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United Nations Economic and Social Commission for Western Asia

# **NATIONAL PROFILE OF THE INFORMATION SOCIETY IN THE SUDAN, 2013**

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**ECONOMIC AND SOCIAL COMMISSION FOR WESTERN ASIA**

**NATIONAL PROFILE OF THE INFORMATION SOCIETY  
IN SUDAN**

United Nations  
New York, 2013

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## I. THE ROLE OF THE GOVERNMENT AND ALL STAKEHOLDERS

### A. NATIONAL INFORMATION SOCIETY POLICIES AND E-STRATEGIES

The quarter century plan (2007-2031) approved in 2007 has as objective the development of the information industry so that government institutions and civil society establishments will have the information background necessary for planning and decision making with the vision of a unified, secure, and developed Sudanese nation.

After the completion of the national strategy for information industry (2001-2006), a five year plan for the information society strategy (2007-2011), then (2012-2016), were adopted within the abovementioned quarter century plan according to the following policies:

- Diffusing the information society culture;
- Developing human resources working in this sector;
- Providing the legislations needed for the information society;
- Developing government administration and improving the governmental services' performance through the application of e-government;
- Providing the funding and its suitable methods for the implementation of the strategy;
- Creating partnerships and firm coordination and cooperation between the government, the private sector, and civil society organizations;
- Supporting and forming scientific research and technological development in the ICT sector;
- Developing, improving, and reducing costs of ICT access for the unprivileged segments of society;
- Connecting rural and distant regions of the country and enabling them to use ICT technologies;
- Increasing investment in the ICT sector and completely freeing it in addition to providing an attractive investment environment;
- Developing relationships with the international community through exchange of information, memorandums of understanding and so on.

|  |   |
|--|---|
| ICT strategy exists:                                       | Yes   |
| Year of adoption   | 2007  |
| Government Agency in charge (in English and Arabic)        | National Council for Strategic planning<br><a href="http://www.ncsp.gov.sd">www.ncsp.gov.sd</a> |
| Pace of implementation (Excellent/ Good/ Average/ Limited) | Good  |

### B. PUBLIC/PRIVATE PARTNERSHIP (PPP) OR MULTI-SECTOR PARTNERSHIP (MSP)

Freeing the Sudanese market and the telecommunications sector contributed to the building of several partnerships. The private sector is represented by two representatives in all national committees and work teams working on the national ICT strategies and plans. This was clearly shown in the e-government plan which stated that the Sudanese private sector is to be charged with the implementation of 20 per cent of the projects funded by foreign sources.

The Ministry of Electricity constructed several partnerships with the private sector in electricity distribution as Sudan works with electricity pre-paid systems as one application of e-payment. Six contracts

were signed in 2010 with private sector companies for e-sales over the internet and mobile phones and ATMs.

The Central Bank developed smart partnerships with companies such as EBS for the connection of the banking network, and adopted several e-banking solutions. The implementation of the mobile payment project began in 2011 and is expected to be operational in 2014.

There is an active partnership between the National Information Centre (NIC) and the four telecommunications companies to offer network connectivity between the ministries in the e-government program; it also links the heads of the provinces with the Prime Ministry. NIC and the Ministry of Higher Education have built a partnership with Huawei (Chinese company) to execute the e-university project, and a partnership with Turkish companies to construct the medical network linking all public hospitals with the ministry of health. The National Data Centre was opened in 2011 in the NTC Tower in Khartoum. The ICT chamber in the Union of Commercial Chambers was formed in 2010.

Portals which represent cities and towns increased over the last three years to exceed 2,000. , They are encouraged through periodic tournaments beginning with university Olympics and supported by civil society organizations working in the informatics field.

