA has been working on enhancing its internal ICT systems and infrastructure in order to meet the demand of working from home and allowing access to its intranet, thereby providing Internet-accessible webmail, reverting to IP telephony for voice communications, and providing external storage for data safeguarding and backups.

F. CLASSIFICATION AND RANKING OF ESCWA MEMBER COUNTRIES ACCORDING TO MATURITY LEVEL

1. *Maturity level 1: Iraq, Palestine, the Sudan, Syrian Arab Republic, and Yemen*

This level is characterized by poor use of ICT applications in Government, weakness or absence of e-commerce and related legislation (though the Sudan has an e-commerce law, related applications are scarce), limited usage of ICT in education (while the Syrian Arab Republic has a virtual university, computers and Internet access in schools are rare), inferior usage of ICT in health care, and barely perceptible use of ICT in the employment sector.

2. *Maturity level 2: Egypt and Lebanon*

This level is characterized by the existence of clear strategies for the use of ICT applications in the Government but no clear implementation is seen or plans of action devised. Countries at this maturity level have witnessed some readiness in e-commerce, especially on the legislative side, while the utilization of these applications is still partial. While the use of ICT in education in perceptible, computers and Internet access in schools is limited; usage of ICT in health care and in the employment sector is moderate. Egypt has made some progress in most areas; however, such progress was insufficient in the period under study for it to attain a higher maturity level. Lebanon has been stagnant and risks to be dropped to level 1 if no progress is seen in 2011-2012.

3. *Maturity level 3*: *Jordan, Kuwait, Oman, Qatar, and Saudi Arabia*

This level is characterized by established ICT applications with advanced levels of implementation in the Government sector. Countries at this maturity level have witnessed considerable levels of e-commerce adoption and use. Computers and Internet access in schools are commonly available; and the usage of ICT in health care and in the employment sector is sizeable. While Qatar and Saudi Arabia have made good progress, the former in e-commerce (passing a comprehensive e-commerce law in 2010) and the latter in e-Government and e-learning, such progress was insufficient in the period under study for both countries to attain maturity level 4 owing to their lag in other areas. Jordan and Oman have sustained their progress from 2009 with good progress in education, while Kuwait has shown good improvement in e-Government which led it to attain a higher maturity level than the one registered in 2009.

[247] ESCWA. 2011h.

4. *Maturity level 4: Bahrain and United Arab Emirates*

The fourth level is characterized by existence of high quality, citizen-centred ICT applications and services in the Government sector. Countries at this maturity level have witnessed extensive levels of e-commerce adoption and use. Computers and Internet access in schools are widely available; and the usage of ICT in health care and in the employment sector is significant. Bahrain and the United Arab Emirates have made significant progress in most areas, and sustained the levels achieved in 2009.

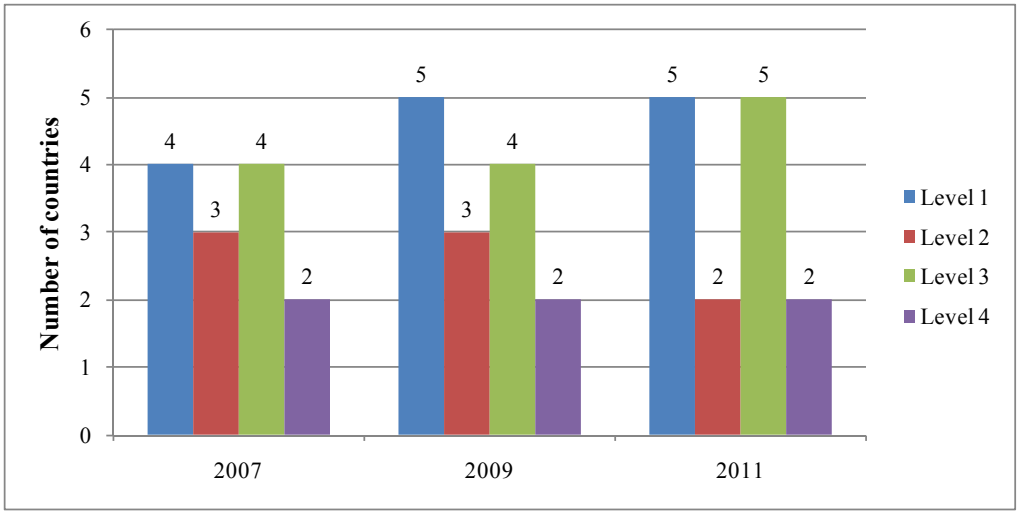
TABLE 65. RANKING OF ESCWA MEMBER COUNTRIES BY MATURITY LEVEL IN ICT APPLICATIONS

	Maturity level 1			Maturity level 2			Maturity level 3			Maturity level 4		
Country or territory	2007	2009	2011	2007	2009	2011	2007	2009	2011	2007	2009	2011
Bahrain										✓	✓	✓
Egypt				✓	✓	✓						
Iraq	✓	✓	✓									
Jordan							✓	✓	✓			
Kuwait					✓		✓		✓			
Lebanon				✓	✓	✓						
Oman				✓				✓	✓			
Palestine	✓	✓	✓									
Qatar							✓	✓	✓			
Saudi Arabia							✓	✓	✓			
The Sudan[a/]		✓	✓									
Syrian Arab Republic	✓	✓	✓									
United Arab Emirates										✓	✓	✓
Yemen	✓	✓	✓									

Source: Compiled by ESCWA.

Note: a/ No assessment was provided for the Sudan prior to 2009, which only joined ESCWA in 2008.

Figure 9. Maturity levels of ESCWA member countries in ICT applications



G. SUGGESTIONS AND RECOMMENDATIONS

(a) *ICT applications in Governments*

(i) Increase Government commitment as well as political and financial support to rapidly implement plans and strategies relating to ICT applications in general and e-Government in particular;

(ii) Establish an independent authority in charge of e-Government planning, implementation and monitoring and link it directly to the highest authority in the country, for instance the council of ministers, rather than to a specific ministry;

(iii) Mobilize the proper resources for implementing e-Government initiatives in order to avoid potential losses incurred from developing multiple systems to solve the same problem, and generating the same data by several sources;

(iv) Simplify and reinvent Government procedures and processes before moving them to an electronic environment; a very misleading tendency is for Governments to start implementing online services through a mere digital translation of existing services;

(v) Raise staff and citizen awareness on the importance of e-Government, with focus on benefits gained by citizens, staff awareness coming as part of change management with due regard to resistance to change;

(vi) Improve and make affordable the access of rural and marginalized areas and citizens with special needs to e-Government tools;

(vii) Provide citizen-centric, interactive e-services while urging users to provide feedback and boost their participation using Web 2.0 and social networking tools;

(viii) Promote collaboration among ESCWA member countries for sharing experiences and best practices and develop applications that apply to more than one country in the region; ESCWA could provide the platform for such collaboration.

(b) *ICT applications in business and commerce*

(i) Formulate and implement national plans to increase the participation of citizens and to build their trust in e-business and e-commerce applications, including improved online security and enactment of e-transactions/e-commerce and e-signature laws;

(ii) Build national capacities for the development of ICT applications in business and commerce, while ensuring reliability, security and privacy, and provide incentives to companies for local development of these applications;

(iii) Encourage central banks in the ESCWA region to support or establish national e-payment gateways, while conducting financial and legal coordination between banks and companies working in the field of e-payment services provisioning;

(c) *ICT applications in education and training*

(i) Integrate ICTs into the national strategy for school education whether for digitizing curricula, supporting the classroom teaching process or providing appropriate teacher training; a selected number of pilot schools could serve as a starting point;

(ii) Improve availability and access of quality lifelong e-learning programmes to meet the needs of the constantly changing job market;

(iii) Encourage the use of e-learning in upgrading professional skills;

(iv) Motivate the development of digital instructional content, learning object repositories and the use of course authoring tools;

(v) Encourage the development of specialized learning portals covering various sections of knowledge and disciplines.

(d) *General recommendations*

(i) Update ICT sectoral strategies after their evaluation or formulating new strategies that include benchmarks and processes for evaluating impact and monitoring progress;

(ii) Provide regular training for staff, namely teachers, business professionals, Government employees and health-care providers, among others, on ICT and relevant applications, at different levels of competency;

(iii) Increase general public ICT literacy through media campaigns and training in order to reap more benefits of ICT applications in general, with selected social groups, including the disadvantaged and women, in mind;

(iv) Give special attention to new, innovative services that can provide better access to all citizens, for instance the use of mobile applications or smartphones;

(v) Provide broadband for all, especially in rural and urban areas, at affordable prices, using the PPP model.

VIII. CULTURAL DIVERSITY AND IDENTITY, LINGUISTIC DIVERSITY AND LOCAL CONTENT

A. COMPARATIVE ANALYSIS

Regional initiatives and plans continue to recognize the importance of ICT for the preservation of cultural heritage, on the one hand, and for improving online cultural and linguistic diversity, on the other. As part of its involvement in information society development, ESCWA stresses the importance of cultural and linguistic diversity as well as the development of Digital Arabic Content (DAC) through such activities as the Regional Plan of Action for Building the Information Society,[248] the field project entitled Promotion of Digital Arabic Content through Incubation,[249] and, more recently, the Arab Regional Roadmap for Internet Governance: Framework, Principles and Objectives.[250] In 2009, the Arab ICT Strategy – Building the Information Society 2007-2012 was formulated and included nine projects, four of which relate to Arabic content in some way or another.[251] These projects were approved by the Arab Telecommunications and Information Council of Ministers in January 2010.

1. *ICT in support of cultural and linguistic diversity*

To varying degrees, the ESCWA member countries have given online information about their culture, heritage, history and identity the priority it deserves. In general, ministries of culture and heritage have been the focal points for the electronic production and management of this type of information. There is a notable difference, however, between having a website for such a ministry to publish information online on cultural, historic and touristic aspects and having an active role through projects and programmes to digitize manuscripts and historic documents. Egypt, Jordan, Kuwait, and Oman have ongoing national initiatives for the digitization of manuscripts, heritage and historic documents. These and other ESCWA member countries; namely, Bahrain, Lebanon, Qatar, Saudi Arabia, Syrian Arab Republic and United Arab Emirates, have active websites for their ministries of culture that are regularly updated with the latest events and activities.

Previous issues of the Regional Profile of the Information Society have highlighted the active role of Egypt in developing content on local and cultural heritage that are led by the Centre for Documentation of Cultural and Natural Heritage (CULTNAT). Newly launched projects by CULTNAT are documenting the cultural aspects of the Cairo Governorate and replicating the Luxor city in a virtual context.[252] A CULTNAT spin-off was the Memory of the Arab World project, which was completed in July 2011 and succeeded in providing valuable deliverables regarding six themes, covering cultural, architectural, and historic aspects of the Arab region. For example, within the common memory theme, information was collected on 295 historical periods and countries, States and dynasties that ruled during these periods.[253] Findings and content related to this project are published on its website in Arabic.

The Ministry of Culture[254] in Bahrain is maintaining an online presence that portrays the Bahraini culture and heritage by means of its website, which includes a calendar of cultural events and an interactive map of Bahrain that spots the cultural locations with brief information on each, in Arabic and English. It also

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[248] ESCWA. 2004; available at: http://documents-dds-ny.un.org/doc/UNDOC/LTD/I05/000/23/img/I0500023.pdf?OpenElement.

[249] See: http://www.escwa.un.org/divisions/projects/dac/index.asp.

[250] ESCWA. 2010. *Arab Regional Roadmap for Internet Governance: Framework, Principles and Objectives. (E/ESCWA/ICTD/2010/Technical Paper.5)*, available at: http://www.escwa.un.org/arabic/information/pubaction.asp?PubID=943.

[251] The subjects of these projects are Arabic domain names, memory of the Arab world, Arabization of ICT terms, and an Arabic guiding framework for telecommunications regulation.

[252] ESCWA. 2011h.

[253] CULTNAT report on the project Memory of the Arab World, April 2011.

[254] See: http://www.moc.gov.bh/en.

includes electronic versions of an Arabic national cultural magazine. The website was a winner of the 2010 e-Government Excellence Award in the e-Content category.

In Oman, as of December 2010, the Ministry of Culture and Heritage digitized, and thus preserved, a total of 2,000 manuscripts about Oman collected nationally and regionally. The manuscripts are available at the local Intranet[255] of the Ministry, and their indexes are available on the ministry website.[256]

2. *Local and national digital content development*

Stagnant at less than 0.3 per cent for several years, the percentage of online DAC has received more optimistic estimates ranging from 1.5 per cent[257] to 2.31 per cent[258] in 2011. This improvement was the result of increased awareness by Governments on the importance of promoting DAC to build the information society, and by the private sector on the opportunities offered by the digital content industry.

Another factor supporting the increase in DAC is the major shift towards mobile applications witnessed by the digital content industry since 2009 and the fact that the number of mobile devices considerably exceeds the number of PCs and are within the reach of all communities (refer to chapter II for statistics). Content developers are now keen on making mobile-compatible versions of their applications, or in some cases mobile-only versions. Social networking, applications and entertainment are increasingly being accessed through smart mobile platforms. The World Summit Award (WSA) took note of this move and launched in June 2010[259] a dedicated WSA-mobile award to keep up with new challenges and trends.

The increase in value and quality of content has also led to the emergence of new services. Content aggregators, in particular, have increased in number within the region. These are organizations that gather content from different content publishers to sell to mobile operators.[260] The aggregated content is then sold by mobile operators to end users as a content value-added service. All the ESCWA member countries have operational content aggregators. Each of which may serve up to 50 operators in the Middle East and North Africa region. As for the content services that these aggregators provide, they are categorized as follows: Info SMS, Info MMS, SMS to television for dedications and voting, downloads, ring back tones, interactive voice response, Java games, and full-track songs.

(a) *Government initiatives*

The King Abdullah Initiative for Arabic Content continues to launch new projects for developing and improving online Arabic content. Wikiarabi was launched in September 2010[261] and succeeded in translating a total of 2,100 articles to Arabic as of June 2011.[262] The initiative came in response to indicative statistics available on the Wikipedia website on Arabic content which stood at 0.67 per cent in 2009 and only slightly increased to 0.72 per cent in 2011. Figure 10 shows the percentages of Arabic, English, German and Spanish on Wikipedia, based on article count between 2009 and 2011.

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[255] ESCWA. 2011e.

[256] The indices are searchable at the following URL: http://www.mhc.gov.om/scripts_index.asp.

[257] Nordic Industries Development. Unlock the Potential of the ICT Business in the Middle East.

[258] Noureddine, A. Arab Centre for eContent Development: Setting Standards for Arabic eContent . Presentation given at the Expert Group Meeting on Enabling Environment for the Development of Arabic e-Services, available at: http://css.escwa.org.lb/ICTD/1429/Day1/5.pdf. It should be noted that this percentage is based on the digital Arabic content indicator calculated by KACST, which is updated daily at: http://tawileh.net/kacst/arabic-indicator/arabic_indicator.php.

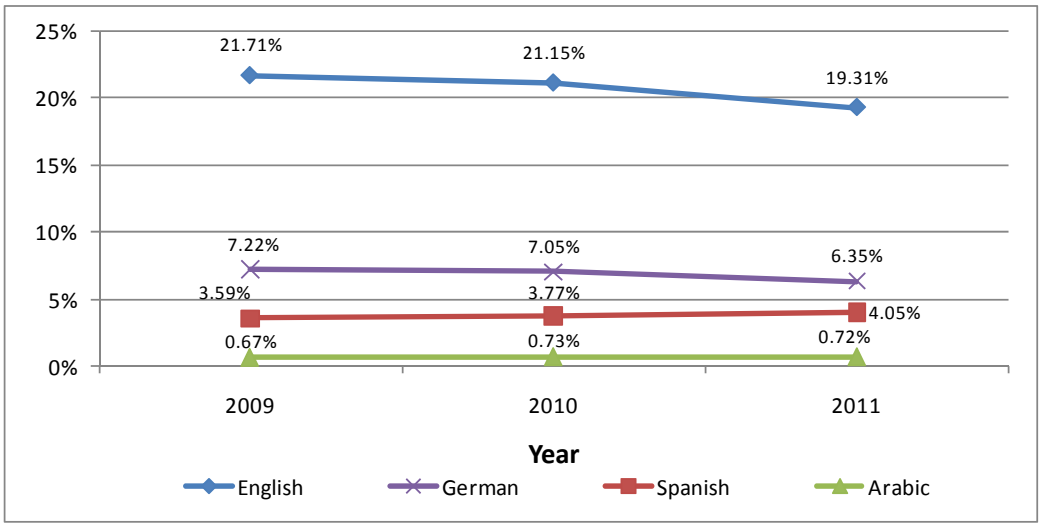
[259] See: http://www.wsa-mobile.org/about/decade-mobile-content-and-applications-26020100517.

[260] AAG. 2009. Mobile Content Aggregators in the Arab World.

[261] See: http://www.alwatan.com.sa/Culture/News_Detail.aspx?ArticleID=22058&CategoryID=7.

[262] See: http://www.wikiarabi.org.

Figure 10. Percentage of selected Wikipedia languages based on article count, 2009-2011



Source: Compiled by ESCWA from statistics available at: http://stats.wikimedia.org/EN/Sitemap.htm.

Note: Statistics are collected in April of each year.

In the Syrian Arab Republic, the Government-formed Committee for Promoting the Arabic Language through its National Team for Digital Arabic Content launched three initiatives in March 2011 focusing on the following: (i) educational knowledge; (ii) standardization; and (iii) audiovisual content.[263] MoCT, the Ministry of Information and academia are contributing to this national team. SCS, an NGO, also plays an active role in promoting DAC through its eSyria blog website that aims at enriching online DAC by presenting all types of background material about the Syrian Arab Republic.[264] eSyria includes thirteen governorate-specific sites, a directory of Syrian websites and other services. It was a winner of the Pan Arab Awards as the best strategic service portal for 2009. Another well regarded SCS project is the development of an Arabic terminology glossary of ICT terms in collaboration with ITU, including English and French translations.[265]

Bahrain took a practical approach with the establishment of the Arab Centre for eContent Development that aims at setting the standards for electronic content development and instilling best practices required for a knowledge-based society in Bahrain and the Arab region.[266] Bahrain has also been a proponent of DAC development through its BEA launched in 2005 and organized biannually to encourage innovation in the development of new media content.[267]

The approach of the Government of the United Arab Emirates is rather different. It provides the private sector with an enabling environment that promotes the growth of the DAC industry. Among the notable achievements of the Government is the twofour54 centre of excellence and incubator dedicated to the development of Arabic media and entertainment content. The centre provides training services and business facilities and support for private companies, particularly operating in media production.[268]

Similar efforts are taking place in other GCC countries. Oman is planning the establishment of a Centre of Excellence for E-Content and Qatar has already established a Digital Content Incubation Centre.[269]

[263] ESCWA. 2011e.

[264] See: http://www.esyria.sy/index.php?p=aboutus.

[265] ESCWA. 2011e.

[266] Noureddine, A. 2011; available at: http://css.escwa.org.lb/ICTD/1429/Day1/5.pdf.

[267] See: http://www.bea.bh.

[268] See: http://twofour54.com/en.

[269] ESCWA. 2011d; and ESCWA. 2011e.

(b) *The private sector and application development*

In the region, success stories are growing of enterprises operating in the development of original digital content or localization and translation of applications; the DAC industry is thus taking shape. The United Arab Emirates is one of the leading ESCWA member countries, owning around 60 per cent[270] of mobile application production firms in the Middle East. Mobile content development is flourishing in the United Arab Emirates due to the availability of an enabling environment supported by strong infrastructure, cost-effective ICT expenses and legislation that facilitates and encourages innovation. Flagship Projects is a company based in the United Arab Emirates that commands 30 per cent[271] of the professional mobile applications in the local market. Flagship Projects mainly develops applications for such mobile devices as its WSA-mobile award winner for 2010, Hesabi, and the WSA eContent creativity for 2011 winner, Rufoof, (see box 16 below).

In Jordan, Rubicon Group Holding was founded in 2004 and has since succeeded in digital content production for entertainment and education, including television and web applications. Rubicon produces educational and gaming products, including a two-dimensional Arabic animated series entitled Tariq wa Shireen and three-dimensional animation shows for children in cooperation with Metro-Goldwyn-Mayer (MGM) studios.[272] The media industry in Jordan was also able to attract international investors in the case of Maktoob, the largest Arab web portal that was purchased by Yahoo in 2009 for a record US$164 million, even though at the time of sale, Maktoob had less than US$1 million in cash and less than US$2 million in contracted revenues leading analysts to point to the recognition by Yahoo of the huge potential for growth in the region.[273]

Al-Nasher Group in the Syrian Arab Republic is a company involved in the media production domain using online tools as well as traditional means. Al-Nasher started out as the academia.sy media portal for the academic sector, which was a winner of the DAC competition organized by ESCWA in 2007 and a start-up graduate from the SCS ICT incubator.

Box 16. Selected e-book applications

The private sector in the region is investing in mobile applications used for publishing e-books. E-books are digital versions of regular books that are usually read on e-readers or tablet computers in accordance with the widely-used standards, PDF and ePub.[274] Some mobile phones and PCs may be used to read e-books as well. Below is a selection of these applications.

iMagalah is a free Arabic e-reader for magazines and books for iPad. Produced by the Lebanon-based Neelwafurat, the application provides access to magazines in 26 categories, covering social, economic, political and entertainment subjects. Users are able to purchase these magazines through iMagalah albeit some issues are offered for free.

Rufoof is a free bookstore application for iPad that won the World Summit Award (WSA) 2011 for e-content creativity as well as the Arab eContent Award for 2011. It is connected to the Rufoof library, which includes a wealth of Arabic and non-Arabic books. The application allows immediate publishing with an open invitation to upload all types of publications to the Rufoof bookstore.

Ertiqabooks is an online publishing site providing ePub and PDF books for purchasing and download in such different categories as literature, politics, health, economics and Islamic religion. The application has an online version that allows the download of books to PCs.

[270] See: http://www.ameinfo.com/251007.html.

[271] See: http://www.albawaba.com/uae-controls-60-mobile-apps-development-middle-east.

[272] See: www.rubicon.com.jo.

[273] Ghannam, J. 2011. Social Media in the Arab World: Leading up to the uprisings of 2011.

[274] EPub is a free and open e-book standard by the International Digital Publishing Forum. See more at: http://en.wikipedia.org/wiki/EPUB.

Box 16 (*continued*)

Maktabati is a free iPhone and iPad application allowing access to free and paid Arab books. The application is developed by the Jordan-based company Barmajeyat.

iKitab is also an e-book application that is supporting different mobile platforms and operating systems, including iPhone, Android and Windows mobile.

It is also noteworthy that the Saudi Research and Marketing Group and Dar al Hayat have free iPad applications for their publications which are also free as of July 2011.

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Source: ESCWA – Applications evaluated by ESCWA on an Apple iPad device.

The video gaming industry is estimated at a value of US$65 billion[275] on a global scale. Major mobile games developers worldwide are investing in the Arab region through game sales and localization activities. A survey by AAG has shown in 2009 that 58 to 60 per cent of mobile users in selected Arab countries download mobile content to their devices, out of which 16 to 38 per cent download games.[276] This was also perceived as an opportunity for startup game development enterprises. Many such examples can be spotted in the region as the Oasis500[277] incubation initiative in Jordan that aims at having 500 startup enterprises in the ICT and media domain. Berytech in Lebanon is incubating around six startup enterprises in gaming and animation. These types of private companies are the main producers and developers of online multimedia and television websites; box 17 provides a few examples.

Box 17. Selected Arabic multimedia and television websites

Taalam.tv was launched in January 2010 as the outcome of a partnership between Qatar Foundation, Al Jazeera Channel and the Supreme Education Council in Qatar. Taalam.tv provides educational multimedia content ranging from videos, animations, graphics, and audio addressing school students and teachers. To achieve optimal results, the videos were designed with pedagogical experts and a maximum length of three minutes. As at June 2011, Taalam.tv had almost 1,000 videos with some being watched over 11,000 times.

Baraem.tv targets pre-school children with educational and entertaining content varying from video, audio and simple games. The website includes episodes of programmes shown on the satellite television channel Baraem owned by Qatar Foundation for Education, Science and Community Development.

ShooFeeTV is a bilingual television content aggregator and guide providing listings for 400 of the most popular satellite channels. ShooFeeTV distributes its content over the Web, print media and mobile services. It provides access to entertainment content, video clips, photographs and celebrity news in a database with more than 3.8 million unique entries.

Youtube.com is the most popular video-sharing community website worldwide. It has thus become the focus of many Arabic satellite channels choosing to set up their dedicated channels on YouTube. Such news channels as AlArabiya, Al Jazeera and BBC Arabic upload selections of their daily broadcasts.

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Sources: http://www.taalam.tv/, http://www.baraem.tv/, http://www.shoofeetv.com/ar, and http://www.youtube.com.

(c) *Community-driven content and social networks*

Since its inception, the Web has been a tool used for networking, connecting with friends, and socializing. With the advent of social networks and media, they are becoming the Web itself. Social networks have become a platform for marketing all types of e-services, advertising, discussions, digital

[275] Factbox: A look at the US$65 billion video games industry. Reuters. 6 June 2011. Retrieved 27 July 2011. Available at: http://uk.reuters.com/article/2011/06/06/us-videogames-factbox-idUKTRE75552I20110606.