Here is a table of some of the Sudanese portals:

| Portal Name                           | URL  | Classification         |
|---------------------------------------|--|------------------------|
| The Blue Nile Network and Forum       | <a href="http://www.blue-nil.net">www.blue-nil.net</a>             | Social, cultural       |
| Encyclopedia of general documentation | <a href="http://www.tawtheegonline.com">www.tawtheegonline.com</a> | Documentation          |
| Sudan Network                         | <a href="http://www.sudan.net">www.sudan.net</a>                   | Social, Cultural, News |
| Rufaa Forums                          | <a href="http://www.rufaaonline.com">www.rufaaonline.com</a>       | Cities                 |
| Sudanese Al-Shabarga Forums           | <a href="http://www.alshabarga.com">www.alshabarga.com</a>         | Villages               |

### C. ROLE OF NON GOVERNMENTAL ORGANIZATION

Civil society organizations play an important role in pushing for an information society. Projects such as the e-citizen project allow citizens basic training in private sector training centres without paying, or a token is paid by their organizations or the municipal administrations. More than one non-profit organization has managed this program, including the Sudanese Information Technology Society and the Gedaref Digital City organization. This project played a good role despite the limited number of people that benefited from it. It has more than 4,000 trainees including teachers, free trades men, police officers, and physically disabled individuals all trained in the use of computer technology. There is an active role for youth and women federations in computer literacy as 200,000 people benefited from their fixed and mobile training centres. Civil society organizations also played an important role in the formation and introduction of information technology related laws such as the informatics crime law and the e-signature law. Several other IT civil society organizations with the National Federation of Sudanese Youth contributed to the administration of universal access centres funded by the Informatics Support Fund. The Sudanese Internet Society manages the Top-Level-Domain (.SD) in addition to holding workshops for the purpose of introducing internet technologies and standards.

## II. ICT INFRASTRUCTURE

The ministries of Telecommunication and Investment encouraged investment in infrastructure, this resulted in four phone operators, including three mobile phone operators (Zain, Sudani, and MTN), while Canar Telecomm in addition to SudaTel (which owns Sudani) offer fixed phone line services. There are two more phone operators from neighbouring African countries, but they are not licensed by the central government. The fibre optics network covered 22,000 km in 2012. This covers most of Sudan's provinces, and it is the longest network in the region. Remote areas are covered using 615 VISAT stations, 415 of these belong to SudaTel and Canar, and 164 belong to other companies and organizations.

In terms of the backbone connection, 35 federal ministries were linked through fibre optic networks within 15 provinces in northern Sudan. The most important usage is secure electronic connections, video conferencing with the cabinet, and VOIP.

The year 2011 witnessed the opening of the National Data Centre which hosts an archive of government data such as the Ministry of the Interior's national records and the various government websites. The National Data Centre opened the Sudanese Internet Exchange Point which won the ITU WSIS award for information and communication infrastructure in May 2012.

**Table 1. Phone Networks Capacity and Subscribers (in Thousands)  
according to the National Telecommunications Corporation**

| years                                  | 2003       | 2004       | 2005       | 2006        | 2007        | 2008        | 2009        | 2010        | 2011        | 2012          |
|--|------------|------------|------------|-------------|-------------|-------------|-------------|-------------|-------------|---------------|
| Network total capacity                 | 1738       | 1965       | 2024       | 2564        | 2734        | 2734        | -           | -           | -           | -             |
| Fixed Line Subscribers                 | 936        | 1027       | 670        | 570         | 583         | 385         | 352         | 545         | 484         | 425           |
| Mobile Line Subscribers (in thousands) | 527        | 1050       | 1866       | 4729        | 8214        | 10373       | 15340       | 18122       | 24106       | 28416         |
| Fixed and Mobile Lines Subscribers     | 1463       | 2077       | 2536       | 5299        | 8797        | 10758       | 15703       | 18123       | 24,590      | 28,841        |
| Population                             | 33600      | 34500      | 35400      | 36300       | 37500       | 39000       | 40000       | 40000       | 30894*      | 34000         |
| Teledensity (per cent)                 | 4 per cent | 6 per cent | 7 per cent | 15 per cent | 24 per cent | 27 per cent | 39 per cent | 45 per cent | 82 per cent | 84.8 per cent |

In 2011 South Sudan became independent and the population of the state was reduced by 8M people. In the education sector, 26 public universities and 41 university complexes are connected in a unified network. 90 per cent of these institutions are connected using fibre optics and 10 per cent use HSDSL technology. The most important application of this network is the virtual university library. 920 schools and 48 hospitals were connected to the internet within the SudaTel 2012 project. In the health sector, work on a health network began in order to connect the main public hospitals to the Ministry of Health in 2010. This project is being implemented with the cooperation of Turkey with the purpose of providing better health services by connecting health service institutions to electronic health systems that offer full medical profiles of patients as well as human resources and inventory administration of these institutions. There are many private sector systems connected to health insurance companies.