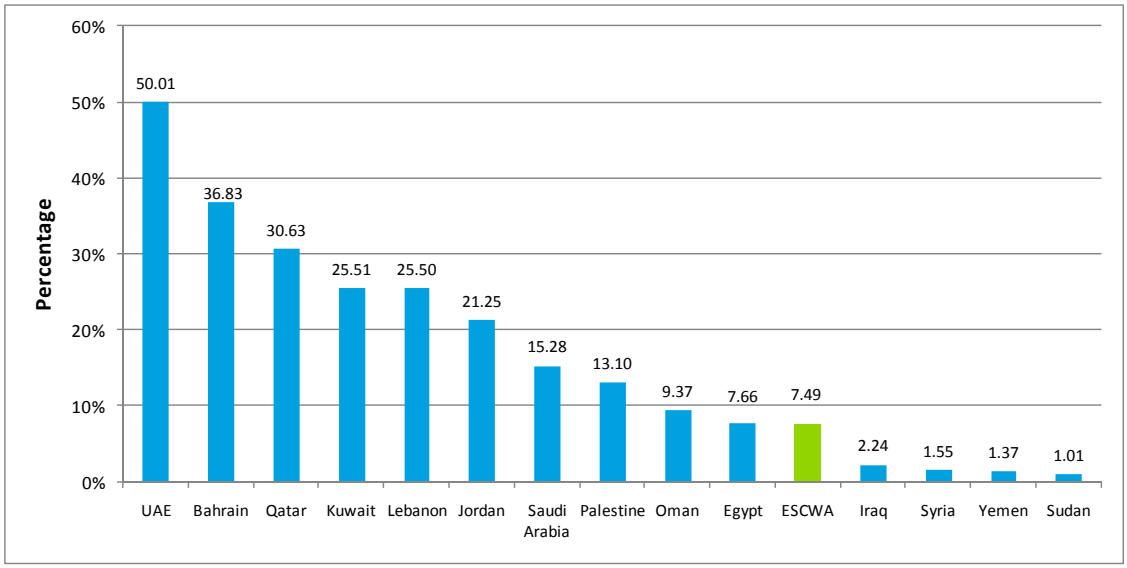
[276] The survey covered Bahrain, Kuwait and Lebanon.

[277] See: http://www.oasis500.com/content/about.

content production and social movements. Organizations used to settle for basic online presence through a website, whether static or interactive. Now, organizations and individuals speed up to develop their Facebook pages and Twitter accounts, try to get the most number of "likes" and prompt users to recommend their page to others.

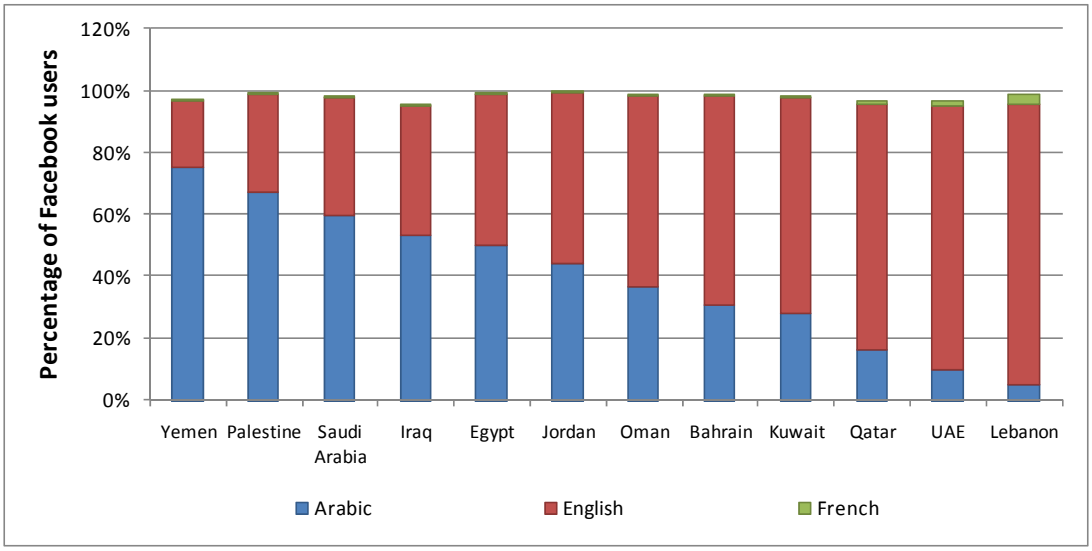
In the ESCWA region, the United Arab Emirates leads with a Facebook penetration of 50 per cent. Bahrain, Qatar and Kuwait, which are all GCC member countries, follow. Countries that are least developed, under crisis or impose Internet limitations have Facebook penetrations less than the ESCWA average of 7.5 per cent (see figure 11 below). A closer look shows that 75 per cent of users in Yemen, with a very low Facebook penetration, prefer the Arabic interface, whereas the United Arab Emirates has a preference of less than 10 per cent for the Arabic interface (figure 12).

Figure 11. Facebook penetration in the ESCWA region



Source: Compiled by ESCWA from Dubai School of Government. 2011.

Figure 12. Facebook interface language use in the ESCWA region



Source: Compiled by ESCWA from Dubai School of Government. 2011

Note: Data for the Sudan and Syrian Arab Republic were not available.

3. *ICT tools and research and development programmes*

Only few ESCWA member countries have setup programmes or centres for dedicated research and development of digital Arabic content, tools, and applications. The Computer Research Institute (CRI) at KACST is heavily involved in the development of Arabic language processing tools, including projects for automated translation, voice recognition and optical character recognition using neural networks.[278] The work of CRI is not limited to the research level but is, in fact, epitomized in actual such products as the ones listed below:

- Automated translation project (http://translate.kacst.edu.sa);
- Interactive Arabic dictionary (http://vocwords.kacst.edu.sa);
- Arabic language parser (http://cri_nlp.kacst.edu.sa/nlp);
- Arabic search engine (http://naba.kacst.edu.sa).

CRI also implements a programme for developing and encouraging the use of open-source software, including awareness-raising, technical support, and capacity-building.[279]

The Data Mining and Computer Modelling Centre of Excellence (DMCM) was launched in 2005 in Egypt to conduct research on data mining and computer modelling, including Arabic text and e-content mining. The Cairo Microsoft Innovation Centre (CMIC) in Egypt is a project implemented in cooperation with MoCIT as part of the Microsoft incubation of innovation. The centre gives special attention to research in data extraction, parallel computing, network services for mobile platforms and enhancing Arabic web search. The centre is also involved in image-based search which has the advantage of being language independent, hence readily extendable to the Arabic language.[280]

ICT research is also part of the programmes at the Higher Institute for Applied Sciences and Technology (HIAST) in the Syrian Arab Republic. The focus of research activities at HIAST are Arabic ontology, text-to-speech quality enhancement based on language analysis, which is being implemented in cooperation with the Lebanese University, and the development of the Interactive Arabic Dictionary[281] which is a joint project with KACST on the basis of an agreement with the Arab League Educational, Cultural and Scientific Organization (ALECSO).

Such ESCWA member countries as Qatar and the Syrian Arab Republic selected the incubation pathway towards developing ICT tools for the Arabic language. In 2010, the Digital Content Incubation Centre[282] was established by the Supreme Council of Information and Communication Technology – ictQATAR to nurture the development of new companies developing digital Arabic content. FahrasQatar[283] was the first spin-off company in 2010, which is a central forum for connecting businesses in Qatar to customers, potential partners, investors, and relevant professional service providers.

The ICT Incubator in the Syrian Arab Republic is the host of a more varied number of incumbent companies focusing on digital content development and production. Among the incubatees are startup companies developing text-to-speech products,[284] mobile applications particularly for e-books,[285] and various e-services.

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[278] See: http://ceri.kacst.edu.sa/index.php?option=com_content&view=article&id=77&Itemid=64&lang=en.

[279] For more details, see: http://www.motah.org.sa.

[280] ESCWA. 2011h.

[281] To access the dictionary, see: http://almuajam.hiast.edu.sy/index.jsp.

[282] ictQATAR. 2010.

[283] See: http://www.fahrasqatar.com.

[284] See: http://www.ti-scs.org/incubated/view.php?id=3#mainTd.

[285] Ibid.

Lebanon is home to the Arab Support Centre for Free and Open Source Software (Ma3bar) established by the regional UNDP programme Information and Communications Technology for Development in Arab Region (ICTDAR), UNESCO, and the University of Balamand. Ma3bar focuses on capacity-building, awareness-raising and supporting the development of applications that meet local needs.[286]

There are also promising efforts in the less-developed countries of the ESCWA region. The Nile Centre for Technology Research in the Sudan was established in 2007 for ICT research and development. The Centre is involved in organization management solutions, data protection, and promoting the use of open-source software. In Yemen, the ICT City continues to develop software and ICT tools to satisfy local needs of ministries and other institutions.[287]

4. *Arabic domain names*

ESCWA and the League of Arab States continue to be the leading regional organizations involved in the promotion of an ADNS. The use of Arabic in Internet domain names as part of the IDNs is envisaged to help bridge the digital divide and improve access of Arab communities that otherwise have limited or no capabilities in accessing the Internet using other languages. The ccTLDs were sped up by ICANN through a fast track that allowed the actual registration and use of Arabic ccTLDs as of 2010.

Table 66 lists the currently registered ccTLDs in the ESCWA member countries. ICANN also witnessed at its 41st meeting in June 2011 a milestone in the history of the Internet with the approval of the new generic TLDs programme. ESCWA and the League of Arab States have been proactively working towards the acquisition of the Arab TLDs .arab and its IDN equivalent عرب. as part of this programme and establishment of the associated registry.

TABLE 66. REGISTERED ARABIC COUNTRY CODE TOP-LEVEL DOMAINS (CCTLDS) IN THE ESCWA REGION

Country or territory	ccTLD	Arabic ccTLD	Registration date of Arabic ccTLD
Egypt	.eg	.مصر	May 2010
Jordan	.jo	.الأردن	August 2010
Oman[a/]	.om	.عمان	February 2011
Palestine	.ps	.فلسطين	August 2010
Qatar	.qa	.قطر	December 2010
Saudi Arabia	.sa	.السعودية	May 2010
Syrian Arab Republic	.sy	.سورية	February 2011
United Arab Emirates	.ae	.الإمارات	May 2010

Source: Compiled by ESCWA from http://www.iana.org/domains/root/db.

Note: a/ Arabic IDN ccTLD not yet assigned (on 27 July 2011).

B. CLASSIFICATION AND RANKING OF ESCWA MEMBER COUNTRIES ACCORDING TO MATURITY LEVEL

1. *Maturity level 1: Iraq, the Sudan and Yemen*

Countries in this maturity level have limited digital Arabic content, a low level of linguistic diversity, very little effort towards preserving cultural identity using ICT. The political and social instability as well as a lesser state of development in the three countries in this category have undermined progress towards the use of ICT for preserving cultural identity, linguistic diversity and the development of local digital content, which is not deemed a national priority. Furthermore, none of the countries in this level have obtained their Arabic ccTLDs.

[286] See: http://ma3bar.org.

[287] See: http://www.tech-city.gov.ye/sddc.htm.

2. *Maturity level 2: Lebanon, Oman and Palestine*

ESCWA member countries at this level have a number of initiatives to preserve cultural and linguistic diversity, and a growing development of Arabic content, albeit insufficient for shaping a DAC industry. Oman is showing serious efforts for the preservation and digital archiving of its historical manuscripts, whereas Lebanon is maintaining cultural online content mainly for tourism purposes. In addition, there is a nascent presence of research and development programmes in such applications and tools supporting a DAC industry as tools for natural language processing.

3. *Maturity level 3: Bahrain, Egypt, Jordan, Kuwait, Qatar, and the Syrian Arab Republic*

Countries in maturity level three have considerable efforts for preserving cultural and linguistic diversity digitally, a moderate development of digital Arabic content and a growing software industry. These countries continue to exert efforts in the preservation of cultural identity, heritage, national archives, through digitization and content development. In this group, Jordan stands on top in terms of its growing DAC industry and an increasing number of enterprises developing various applications in this domain, including mobile and entertainment. Egypt still outranks member countries in the number of projects/initiatives for preserving cultural and historic heritage. Bahrain, Qatar and the Syrian Arab Republic are showing serious interest in DAC through national initiatives, strategies, awards and the establishment of dedicated centres and/or incubators. Bahrain, Kuwait and Qatar have relatively higher Facebook penetration rates and Bahrain has also been keen on reflecting its cultural identity online. However, in this category, only Jordan, Qatar and the Syrian Arab Republic have assigned their Arabic ccTLDs. The absence of an advanced DAC industry and the limited spending on research and development programmes in DAC applications and tools are hindering the progress of these countries to maturity level 4.

4. *Maturity level 4: Saudi Arabia and the United Arab Emirates*

At this level, countries have a significant development of Arabic content, with an advanced software industry. The United Arab Emirates achieved maturity level 4 for this year because of its DAC industry that has grown significantly, particularly in developing mobile applications. It has also shown the highest Facebook penetration when compared to other ESCWA member countries. Saudi Arabia lag behind in terms of the size of their DAC industry, however, Saudi Arabia is doing much better than other countries in terms of developing online Arabic content, conducting research and development programmes for language processing and launching national initiatives dedicated for DAC. All countries in this maturity level have assigned Arabic ccTLDs.

Table 67 and figure 11 summarize the above rankings with their historical evolution for ESCWA member countries.

TABLE 67. RANKING OF ESCWA MEMBER COUNTRIES BY MATURITY LEVEL IN CULTURAL AND LINGUISTIC DIVERSITY AND LOCAL CONTENT

	Maturity level 1			Maturity level 2			Maturity level 3			Maturity level 4		
Country or territory	2007	2009	2011	2007	2009	2011	2007	2009	2011	2007	2009	2011
Bahrain				✓	✓				✓			
Egypt							✓	✓	✓			
Iraq	✓	✓	✓									
Jordan				✓	✓				✓			
Kuwait							✓	✓	✓			
Lebanon				✓	✓	✓						
Oman				✓	✓	✓						
Palestine	✓				✓	✓						
Qatar				✓				✓	✓			
Saudi Arabia							✓	✓				✓
The Sudan[a/]		✓	✓									
Syrian Arab Republic							✓	✓	✓			
United Arab Emirates							✓	✓				✓
Yemen	✓	✓	✓									

Source: Compiled by ESCWA.

Note: a/ No assessment was provided for the Sudan prior to 2009, which only joined ESCWA in 2008.

Figure 13. Maturity levels of ESCWA member countries in cultural diversity and identity, linguistic diversity and local content

C. SUGGESTIONS AND RECOMMENDATIONS

(a) Set up strategies/action plans for the development of DAC and its industry at the national and regional levels;

(b) Develop region-wide standards that are specific to the Arabic language and required for developing digital content;

(c) Integrate the building of high and refined skills for the development of digital content into higher-education curricula and encourage the establishment of training centres that provide hands-on education in software development, as well as technologies and platforms needed for e-books, DAC, smart phone and social networks applications;

(d) Enhance the enabling environment for a flourishing private sector through making national and regional funds available, as well as providing such facilities as the simplification of processes and tax exemptions for the establishment of startups and SMEs in the field of DAC development;

(e) Strengthening cooperation between universities and the private sector in research and development on tools and applications for Arabic language processing and translation from/to Arabic;

(f) Supporting the incubation of DAC applications, including those for mobile devices and tablet computers;

(g) Accelerate the implementation of Arabic-based e-Government projects and the launch of Arabic e-services by allocating additional funds and resources, which should dramatically increase online Arabic content;

(h) Launch governmental initiatives supporting endeavours taken by the private sector, individuals and NGOs to preserve the diversity and cultural heritage of the region through digitization of heritage and archives;

(i) Enhance cooperation among Arab countries by launching regional initiatives in the field of DAC, and strengthen cooperation with international organizations working in this field.

IX. MEDIA

A. OVERVIEW OF THE ROLE OF THE MEDIA IN BUILDING THE INFORMATION SOCIETY IN THE ESCWA REGION

The media sector in its various forms is part of the digital world that encompasses all sectors of the economy. Media systems have an increasingly important role in the development of the information society and are recognized as major contributors to press freedom and plurality of information as they reach wide audiences. Internet, as a media instrument, makes information, knowledge and educational resources available to all citizens and the media sector extensively uses ICTs in the audio-visual, printed or electronic formats, and in supporting the diversity of means for media development. Furthermore, the use of social networking tools is changing media production and distribution into a more participatory environment that defines individuals as influencers.

Democracy and human rights lie at the heart of the media processes requiring a framework of operation which ensures the right to access information. The media sector should be governed by the principles of press freedom that include free information flow, independence, pluralism and diversity. The work of media is based on Article 19 of the Universal Declaration of Human Rights, namely the right to freedom of opinion and expression, including the right to acquire, exchange and use information and ideas. With communication and participation at the foundation of the information society, WSIS addressed the media sector, and allocated Action Line 9 to follow-up on media development (see box 18).

Box 18. Media in the World Summit on the Information Society (WSIS) outcome

The World Summit on the Information Society (WSIS) Declaration of Principles (Geneva, 2003) reaffirmed the commitment to the "principles of freedom of press and of information, and the independence, pluralism and diversity of media … are essential to the information society";[a/] it emphasized the important role of traditional media and its supporting ICT tools in the information society. The WSIS Geneva Plan of Action designated one of its eleven action lines for media, which, in its digital and traditional forms and diverse ownership, contributes "to freedom of expression and plurality of information".[b/]

The Media Action Line seeks to promote media and the development of legislation that ensures its independence and plurality; attend to the content of media and its consistency with freedom of expression; support partnerships and networking for media development and field training; promote a balanced media portrayal of both women and men; reduce imbalances affecting media compatibility in terms of technological resources; and encourage bridging the knowledge and digital divide in remote areas through traditional media.

The 2005 WSIS Tunis Agenda reaffirmed the international commitment to promote the use of traditional and digital media for enabling all people to access information, culture and knowledge, and as educational and learning tools, in addition to their use for the transmission of information and news. It also stressed the "independence, pluralism, and diversity of media, and freedom of information",[c/] and recognized the role of media as an integral part of the process towards the multilingualism on the Internet.

Sources: World Summit on the Information Society (WSIS) available at: http://www.itu.int/wsis/index.html.

a/ WSIS. 2003. *Declaration of Principles*. Para. 4. 12 December 2003;

b/ WSIS. 2003. *Plan of Action*. Para. 24. 12 December 2003;

c/ WSIS. 2005. *Tunis Agenda for the Information Society*. Paras. 53 and 90. 18 November 2005.

In the ESCWA region, the media sector, both in its traditional and technology-based forms, is facing many challenges that relate to the divide between the existing media governance systems and the continuously developing media-enabling tools and technologies, including social media and networking platforms. The challenges include the need to deploy significant efforts towards the convergence of television, Internet and telecommunications in general; the need to develop modern media legislations to

promote freedom in information exchange; and directing resources towards strengthening professionalism in the media sector.

1. *Status of the media sector in the ESCWA region*

Satellite broadcasting in the region is booming and the media industry is concentrated in Beirut, Cairo, Doha and Dubai.[288] There are free media zones available within which the start of a television channel could be realized with capital and national security-related guidelines. The wider coverage of areas worldwide enables outreach to promote Arab culture and values.

The most viewed media outlet in the region is the audio-visual media that could be the most effective outlet to share information and make quality content available to all society groups. The content of audio-visual programmes revolves mainly around entertainment, which receives less censorship than programmes on political issues and themes, and seems to be the only category of media approaching regional integration.

Available media outlets and digital platforms provide opportunities to support freedom of expression and plurality of information. These outlets are increasingly serving as tools through which oppressed segments of the society could pave the way towards democracy. This section looks at media ownership and press freedom in the region, as well as monitoring indices related to the media sector, namely the Press Freedom Index (PFI).

(a) *Media ownership in the region*

While the Internet and ICTs have accelerated the development of the media sector and communications, the use of evolving technology tools is not reducing the national restrictions and interference in the press and media ownership in relation to conflict and security issues. In the region, news agencies are mostly governmentally owned, reflecting the influence of Governments on the media sector.

The report on press freedom in the Arab countries, published in 2009 by the Federation of Arab Journalists (FAJ),[289] indicates a high degree of disparity in the region in relation to the existing patterns of newspaper ownerships, having a mixture of ownerships: joint stock ownership, individual private, Government, political parties, and mixed.

The report found that the most common pattern of ownership is the joint stock ownership, which exists in Bahrain, Egypt, Iraq, Jordan, Lebanon, Oman, Palestine, Saudi Arabia, the Sudan, and the Syrian Arab Republic. The individual private ownership comes next, which exists in Kuwait, Lebanon, Palestine, Saudi Arabia, Syrian Arab Republic, United Arab Emirates, and Yemen. The Government-ownership pattern exists in Egypt, Iraq, Oman, Saudi Arabia, the Syrian Arab Republic, United Arab Emirates, and Yemen. The pattern of political parties ownership can be found in Egypt, Iraq, Lebanon, Palestine, Syrian Arab Republic, and Yemen. Finally, the mixed-ownership pattern exists in Jordan and Lebanon.

Radio and television ownership, based on the 2011 national profiles and BBC country profiles,[290] shows a mixture of private and Government ownership, with the exception of Bahrain, Qatar and Yemen, which have only Government-owned radio and television stations (see table 68).

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[288] Dajani, J. 2007. The Arab Media Revolution; see: http://www.pbs.org/frontlineworld/stories/newswar/war_arabmedia.html.

[289] FAJ. 2009. Report on press freedoms in the Arab region; see: http://www.essevir.net/IMG/doc/_.doc.

[290] BBC. Country profiles for the Middle East; see: http://www.bbc.co.uk/news/world/middle_east/.

TABLE 68. MEDIA OWNERSHIP IN ESCWA MEMBER COUNTRIES, 2009

Country or territory	Newspaper ownership				Radio and television ownership				News agencies
	Private	Mixed	Government	Foreign	Private	Mixed	Government	Foreign	Private
Bahrain	✓						✓		
Egypt	✓	✓	✓	✓	✓		✓		
Iraq	✓	✓	✓	✓	✓	✓	✓	✓	✓
Jordan	✓	✓			✓		✓		
Kuwait	✓	✓	..	✓	✓		✓		
Lebanon	✓				✓	✓	✓		✓
Oman	✓		✓	..	✓		✓		
Palestine	✓	..	✓	✓	✓		✓		✓
Qatar	✓		✓				✓		..
Saudi Arabia	✓		..		✓		✓	✓	
The Sudan	✓	..	..	..	✓	✓	✓	✓	✓
Syrian Arab Republic	✓		✓	✓	✓		✓		
United Arab Emirates	✓	✓	✓	✓	✓	✓	✓	✓	
Yemen	✓	..	✓		✓		✓		

Sources: ESCWA. 2011a. *National Profile of the Information Society in ESCWA member countries*; and BBC. Country Profiles 2011.

Note: Two dots (..) indicate that data are not available.

(b) *Government support and freedom of the press*

The media sector is the key framework within which Governments could support independent media and foster the media basic values of freedom of expression, access to information, media plurality and diversity.

The existence of Government support to media institutions and reporters in the region was analysed in the 2009 FAJ Report on press freedoms in the Arab region. The report indicated that newspapers receive financial support from the Government in Iraq, Kuwait, Lebanon, Oman, the Sudan, United Arab Emirates, and Yemen. The table below shows the Government support to media institutions and whether they restrict the right to publish newspapers (see table 69).

TABLE 69. GOVERNMENT SUPPORT TO THE MEDIA SECTOR IN ESCWA MEMBER COUNTRIES, 2009

Country or territory	Government law supports reporters access to information	Government financial support to newspapers	Government does not restrict right of companies to own newspapers
Bahrain	✓		✓
Egypt			
Iraq		✓	…
Jordan			
Kuwait	✓	✓	✓
Lebanon	✓	✓	✓
Oman	…	✓	✓
Palestine	✓		✓
Qatar	✓		
Saudi Arabia	✓		
The Sudan	✓	✓	✓
Syrian Arab Republic	✓		✓
United Arab Emirates		✓	
Yemen		✓	

Source: FAJ. 2009.

The financial support of Governments to newspapers represents the highest percentage, namely 43 per cent, of the total financial support they receive from various such sources as businessmen and local and foreign institutions. This indicates that, according to the same report, newspapers in the region would be subject to interference from the funding sources that subsequently affect their press policies and independence.

The 2009 FAJ report revealed that Governments do not restrict the right of individuals or companies to publish newspapers in Bahrain, Iraq, Jordan, Kuwait, Lebanon, Oman, Palestine, the Sudan, and the Syrian Arab Republic. This aspect of press freedom is restricted in Egypt, Saudi Arabia, the United Arab Emirates and Yemen. At another level, there are rules organizing the publishing of newspapers in almost all member countries, except in Iraq, Kuwait, and the United Arab Emirates. The report perceived a positive change in the margin of freedom for the press in the region, and pointed to a significant level of diversity and plurality of sources in most countries in the region.

The NGO Reporters Without Borders (RWB) publishes the PFI for countries across the world. Table 70 provides the PFI global ranking of ESCWA member countries for 2010 and the change in the rank from 2009.

Kuwait, Lebanon and the United Arab Emirates ranked within the top 100 countries according to the PFI. Between 2009 and 2010, the global rankings for Egypt, Iraq and Palestine have increased by more than ten places, and the rankings of other countries have either maintained almost the same status or decreased. The global rankings of Lebanon and Oman decreased by more than ten places, and those of Bahrain, Kuwait, Qatar and the Sudan have decreased by more than 20 places. The 2010 global ranking of countries in terms of press freedom is from 1 to 178, within which Yemen, the Sudan and the Syrian Arab Republic lie practically at the bottom of the list, at places 170, 172 and 173, respectively.

TABLE 70. RANKING OF ESCWA MEMBER COUNTRIES ON THE PRESS FREEDOM INDEX, 2010

Rank	Country or territory	Index value		Global ranking		Change in global rank
		2009	2010	2009	2010	
1	Lebanon	15,42	20,50	61	78	-17
2	Kuwait	15,25	23,75	60	87	-27
3	United Arab Emirates	21,50	23,75	86	87	-1
4	Jordan	31,88	37,00	112	120	-8
5	Qatar	24,00	38,00	94	121	-27
6	Oman	29,50	40,25	106	124	-18
7	Egypt	51,38	43,33	143	127	+16
8	Iraq	53,30	45,58	145	130	+15
9	Bahrain	36,50	51,38	119	144	-25
10	Palestine	69,83	56,13	161	150	+11
11	Saudi Arabia	76,50	61,50	163	157	+6
12	Yemen	83,38	82,13	167	170	-3
13	The Sudan	54,00	85,33	148	172	-24
14	Syrian Arab Republic	78,00	91,50	165	173	-8

Source: RWB. 2010. Press Freedom Index (PFI); available at: http://en.rsf.org/press-freedom-index-2010,1034.html.

The 2010 PFI report of the RWB analysis considered that press freedom has been shrinking in such countries as the Sudan, the Syrian Arab Republic and Yemen. The report considered that the positive change in the score of some countries does not necessarily reflect progress, in view of the media situation and recorded violations. The drop in the index ranking of such countries as Bahrain, Qatar and the Sudan were mainly explained by the ill-treatment and punishment of journalists and institutions by the State.

The Freedom of the Press 2011 report, which produces rankings of countries, resulted with Kuwait and Lebanon as the only two countries in the region having a status of partly free, with all other ESCWA members having the status of not free.

On gender in the media sector, the participation of women journalists in the Arab media was not covered in the 2009 FAJ report and was not part of the aforementioned monitoring indexes. Women still face discrimination in the region, and efforts continue to reach gender balance in the media.

With professionalism and skills, women are progressing in their media presence and roles; however, gender discrimination challenges exist and are linked to the traditional way of thinking that women in the workplace continue to face.[291]The situation of women in the Arab media reflects their position in the society, and varies across countries and institutions.

2. *Social media in the ESCWA region*

(a) *Role of social media*

Social media are web-based or mobile-based technologies that enable wide participation of people in the content production and news-making process. They represent a new revolution in the digital age and enable the world to become more social, and the production/distribution of content and news to be personalized rather than mass distributed. Online social media tools facilitate finding and sharing information, and offer users an insight to the work of institutions. Examples of social media websites are Facebook, LinkedIn, Twitter and YouTube.

The role of social media in the Arab uprisings was studied during 2011. Box 19 provides key points in two reports addressing social media in the Arab region, namely an article by Jeffrey Ghannam of 2011[292] and a report by the Dubai School of Government (DSG).[293]

Box 19. Social media in the Arab region

With the digital age, social media has facilitated the change in freedom of expression and given a voice to Arab citizens across the world. It has altered the nature of news and increased the engagement of communities, especially with the convergence of social media, mobile telephony and satellite broadcasting.

The long-term impact of social media would be on individuals as they develop political competencies and expectations and relationships. The uprisings in Egypt, Tunisia and other countries of the region were enabled by communication and citizen mobilization made through such social media platforms as Twitter, Facebook, and YouTube, as well as mobile technology. Social media will continue to play a key role in the civil movements in its different platforms and is increasingly the media for discussions of citizen journalism. (Ghannam, 2011)

The growth of social media and its usage within political activism in the region have had a significant role in mobilization, empowerment, shaping opinions, and influencing change. The role of social media will continue to grow in the region with the increase of penetration and high percent of young populations. (DSG, 2011)

Sources: Jeffrey Ghannam, 2011, Social Media in the Arab World: Leading up to the Uprisings of 2011, available at: http://cima.ned.org/publications/social-media-arab-world-leading-uprisings-2011-0; and DSG, *Arab Social Media Report,* Vol. 1, No. 2, May 2011, available at: http://www.dsg.ae/portals/0/ASMR2.pdf.

[291] International Federation of Journalists (IFJ). 2010. Women Journalists: Partners in Trade Union Leadership; available at: http://www.ifj.org/assets/docs/194/172/9016bc2-1df2aac.pdf.

[292] Ghannam, J. 2011.

[293] Dubai School of Government. 2011.

Across the region, public officials and figures are engaging in using social media to promote their agendas. Governments are practicing mixed reactions to the new media phenomenon. In some countries, social media platforms are banned, and expressions against Government officials lead to arrest. Few countries have started to adapt to the changes enabled through social media and sought to benefit from the growth of social media among the youth through formulating governing guidelines and policies.

In 2011, social networking as well as the capabilities to communicate, mobilize citizens and gain knowledge have accelerated and are expected to have higher impact, in the future, with more freedom of expression, political influence and participation of citizens.

The modern media, including the online social networking tools that facilitate communication among people, has played a key role in mobilizing people towards change in their societies. Modern media involves the integration of modern technologies in the work of the media sector and adopting the interactivity process with the audiences who are increasingly affecting the content of media.

(b) *Use of social media*

The use of Facebook, Twitter and other Internet- and mobile-based technologies has debatable impact on the civil movement in the region. However, the 2011 DSG report concludes that the growth of social media influenced the change. Table 71 shows the number of subscriptions in selected ESCWA countries, in Facebook, Twitter, Internet and mobile phones. Facebook penetration rates are highest for the United Arab Emirates (50 per cent), Bahrain (36.8 per cent) and Qatar (30.6 per cent), and these countries also have very high mobile subscriptions. The same three countries have the highest Twitter penetration rates, namely Qatar (8.5 per cent), Bahrain (7.5 per cent) and the United Arab Emirates (4.2 per cent).

TABLE 71. FACEBOOK, TWITTER, INTERNET AND MOBILE SUBSCRIPTIONS IN THE ESCWA REGION, 2011

Country	Estimated active Twitter users (1/1 - 30/3/2011)	Twitter penetration[a/] (*percentage*)	Number of Facebook users (4/5/2011)	Facebook penetration[a/] (*percentage*)	Internet users per 100[b/]	Mobile subscriptions per 100[b/]
Bahrain	61 896	7.5	302 940	36.8	53	177
Egypt	131 204	0.2	6 586 260	7.7	24.3	67
Iraq	21 625	0.1	723 740	2.2	1.1	64
Jordan	55 859	0.9	1 402 440	21.3	26	95
Kuwait	113 428	3.6	795 100	25.5	36.9	130
Lebanon	79 163	1.9	1 093 420	25.5	23.7	57
Oman	6 679	0.2	277 840	9.4	51.5	140
Palestine	11 369	0.3	595 120	13.1	32.2	29
Qatar	133 209	8.5	481 280	30.6	40	175
Saudi Arabia	115 084	0.4	4 092 600	15.3	38	174
Syrian Arab Republic	40 020	0.2	356 247	1.6	20.4	46
The Sudan	9 459	0.0	443 623	1.0	9.2	36
United Arab Emirates	201 060	4.2	2 406 120	50.0	75	232
Yemen	29 422	0.1	340 800	1.4	9.9	35

Source: Dubai School of Government. 2011.

Notes: a/ Based on 2011 populations of United Nations ILO Department of Statistics, available at: http://laborsta.ilo.org/.
b/ 2009 ITU statistics, available at: http://www.itu.int/ITU-D/ICTEYE/Indicators/Indicators.aspx.

The 2011 DSG report also mentions that the use of Facebook by women in 2011 accounts for 33.5 per cent of users in the region, and is still less than female users worldwide who account for 61 per cent of users in the world. The number of female users in the region is less than male users, with the highest percentage being found in Lebanon at 45 per cent, and the lowest being 20 per cent in Yemen.[294]

[294] See: http://thenextweb.com/me/2011/06/08/uae-and-qatar-top-the-list-of-twitter-users-in-the-middle-east/.

3. *Media sustainability in the ESCWA region*

This section looks at the sustainability of media systems in the region, through the Media Sustainability Index (MSI),[295] which reflects the conditions for independent media in 80 countries across the world. This index was developed in 2000 by the International Research and Exchanges Board (IREX),[296] and was designed to measure the strength and viability of the media sector of any country.

The MSI considers the factors that contribute to the development of media systems through an assessment of five objectives, namely: (i) free speech; (ii) professional journalism; (iii) plurality of news sources; (iv) business management; and (v) supporting institutions. These objectives shape the media system and determine its sustainability. The scoring of MSI ranges from zero to four and indicates one of four levels of sustainability (see box 20).

Box 20. The four levels of the Media Sustainability Index (MSI)

Index 0-1: **Unsustainable, anti-free press**: A country does not meet or only minimally meets objectives. Government and laws actively hinder free media development; professionalism is low; and media-industry activity is minimal.

Index 1-2: **Unsustainable mixed system**: A country minimally meets objectives, with segments of the legal system and Government opposed to a free media system. Evident progress in free-press advocacy, increased professionalism, and new media businesses may be too recent to judge sustainable.

Index 2-3: **Near sustainability**: A country has progressed in meeting multiple objectives, with legal norms, professionalism, and the business environment supportive of independent media. Advances have survived changes in Government and have been codified in law and practice. However, more time may be needed to ensure that change is enduring and that increased professionalism and the media business environment are sustainable.

Index 3-4: **Sustainable**: A country has media that are considered generally professional, free, and sustainable, or to be approaching these objectives. Systems supporting independent media have survived multiple Governments, economic fluctuations, and changes in public opinion or social conventions.

Source: International Research and Exchanges Board (IREX). Media Sustainability Index (MSI) Methodology; available at: http://www.irex.org/resource/media-sustainability-index-msi-methodology.

Table 72 provides the ranking of member countries according to the overall score of MSI for 2009. Based on the MSI overall scores of ESCWA member countries for 2009, five countries, namely Egypt, Kuwait, Lebanon, Jordan and United Arab Emirates, were ranked at near sustainability (MSI 2-3). Furthermore, eight ESCWA members were in the unsustainable mixed system (MSI 1-2), namely Bahrain, Iraq, Oman, Palestine, Qatar, Saudi Arabia, the Sudan, and Yemen. Only the MSI overall score of the Syrian Arab Republic was unsustainable, anti-free press (MSI 0-1). The average MSI of all ESCWA member countries of 1.83 places the region in the indexing process within the unsustainable mixed system (MSI 1-2).

Furthermore, figure 14 indicates the change in the overall score of MSI from 2008 to 2009, showing positive change in the sustainability indices for such countries as the United Arab Emirates and Jordan, yet the changes do not reflect a positive change in the sustainability level of all countries.

[295] See: http://www.irex.org/project/media-sustainability-index-msi.

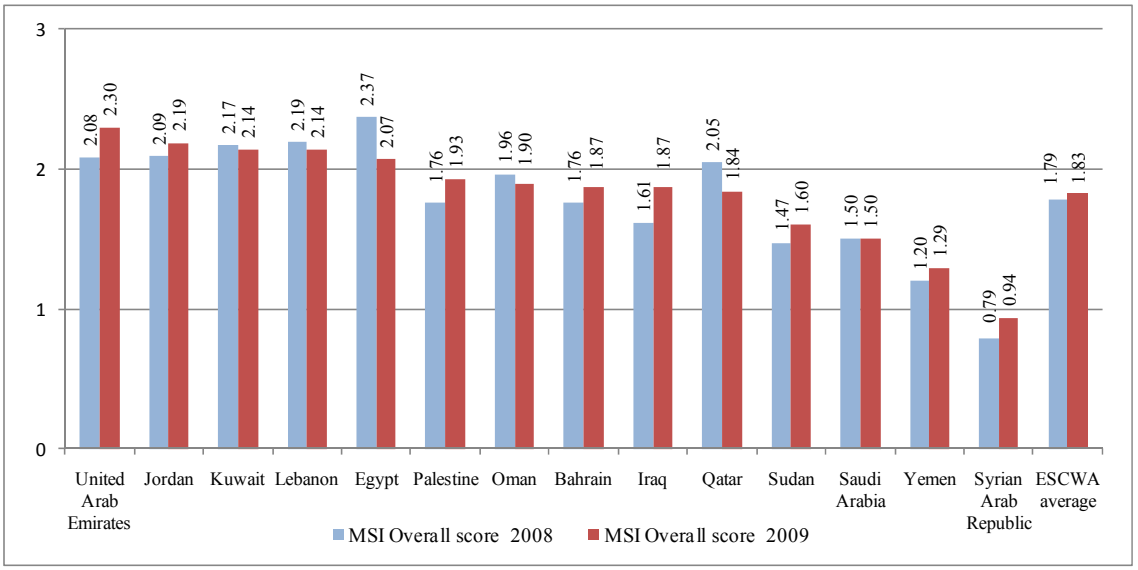
[296] See: http://www.irex.org/. IREX is a non-profit organization established in 1968 with the aim of improving the quality of education, strengthening independent media and fostering pluralistic civil society development.

TABLE 72. MEDIA SUSTAINABILITY INDEX (MSI) RANKING OF ESCWA MEMBER COUNTRIES, 2009
(*Ranked by overall score*)

Country or territory	Free speech	Professional journalism	Plurality of news sources	Business management	Supporting institutions	Overall score	MSI ranking
United Arab Emirates	2.14	2.49	2.13	2.65	2.09	2.30	
Jordan	2.12	2.07	2.19	2.22	2.34	2.19	
Kuwait	2.24	2.18	2.36	2.17	1.77	2.14	
Lebanon	1.99	2.20	2.43	2.13	1.94	2.14	2-3 near
Egypt	1.83	2.08	2.25	2.14	2.06	2.07	sustainability
Palestine	1.72	1.83	2.21	1.78	2.10	1.93	
Oman	1.84	2.08	1.96	1.99	1.62	1.90	
Bahrain	1.96	1.82	1.70	2.02	1.87	1.87	
Iraq	1.73	2.13	2.28	1.22	2.00	1.87	
Qatar	1.87	1.98	2.12	1.87	1.36	1.84	
The Sudan	1.56	1.60	1.78	1.78	1.31	1.60	1-2
Saudi Arabia	1.19	1.99	1.04	2.18	1.10	1.50	unsustainable
Yemen	1.13	1.52	1.15	1.04	1.60	1.29	mixed system
Syrian Arab Republic	0.88	1.32	0.83	0.84	0.81	0.94	0-1 unsustainable
ESCWA average	1.73	1.95	1.89	1.86	1.71	1.83	

Source: IREX. MSI Middle East and North Africa 2009 and Africa 2009; available at: http://www.irex.org/project/media-sustainability-index-msi.

Figure 14. Ranking of ESCWA member countries based on the overall score of Media Sustainability Index (MSI), 2008-2009



Source: IREX. MSI Middle East and North Africa 2009 and Africa 2009; available at:http://www.irex.org/project/media-sustainability-index-msi.

B. CLASSIFICATION AND RANKING OF ESCWA MEMBER COUNTRIES ACCORDING TO MATURITY LEVEL

Four maturity levels categorize countries in relation to media development, with the first maturity level as the lowest and the fourth maturity level as the highest. The assessment of member countries in terms of their category within the maturity levels is based on the above overview, including specialized reports indicated as references, particularly by RWB and IREX reports.

1. *Maturity level 1: The Sudan and Yemen*

Countries ranked at this level have laws that restrict press freedom and hinder independent press, and have weak professional journalism and business management. The MSI scores of the two countries in this level are in the bottom of the list of the MSI score 1-2.

2. *Maturity level 2: Bahrain, Egypt, Iraq, Oman, Palestine, Saudi Arabia and Syrian Arab Republic*

Countries attaining this maturity level have some laws and legislations that go against press freedom in spite of relative improvements in media freedom and journalistic professionalism. Overall, the MSI score for Iraq increased from 2008 to 2009, and the rise in MSI was evident in four of the five objectives of the Index, mainly professional journalism, supporting institutions and plurality of news sources.

3. *Maturity level 3: Jordan, Kuwait, Lebanon, Qatar and United Arab Emirates*

This maturity level indicates clear improvements made towards an independent media and its governing laws, as well as existence of legal and professional standards that define a general framework of freedom for the media. These countries in this maturity level have an overall MSI score that ranks them within the near sustainability level (MSI 2-3). Jordan was considered to be in this maturity level in view of the slight increase in two of the MSI objectives, namely plurality of news sources and business management.

4. *Maturity level 4: None*

None of the ESCWA members has developed the media system for the maturity level 4 in 2011. This level indicates that countries have professional journalism and a high degree of press freedom with existing laws that protect independent press.

Table 73 and figure 13 provide historical evolution of maturity-level rankings of ESCWA member countries over the last three cycles.

TABLE 73. RANKING OF ESCWA MEMBER COUNTRIES BY MATURITY LEVEL OF THE MEDIA ENVIRONMENT

	Maturity level 1			Maturity level 2			Maturity level 3			Maturity level 4		
Country or territory	2007	2009	2011	2007	2009	2011	2007	2009	2011	2007	2009	2011
Bahrain	✓				✓	✓						
Egypt				✓	✓	✓						
Iraq	✓	✓				✓						
Jordan				✓	✓				✓			
Kuwait							✓	✓	✓			
Lebanon							✓	✓	✓			
Oman				✓	✓	✓						
Palestine				✓	✓	✓						
Qatar							✓	✓	✓			
Saudi Arabia				✓	✓	✓						
The Sudan[a/]		✓	✓									
Syrian Arab Republic	✓				✓	✓						
United Arab Emirates				✓				✓	✓			
Yemen	✓	✓	✓									

Source: Compiled by ESCWA.

Note: a/ No assessment was provided for the Sudan prior to 2009, which only joined ESCWA in 2008.

Figure 15. Maturity levels of ESCWA member countries in the media environment

C. SUGGESTIONS AND RECOMMENDATIONS

(a) Countries in the region need to enhance support to press freedom and media organizations, to reduce the legal, legislative and managerial constraints on publishing, remove prison penalties for journalists, and promote free of expression in all media outlets;

(b) The role of unions of journalists and the media sector need to be strengthened towards promoting professional journalism and building regional capabilities in the media sector;

(c) The need exists to empower women and strengthen their role in the media sector, through widespread practices that ensure equitable opportunities based on skills and professionalism;

(d) The content of media outlets targeting free development and addressing the regional needs for education and skills should be strengthened in order to benefit the building of the information societies;

(e) The capabilities of such media outlets as radio and television, need to be enhanced to reach all people in remote areas similarly to urban areas, with diverse and informative programmes involving educative and cultural content.

X. REGIONAL AND INTERNATIONAL COOPERATION

The successful implementation of the information society requires cooperation among all stakeholders at both international and regional levels, especially in financing and implementing ICT development and in devising plans of actions for building the information society

A. COMPARATIVE ANALYSIS

1. *Financing ICT networks and services*

Various stakeholders from the public and private sectors in the ESCWA region have played a significant role in financing the ICT infrastructure whether in launching new satellite communication or in establishing consortia and partnerships with regional and international companies to launch interregional ICT initiatives and devise innovative plans and new revenue generation models. Telecom regulators have pushed for reduced tariffs in various services in addition to putting strategies in building digital capacities and enhancing ICT infrastructure.

Satellite communication was a main beneficiary of investments in the ESCWA region. In 2009, a US$500 million investment was made to build the first satellite operations company in the MENA region, SmartSat. This company is a joint venture between Smartlink, the Jordanian operator of a global broadband satellite service provider in the Middle East, North Africa and Eastern Europe, and a leading Kuwaiti investment holding company.[297] SmartSat will contribute to the enhancement of the quality of Internet, GSM and broadband-based services. Although SmartSat will primarily serve the MENA region, it will also focus on other international markets, particularly Eastern Europe.

Building the digital capacity of the ESCWA region to cater for the enormous growth in international Internet bandwidth and to create a redundant backup route crossing the Mediterranean Sea and the Red Sea has been felt as a must, particularly since the area witnessed sporadic cable cuts over the past few years causing disruptions in Internet services. Hence, Turk Telekom, Saudi Telecom, Orange Jordan and Syrian Telecom agreed to partner in building the fully terrestrial cross-border fiber-optic cable JADI that kicked off in July 2010.[298] The project will enrich each partnered operator with a digital capacity of 200 Gbps. JADI will work as a catalyst to increase Internet penetration in the region, reducing Internet connectivity rates and greatly increasing the availability and quality of Internet services and international traffic.

On 10 May 2010, ictQATAR and Eutelsat Communications signed a partnership agreement to invest in a high-capacity satellite called Es'hail. The cost of the project was estimated at US$300 million on equity share basis, and the satellite is expected to be launched by the end of 2012.[299] The state-of-the-art high-capacity satellite will bring enhanced availability and quality of communications that will meet future demand and help spur economic growth in the Gulf and MENA regions.

Telecom service providers and regulatory authorities in the GCC sub-region have agreed to reduce the mobile roaming charges by 30 per cent by 1 July 2011 following a similar cut in September 2010.[300] The decision is a consequence of the recent ministerial resolution that was announced after conclusion of a three-day meeting in Kuwait for the telecommunication regulators of the six GCC countries. As a result, mobile subscribers will benefit from approximately 60 per cent reduced tariff charges while roaming in Gulf countries.

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[297] See: http://www.ameinfo.com/184200.html.

[298] See: AAG. 2010. *Strategic Research Service*. 6 July 2010.

[299] See: AAG. 2011. *Strategic Research Service.* 17 May 2011.

[300] See: http://www.ameinfo.com/268966.html?n=industry_Telecoms.

Microsoft partnered with a digital agency based in the United Arab Emirates, namely Prototype Interactive, to launch a web-based interactive portal, Yalla Apps, in Dubai in 2011. Yalla Apps intends to provoke the software developer community to have access to sample existing software codes in order to serve as an accelerator for their application development. The portal will also work as a marketing campaign to publish their products and inventions under their secured credentials creating opportunities for new sources of revenue.[301] Furthermore, combined efforts between Microsoft Arabia, the Saudi Arabian Government, a number of civil institutions and other interested organizations have brought to light a new plan to establish Microsoft ITCAN.[302] This training academy targets the youth in the country and increases their potential to build up their future prospects, whether by elevating their skills or creating job opportunities, thus enhancing the IT sector in Saudi Arabia.[303] Its objective is to elevate the educational standard of IT in the country and convene with the local skilled workforce requirements. The academy planned to commence in June 2011 with a set of innovative workshops dealing with advanced portfolios of IT training material addressing different skill levels.

2. *Development projects*

Since 2003, World Links Arab Region (WLAR) has been working on enhancing the educational system and global understanding in the Arab region. WLAR strongly believes that only through creating lifetime learners for the knowledge economies and communities of the future, the bridging of the digital divide will be attained. Among 75 evaluated programmes, World Link Teacher Professional Development (TPD) has been promoted by the WEF to be one of the best educational programmes.[304] WLAR, with its distinguished agenda, has trained around 10,000 teachers in five different ESCWA member countries, reaching approximately 1.5 million Arab students as classified in table 74.

TABLE 74. WORLD LINKS ARAB REGION (WLAR) PERFORMANCE IN SELECTED ESCWA MEMBER COUNTRIES, 2003-2009

Country or territory	Donors	Year	Teachers	Students (accumulative)
Jordan	Aqaba Special Economic Zone Authority (ASEZA)	2003-2008	3 342	493 400
Lebanon	Hariri Foundation Consolidated Contractors Company (CCC)	2007-2009	500	100 000
Lebanon (UNRWA Schools)	Welfare Association and UNRWA	2007-2009	200	40 000
Palestine	Arab Fund and OPEC	2007-2009	1 000	200 000
Palestine (UNRWA Schools)	UNRWA	2006-2008	1 000	200 000
Syrian Arabic Republic	Trust Fund	2005-2007	1 450	321 200
Yemen	Al-Awn Foundation	2004-2008	769	160 000
Total			8 261	1 514 600

Source: WLAR portal, available at: http://www.wlar.org.

The partnership between UNDP, Total E&P, the Syrian Ministry of Education and MoCT cannot but be regarded as completely fruitful since it resulted in the issuing of the Interactive Schools project, which took place in twenty schools spread around the country. The project objective is to use ICT tools in order to

[301] See: http://www.itp.net/584100-yalla-apps-launched-in-middle-east.

[302] See: http://www.microsoft.com/saudi/itcan/default.aspx.

[303] See: http://microsoftfeed.com/2011/microsoft-arabia-unveils-landmark-microsoft-itcan-academy-to-empower-saudi-youth-for-it-jobs.