## A. MARKET STRUCTURE AND REGULATORY LANDSCAPE

We already cited the four operators in the telecommunications sector. Thabit is also on its way to acquire a license. SudaTel and Canar, the electricity company and several government units have constructed a 22,000 km long fibre optic network. Mobile phone companies offer their services in 3.5G and 3.75G technologies. Freeing the mobile market sparked a great competition causing reduction in fees and to the creation of promotional packages to the benefit of citizens. However, the NTC (National Telecommunications Corporation) and the public still demand further reductions in phone call and internet costs.

|                           | Please specify whether service is competitive, duopoly, or monopoly |
|---------------------------|---|
| Mobile Telephone Services | Competitive   |
| Fixed Telephone Services  | Competitive   |
| Internet Services         | Competitive   |

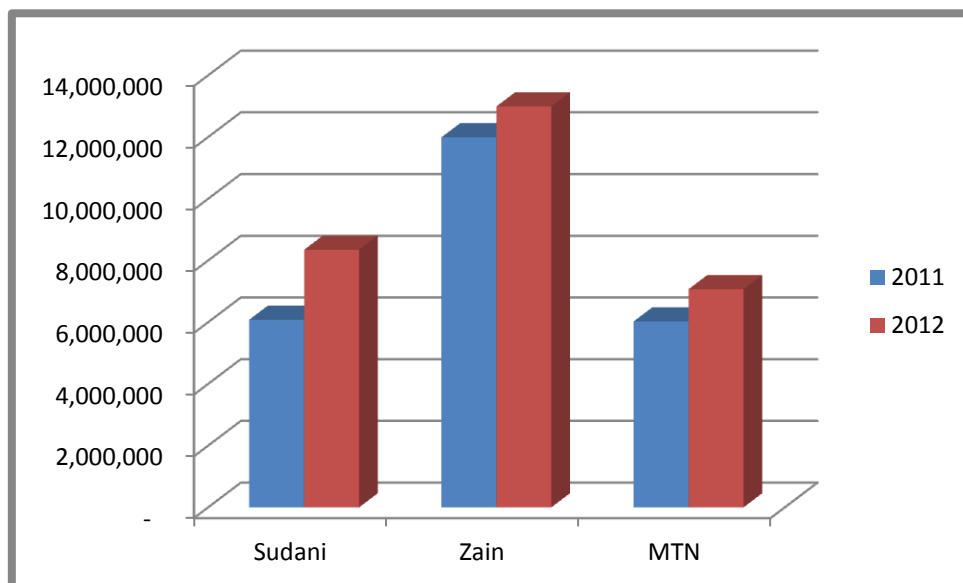
### Telecommunications Market Distribution

| Services                        | Operator     | Number of Subscribers |                   |                   |
|---------------------------------|--------------|-----------------------|-------------------|-------------------|
|                                 |              | 2010                  | 2011              | 2012              |
| Fixed Line                      | Sudatel      | 62,330                | 171,337           | 107,816           |
|                                 | CANAR        | 15,463                | 312,280           | 316,770           |
|                                 | <b>Total</b> | <b>77,793</b>         | <b>483,617</b>    | <b>424,586</b>    |
| Mobile Phone                    | Zain         | 10,249,505            | 11,995,000        | 12,994,000        |
|                                 | MTN          | 3,474,879             | 6,028,000         | 7,072,000         |
|                                 | Sudani       | 4,320,328             | 6,083,008         | 8,350,000         |
|                                 | <b>Total</b> | <b>18,044,712</b>     | <b>24,106,008</b> | <b>28,416,000</b> |
| <b>Fixed &amp; Mobile Total</b> |              | <b>18,122,505</b>     | <b>24,589,625</b> | <b>28,840,586</b> |

## B. PENETRATION OF ICT SERVICES

The figure below indicates the overall growth of mobile phone subscribers, reflecting a quick growth in the telecommunications sector. By the end of 2012 there were 28 million subscribers.