[304] See: http://www.wlar.org.

enhance interactivity between schools, students, parents and their communities. A further advantage of the Interactive School project is educating the community members in an indirect way by motivating students to perform some home research, which allows parents to be updated on the progress of their children. For this endeavour, TOTAL E&P donated US$450,000 for equipping the schools.[305] The chief outcomes of such a project are: automation and reduction of work; reducing paper work; encouraging research work for the students that will strengthen their skills and knowledge; positive competition between teachers and, finally, the direct notification for parents of the progress of their children as well as the facilitation of communication between parents and the school management and teachers.

After several years of preparatory work, ESCWA succeeded to establish a regional technology centre for development. Upon endorsing ESCWA resolution, the United Nations Economic and Social Council adopted resolution 2010/5, dated 20 July 2010, regarding the establishment of the ESCWA Technology Centre (ETC) and its governing act.[306] Subsequently, ESCWA and Jordan signed, on 23 December 2010, the Host Country Agreement for the establishment of the Centre in the Jordanian capital Amman, within El Hassan Science City. The main objectives of ETC are to coordinate and network national centres of excellence in science, technology and innovation (STI), and promote technology transfer to ESCWA member countries, complementing activities aiming at socio-economic development in the region.

3. *WSIS follow-up*

The WSIS was organized by the United Nations with the aim of achieving a worldwide vision of the information society and initiating international collaboration to help developing countries build a people-centric, inclusive and development-oriented information society. The two-phase summit created an evolving multi-stakeholder platform aimed at promoting the issues related to the information society at the national, regional and international levels.

The WSIS outcome documents, the Geneva Declaration of Principles (2003)[307] and the Tunis Agenda for the Information Society (2005),[308] set forth key principles for building an inclusive information society. The WSIS Plan of Action, which is defined by eleven action lines, calls for the effective participation of Governments and all stakeholders in developing an information society within a partnership framework.

(a) *Role of United Nations organizations*

As a follow-up to the WSIS implementation, a cluster of related events, organized by ITU, UNCTAD, UNDP and UNESCO, has been held annually in Geneva during the month of May. In 2009, this cluster of WSIS-related events was rebranded as the WSIS Forum.[309] In 2009 and 2010, ESCWA, along with a number of its member countries, participated in the Forum, presenting achievements related to WSIS outcomes.

In 2010, the ITU Arab Regional Office (ITU/ARO) launched a regional project entitled ICT Indicators and Capacity-building for ICT Measurement in the Arab Region. The project, which aims at establishing effective and efficient mechanisms in the Arab region to collect, analyse and disseminate ICT indicators, was initiated within the Arab ICT Strategy developed by the League of Arab States. A steering committee was formed to oversee the implementation of the project, which currently includes ITU, MoCIT in Egypt, ESCWA, and the Arab Institute for Training and Research in Statistics (AITRS). The two-years project,

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[305] See: http://www.undp.org.sy/index.php/stories/58-social-development-for-poverty-reduction-/562-interactive-schools.

[306] See: http://www.escwa.un.org/divisions/ictd/etc/main.asp.

[307] See: http://www.itu.int/wsis/docs/geneva/official/dop.html.

[308] See: http://www.itu.int/wsis/docs2/tunis/off/6rev1.html.

[309] See: http://www.wsis.org/forum.

upon its completion by the end of 2011, is expected to contribute towards improving the quality and availability of ICT statistics in the region, needed for sound benchmarking and planning.

In line with the commitments of the first phase of the WSIS, serious work spearheaded by international and regional organizations was carried out to develop a methodology for measuring the information society. In this regard, a global Partnership on Measuring ICT for Development[310] was launched in Brazil in 2004 dedicated to developing, collecting and disseminating globally-relevant indicators to measure the information society (see box 21). This Partnership exemplifies the success of international and multi-stakeholder partnerships by providing an open framework for coordinating ongoing and future activities and for developing a coherent and structured approach to the development of ICT indicators.

Box 21. Partnership on Measuring ICT for Development

Launched

June 2004 at United Nations Conference on Trade and Development (UNCTAD) XI (São Paulo, Brazil).

Current members

International Telecommunication Union (ITU), Organisation for Economic Co-operation and Development (OECD), UNCTAD, United Nations Department of Economic and Social Affairs (DESA), United Nations Educational, Scientific and Cultural Organization Institute for Statistics (UIS), World Bank, Economic Commission for Africa (ECA), Economic Commission for Latin America and the Caribbean (ECLAC), Economic and Social Commission for Asia and the Pacific (ESCAP), Economic and Social Commission for Western Asia (ESCWA) and Eurostat.

Objectives

To achieve a common set of core information and communication technology (ICT) indicators, to be internationally harmonized and agreed upon, which will constitute the basis for a database on ICT statistics; to enhance the capacities of national statistical offices in developing economies and to build competence in developing statistical compilation programmes on the information society based on internationally agreed indicators; to develop a global database of ICT indicators and to make it available via the Internet.

Structure

A steering committee consisting of ITU, UNCTAD and ECLAC, plus six task groups on ICT in education, e-Government, measuring impact, measuring WSIS targets, capacity-building and database development.

Major achievements

One of the key achievements of the Partnership has been the identification of a core list of 48 ICT indicators. This list, which was agreed upon through a consultation process involving Governments and international organizations, covers basic infrastructure and access indicators as well as ICTs in households, businesses, the ICT sector and education. The list, which is revised regularly, was compiled to help guide countries in measuring the information society.

The most recent contribution of the Partnership in tracking the progress towards the achievement of the WSIS is the development of a statistical framework for measuring the WSIS targets. A dedicated report[311] was launched at the WSIS Forum 2011, held in Geneva in May 2011 for that purpose; it is expected to become the main reference document for the final review of the achievements made towards meeting the WSIS targets in 2015.

[310] See: http://www.itu.int/ITU-D/ict/partnership.

[311] See: http://www.itu.int/ITU-D/ict/partnership/wsistargets/index.html.

(b) *Role of ESCWA*

ESCWA, like other United Nations regional commissions, was involved in the preparations of the summit and has continued to play an important role at the regional level in many WSIS action lines. Activities have included workshops on ICT policies and strategies, building the ICT sector, the delivery of e-services in civil society, the enhancement of ICT statistics, and data/information collection. It has planned and conducted activities on the harmonization of cyberlegislation, initiated in 2009, including researching and compiling reports on the status of legislation in 18 Arab countries[312] and producing a set of comprehensive directives. It has coordinated its efforts with those of the ITU, the League of Arab States and other regional and international organizations to promote linguistic and cultural diversity in the information society, including wider use of the Arabic language.

ESCWA sustained its work to implement ICT-for-development objectives within the framework of the Regional Plan of Action for Building the Information Society, developed in 2005 and updated in the WSIS Follow-up Conference in Damascus in 2009.[313] Its information society portal and its publication on the Regional Profile of the Information Society in Western Asia provide valuable up-to-date information on ICT and the information society within the region.

ESCWA emphasized the importance of confidence and security in the use of ICT in the region. Following the publication of a study in 2009 entitled Building Trust in E-Services in the ESCWA Region,[314] it organized a workshop entitled Building Trust and Confidence in Arabic e-Services. Recommendations from this workshop included the formulation of national strategies for trust-building, the training of judges and lawyers in cyberlaw, and the development of regional awareness on the ethical dimension of the Internet.

ESCWA believes that the benefits of regional integration can be promoted by highlighting the advantages of such common initiatives as the development of high-speed regional backbone networks, harmonization of cyberlegislation and adoption of an ADNS.[315] It confides that there is a need for awareness-raising and skill-acquisition within the general population to enable more effective utilization resulting from the opportunities presented by ICTs. ESCWA is leading regional efforts pertaining to initiatives in the above areas.

During 2010, ESCWA, together with the other regional commissions, namely ECA, ECE, ECLAC and ESCAP, completed the United Nations Development Account project Knowledge Networks through ICT Access Points for Disadvantaged Communities" (KN4DC) (see box 3).[316] This project stimulated telecentres and other community access points in rural areas. Activities have included workshops on management and sustainability of knowledge hubs and networks in Egypt as well as in the Syrian Arab Republic, and an evaluation which has recommended the establishment of a successor programme to KN4DC. Activities also included building a knowledge-hub portal that networks all five regional knowledge networks at the global level.

The Information Society Portal for the ESCWA Region (ISPER),[317] launched in 2008, continued to provide users with up-to-date information on several aspects of the information society. These include measuring the information society in the region, cyberlegislation, Arabic domain names, the implementation of WSIS and its related activities in Western Asia. The portal focuses on the activities of ESCWA in these areas, providing detailed research, analysis and recommendations to the users. In addition, the interactive

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[312] Ibid.

[313] See: http://www.unctad.org/Templates/Page.asp?intItemID=4972&lang=1.

[314] See: http://www.escwa.un.org/information/meetingdetails.asp?referenceNum=1246E.

[315] See: Ibid.

[316] See: http://css.escwa.org.lb/ictd/1326/KN4DCproject.pdf.

[317] See: http://isper.escwa.un.org.

features of the portal make it possible for stakeholders in the region and globally to make their voices heard and participate actively in the knowledge management process. The portal is regularly used by people in the region, as evidenced by increasing user registration numbers and the popularity of downloaded content from the site.

(c) *Role of ESCWA member countries*

Several ESCWA member countries have seriously considered the necessity to evaluate and monitor the progress of their contribution in accordance to the mandate of the WSIS and have taken action accordingly. For instance, in Egypt, a dedicated web portal has been developed, under the auspices of MoCIT, to cater for and record all the initiatives, projects and programmes that were implemented according to the WSIS action lines.[318]

The Government of Jordan continuously evaluates and regularly assesses the magnitude of the digital divide, in both its domestic and international dimensions, and tracks its national versus regional and global progress in the use of ICTs.[319] This is evident by the regular ICT diffusion and usage surveys and ICT impact studies conducted in Jordan and the regular analysis of the ranking of Jordan in the Global Information Technology Report.

Qatar is actively working toward the achievement and realization of the WSIS objectives. Liberalization of the telecommunications sector, elevation of Government services online, concentration on the education sector, and facilitation of access to public information are all strong indicators of the alignment with WSIS targets.[320] Furthermore, the Digital Inclusion Programme of Qatar aims to bridge the digital divide in the country by enhancing the ICT readiness and usage of all members of society.

Finally, the National WSIS Committee in the United Arab Emirates was established in 2009 in order to follow up on the implementation of the WSIS recommendations and action lines. The Committee participated in the WSIS Forum 2011 as the official sponsor and a strategic partner of the event, during which the United Arab Emirates National WSIS Report 2010-2011 was launched. The report contains all information pertaining to WSIS activities in the United Arab Emirates, including national progress made to date, and highlights the vital role the Committee plays in creating an ambitious plan to fulfil the WSIS recommendations before 2015.[321]

4. *Participation in Internet governance activities*

The Internet Governance Forum (IGF) is a multi-stakeholder forum that was formed in 2006 as an outcome of the Tunis Agenda to support the United Nations Secretary-General in carrying out the WSIS mandate. Internet governance policy, being the main objective of IGF, involves all stakeholders including Governments, private sector, civil society and international organizations.

Since the establishment of the IGF, five annual forums have been organized to serve its objective and pave the way for debate and discussion among all participating stakeholders. The main themes of the discussion can be summarized as: setting public policy of Internet governance-promoting sustainability, robustness, security stability and development of the Internet to better serve all communities in developed as well as developing countries.

During the Fourth IGF that was held in 2009 at Sharm el Sheikh, Egypt, UNESCO, in collaboration with ICANN, addressed issues that focused on cultural diversity and multilingualism, privacy, security, and openness. The discussion covered social networks and promoted freedom of expression versus filtering and

[318] ESCWA. 2011h.

[319] The annual analysis report of the ranking of Jordan in the GITR report is prepared and published on the MoICT website: http://moict.gov.jo/ar_MoICT_tkrer.aspx.

[320] See: http://www.itu.int/wsis/stocktaking/plugin/listing.asp?lang=en&c_from=%7CQAT&c_from_text=Qatar.

[321] See: http://www.wsis.ae.

censorship. Consequently, UNESCO and ICANN signed a cooperation agreement in December 2009 to promote linguistic diversity on the Internet.[322]

ITU, in turn, played an important facilitation role to organize and co-organize several events in the Fourth IGF,[323] pertaining to domain names, child protection, cybersecurity, Internet Protocol version 6 (IPv6), climate change, and other issues.

Internet Society (ISOC) has worked with constant commitment with all stakeholders to make IGF a success story in addition to providing financial support for its operation. ISOC has established a special programme, Ambassador, that aims to bring qualified participants to learn and teach about Internet governance. In 2009, ISOC succeeded to bring over participants from 20 developing and developed countries to the Fourth IGF, who, in turn, added their significant local and regional experiences and insight to discussions and interventions during sessions and workshops.[324]

Furthermore, ESCWA harnessed the 41st ICANN meeting, which took place in Singapore in June 2011, which opened a window for applying to new generic top-level domains (gTLDs) during the first four months of 2012, to acquire the Arab TLDs .arab and its IDN equivalent عرب. as part of a joint project with the League of Arab States and ITU. Recently, ESCWA, in partnership with the League of Arab States, organized the Partnership Building Forum for the Implementation of Arab TLDs, which took place in Cairo, 5-6 July 2011.[325] The Forum was hosted by the Egyptian National Telecom Regulatory Authority. It aimed at engaging such regional and global domain name stakeholders as registry operators and registrars in the project. It provided a platform for exchanging ideas and thoughts with the steering committee of the Arab TLDs project and all involved partners about the next phase of the process, which is the selection of the Arab TLDs manager and operator through a request for proposals (RFP) process. The Forum set the scene for upcoming awareness-raising and needed preparations to draft and submit the application dossier of the League of Arab States to ICANN.

In continuation and follow-up of the outcomes from the Fourth IGF, ESCWA organized a joint session with the League of Arab States not only to present the ESCWA initiative of the Arab Dialogue on Internet Governance but also to announce the regional roadmap, proposed in the preceding Forum, on Internet governance and present its framework and main ideas to the public.

As for the Fifth IGF, which took place in Vilnius, Lithuania, between 13 and 18 September 2010, the essence of the discussions dealt with issues related to regional perspectives, critical Internet resources, security, diversity, access, openness, privacy, and emergence. It also discussed Internet governance for development, and took stock of the IGF process at large. The Forum endeavoured to find solutions to improve Internet access by all and promote local content and cultural diversity; ensure the safety of the Internet and fight cybercrime; and manage such key Internet resources as the root server system, technical standards, interconnection and telecommunications, the domain name system and Internet protocol addresses.

Another major milestone was that stakeholders welcomed the proposal made in IGF-5 to extend the mandate of IGF by another five years until the end of 2015, provided that a number of improvements to its format, functions and operations would be considered. The later proposition was the result of confidence in the achievements of the Forum that needs to be prolonged for further contribution. Accordingly, the Secretary-General of the United Nations adopted the suggestion and issued, during the 65th session of the General Assembly dated 7 May 2010, resolution A/65/78[326] recommending the extension of the mandate of IGF until the designated period.

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[322] See: http://www.unctad.org/Templates/Page.asp?intItemID=5342&lang=1.

[323] Ibid.

[324] See: http://www.isoc.org/isoc/conferences/wsis/IGF.shtml.

[325] See: http://www.escwa.un.org/information/meetingdetails.asp?referenceNum=1620E.

[326] See: http://doc.un.org/DocBox/docbox.nsf/GetAll?OpenAgent&DS=A/65/78.

B. CLASSIFICATION AND RANKING OF ESCWA MEMBER COUNTRIES ACCORDING TO MATURITY LEVEL

This classification is done in accordance with the comparison of presented information and available data, including the national profiles analysis, regarding international and regional cooperation in financing mechanisms and implementation of ICT development projects. The United Arab Emirates and Qatar attained maturity level 3 due mainly to their adoption of a multi-regional undersea fibre optic network and state-of-the-art satellite communication.The remaining countries are classified with maturity levels not exceeding level 2.

Table 75 and figure14 depict the maturity level classification of ESCWA member countries in regional and international cooperation.

1. *Maturity level 1: Bahrain, Lebanon, Oman, Palestine, Saudi Arabia, the Sudan, Syrian Arab Republic and Yemen*

This lowest level is characterized by the following: lack of international or regional cooperation in financing mechanisms and implementation of ICT development projects, with no established national or regional action plans for building the information society and following up on WSIS.

2. *Maturity level 2: Iraq, Egypt, Jordan, Kuwait and Saudi Arabia*

This level is characterized by weak international/regional financing mechanisms and growing implementation of ICT development projects, with limited action plans for building the information society and weak international/regional cooperation.

3. *Maturity level 3: Qatar and United Arab Emirates*

This level is characterized by diverse international/regional financing mechanisms and moderate implementation of ICT development projects by national and foreign sources, and established national and regional action plans for building the information society with moderate regional cooperation.

4. *Maturity level 4: None*

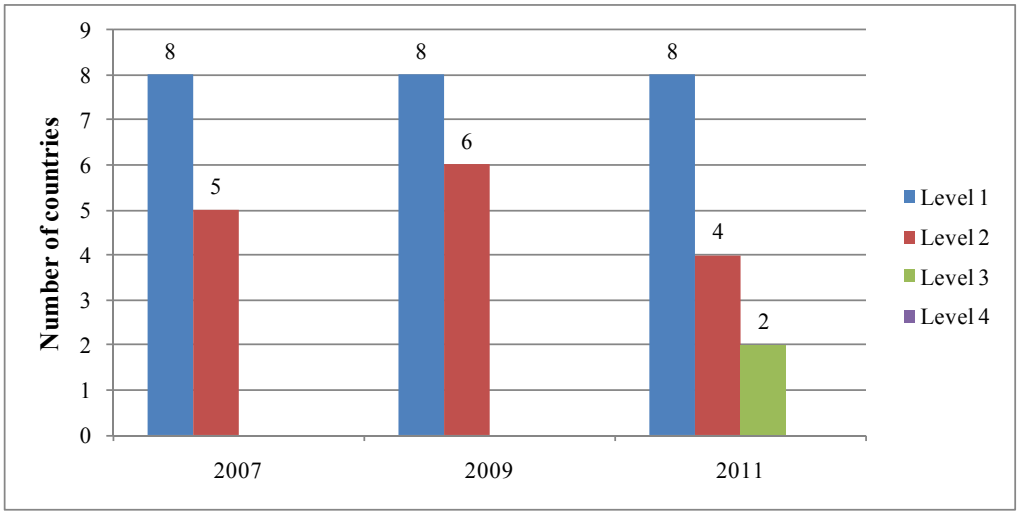
TABLE 75. RANKING OF ESCWA MEMBER COUNTRIES BY MATURITY LEVEL IN REGIONAL AND INTERNATIONAL COOPERATION

	Maturity level 1			Maturity level 2			Maturity level 3			Maturity level 4		
Country or territory	2007	2009	2011	2007	2009	2011	2007	2009	2011	2007	2009	2011
Bahrain	✓	✓	✓									
Egypt				✓	✓	✓						
Iraq	✓				✓	✓						
Jordan				✓	✓	✓						
Kuwait				✓	✓	✓						
Lebanon	✓	✓	✓									
Oman	✓	✓	✓									
Palestine	✓	✓	✓									
Qatar				✓	✓				✓			
Saudi Arabia	✓	✓	✓									
The Sudan[a/]		✓	✓									
Syrian Arab Republic	✓	✓	✓									
United Arab Emirates				✓	✓				✓			
Yemen	✓	✓	✓									

Source: Compiled by ESCWA.

Note: a/ No assessment was provided for the Sudan prior to 2009, since it only joined ESCWA in 2008.

Figure 16. Maturity levels of ESCWA member countries in regional and international cooperation



C. SUGGESTIONS AND RECOMMENDATIONS

Despite efforts of member countries and regional and international organizations during the past decade, cooperation in building an information society in the region still needs to be strengthened. All ESCWA member countries have taken tangible steps towards regional integration in such economic sectors as tourism, electricity, communications, and natural gas. In order to build an information society in the region, however, further regional cooperation in ICT is necessary. The suggestions and recommendations to strengthen regional cooperation in ICT are set forth below:

(a) Promote and emphasize partnerships between various such ICT stakeholders as national and regional governmental organizations, the private sector and NGOs to realize the stated WSIS goals;

(b) Strengthen regional cooperation in the field of ICT development through various such organizations as the League of Arab States and ESCWA;

(c) Enhance the role and activities of international and regional organizations in establishing networks and hubs for regional cooperation;

(d) Establish national task forces to coordinate with regional task forces and follow up on the activities within the framework of regional cooperation in building the information society;

(e) Develop a coordinated approach on issues of common concern among member countries in international telecommunication and Internet governance;

(f) Strengthen such existing regional cooperatives as AICTO, GAID and Arab States Research and Educational Network (ASREN), by developing support and follow-up mechanisms;

(g) Promote the establishment of a regional network for information sharing by stakeholders in the region, creating communities of practice for sharing expertise, especially in education, ICT capacity-building, cyberlegislations and e-Government;

(h) Encourage regional and sub-regional application projects that enhance regional harmonization efforts, particularly those with multiplier effect across countries of the region;

(i) Enhance national and regional mechanisms that support FDI for regional integration.

XI. MILLENNIUM DEVELOPMENT GOALS

During the Millennium Summit, which was held at United Nations Headquarters between 6 and 8 September 2000, the General Assembly adopted the United Nations Millennium Declaration.[327] The Declaration asserted that equality, freedom, peace, security, development, access to education, gender equality, and health are among the basic rights of citizens of all nations. Assembled leaders committed to working towards achieving eight time-bound goals aimed at improving the living conditions of women, men and children. All member States have since adopted what has become collectively known as the Millennium Development Goals (MDGs). During the 2005 World Summit, 170 heads of State and Government renewed their commitment to achieve the MDGs by 2015.[328] Five years later, at the United Nations High-level Plenary Meeting on the Millennium Development Goals, also known as the MDG Summit, the General Assembly welcomed the progress made since 2005 on the attainment of the MDGs, while noting that member States and other stakeholders should increase efforts and initiatives aimed at achieving goals and targets by the 2015 deadline.[329]

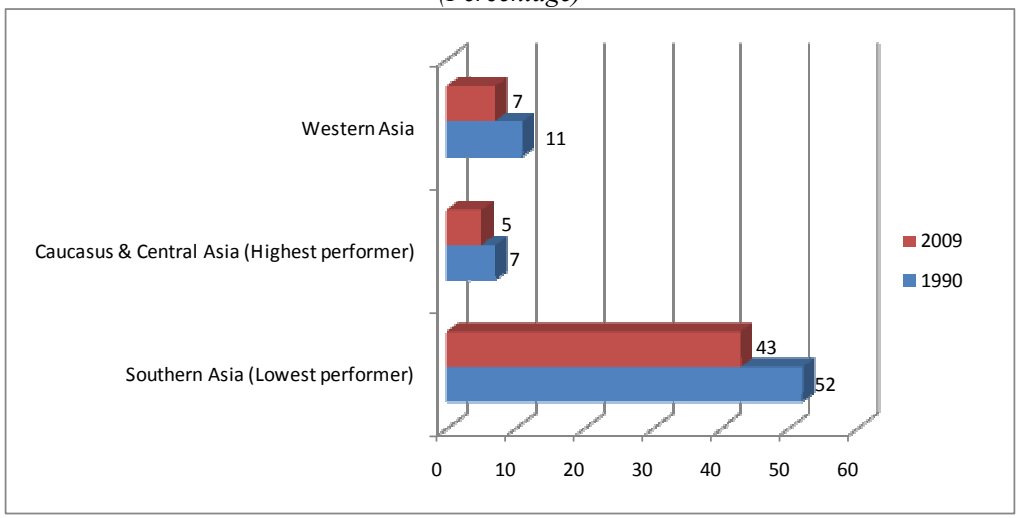
A. BRIEF LOOK AT THE STATUS OF THE MDGS IN THE ESCWA REGION

ESCWA member countries face a common set of challenges, namely peace, security, sustainable development, regional partnership and integration, good governance, respect for human rights and democracy as well as protection of the environment. This section sheds light on the status of the MDGs in the ESCWA region and compares its accomplishments to those of the lowest and highest global performers.[330]

(a) *Goal 1: Eradicate extreme poverty and hunger*

Extreme poverty is absent in wealthier ESCWA member countries, specifically those countries that are part of the GCC, but may be found in Palestine, the Sudan and Yemen. Figure 17 indicates that the ESCWA region has made steady but slow progress towards meeting Target 1.C.[331]

Figure 17. Proportion of children under age five who are underweight (lower = better)
(Percentage)



[327] See: http://www.un.org/millennium/declaration/ares552e.htm.

[328] See: http://daccess-dds-ny.un.org/doc/UNDOC/GEN/N05/487/60/PDF/N0548760.pdf?OpenElement.

[329] See: http://www.un.org/en/mdg/summit2010/pdf/outcome_documentN1051260.pdf.

[330] The contents of section A are meant to act as an MDG primer. For a more comprehensive look at MDGs, refer to The Millennium Development Goals Report – 2011 at this link: http://www.un.org/millenniumgoals/11_MDG%20Report_EN.pdf.

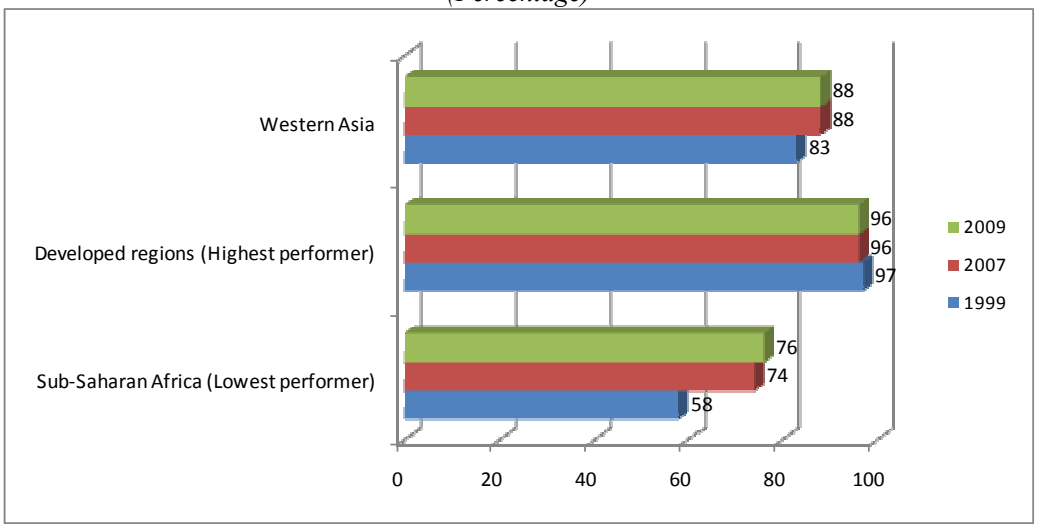
[331] Target 1.C: Halve, between 1990 and 2015, the proportion of people who suffer from hunger; Indicator 1.8: Prevalence of underweight children under five years of age.

(b) *Goal 2: Achieve universal primary education*

In 1999, the rate of enrolment in primary schools in ESCWA member countries was 83 per cent, progressing to 88 per cent in 2007, but remaining unchanged for 2009 (see figure 18). While the 5 per cent increase that took place between 1999 and 2007 is a step in the right direction, the rate is too low to help the region achieve Goal 2 by 2015.

Figure 18. Net enrolment ratio in primary education[332] (higher = better)

(Percentage)

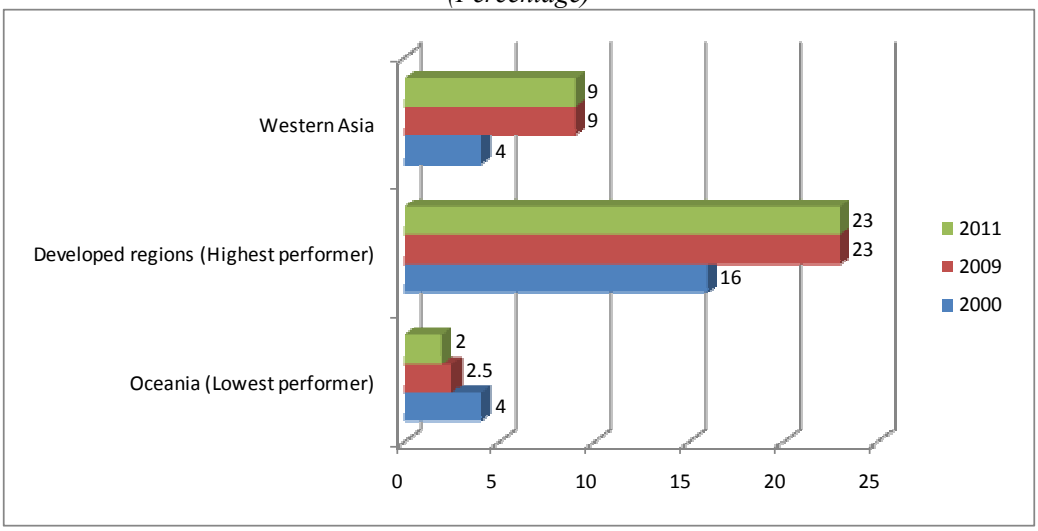


(c) *Goal 3: Promote gender equality and empower women*

Major gender disparities continue to exist, specifically with regard to political representation, where the number of women in the parliaments in the region is a low 9 per cent of the total number of representatives (see figure 19). There were no discernible improvements in the two-year period that separates this report from its predecessor.

Figure 19. Seats held by women in national parliaments[333] (higher = better)

(Percentage)



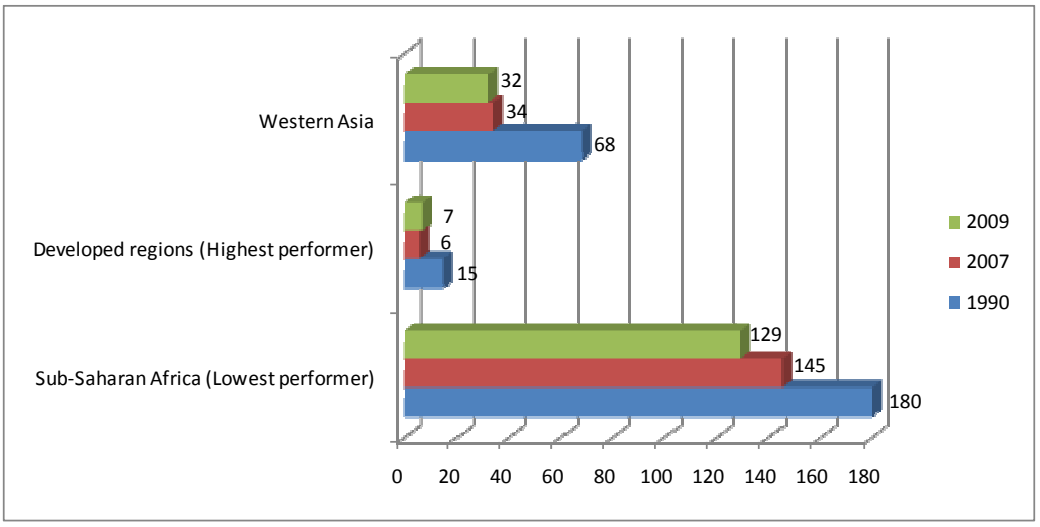
[332] Target 2.A: Ensure that, by 2015, children everywhere, boys and girls alike, will be able to complete a full course of primary schooling; Indicator 2.1: Net enrolment ratio in primary education.

[333] Indicator 3.3: Proportion of seats held by women in national parliament.

(d) *Goal 4: Reduce child mortality*

Between 2007 and 2009, the number of deaths of children under five continued to decrease, albeit at half the rate achieved between 1990 and 2007 (see figure 20). If the rate of decrease does not pick up in the last four years of the MDGs, the ESCWA region might fall short of reaching Target 4.A.[334]

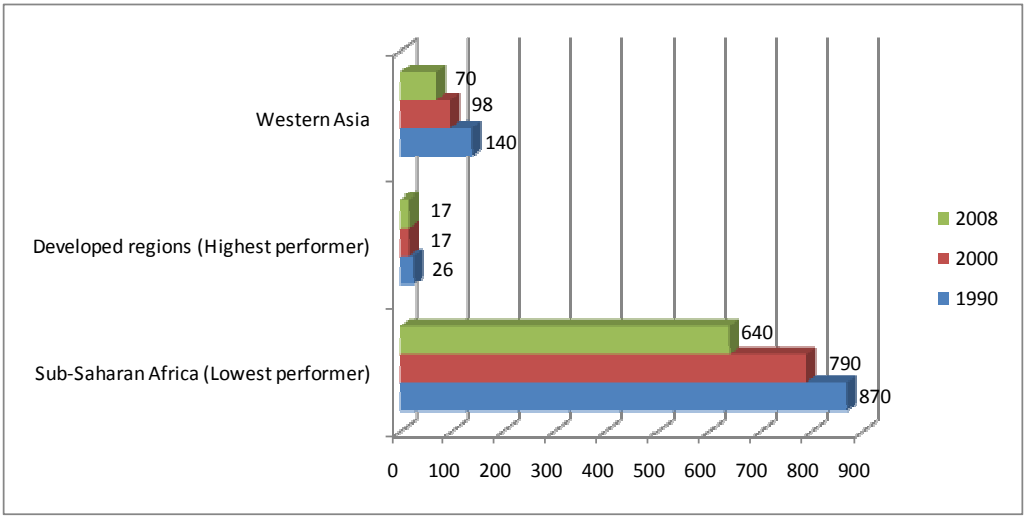
Figure 20. Under-five mortality rate per 1,000 live births (deaths per 1,000 live births) (lower = better)



(e) *Goal 5: Improve maternal health*

In order to achieve Target 5.A,[335] the number of maternal deaths in ESCWA member countries must not exceed 35 per 100,000 live births. In 2008, ESCWA member countries had reduced this number to 70, half of what it was in 1990 (see figure 21). At this rate, ESCWA members will only achieve the target in 2017, missing the 2015 deadline by two years.

Figure 21. Maternal deaths per 100,000 live births (lower = better)



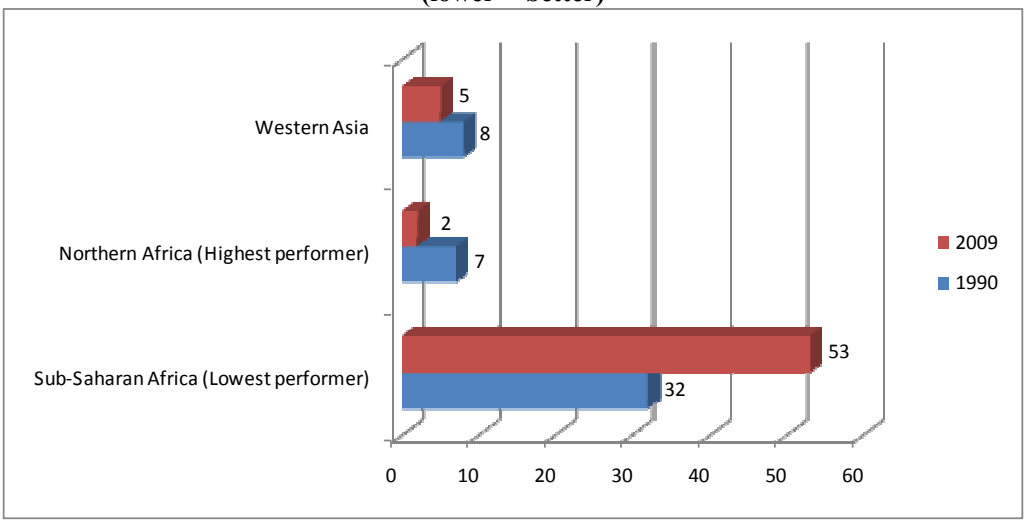
[334] Target 4.A: Reduce by two-thirds, between 1990 and 2015, the under-five mortality rate; Indicator: 4.1: Under-five mortality rates.

[335] Target 5.A: Reduce by three quarters, between 1990 and 2015, the maternal mortality ratio.

(f) *Goal 6: Combat HIV/AIDS, malaria and other diseases*

As in most other regions in the world, with the exception of Sub-Saharan Africa, tuberculosis cases in the ESCWA region have been decreasing gradually (see figure 22). If no changes to this trend occur between 2011 and 2015, ESCWA member States will be able to met Target 6.C.[336]

Figure 22. Number of tuberculosis deaths per 100,000 population (excluding people who are HIV-positive) (lower = better)

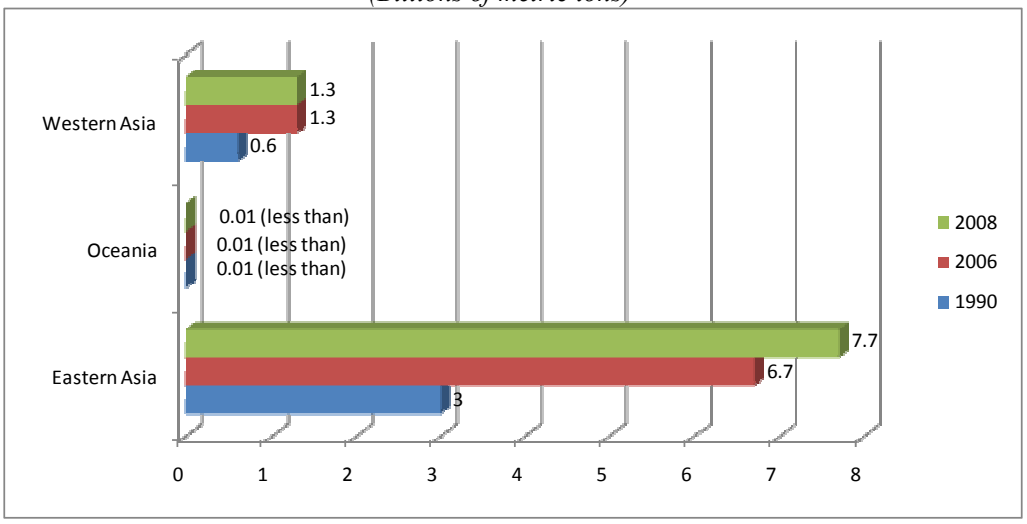


(g) *Goal 7: Ensure environmental sustainability*

When compared to those of fast-industrializing countries of Eastern Asia, carbon dioxide (CO_2) emission figures for ESCWA member countries may seem quite low (see figure 23). This is as positive a spin as one could put on pollution figures which more than doubled between 1990 and 2008.

Figure 23. Emissions of carbon dioxide (CO_2) (lower = better)

(Billions of metric tons)[337]



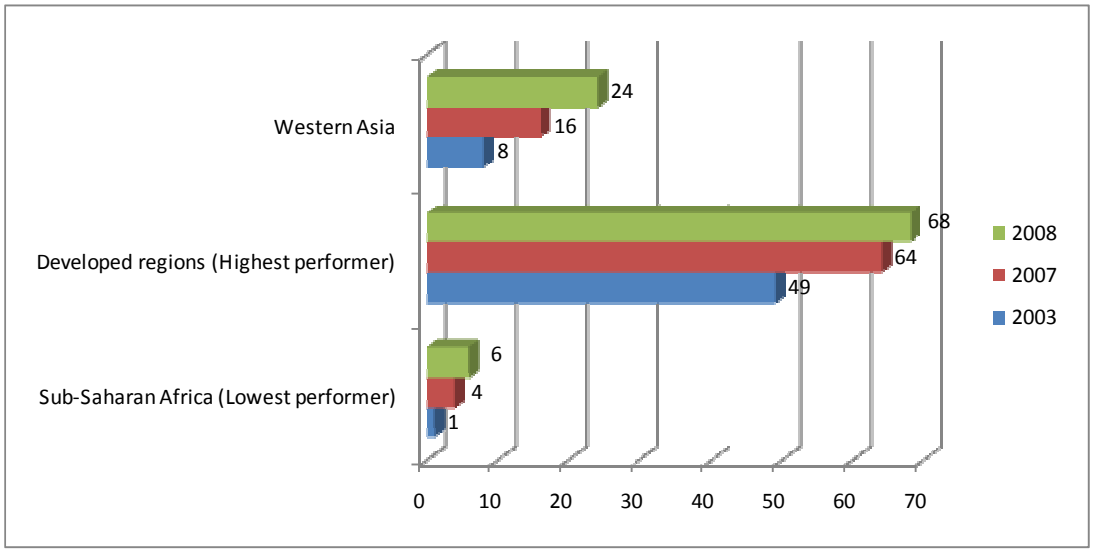
[336] Target 6.C: Have halted, by 2015, and begun to reverse the incidence of malaria and other major diseases; Indicator 6.9: Incidence, prevalence and death rates associated with tuberculosis.

[337] Target 7.A: Integrate the principles of sustainable development into country policies and programmes and reverse the loss of environmental resources; Indicator: 7.2: CO_2 emissions, total, per capita and per US$1 GDP (PPP).

(h) *Goal 8: Develop a global partnership for development*

Western Asia tripled its number of Internet users between 2003 and 2008 (see figure 24). This is a remarkable feat, but the region is still far short of the figure recorded for the developed regions during the same five-year period.

Figure 24. Number of Internet users per 100 inhabitants[338]
(higher = better)



B. COMMON GOALS: LINKS BETWEEN THE MDGS AND WSIS

In 2003, during the first phase of WSIS, participants and delegates from developed and developing nations renewed the commitment of their countries to the MDGs and declared their intention to make full use of the opportunities presented by ICT to uphold the principles and promote the development goals of the Millennium Declaration.[339]

The second phase of WSIS took place in Tunisia two years later. The Tunis Commitment,[340] one of the outputs of this phase, encapsulated the pledges of the participants of the summit who reaffirmed their backing for internationally agreed development goals and objectives, including the MDGs. The document further linked some of the action lines of WSIS to various MDGs.

The trend to link WSIS action lines and MDGs continued during subsequent global and regional WSIS events. Various papers, studies, presentations and discussions that have been issued and have taken place throughout the years during WSIS follow-up forums have broached the subject. A recent example is a session entitled Assessing the Impact of ICT on Development – WSIS and MDGs,[341] which took place in May 2010 during the Geneva WSIS Forum. The session was named after a joint ITU-United Nations University (UNU) project that aims at:

[338] Target 8.F: In cooperation with the private sector, make available the benefits of new technologies, especially information and communications; Indicator 8.16: Internet users per 100 inhabitants.

[339] See: http://www.itu.int/wsis/docs/geneva/official/dop.html.

[340] See: http://www.itu.int/wsis/docs2/tunis/off/7.html.

[341] See: http://www.itu.int/wsis/implementation/2010/forum/geneva/is/is_3.html.

- Investigating the impact of the WSIS action lines on the MDG process;
- Establishing the actual needs of practitioners, member States and international organizations in effectively assessing the impact of their ICT for development (ICT4D) initiatives (WSIS action line projects) on the MDGs;
- Providing an annotated repository of resources like frameworks, toolkits, and others to guide practitioners on the use of existing ICT impact assessment models, frameworks and measurement systems;
- Developing a system for monitoring the impact of the WSIS process on the MDG process, integrated with the WSIS Stocktaking Platform.[342]

C. THE ROLE OF ICT IN DEVELOPMENT: EVOLVING PERSPECTIVES

Even before the Millennium Summit in 2000, many ICT projects had been conceived and implemented to achieve developmental goals. One could assert that ICT projects for development have been implemented since the 1950s, especially if the definition of ICT includes "any communication device or application, encompassing: radio, television, cellular phones, computer and network hardware and software, satellite systems and so on, as well as the various services and applications associated with them, such as videoconferencing and distance learning".[343] With as wide a definition, making radios available in underdeveloped regions to allow local communities access to educational programmes that would help them improve their daily lives is an ICT4D project. Depending on the situation and the implementation environment, a simple project which uses what would be considered older communication technologies is definitely better than a project that wastes funds on more sophisticated technologies that would be of little use to communities with simpler needs.

The advent of the MDGs provided a plausible framework to ICT4D concepts and projects that had been, until that point, conceived and carried out without a high-level, internationally mandated, umbrella. The MDGs gave impetus to fund providers and encouraged the implementation of ICT4D projects because they identified and structured problem areas and specified goals and targets. The MDG framework made it easier for donors to name clearer objectives and, by doing as much, to justify project expenditures. ICT4D projects, with apparent impact on development in general and the MDGs in particular, became common. Many of these projects sought to bring new technologies and to facilitate access to these technologies to impoverished remote rural areas. A very common example of an ICT4D project, one emulated by many national, regional and international organizations, included the establishment of telecentres that brought computers and Internet access to villages and villagers who would otherwise have been left out of the digital age. These typical projects are not uncommon in the ESCWA region. One can easily locate telecentres in Egypt, Jordan, Lebanon, the Sudan, Syrian Arab Republic and other countries by accessing the websites of various telecentre networks.[344] Examples of other ICT4D projects with links to the MDGs were covered in the 2007[345] and 2009[346] editions of the Regional Profile of the Information Society in Western Asia.

In retrospect, what the MDGs may have failed to do is to provide a clear set of indicators to facilitate the measurement of the impact of ICT4D projects on the development of targeted communities. After the initial ICT4D project implementation rush, some fund providers started questioning the true value and real impact of such projects. Beyond the unease felt by ICT4D project managers who were more concerned with

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[342] See: http://www.egov.iist.unu.edu/cegov/NEWS/APRIL-JUNE-2010/EVENT-UNU-Contributes-to-the-WSIS-Process.

[343] See: http://searchcio-midmarket.techtarget.com/definition/ICT.

[344] See: http://mogtamaa.ning.com/ or http://www.knowledgenets.net/?q=.

[345] See: http://www.escwa.un.org/information/publications/edit/upload/ictd-07-15-e.pdf.

[346] See: http://www.escwa.un.org/information/publications/edit/upload/ictd-09-12.pdf.

getting their work done, theoreticians and researchers mulled over the significance of conventional, computer-centric ICT4D projects and the need to find new models that would utilize easy-to-use technologies that are easily accessible and readily available. The most commonly mentioned example of a seemingly ubiquitous technology is the mobile phone, which is increasingly cited as the medium of choice by some researchers who prefer it to computers which are more expensive to buy and more difficult to operate.[347]

In the hope that further research will provide clearer answers to the questions posed by researchers and theoreticians on the actual/tangible-versus-perceived impact of ICT on human development, the upcoming sections of this chapter will discuss the perceived impact of ICT4D on each of the MDG goals and cite examples of past and current ICT initiatives that help with the achievement of the MDGs in the ESCWA region.

D. Perceived impact of ICT on the achievement of the MDGs

A number of research papers have been written on the role that ICT can play in the achievement of the MDGs.[348] Many of them spend little or no time challenging the assumption that ICT has a role to play and even less time suggesting how to measure its real impact. Most state that, if applied appropriately in conjunction with a development strategy, ICT is a tool which can definitely yield positive results. This section summarizes the perceived role of ICT for selected goals and targets and suggests sample indicators to help monitor the diffusion of ICT in targeted populations, noting that these are rough samples in need of further research and development. Other indicators designed to measure the impact of ICT on the MDGs need to be developed. Table 76 is meant to be indicative, not exhaustive.

Table 76. Perceived role of ICT in the achievement of the Millennium Development Goals (MDGs)

Goal/target[349]	Perceived role of ICT	Impact	Sample output indicators
G1/T1	Provide easy access to market information and reduce transaction costs	Make records and databases easily accessible to farmers	Number of farmers using ICT to conduct their daily business
G2/T3	Create virtual networks of trained teachers	Alleviate shortages of skilled teachers	Number of schools with computers
			Number of schools offering ICT-based education
			Number of new teachers trained per year
	Develop ICT-based education curricula	Enhance ICT skills of teachers and students alike	Evaluation of cost-effectiveness
			Number of primary school teachers trained through ICT-based education
	Encourage e-learning with the development of localized content	Increase distance learning opportunities to unilingual speakers	Number of primary school learning materials available on Internet
G3/T4	Use various ICT tools to raise awareness of general population on gender issues	Help reduce gender-based inequality	Number of women trained to perform technology-based jobs
			Number of jobs created for empowered women
	Educate disadvantaged girls and women on the use of new technologies	Increase the number of women working in the knowledge economy (Web, programming, data entry, etc.)	Number of women using telecentres for various purposes (education, access to data and information)

[347] Heeks, R. 2010. Do information and communication technologies (ICTs) contribute to development? *Journal of International Development*. 22: 625-640. doi: 10.1002/jid.1716.

[348] Various searches in google.com or a similar Internet search engine will return numerous hits. Suggested searches include "Impact of ICT on MDGs", "How ICTs can help achieve MDGs" or simply "ICT and MDGs".

[349] For goals, targets and indicators, go to: http://mdgs.un.org/unsd/mdg/Host.aspx?Content=Indicators/OfficialList.htm.

TABLE 76 (*continued*)

Goal/target	Perceived role of ICT	Impact	Sample output indicators
G4/G5/G6	Train health workers on the use of ICT	Improve administration and management of health institutions	Number of health workers using ICT in their jobs
		Better collection and management of health data	Number of clinics and hospitals with ICT access used for telemedicine
	Make telemedicine available at remote clinics and hospitals	Availability of health services in disadvantaged and remote areas	Percentage of registered or certified practitioners of telemedicine
G7/T9	Use geographical information systems (GIS) for water management	Better management of water resources, maximize access to safe drinking water	Number of polluted water supplies pinpointed by GIS
G8/T8F	Create telecentres in disadvantaged communities	Facilitate access to knowledge in disadvantaged areas	Percentage of population in disadvantaged areas using telecentres
		Educate disadvantaged groups on the use of ICT	Number of women and youth trained on the use of ICT

E. MATRIX OF ICT INITIATIVES HELPING ESCWA MEMBER COUNTRIES ACHIEVE THE MDGS

Table 77 contains descriptions of five national and regional ICT initiatives that help in the achievement of the MDGs in the ESCWA region. The MDGs impacted by these initiatives are listed in the fifth column. The listed initiatives constitute a very small sample of initiatives on the ground.

TABLE 77. EXAMPLES OF ICT INITIATIVES HELPING TO ACHIEVE THE MILLENNIUM DEVELOPMENT GOALS (MDGS) IN ESCWA MEMBER COUNTRIES

Title	Location	Initiators	Description	MDGs
Knowledge Networks through ICT Access Points for Disadvantaged Communities[350] (see box 3)	EMCs	ESCWA, NGOs in various EMCs	The main objective of the project is to empower disadvantaged communities by transforming selected ICT access points/telecentres into networked knowledge hubs. The project sought to improve the living standards of the targeted communities by developing, organizing, sharing, and disseminating knowledge that is mainly related to employment, education, gender, and health.	1, 2, 3, 4, 5, 6, 8
Empowering Communities through Telecentre Networking[351]	Egypt	IDRC, UNDP, Telecentre.org	With over 1,300 telecentres (IT Clubs) under a national programme that dates back to the early 1990s, Egypt has the highest concentration of telecentre activities in a single country in the region. This project aims at allowing the Egyptian Ministry of Information and Communication Technology (MoCIT) and the IT Trust Fund to strengthen the current model of IT Clubs in Egypt by providing such support services as on-demand helpdesk services, telecentre staff training and online and offline knowledge-sharing platforms.	1, 3, 8

[350] See: http://www.knowledgenets.net/?q=.

[351] See: http://web.idrc.ca/en/ev-83261-201_104565-1-IDRC_ADM_INFO.html.

TABLE 77 (*continued*)

Title	Location	Initiators	Description	MDGs
Acacia[352]	EMCs	IDRC	The Acacia programme works to help countries in Africa and the Middle East achieve social and economic change by applying ICT. The programme's objectives are to: (a) demonstrate how ICT can help communities tackle development problems with local solutions; (b) create knowledge about approaches that promote the use of ICT by such marginalized groups as women; (c) support researchers studying the impact of ICT on education and employment; (d) monitor policies that create equitable and inclusive access to knowledge through ICT; and (e) develop ICT to foster development and improve the delivery of social services.	1, 2, 3, 8
ICT for Education[353]	Iraq	UNESCO, ESCWA	The development goal and immediate objectives of this project are to: (a) reorient Iraqi educational policy objectives and strategies to maximize the effectiveness of the use of ICT in education; (b) build sustainable capacity in the Ministry of Education in Iraq to develop ICT-based curriculum instruction, learning and assessment; and (c) upgrade the school physical learning environment through the provision of ICT facilities.	2, 8
Lebanon Development Gateway (LDG)[354]	Lebanon	Collective for Research and Training on Development – Action (CRTD-A)	LDG seeks to address problems associated with poverty, illiteracy and unemployment. The project aims at strengthening knowledge-based interaction on gendered sustainable development between civil society organizations, Government organizations and the private sector. LDG uses ICT to foster exchange, dialogue and cooperation, and to promote accessibility to gender and social development information and resources in Arabic, English and French.	1, 2, 3, 8

Note: EMC stands for ESCWA member countries.

F. CLASSIFICATION AND RANKING OF ESCWA MEMBER COUNTRIES ACCORDING TO MATURITY LEVEL

The unavailability of indicators designed to measure the impact of ICT on the achievement of the MDGs inhibits us from ranking ESCWA member countries with regard to their specific use of ICT for development. As such, the rankings below reflect the general human development status of countries in the ESCWA region. They are based on the Human Development Index (HDI) ratings that are commonly available in human development reports, the most recent being the 2011 UNDP Human Development

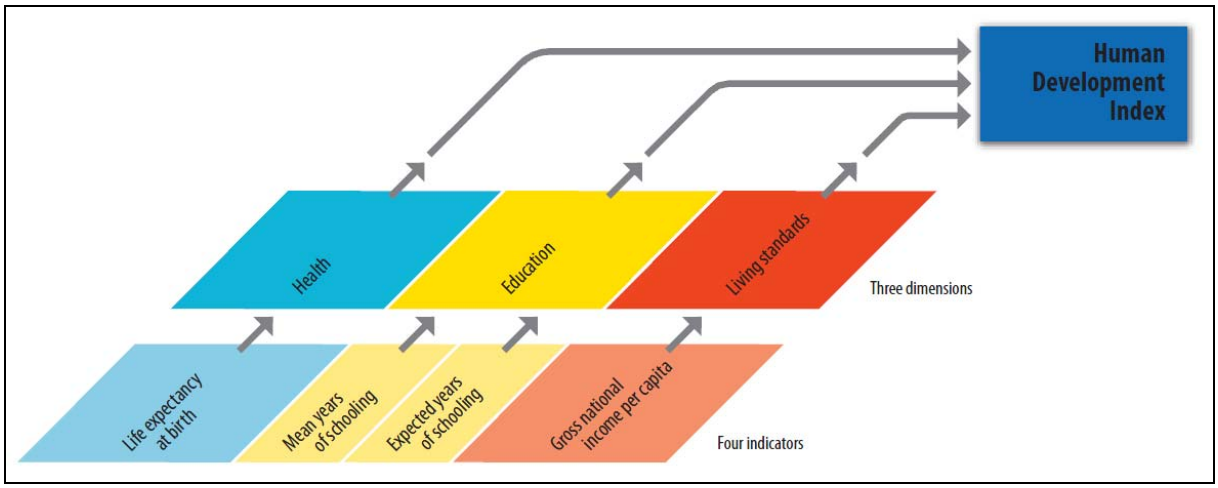
[352] See: http://www.idrc.ca/EN/Programs/Information_and_Communication_Technologies_for_Development/Acacia/Pages/default.aspx.

[353] See: http://www.unesco.org/en/iraq-office/education-sector-at-the-unesco-office-for-iraq/general-education-at-the-unesco-office-for-iraq/ict-in-education-in-iraq/.

[354] See: http://www.lkdg.org.

Report.[355] Figure 25[356] illustrates the components that are used to measure human development in those reports.

Figure 25. Components used to measure human development − Human Development Index



Source: UNDP. 2010. *Human Development Report 2010.,*

Countries of the ESCWA region were classified in accordance with the HDI ratings they received for 2010. As a general guideline, countries that scored less than 0.6, with 1.0 being the maximum score, were classified in maturity level 1, countries that scored between 0.61 and 0.75 in maturity level 2, between 0.76 and 0.9 in maturity level 3. There were no countries that achieved maturity level 4 which was reserved for countries scoring above 0.9.

1. *Maturity level 1: Iraq, the Sudan and Yemen*

Iraq, the Sudan and Yemen remain in this level, largely because they share the sad designation of being conflict areas, the last two also being the least-developed countries in the region. Wars, sanctions, political instability and civil unrest hamper the efforts of these countries to achieve many of the MDG targets. Security may have improved in Iraq since the 2009 edition of this report but the country continues to suffer from political instability. Bickering clans, factions, militias and political parties stood several months in the way of the formation of a Government. Adding to the developmental problems of the Sudan, the country split into two during July 2011 after an extended civil conflict. Yemen, already one of the poorest countries of the ESCWA region, will most likely decline further due to a long period of civil unrest that started in January 2011 and has continued unabated for several months.

2. *Maturity level 2: Egypt, Jordan, Lebanon, Palestine and Syrian Arab Republic*

After suffering from a political conflict that split Gaza and the West Bank into two separately-controlled areas and after the devastating effects of the 2008 Gaza war, Palestine has been reaping the rewards of a relative period of stability, managing to move up to this maturity level. Further improvements may take place due to rapprochement between political authorities in Gaza and the West Bank. Unchanged from 2009, Syria may decline to a lower level if the period of civil unrest, which started in March 2011, is sustained. Jordan and Lebanon maintain this level of maturity with continued improvements in health, education and poverty reduction but somewhat spotty records on gender and environmental sustainability.

[355] See: http://hdr.undp.org/en/reports/.

[356] See: http://hdr.undp.org/en/statistics/hdi/.

3. *Maturity level 3: Bahrain, Kuwait, Oman, Qatar, Saudi Arabia and United Arab Emirates*

With the exception of Saudi Arabia, which has managed to move up one level, the situation in other countries of this level of maturity has changed little since the 2009 Regional Profile. It is interesting to note that all countries at this level are GCC members. Issues preventing them from moving up to the highest maturity level are mainly related to gender inequality.

Tables 78 and figure 26 summarize the rankings of ESCWA member countries with regard to their achievement of MDGs.

TABLE 78. RANKING OF ESCWA MEMBER COUNTRIES BY MATURITY LEVEL IN ACHIEVING THE MILLENNIUM DEVELOPMENT GOALS

	Maturity level 1			Maturity level 2			Maturity level 3			Maturity level 4		
Country or territory	2007	2009	2011	2007	2009	2011	2007	2009	2011	2007	2009	2011
Bahrain							✓	✓	✓			
Egypt				✓	✓	✓						
Iraq	✓	✓	✓									
Jordan				✓	✓	✓						
Kuwait							✓	✓	✓			
Lebanon				✓	✓	✓						
Oman				✓				✓	✓			
Palestine	✓	✓				✓						
Qatar							✓	✓	✓			
Saudi Arabia				✓	✓				✓			
The Sudan[a/]		✓	✓									
Syrian Arab Republic				✓	✓	✓						
United Arab Emirates							✓	✓	✓			
Yemen	✓	✓	✓									

Source: Compiled by ESCWA.

Note: a/ No assessment was provided for the Sudan prior to 2009, which only joined ESCWA in 2008.

Figure 26. Millennium Development Goals maturity levels in ESCWA member countries

G. SUGGESTIONS AND RECOMMENDATIONS

(a) Reduce the cost of ICT by abolishing taxes on ICT equipment and services, liberalizing the telecom sector, fostering competition between access providers, reducing the cost of local and international bandwidth, improving broadband access and implementing inexpensive faster-to-deploy wireless solutions in regions where telecommunication infrastructure projects would be costly and time-consuming;

(b) Democratize access to knowledge by increasing the number and services of public access centres in regions where ICT is not affordable, supporting the development of local digital content that would address the needs of local communities and using more affordable and simpler technologies, particularly mobile phones, which have managed to establish a significant presence even in the most deprived of communities;

(c) Persuade reluctant citizens to start using e-services by conducting regular mass media campaigns aimed at debunking the false theories that are behind their most common fears and at teaching them how to deal with and overcome real and perceived online threats, as well as by encouraging the development of trustworthy, citizen-centric applications;

(d) Build a knowledge-based culture by instilling awareness of the developmental role of new and traditional knowledge and by training communities on how to gather, create, store, share and use data, information and knowledge which would enhance their quality of life and help them become active players in knowledge-based economies;

(e) Create ICT employment opportunities by fostering ICT research and development, supporting innovation and entrepreneurship, encouraging the establishment of new business ventures, building science and technology parks, developing a culture of transparency and accountability and drafting cyberlegislation that would guarantee and protect the rights of businesses;

(f) Improve, update and integrate education methods through the use of ICT;

(g) Entice Governments to measure the economic impact of ICT by bolstering the bodies and mechanisms necessary for data collection, measurement and analysis, particularly comparative analysis between urban and rural/remote areas.

XII. BUILDING THE ICT SECTOR

The global economy is experiencing one of its most complex and comprehensive challenge in history. The recent credit crisis has led to record unemployment and economic hardship worldwide. Focusing on the transformational opportunities posed by the global economic turmoil, leaders from industry, Government and civil society attending the 2009 WEF Annual Meeting[357] agreed that ICT can play a vital role in the pathway to an economic recovery. The digital revolution can form the foundation of a sustainable global economy. In particular, the ICT sector can play a dramatic role in enhancing economic development by acting as a production sector for economic growth and an enabler for the development of other sectors.

While growing at a healthy pace during the last decade, the ICT sector as a stand-alone economic sector in the ESCWA region remains underdeveloped, especially when compared to the ICT sector of countries with developed knowledge economy. Even when implementing ICT-related projects that target the development of knowledge economies in the region, both the public and private sectors are acting as consumers of existing technologies rather than producers and innovators. In the last few years, major improvement and significant advance have been witnessed in the ICT sector in the ESCWA region, particularly in the Internet and mobile areas. Despite this progress, disparity among ESCWA member countries still exists and efforts are still needed to build the ICT sector as a stand-alone sector in the region. From national and regional perspectives, there are still many issues at stake that may help develop the ICT sector in the region, including ICT financing, venture capital and entrepreneurship; human and financial resources; national ICT strategies and policies and their implementation; regulatory status of the sector in ESCWA member countries; trade considerations for ICT products; contributions of the sector to the GDP of ESCWA member countries; measuring performance of the sector; and tools for sustainability of the sector.

A. COMPARATIVE ANALYSIS

1. *Companies working in the ICT sector*

The companies working in the ICT sector in the ESCWA region have various activities related to hardware and software retail, software design and development, ICT services as well as ICT capacity-building. They can be classified into three main categories: telecommunication companies, IT companies and systems technology services. Currently, most ICT companies in the Arab region are involved in the retail of computers and software tools and applications. There is a growing number of companies, especially in the Gulf region, that provide total ICT solutions, including system integration and customization. Following the liberalization of the telecom sector in most ESCWA member countries, telecommunication companies constitute the dominant share in the ICT-sector market mainly due to their annual profit. The main contribution of the ICT sector in the national economies in the region is mainly based on the telecommunication services component.

Table 79 shows available data for the number of companies working in the ICT sector in selected ESCWA member countries.

TABLE 79. NUMBER OF COMPANIES WORKING IN THE ICT SECTOR IN SELECTED ESCWA MEMBER COUNTRIES

Country or territory	Number of ICT companies	Year
Bahrain	576	2010
Egypt	3,972	2011
Jordan	442	2009
Lebanon	559	2011
Palestine	150	..
Syrian Arab Republic	192	..
The Sudan	804	2011

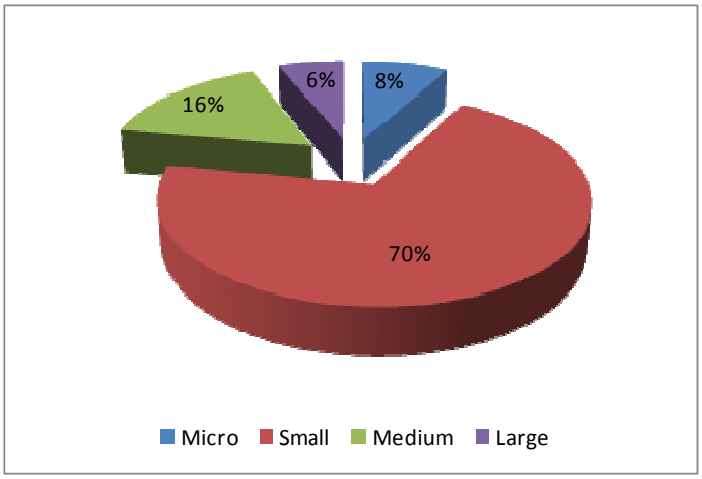
Source: ESCWA. 2011a.
Note: Two dots (..) indicate that data are not available.

[357] Report of the WEF Annual Meeting 2009, available at: http://www.weforum.org/events/world-economic-forum-annual-meeting-2009.

Box 22. ICT companies in Egypt[358]

In Egypt, the number of companies working in the ICT sector was 3,500 in January 2010 and increased to 3,972 companies in January 2011, which corresponds to an increase of 13.49 per cent over the previous year.

Those companies are mainly IT companies (78 per cent or 3,106 out of 3972), while IT-systems services companies constitute 14 per cent (542 out of 3,972), and communications companies constitute 8 per cent (324 out of 3,972). In Egypt, the ICT companies employ 205,280 people. The great majority, namely 70 per cent of the ICT companies in Egypt are small companies,, while medium companies constitute 16 per cent, micro companies constitute 8 per cent and large companies 6 per cent of the total number of ICT companies.



Sources: http://www.mcit.gov.eg/Upcont/Documents/ICTinBriefFeb2011-E.pdf; and ESCWA. 2011h.

2. *Government facilitation*

The role of Governments in facilitating economic growth is very significant. In broad terms, ICT is a comparatively new segment of the macroeconomic profile, with most advances seen in the telecommunications sector. As such, analysis has tended to focus on investments, growth and penetration of these services. Comparatively little is known about ICT as a productive and innovative sector of the economy. One thing that is clear is that ESCWA member countries, in general, have shown support for the construction of knowledge parks and research clusters, with nearly every country having deployed an initiative in this regard. The effectiveness of these efforts should be understood in the context of the resulting innovations, growth in the sector, and so forth.

Generally speaking, the ICT sector is subject to nearly the same constraints as those of the economy as a whole. While it must be acknowledged that there are many entangling factors which make a well-supported analysis difficult, the totality of the available data suggests that the countries which have successfully created hospitable business environments also tend to be those with the most advanced ICT sectors. As measured by the World Bank Ease of Doing Business Index (see table 80), the countries which rank in the top third of the Index at the global level, namely Saudi Arabia, Bahrain, the United Arab Emirates and Qatar, are also those with the most favourable infrastructure, capacity and regulatory environments.

[358] See: http://www.mcit.gov.eg/Upcont/Documents/ICTinBriefFeb2011-E.pdf.

TABLE 80. RANKING OF ESCWA MEMBER COUNTRIES ON THE WORLD BANK EASE OF DOING BUSINESS INDEX, 2009-2011

Rank	Country or territory	Global rank in 2009 (183)	Global rank in 2010 (183)	Net change in position
1	Saudi Arabia	12	11	1
2	Bahrain	25	28	-3
3	United Arab Emirates	37	40	-3
4	Qatar	39	50	-11
5	Oman	57	57	0
6	Kuwait	69	74	-5
7	Egypt	99	94	5
8	Yemen	104	105	-1
9	Jordan	107	111	-4
10	Lebanon	109	113	-4
11	Palestine	133	135	-2
12	Syrian Arab Republic	144	144	0
13	The Sudan	153	154	-1
14	Iraq	166	166	0

Source: http://data.worldbank.org/indicator/IC.BUS.EASE.XQ.

As most of the criteria of the Ease of Doing Business Index do not directly involve ICT-specific solutions, it is reasonable to conclude that success in the ICT field is enabled by the same regulatory changes which make it easier for the economy as a whole. This suggests that Governments which seek to make their economies attractive through active engagement in keeping their regulatory environments competitive, are rewarded with economic growth generally, including progress in the ICT sector and by implication, the knowledge economy.

When conducting this analysis, it is very important to note that the ESCWA region incorporates many factors which make transnational and global comparisons difficult. These factors include the susceptibility of commodity-exporting countries to volatile pricing which effects total GDP growth, physical security challenges due to armed conflict, and political instability. At the national level, a given country may be significantly more or less susceptible to these variables, making it difficult to control and normalize the data effectively. Therefore, it is necessary to acknowledge that these indicators and the policy direction they imply must be understood within the national/regional context.

3. *Contribution of the ICT sector to the national economy*

Currently, most researchers acknowledge that technological progress and innovations in the ICT sector are long-term drivers of economic growth, especially in developing countries. As a key technology producer, the ICT sector has contributed positively at macro- and microeconomic levels and has been the engine of economic growth as it continues to spur the globalization of the economy. Researchshows that investment in ICT is associated with such economic benefits as higher productivity, lower costs, new economic opportunities, job creation, innovation, and increased trade and exports. [359]

While the ICT sector, in most of the ESCWA countries, has been evolving positively and at a very healthy pace during the last few years, there are no reliable indicators to measure its comprehensive contribution to the national economies. This is due to the fact that the ICT sector is not considered as a stand-alone economic sector in the ESCWA region. The problem resides in quantifying the ICT sector and its

[359] See: http://www.prnewswire.com/news-releases/investment-in-ict-and-productivity-growth-can-add-euro-760-billion-to-european-economy-by-2020-130253808.html, http://ifap-is-observatory.ittk.hu/node/693, and http://www.labs-associados.org/docs/OCDE_TIC.PDF.

contribution to the national GDP. However, some aspects of ICT-sector contribution to the national economies are discussed in the following sub-sections.

(a) *Telecommunications investments and revenues*

Despite the lack of sufficient data to track the impact of ICT in economic growth, studies have highlighted growth at the level of the ICT contribution to the GDP in most ESCWA member countries during the last ten years from 2.9 per cent on average in 2000 to 3.5 per cent in 2008 and 3.4 per cent in 2009, according to World Bank data. This average contribution for the region is considered very important as it exceeds the global average recorded during the same period, which stands at 3.2 per cent in 2008 and 3.1 per cent in 2009. It is worth noting that, in the region, ICT revenues mainly comprise revenues from the provision of such telecommunication services as fixed line, mobile and data. A small decrease in telecommunications revenue can be noted between 2008 and 2009. Among ESCWA member countries, Lebanon takes the lead in terms of percentage of telecommunications revenue to GDP by nearly 8 per cent, followed by Jordan at 6.3 per cent, while Palestine, Yemen and Qatar recorded the lowest percentage with 1.7 per cent for Qatar, 1.2 per cent for Yemen, and 0.8 per cent for Palestine, as shown in table 81.

TABLE 81. TELECOMMUNICATIONS REVENUES IN SELECTED ESCWA MEMBER COUNTRIES, 2008-2009

Country or territory	GDP in 2008 (*billions of US$*)	Telecommunications revenues 2008 (*percentage of GDP*)	Telecommunications revenues 2009 (*percentage of GDP*)
Lebanon	29 933	7.9	7.9
Jordan	22 696	6.7	6.3
Bahrain	21 902	4.1	4.1
Egypt	162 836	3.7	3.7
Iraq	86 523	3.5	3.5
Kuwait	148 023	3.5	3.5
The Sudan	60 299	3.3	3.2
United Arab Emirates	58 032	3.1	3.1
Syrian Arab Republic	261 347	3.0	3.0
Saudi Arabia	54 516	2.7	2.7
Oman	476 304	3.4	2.5
Qatar	110 712	1.8	1.7
Yemen	26 917	1.2	1.2
Palestine	11 950	0.8	0.8
ESCWA average		3.5	3.4
World average		3.2	3.1

Sources: World Bank. The Little Data Book on Information and Communication Technology. 2010 and 2011 editions.

In the Arab region, the ICT sector is expected to grow continuously during the next decade. In the GCC, where the ICT sector has been boosted by industrial investments, it is expected to grow from 8 per cent to 10 per cent a year. This outperforms the global-sector growth which has reached 4.3 per cent in 2010 and is forecasted to reach 2.6 per cent in 2011,according to the data from the World Information Technology and Services Alliance (WITSA).[360]

With regard to investment in the telecommunication sector, IT data available for selected countries of the ESCWA region indicate that eight countries invested as much as US$22.6 billion in the telecommunication sector in 2008, and nine ESCWA member countries invested US$24 billion in 2009. For

[360] Nordic Industries Development. 2010. The ICT Business in the Middle East: A Market Research Publication.

the ICT investments in 2009, Saudi Arabia ranked first with a value of US$10.6 billion, followed by the Sudan, with investments of US$7.7 billion and Egypt with investments of US$3.1 billion. In terms of annual growth of the telecommunications investments between 2008 and 2009, the table below shows a significant growth in the Syrian Arab Republic rated at 55 per cent and valued at US$345 million, followed by 14 per cent in Egypt with US$380 million. However, Saudi Arabia witnessed a small decrease in investments during 2009, which can be owed to the financial crisis. Table 82 provides more details about telecommunications investments in ESCWA member countries.

TABLE 82. TELECOMMUNICATIONS INVESTMENTS IN SELECTED ESCWA MEMBER COUNTRIES, 2008-2009

Country	Telecommunications investments 2008 (*thousands of US$*)	Telecommunications investments 2009 (*thousands of US$*)
Egypt	2 737 143	3 117 169
Iraq	..	256 410
Jordan	161 971	247 183
Oman	200 130	396 548
Qatar	383 315	346 241
Saudi Arabia	10 771 175	10 561 218
The Sudan	7 708 325	7 708 325
Syrian Arab Republic	628 240	973 630
Yemen	267 700	243 257
ESCWA total	22 590 303	23 849 983

Source: Compiled by ESCWA based on data from ITU. 2011a.

Note: Two dots (..) indicate that data are not available.

(b) *ICT expenditures*

According to 2010 data from the World Bank, the average expenditure of ESCWA member countries on ICT as a proportion of GDP is about 5.3 per cent, which is very close to the world average of 6 per cent. ICT expenditure covers computer hardware (computers, storage devices, printers, and other peripherals), computer software (operating systems, programming tools, utilities, applications, and internal software development), computer services (IT consulting, computer and network systems integration, web hosting, data processing services, and other services), communications services (voice and data communications services) and wired/wireless communications equipment. Among the five ESCWA countries for which data is available, Jordan ranks first in terms of ICT expenditures as percentage of the GDP with a significant 7.3 per cent rate which is higher than the world average. This is so because developing the ICT sector in Jordan represents one of the top national priorities. Egypt comes second with a 5.7 per cent rate, followed by Saudi Arabia with 5.2 per cent, and the United Arab Emirates with 4.9 per cent, while the lowest proportion of ICT expenditures is recorded by Kuwait with 3.2 per cent. Table 83 provides more details about ICT expenditures in selected ESCWA member countries.

TABLE 83. ICT EXPENDITURES IN SELECTED ESCWA MEMBER COUNTRIES, 2008

Country or territory	GDP in 2008 (*billions of US$*)	ICT expenditures 2008 (*% of GDP*)	ICT expenditures 2008 (*millions of US$*)
Egypt	162 836	5.7	9 281 652
Jordan	22 696	7.3	1 656 808
Kuwait	148 023	3.2	4 736 736
Saudi Arabia	476 304	5.2	24 767 808
United Arab Emirates	261 347	4.9	12 806 003
ESCWA average		5.3	
World average		6.0	

Source: World Bank. 2010b. The Little Data Book on Information and Communication Technology.

(c) *ICT exports and imports*

ICT industries make modest contributions to the national economy of almost all ESCWA countries. This can be visualized by the movement of ICT goods and services recorded by these countries during 2008 and 2009 as shown in table 84.

TABLE 84. ICT IMPORTS AND EXPORTS IN ESCWA MEMBER COUNTRIES, 2008-2009

	Goods				Services	
	ICT exports (*percentage of total goods exports*)		ICT imports (*percentage of total goods imports*)		ICT exports (*percentage of total service exports*)	
Country or territory	2008	2009	2008	2009	2008	2009
Bahrain	0.1	0.1	2.3	2.3	..	..
Egypt	1.8	1.8	4.4	4.4	7.3	4.7
Iraq	..	..	..	..	3.3	0.6
Jordan	5.5	3.1	7.2	5.4	..	..
Kuwait	0.3	0.4	6.0	7.2	45.9	60.9
Lebanon	1.9	3.0	3.6	3.5	1.9	2.9
Oman	1.6	1.5	3.2	3.2	..	..
Palestine	..	..	..	..	7.6	5.4
Qatar	..	..	8.2	8.2	..	..
Saudi Arabia	0.4	0.3	8.0	4.6	..	..
The Sudan	..	..	2.3	4.7	1.2	1.2
Syrian Arab Republic	0.6	0.2	2.0	1.4	4.5	4.4
United Arab Emirates	2.0	2.0	5.3	5.3	..	..
Yemen	0.3	0.1	1.8	2.5	18.9	8.5

Sources: World Bank. The Little Data Book on Information and Communication Technology. 2010 and 2011 editions.

Notes: ICT goods exports and imports include telecommunications, audio and video, computer and related equipment, electronic components, and other information and communication technology goods. However, software is excluded.

Two dots (..) indicate that data are not available.

ICT goods exports and imports are goods that are intended to fulfil the function of information processing and communication by electronic means, including telecommunications equipment, computers and related equipment, electronic components, audio and video equipment, and other goods. Re-exports, which are exports of foreign goods in the same State as previously imported, are included.

It is clear from table 84 that import rates for ICT goods in the ESCWA region largely exceeded export rates. This is mainly due to the absence of a real ICT industry. The average of ICT goods exports as a percentage of the total exports of goods in ESCWA member countries was about 1.2 per cent in 2009, while the percentage of ICT goods imports to total goods imports is about 4.4 per cent for the same year. It can be noticed that Jordan continues to have substantially higher ICT goods export rates than other ESCWA member countries with a rate of 3.1 per cent in 2009, although with a significant decrease down from 5.5 per cent in 2008. In Lebanon, the ICT goods export rate has been increased during the last two years and has regionally achieved the second rank, with a 3 per cent rate, and is followed by the United Arab Emirates with 2 per cent. A significant proportion of ICT goods exports of these three countries mainly include computers, hardware components, mobile phones and other peripherals.

With regards to the ICT services exports, the situation is better where the average of ICT services exports for the ESCWA region is about 11 per cent for 2008 and 2009. We can mention that, for some ESCWA countries, a significant proportion of the total services exports is represented by the ICT services exports, as is the case in Kuwait with 45.9 per cent for 2008 and 60.9 per cent for 2009, and in Yemen with 18.9 per cent for 2008. However, this rate in Yemen experienced a considerable decrease during 2009 and only reached 8.5 per cent. Many other countries in the region have seen their ICT services export rates decrease during 2009, including Egypt, Iraq, Palestine and the Syrian Arab Republic. ICT services exports comprise communications services (telecommunications, business network services, teleconferencing,

support services, and postal services) and computer and information services (database, data processing, software design and development, maintenance and repair, and news agency services).

(d) *Employment in the ICT sector*

With reference to employment in the ICT sector, available ITU data refer only to full-time employees in the telecommunication sector. In ten of the ESCWA member countries, the level of employment in the telecommunication sector reached 145,000 workers in 2008 and 149,000 workers in 2009. Egypt is considered the most successful in generating jobs in the telecommunication sector, where the number of employees is around 62,000, followed by Saudi Arabia with 25,000 workers. Table 85 shows the number of full-time employees in the telecommunication field in 2008 and 2009 for selected ESCWA member countries.

TABLE 85. EMPLOYMENT IN THE TELECOMMUNICATIONS SECTOR IN SELECTED ESCWA MEMBER COUNTRIES, 2008-2009

Country	Full-time telecommunications employees 2008	Full-time telecommunications employees 2009
Bahrain	2 470	2 500
Egypt	62 113	61 127
Iraq	16 957	21 000
Jordan	5 280	5 756
Oman	3 612	3 598
Qatar	2 048	2 414
Saudi Arabia	24 789	24 261
The Sudan	5 700	5 700
United Arab Emirates	11 759	11 890
Yemen	10 372	10 937
ESCWA total	145 100	149 183

Source: Compiled by ESCWA based on data from ITU. 2011a.

Employment in other sectors in the ICT field requires a more skilled ICT workforce, which is currently becoming more readily available in the market due to the return of expatriate ICT professionals to the Arab region as a result of the global economic downturn. Such large countries as Egypt reported a total of 205,000 persons working in the ICT sector. That number is 92,000 in Saudi Arabia.[361] In Jordan, the ICT sector contributed to the creation of more than 80,000jobs (direct and indirect), [362] including around 25,000 employments in the sector itself. In Qatar, an estimated 20,000 staff were employed by the ICT sector, representing 1.6 per cent of the entire workforce in the country. This number is expected to increase to approximately 24,000 by the end of 2011.[363]

4. *Research and development in the ICT sector*

Research and development in the region remains an area in need of improvement, and ICT is no exception. Spending in this area is dominated by Governments and State-owned enterprises. Measured by dollar value, these investments tend to be in telecommunications and the acquisition of high-tech products for use in such commodity-related industries as the energy sector. As these expenditures are less effective in promoting research and development, the situation can be distorted by these measures. A more accurate picture could be obtained by examining private and public-sector research spending which results in a marketable innovation. Unfortunately, data at this level is insufficient to draw meaningful conclusions.

With these limitations acknowledged, existing information does suggest certain conclusions. Financial investment inputs can be tracked in some ESCWA member countries. When examining these data for the

[361] ESCWA. 2011k.

[362] See: http://www.slideshare.net/ashamlawi/jordan-ict-sector-apr-2011.

[363] ictQATAR. 2011.

ESCWA region, variances in levels of investment, and the implied prioritization, demonstrate that Jordan and Egypt are investing the largest proportion of their GDP in research and development activities, at 0.34 per cent and 0.23 per cent, respectively. By contrast, higher-GDP countries, as Saudi Arabia and Kuwait for instance, are investing at much lower levels, namely 0.05 per cent and 0.09 per cent, respectively. Because research and development is a vital part of building innovative capacity, countries which value these outputs should carefully consider the reality that, on a global level, high-income countries typically spend 2.29 per cent of their GDP on research and development. A variance at this level suggests it will be unlikely that the region will be able to effectively compete in this sector without structural reform.

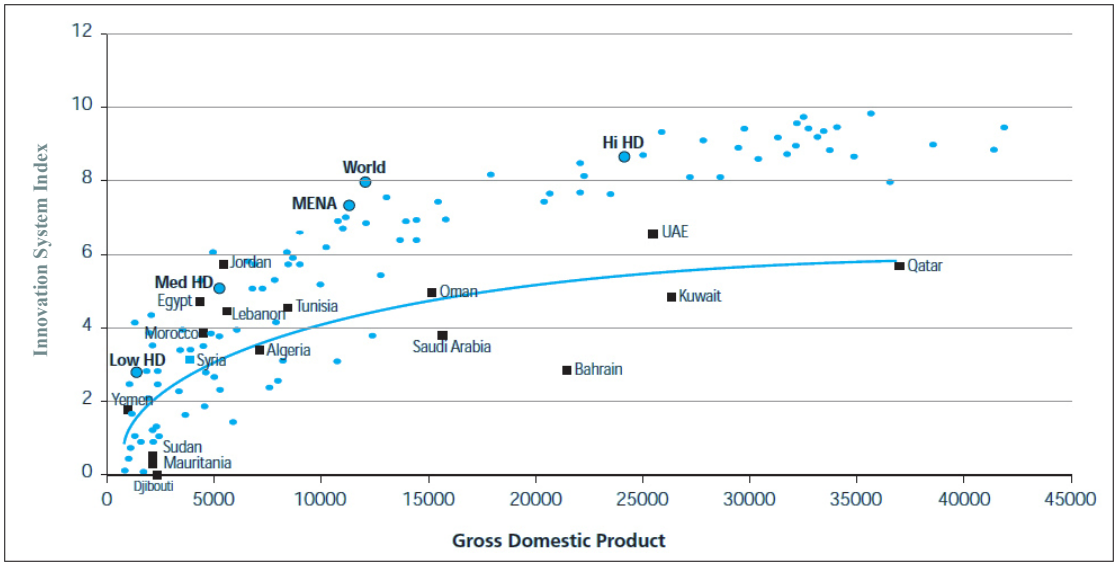
TABLE 86. RESEARCH AND DEVELOPMENT SPENDING IN SELECTED ESCWA COUNTRIES

Country	Spending on research and development *(percentage of GDP)*
Saudi Arabia	0.05
Egypt	0.23
Jordan	0.34
Kuwait	0.09

Source: World Bank. 2010. Knowledge Assessment Mechanism.

When examining spending on research and development as a percentage of GDP, combined with the World Bank Innovation System Index, comparative correlations arise which further illustrate these points (see figure 27). Surprisingly, these data show that countries with lower GDPs per capita in the ESCWA region have a closer correlation between GPD per capita and resulting innovation than their wealthier counterparts, roughly tracking the inputs in research and development spending. This suggests that not only are the wealthier ESCWA countries investing a lower proportion of their GDP in research, they are also converting investments into innovation less effectively than their poorer neighbours or their OECD competitors. As a matter of public investment decisions, this would strongly suggest that despite notable achievements, wealthier countries would be well-advised to carefully evaluate the level and nature of their investments in these areas in order to encourage economic diversification and maintain momentum as creators of innovative products rather than well-funded consumers of externally produced high-tech goods.

Figure 27. Per capita GDP and the Innovation System Index



Source: Mohammed bin Rashid al Maktoum Foundation. 2009. *Arab Knowledge Report: Towards Productive Intercommunication for Knowledge*. P. 183.

Note: Data source from World Bank database. Knowledge Assessment Methodology (KAM); available at: http://info.worldbank.org/etools/kam2/KAM_page5.asp.

Within this macroscopic picture, there are several useful initiatives to examine. For example, Egypt deployed a new electronic customs clearing application in the Alexandria seaport. This investment has made it easier for goods to transit through the port more quickly. This investment in ICT as an enabler for broader economic activity has been highlighted by the World Bank as a success case in trade facilitation and was profiled in subsequent research by ESCWA. Similar initiatives in Bahrain and Dubai have helped those countries achieve and maintain high scores in clearing cargo through their ports, and thus benefiting their economies and strengthening their roles in international trade.

B. CLASSIFICATION AND RANKING OF ESCWA MEMBER COUNTRIES ACCORDING TO MATURITY LEVEL

As can be deducted from previous sections, there is an absence of accurate and useful data from member countries that allows assessing and monitoring the contribution of the ICT sector to national economies and the measurement of its impact on sustainable development. Given that fact and in order to provide an objective classification of ESCWA member countries, focus in this section will be on a number of factors that constitute key drivers to build a robust and competitive ICT sector in the region. Hence the maturity level of each country will be assessed based on efforts exerted to ameliorate the regulatory and enabling environment, promote market facilitations and incentives and the investment in technological innovation and ICT research and development.

In this context, it is worth mentioning that, even though many initiatives to develop the ICT sector in the region have been carried out by a number of ESCWA member countries, the sector remains underdeveloped preventing any country from reaching maturity level 4.

1. *Maturity level 1: Iraq, Palestine, the Sudan, Syrian Arab Republic and Yemen*

This maturity level depicts scarce low level of investment in the ICT sector, and a limited facilitation role played by the Government in this context. Despite the efforts deployed by a number of countries at this maturity level, more work is needed at all levels to build a robust ICT sector.

2. *Maturity level 2: Bahrain, Kuwait, Lebanon, Oman and Qatar*

Countries at this level focused mainly on extending telecommunications services and disseminating e-Government services through upgraded ICT infrastructure. However, investments in the ICT sector, particularly research and development, are still relatively small, as well as ICT exports and the ICT workforce. More governmental incentives should be put in place in order to stimulate the process of technological innovation and facilitate the growth of a flourished ICT market.

3. *Maturity level 3: Egypt, Jordan, Saudi Arabia and United Arab Emirates*

This maturity level includes countries having adopted policies and initiated activities to promote the ICT sector and its contribution to the national economy and to advance the development of technological innovation in the ICT fields. As a result, they have a growing ICT sector, with increasing exports of ICT products and services, and a developing research and development in ICT. In addition, almost all those countries provide an adequate enabling and regulatory environment stimulating the growth of the sector and leading to an increase of investments.

4. *Maturity level 4: None.*

Table 87 and figure 28 summarize the above maturity level rankings compared to previous rankings.

TABLE 87. RANKING OF ESCWA MEMBER COUNTRIES BY MATURITY LEVEL IN BUILDING THE ICT SECTOR

	Maturity level 1			Maturity level 2			Maturity level 3			Maturity level 4		
Country or territory	2005	2009	2011	2005	2009	2011	2005	2009	2011	2005	2009	2011
Bahrain	✓				✓	✓						
Egypt				✓				✓	✓			
Iraq	✓	✓	✓									
Jordan							✓	✓	✓			
Kuwait	✓				✓	✓						
Lebanon				✓	✓	✓						
Oman	✓				✓	✓						
Palestine	✓	✓	✓									
Qatar	✓				✓	✓						
Saudi Arabia				✓				✓	✓			
The Sudan[a/]		✓	✓									
Syrian Arab Republic	✓	✓	✓									
United Arab Emirates							✓	✓	✓			
Yemen	✓	✓	✓									

Source: Compiled by ESCWA.

Note: a/ No assessment was provided for the Sudan prior to 2009, which only joined ESCWA in 2008.

Figure 28. Evolution of maturity levels of ESCWA member countries in building the ICT sector

C. SUGGESTIONS AND RECOMMENDATIONS

Building a robust, stand-alone and competitive ICT sector in the ESCWA region still has to overcome a number of challenges. Almost all countries in the region remain consumers of imported technology rather than producers. Despite the fact that a number of countries have developed strategies and have launched initiatives to promote the ICT sector in the region, the sector remains underdeveloped and more efforts are still needed in order to make it stronger, matching or competing with similar sectors in developed countries.

Some suggestions to develop the ICT sector in the ESCWA region are as follows:

(a) Systematic regulation of the ICT sector, particularly telecommunications, needs to be implemented effectively in order to have a transparent, fair and competitive environment;

(b) Separation of the ICT sector from other economic sectors on the macroeconomic level is a must in order to measure its contribution to the national and regional economies;

(c) Governments should ensure an adequate enabling environment and provide incentives for investment in ICT industries/services, whether through tax reduction or protection of national products/services;

(d) PPP is a major catalyst for the development of the ICT sector and needs to become widespread in the region;

(e) Excellence centres/institutions in ICT, particularly in the field of software development and telecommunications, are needed to be able to compete at the regional and global levels;

(f) Cooperation among research institutions should be encouraged and ICT research and development in universities should be linked to industry and should focus on providing such innovative solutions to local and regional needs as promoting digital Arabic content.

XIII. REGIONAL AND GLOBAL COMPARATIVE ANALYSIS

A. PERFORMANCE OF THE ESCWA REGION IN BUILDING THE INFORMATION SOCIETY

In order to depict the current status of the information society in the ESCWA region and measure the progress made in realizing it, the regional profile of the information society has been divided into twelve basic components. Member countries were rated on every component based on a four-level maturity scale, with level one indicating the lowest level of maturity and level four the highest. The average score of the ESCWA region on each information society component is then calculated by adding up the respective point scores of every member country divided by a total of 14 (see table 88).

Each chapter of the report provided maturity level assessment scores (one to four) for every member country on a particular information society component. However, as stated in the introduction, the four subjective maturity levels adopted by this report cannot be translated into comparable statistical indicators. Hence, the maturity level assessment results provided in each chapter should be used by member countries as tools aimed at identifying gaps and at outlining corrective measures rather than merely focusing national efforts on improving one's rank.

Table 88 depicts the average scores of the ESCWA region in various information society components. While a fair comparison cannot be established between the scores of 2007 compared to 2009 and 2011 owing to the admission of the Sudan to ESCWA in 2008, this table presents a time-series perspective. Moreover, while this represents a short-time series, some interesting patterns emerge as do some of the impediments for realizing the information society in the region.

TABLE 88. AVERAGE SCORES OF THE ESCWA REGION IN VARIOUS INFORMATION SOCIETY COMPONENTS, 2007-2011
(*Ranked from lowest to highest based on 2011 scores*)

Information society component	Average score 2007	Average score 2009	Average score 2011
Building confidence and security in the use of ICTs	1.46	1.29	1.29
Regional and international cooperation	1.38	1.43	1.57
Building the ICT sector[a/]	..	1.93	1.93
Millennium Development Goals	2.08	2.07	2.21
Media	1.92	2.07	2.21
ICT applications	2.31	2.21	2.29
Access to information and knowledge	2.00	2.21	2.43
Enabling environment	2.00	2.21	2.43
ICT capacity-building	2.46	2.29	2.43
Cultural diversity and identity, linguistic diversity and local content	2.15	2.21	2.50
ICT infrastructure	2.46	2.43	2.50
Role of Governments and stakeholders	2.46	2.50	2.64
Overall average	2.06	2.07	2.20

Source: Compiled by ESCWA.

Note: a/ In terms of building the ICT sector, this component was not evaluated in 2007 and figured within chapter VI of the 2007 Regional Profile report.

Two dots (..) indicate that data are not available.

The average score of the information society in the ESCWA region improved by 6 per cent in 2011 compared to its 2009 figure. The biggest improvement was seen in the cultural diversity and identity, linguistic diversity and local content component owing to the increase of Internet penetration rates in the

region which translated into increased availability of digital content. The region scored lowest on building confidence and security in the use of ICT as a result of the absence of laws and regulations aimed at ensuring the privacy and confidentiality of people and the delay in promulgating laws and regulations to counter the misuse of ICT. The ESCWA region also scored low on regional and international cooperation due to the lack of integration and inadequacy of regional and international joint initiatives leading to a common vision for building the information society.

In addition to a shortage of finance and venture-capital mechanisms, the ICT sector in the region remains a consumption-based and not a production-based sector. It was still considered by most member countries as part of other economic and service sectors, thereby contributing to the low regional score of 1.93 points attained by that sector.

The components on role of Governments and all stakeholders and ICT infrastructure registered the highest average scores of 2.64 and 2.50 points, respectively. This is reflective of the effective roles played by Governments in the region and to the relatively high ICT-penetration rates attained, especially by the GCC countries.

B. Performance of the ESCWA region compared with other countries and regions

1. *Performance of the ESCWA region in the role of Governments and all stakeholders*

Despite the formulation of national ICT strategies in line with the WSIS objectives, which call for the integration of ICT-related programmes with national and regional development strategies, the differences in development strategies among countries make it difficult to establish common international standards that can be used to measure or quantitatively compare performance. Nevertheless, while efforts in this regard differ from one country to another, depending on local conditions, the region has witnessed, year after year, a greater participation of Governments and all stakeholders in building the information society. Specifically, most member countries are seriously striving to formulate, update and implement ICT-related policies and strategies.

2. *Performance of the ESCWA region in ICT infrastructure*

Most member countries have sought to focus on improving their ICT infrastructures by establishing telecommunications regulatory authorities (TRA), liberalizing the telecommunications sector and attracting foreign investments. Across the region, there is a significant positive correlation between the liberalization of telecommunications and higher phone and Internet penetration rates. Mobile and Internet penetration rates, in particular, have witnessed considerable increase in all ESCWA member countries. As competition enters the market, the quality of service increases and costs are reduced. These conditions have been shown to promote the development of the information society.

(a) *Internet penetration*

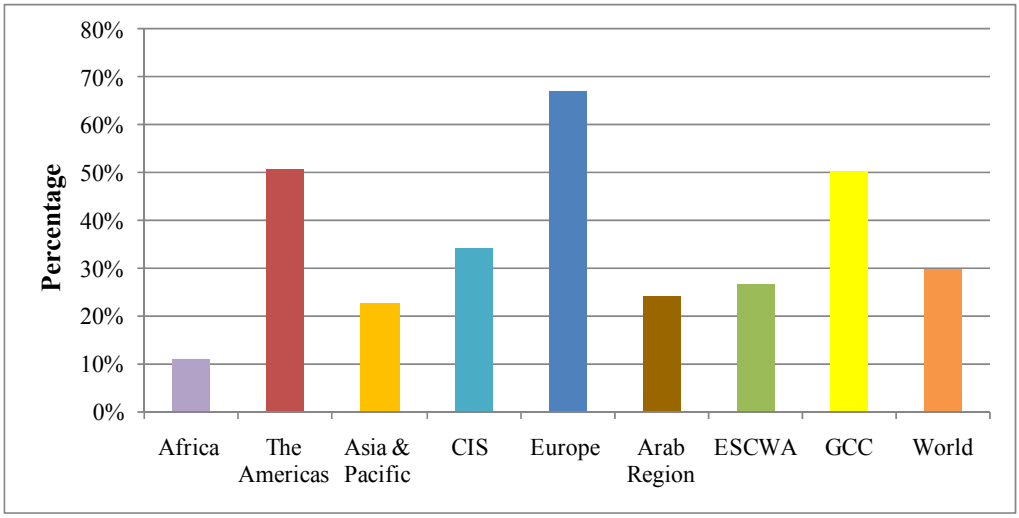
While the Internet penetration rate of the ESCWA region increased by 56 per cent between mid-2009 and the end of 2010 (the world rate grew by 19 per cent during the same period), the current penetration rate at 26.5 per cent remains lower than the world average at 30 per cent. The ESCWA region lags behind most other regions of the world in Internet penetration, with the exception of Africa (at 11 per cent). However, the Internet penetration rate in GCC countries averages at 50 per cent, thereby overtaking the Commonwealth of Independent States (CIS) and stopped short of reaching the levels attained by the Americas, albeit falling significantly behind the average rate of European countries (at 67 per cent) (see table 89 and figure 29).

TABLE 89. INTERNET USERS PENETRATION RATES IN SELECTED REGIONS, 2010

Region	Internet penetration (*percentage*)
Africa	10.8
The Americas	50.7
Asia and Pacific	22.5
CIS	34.0
Europe	67.0
Arab region	24.1
ESCWA	26.5
GCC	50.1
World average	29.7

Source: Compiled by ESCWA based on data from ITU. 2011a.

Figure 29. Internet penetration rates in selected regions, 2010



Source: Compiled by ESCWA based on data from ITU. 2011a.

(b) *Mobile phone penetration*

Mobile service markets in the region have gone a long way in terms of competition and sophistication. A notable growth rate of around 38 per cent has been observed between 2008 and 2010, overtaking the global growth rate of 30 per cent during the same period. One of the interesting trends in mobile phone markets in the region is the increased number of regional operators investing in other ESCWA member countries, thereby inducing more opportunities for regional integration (see table 90).

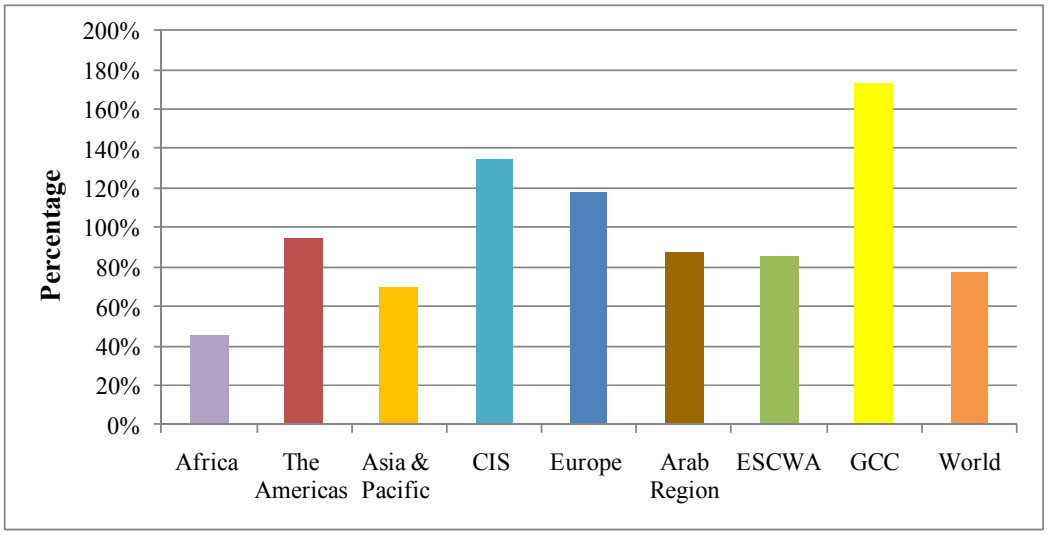
TABLE 90. MOBILE PHONE PENETRATION RATES IN SELECTED REGIONS, 2010

Region	Mobile phone penetration (*percentage*)
Africa	45.2
The Americas	94.5
Asia and Pacific	69.2
CIS	134.8
Europe	117.7
Arab region	87.4
ESCWA	85.7
GCC	173.3
World average	78.0

Source: Compiled by ESCWA based on data from ITU. 2011a.

When comparing regional mobile phone penetration rates, it is evident that the ESCWA region surpasses the Asia and Pacific region by a good margin, while drastically trailing behind Europe and CIS (at 135 per cent and 118 per cent, respectively). By stark contrast, the penetration rate of 173 per cent achieved in the GCC countries is by far the highest in the world. While the average in the ESCWA region is higher than the world average, the sector is expected to grow further as such countries as Lebanon, Qatar, Syrian Arab Republic and United Arab Emirates shun duopoly and opt out for competitiveness (see figure 30).

Figure 30. Mobile phone penetration rates in selected regions, 2010



Source: Compiled by ESCWA based on data from ITU. 2011a.

(c) *Fixed-line penetration*

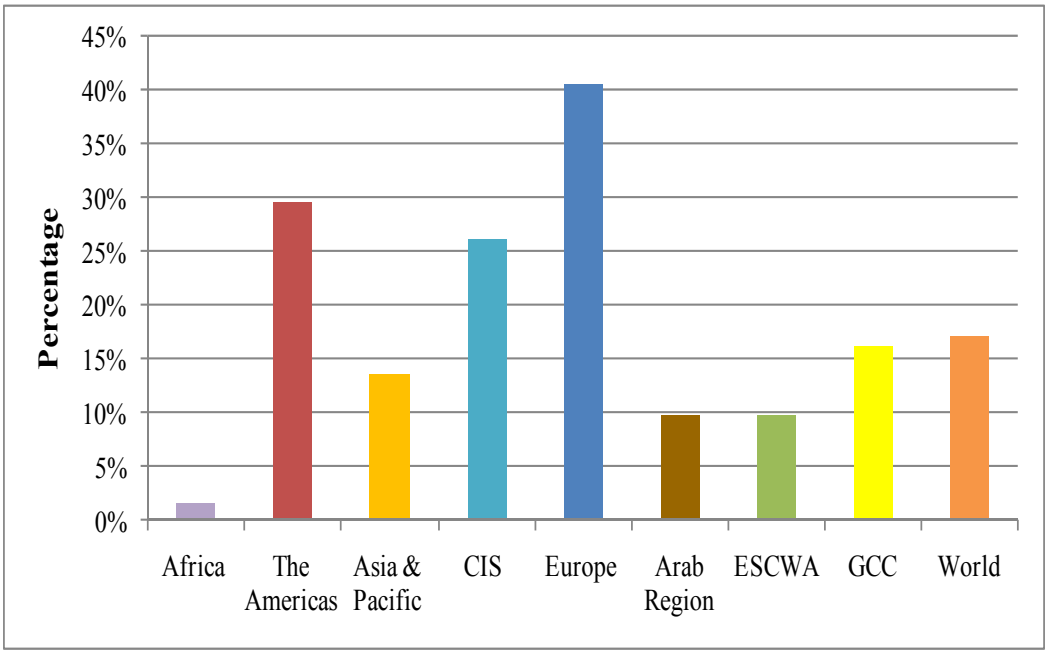
With regard to fixed-line phone services, ESCWA regional markets are becoming more competitive, albeit far less competitive than the mobile and Internet markets. The fixed-line penetration rate of the ESCWA region remains low at an average of around 10 per cent, which is well below the world average at 17 per cent. In fact, the region has been witnessing a steady decline in its fixed-line penetration rates; compared to 2008, this rate has declined by around 10 per cent, which is in line with a global trend as more people are substituting their fixed lines with mobile services. While GCC countries are on relatively higher ground with a penetration rate of 16 per cent, this rate is still far below that of such developed regions as the Americas and Europe, each approximately at 30 and 40 per cent, respectively. See table 91 and figure 31.

TABLE 91. FIXED-LINE PENETRATION RATES IN SELECTED REGIONS, 2010

Region	Fixed-line penetration (*percentage*)
Africa	1.5
The Americas	29.5
Asia and Pacific	13.6
CIS	26.2
Europe	40.7
Arab region	9.76
ESCWA	9.85
GCC	16.14
World average	17.2

Source: Compiled by ESCWA based on data from ITU. 2011a.

Figure 31. Fixed-line penetration rates in selected regions, 2010



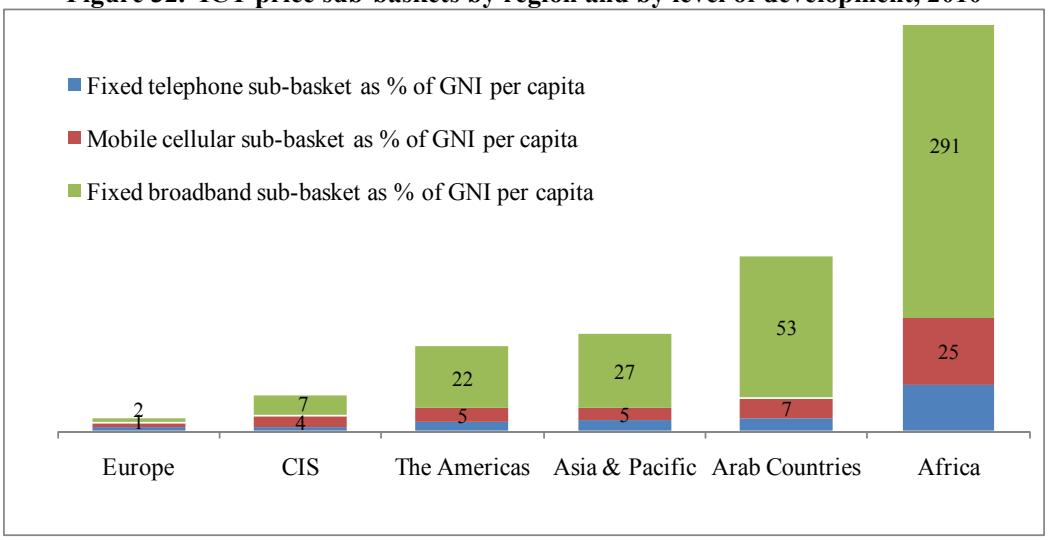
Source: Compiled by ESCWA based on data from ITU. 2011a.

3. *Performance of the ESCWA region in access to information and knowledg*e

Access to information and advocating knowledge sharing remain a challenge in the region. The challenge is only exacerbated by the emergence of the global knowledge society as most member countries have not yet recognized that knowledge and digitization of information are becoming factors of production and a driver for economic and social development. The disparity between ESCWA member countries in terms of access to information owes to a disparity in the availability of advanced ICT infrastructure, low Internet penetration rates, high access costs, and the limited availability of multipurpose community access centres in some countries. While the region is making some progress in this regard, efforts are still needed to enhance further accessibility to digital content.

One of the main impediments to access in the ESCWA region remains the low penetration rates of ICTs due to the high cost of services as compared to income levels. The IPB is a composite indicator published by ITU which measures affordability of three ICT services, namely fixed telephone, mobile cellular and fixed broadband Internet services. It is computed as a percentage of average GNI per capita and is considered an international benchmarking tool providing an indication of how affordable services are. Figure 32 clearly shows that the Arab region is the second most expensive region in the world when it comes to the cost of ICTs, only ahead of Africa. Moreover, it reveals that the monthly cost of fixed broadband Internet is the highest of all services in the region at around 53 per cent of the monthly GNI per capita, compared to 22 per cent in the Americas and 2 per cent in Europe.

Figure 32. ICT price sub-baskets by region and by level of development, 2010



Source: Compiled by ESCWA based on data from ITU. 2011a.

4. *Performance of the ESCWA region in ICT capacity-building*

Measurements of ICT capacity-building mainly reflect the use of ICT in education, training and literacy programmes, the status of research and development and the development of an enabling environment for innovation. To illustrate the situation in the ESCWA region, a number of criteria have been selected for comparison with other regions and countries.

Illiteracy is still widespread in the region, especially among women in the less-developed member countries. Despite great strides in fighting illiteracy, the region has one of the highest rates in the world, demonstrating that these countries have yet to benefit from the use of ICT to reduce prevailing high illiteracy rates.

Furthermore, spending on research and development and the number of working scientists in the region remain very limited and far below the world average. When comparing patent registration in ESCWA member countries with that in other countries (see table 92), the ESCWA region outperforms the Arab countries by a margin of 33 per cent, but lags behind Malaysia by a great margin. While the Gulf sub-region, whose average of 0.99 patents per million people exceeds ESCWA average, is ahead of Turkey (at 0.24), it slightly lags behind India (at 1.06) and is dramatically behind Israel (at 155.24).

TABLE 92. AVERAGE PATENTS PER PERSON: ESCWA REGION AND SELECTED COUNTRIES, 1999-2010

Country or region	Average number of registered patents (*per annum*)	Patents granted per million people (*per annum*)
ESCWA	48.25	0.20
Arab countries	50.92	0.15
GCC countries	36.33	0.99
World	170 548.42	25.14
Germany	10 441.83	127.12
India	1 211.58	1.06
Israel	1 134.50	155.24
Japan	35 047.58	274.44
Malaysia	101.00	3.74
Turkey	17.75	0.24
United States of America	87 784.25	288.71

Source: United States Patent and Trademark Office (USPTO).

5. *Performance of the ESCWA region in building confidence and security in the use of ICTs*

Most countries in the ESCWA region are working towards promoting and building confidence and security in the use of ICTs. While tangible progress has been achieved by some countries, disparities exist among others and initiatives remain scarce, insufficient and inefficient in most ESCWA member countries.

The region still faces major shortcomings in privacy, online security and data protection owing to the lack of comprehensive legislations and the inadequacy of available legal texts to govern impeding issues. However, almost all member countries have shown serious concerns for information misuse and securing e-transactions. Most member countries have promulgated e-transactions and e-signatures laws, while others are expected to follow suit in the near future. Despite the progress exhibited, the region lags behind the developed countries in terms of building confidence and security in the use of ICT.

6. *Performance of the ESCWA region in establishing an enabling environment*

Most developed countries as well as some developing countries have already modernized their legal and regulatory frameworks to meet new requirements brought forth by the advent of ICTs and their applications. While several ESCWA member countries have already started, during the past years, to enact laws aimed at building the information society, most are still at an early stage, lacking the implementation of serious Government services and the expertise and experience in ICT legislations.

Despite the exceptional performance of some ESCWA member countries in combating software piracy, the region still suffers from high piracy rates. The 2010 Software Piracy Study published by BSA and IDC indicates that pirated software accounts for 61 per cent of software in use in the ESCWA region, which is 1.5 times higher than the world average, at 42 per cent, and three times higher than the corresponding rate in North America (see table 93). Meanwhile, the software piracy rate of the GCC sub-region was lower than the ESCWA and Arab rates. Despite a recent drop in rates compared to 2009, software piracy is still a major problem in most ESCWA member countries, with the exception of the United Arab Emirates, which registered the lowest rate at 36 per cent.

TABLE 93. SOFTWARE PIRACY RATES IN SELECTED COUNTRIES AND REGIONS, 2010

Country or region	Software piracy (*percentage*)
North America	21
Western Europe	33
European Union	35
Asia and Pacific	60
Latin America	64
GCC countries	52
ESCWA	61
Arab region	65
Russian Federation	65
China	78
World average	42

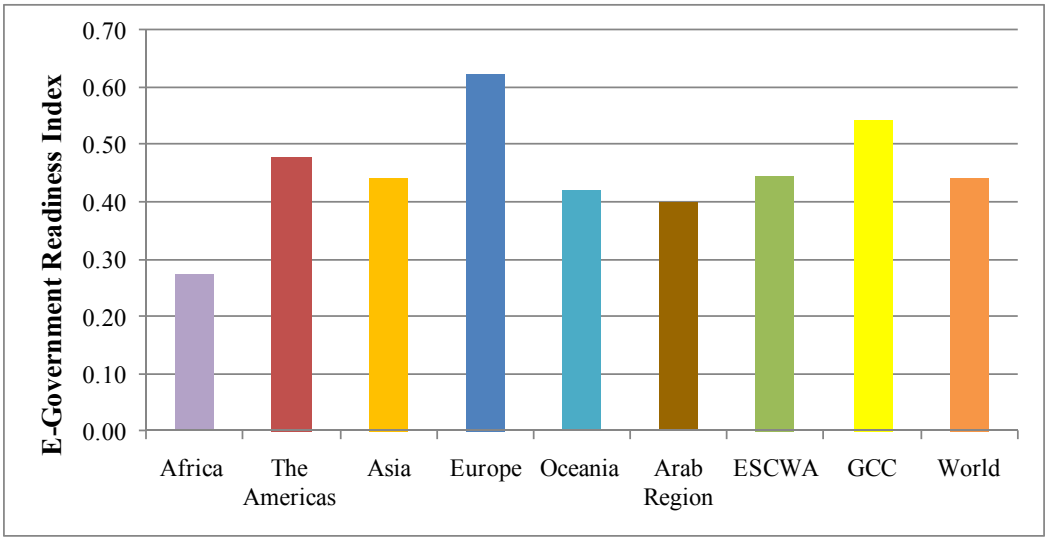
Source: BSA and IDC. 2011.

7. *Performance of the ESCWA region in ICT applications*

Most early efforts of the ESCWA region in developing and using ICT applications focused on e-Government implementation and e-commerce. Countries in the ESCWA region, like many others across

the world, have started their e-Government initiatives with a focus on providing information and services to their citizens through advanced delivery platforms, namely, dedicated Government web portal (see figure 33). All ESCWA member countries have now dedicated and interactive Government web portals, though at different levels of development and sophistication.

Figure 33. E-Government Readiness Index scores in selected regions, 2010



Source: DESA. 2010.

In such member countries as GCC countries, the focus of e-Government initiatives started to shift from the provision of services through integrated one-stop-shop portals to actively soliciting the views of citizens that can be used to design public services or to shape public policies. This is being achieved through the use of such advanced online participation tools as blogs, forums and social media applications.

The e-Government survey by DESA measures the implementation of online Government services for all member States and found that the E-Government Readiness Index score of the ESCWA region was comparable to the world average, at 0.44, albeit far lower than that of the Americas, at 0.48. However, the GCC region scored the second-highest average in the world, at 0.54, only behind Europe, at 0.62.

8. *Performance of the ESCWA region in cultural diversity and identity, linguistic diversity and local content*

As more people in the region enter the global communications system, a key issue is the accessibility of content, information and knowledge. Per capita, there are proportionally fewer sources of information available to Arab speakers than to other language groups in comparable regions. In order to empower the citizens of the region to make use of their growing capacity to communicate, several initiatives to promote the use of Arabic in digital media have been launched. Arabic web content has improved since 2008, when it accounted for only 0.3 per cent of total online content to around 2.1 per cent in 2011, thereby signalling a significant growth in the Internet content in the region.

Table 94 further shows that the Arabic language made the top-ten languages used on the Internet. While the Arabic language was ranked seventh on that list, it registered by far the highest growth rate among all other languages followed by Russian and Chinese.

TABLE 94. TOP-TEN LANGUAGES USED ON THE INTERNET, 2011

Language	All Internet users (*percentage*)	Internet penetration by language (*percentage*)	Language growth rate 2000-2011 (*percentage*)
English	26.8	43.4	301.4
Chinese	24.2	37.2	1 478.7
Spanish	7.8	39.0	807.4
Japanese	4.7	78.4	100.7
Portuguese	3.9	32.5	990.1
German	3.6	79.5	174.1
Arabic	3.3	18.8	2 501.2
French	3.0	17.2	398.2
Russian	3.0	42.8	1 825.8
Korean	2.0	55.2	107.1
Other languages	17.8	36.4	421.2

Source: Internet World Stats, available at: http://www.internetworldstats.com/stats7.htm, as of May 2011.

9. *Performance of the ESCWA region in the media*

Despite the diversity of media in ESCWA member countries, the role of the media remains weak in developing information societies. One of the findings of the report is that media freedom in all countries in the developing world is at its lowest level compared with developed countries. According to the 2011 Press Freedom Index, all ESCWA member countries trailed behind other such developing countries as India, but some scored better than Malaysia and Turkey. Social issues continue to be portrayed in a stereotypical way by most media outlets in the ESCWA region, unlike their coverage in developed countries of the world. However, the rise of social media application in the region and its impact on the civil movement in the region has been phenomenal. The quick adoption of such applications as Facebook and Twitter is expected to have more impact in the future on the freedom of expression, the participation of citizens and democracy (see table 95).

TABLE 95. RANKING OF ESCWA MEMBER COUNTRIES ON THE PRESS FREEDOM INDEX, 2011

Country or territory	Global ranking	Selected countries	Global ranking
Lebanon	108	Finland	1
Kuwait	124	Switzerland	7
Jordan	141	USA	17
Egypt	146	Israel	61
Qatar	148	Hong Kong	70
Iraq	150	India	77
Oman	156	Turkey	112
United Arab Emirates	156	Malaysia	143
Bahrain	159		
The Sudan	168		
Palestine	177		
Saudi Arabia	177		
Yemen	177		
Syrian Arab Republic	181		

Source: Freedom House. 2011. *Freedom of the Press: Signs of Change Amid Repression*.

10. *Performance of the ESCWA region in regional and international cooperation*

Despite the importance of international and regional cooperation, it is difficult to measure what has been achieved in this regard by different countries and regions. Consequently, it is difficult to make quantitative comparisons between the level of cooperation in the ESCWA region and that in the rest of the world.

The critical importance of regional and international cooperation for capacity-building in developing countries is underlined by MDG 8, which calls for developing a global partnership for development. Some of the targets set for attaining this Goal focus on developing strategies to create decent and productive job opportunities for youth, spread the benefits of modern technology, address the special needs of the least-developed countries and increase official aid for development. Despite falling into the least-developed countries category, Yemen and the Sudan receive very little aid relative to other ESCWA member countries, especially Jordan, Iraq and Egypt, and not nearly enough to meet their dire needs for development. Hence, it is necessary to increase the amount of aid pledged to the least-developed countries and to intensify projects and initiatives, especially regional ones, in order to help the development of these countries.

11. *Performance of the ESCWA region in achieving MDGs*

The UNDP HDI is an international standard for measuring national development and is linked to the likelihood of achieving the MDGs. The ESCWA region scored slightly higher than the world average, at 0.624. Specifically, its index score of 0.665 translates into a medium level of human development assessment. Latin America and the Caribbean region (at 0.704) fared slightly better than the ESCWA region on HDI, but the gap widens when the region is compared with the countries of the OECD (at 0.879), Israel (at 0.872), Cyprus (at 0.810) and Malaysia (at 0.744). Even GCC countries, whose sub-regional average of 0.788 topped the ESCWA region, had lower scores than those of the developed non-OECD countries (see table 96).

TABLE 96. HUMAN DEVELOPMENT INDEX (HDI) FOR SELECTED COUNTRIES AND REGIONS, 2010

Region	Human Development Index
ESCWA member countries[a/]	0.665
Arab countries[a/]	0.588
GCC countries[a/]	0.788
OECD countries	0.879
Developed non-OECD countries	0.844
Latin America and the Caribbean	0.704
World	0.624
Other countries	
Israel	0.872
Cyprus	0.810
Malaysia	0.744
Turkey	0.679

Source: UNDP. 2010.

Note: a/ The countries of Iraq, Lebanon, Oman, Palestine, and Somalia were excluded due to data limitation.

12. *Performance of the ESCWA region in building the ICT sector*

The ICT sector in the ESCWA region is a study in contrasts. Wide disparities exist in general levels of development, economic strategy and the adoption and use of ICTs. While some countries have taken a top-down approach, others have used market-based and laissez-faire strategies. In addition, such external forces

as exposure to the global economic crisis, changing commodity prices and political turmoil affect member countries in unique ways.

In fact, the ICT sector in the ESCWA region lacks its own autonomy given that it is still largely considered part of other such economic and service sectors as transport or media. Additionally, this sector remains a consumption-based rather than a production-based sector. It relies heavily on telecommunications, with very minimal contribution from software or professional service industries. Consequently, no real value added exists that encapsulates a genuine competitive advantage.

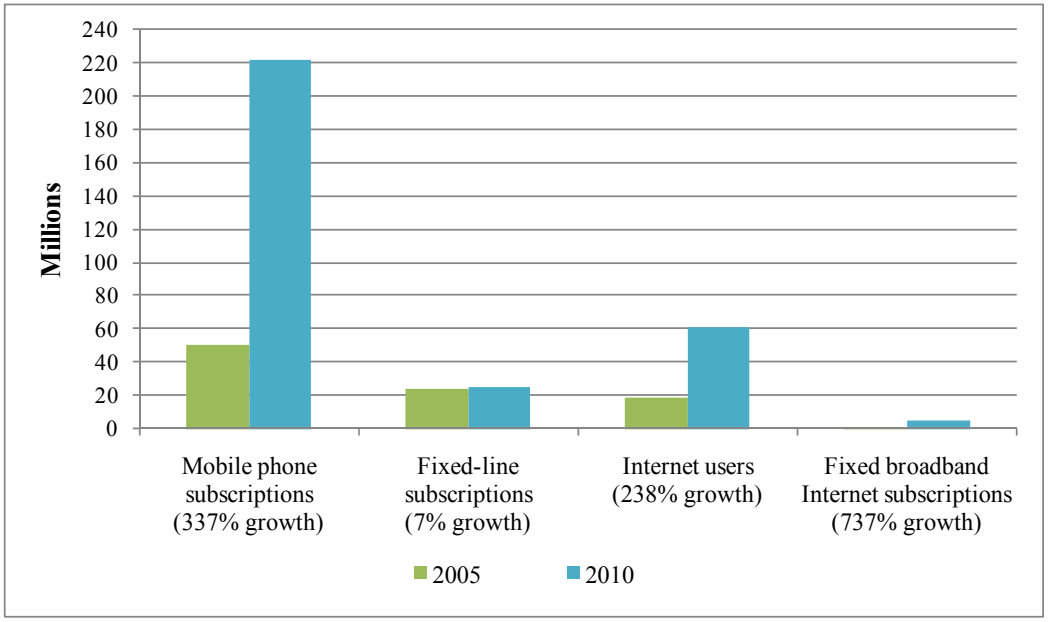
Countries in the ESCWA region still have many milestones to overcome in order to build a productive ICT sector and reach comparable levels with other developed nations. Despite the economic slowdown seen in the past two years, the future of the ICT sector in the ESCWA region remains bright. In fact, this sector enjoys high growth potentials, especially as oil-producing countries have sought to reduce their dependency on oil and invest massively in building an ICT industry.

C. FINDINGS AND RECOMMENDATIONS

The development of the information society in the ESCWA region encompasses many different facets and variables. Broad trends are very hopeful. Most countries are performing better today than six years ago. ICT adoption and use rates are higher, costs are lower and more attention is being focused on building the ICT sector.

The ESCWA region has taken significant steps towards bridging the digital divide and building the information society. Figure 34 shows that the prominence of ICTs has grown across the region, with dramatic increases in telecommunications penetration rates and mounting adoption of broadband technologies. Consequently, the region has witnessed an increasing adoption and use of ICT applications and e-services, and a greater participation of the Governments and all stakeholders in building the information society.

Figure 34. Growth of the ESCWA region in ICTs, 2005-2010



Source: ITU Database 2011, compiled by ESCWA.

In addition, significant investments are underway to increase integration with regional and global communication networks. These efforts will make it easier for ESCWA member countries to address such issues as access to information and knowledge, building capacity for regional integration and the availability of digital Arabic content.

While bright spots have been observed in realizing the information society in the region, the analysis presented in this report clearly indicates that GCC countries have made greater strides than the rest of ESCWA member countries in building information societies. Nevertheless, all ESCWA member countries, including the most advanced ones, still need to exert considerable efforts before reaching the levels attained by developed countries in this regard.

Beside the traditional applications of ICT for socio-economic development, creative solutions are necessary to achieve the MDGs. For many reasons, including armed conflicts and high population growth, the percentage of people living in poverty has increased in the ESCWA region over the past 15 years. While ICT has a key role to play in creating job opportunities and alleviating poverty, the difficulties of development in conflict-prone areas preclude any role for ICT for development, and require different priorities and focus. While much remains to be done, realistic options exist for making concrete improvements throughout the ESCWA region.

Based on the analysis and findings of this report, several initiatives and projects can be launched to reduce the existing digital divide between rural and urban areas, among ESCWA member countries, and between the region and the more developed regions of the world. Within that context, ESCWA is fostering support for important regional projects through its RPoA for Building the Information Society. The RoPA has been adopted by member countries, cognizant of the vital need to collaborate and synchronize efforts in order to reduce the digital divide and press forward towards the information society.

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