**Fig. 1. Growth of Phone Subscribers by Company**





- Most of the states are covered by mobile phone services, remote areas are covered with VISAT and GMPCS. Sudan is the largest GMPCS market in Africa and the Arab world. There are several other networks which allow data transmission with technologies such as Frame Relay / ATM / DSL / G / MDSL/EVDO/G;
- Data transmission networks cover all the regions with fibre optics and wireless networks;
- There are several fixed-line wireless technologies such as microwave, Wi-Max, and Wi-Fi networks;
- The greater telecommunications companies own the microwave network, Zain owns 2,000 links;
- There are private companies which offer internet via Wi-Max, which are Jet Net and Vision Valley.

Both operate in the state of Khartoum. All four phone operators offer internet services in addition to Vision Valley and Jet Net.

Use of computers increased steadily over the last few years. According to the estimate its penetration increased from 11.25 per cent in the year 2009, to 13 per cent in 2010. In 2011 the number of computers reached 5,200,000 and in 2012 the computer penetration reached 14 per cent.

#### C. INITIATIVES/PROJECTS FOR ICT INFRASTRUCTURE AND DEVELOPMENT OF NEW SERVICES

Despite the continuous increase in internet usage and computer penetration, the current situation does not fulfil the ambitions of the parties involved. E-content in government websites is still mediocre, designing procedures is still stalling in many websites, which necessitates initiatives with partners to benefit from the good available infrastructure.

In the third quarter of 2010 Sudan Post put forward an initiative to activate public access centres available in the provinces to serve postal work in addition to other training purposes and internet access. The Chinese government sponsored the electronic university project in 2010 with the purpose to link universities and develop virtual libraries and establish distinction centres for scientific research development. The Africa City of Technology was formed as a technological oasis for the development and sponsorship of advanced technology projects. Its most important projects include: the biotechnology park, the Cyber Park, the Hi-tech park, knowledge park, business park, edutainment park, technology business incubator, medical tech, mining park, material park, aerospace tech, global villages among other projects and themes.

#### D. ICT CONNECTIVITY

To reach the information society, the national strategy integrated networks, equipment, and content. Furthermore, investment in telecommunications infrastructure was encouraged, and an initiative was launched for providing 1 PC per family and making internet access easier in all the country's regions. The content industry is crystallizing although it is below the desired level, the government is striving to encourage government administrations, civil society organizations, student sectors to improve Internet penetration which will eventually aid in building e-content and providing the knowledge and resources.

Canar and SudaTel are working for the implementation and use of 3G technology as well as replacing some of the digital switchboards with soft switch operators and media gateways. Line based phones were replaced with Limited Mobility Phones with the CMDA system. SudaTel is now developing the technologies it uses and is heading towards the use of LTE networks.

#### **Number of Switchboard in other Telecommunications Companies**

- |          |                 |
|----------|-----------------|
| ▪ Zain   | 20 Switchboards |
| ▪ MTN    | 10 Switchboards |
| ▪ Sudani | 4 Switchboards  |

## Types of Services based on the National Telecommunications Corporation report

| Service Types     | Number of Licenses | Operating Now |
|-------------------|--------------------|---------------|
| ISP-Public        | 21                 | 4             |
| Pre-Paid card     | 17                 | -             |
| Voice Mail        | 1                  | -             |
| IVR/SMS           | 73                 | 27            |
| AVL               | 13                 | 6             |
| Technical support | 79                 | 22            |

There are 99 private active internet networks in Sudan. Internet services which use Wi-Max technology are offered by Vision Valley and Solanco companies in Khartoum. Four other companies offer mobile network services as already mentioned

### E. INTERNET INFRASTRUCTURE

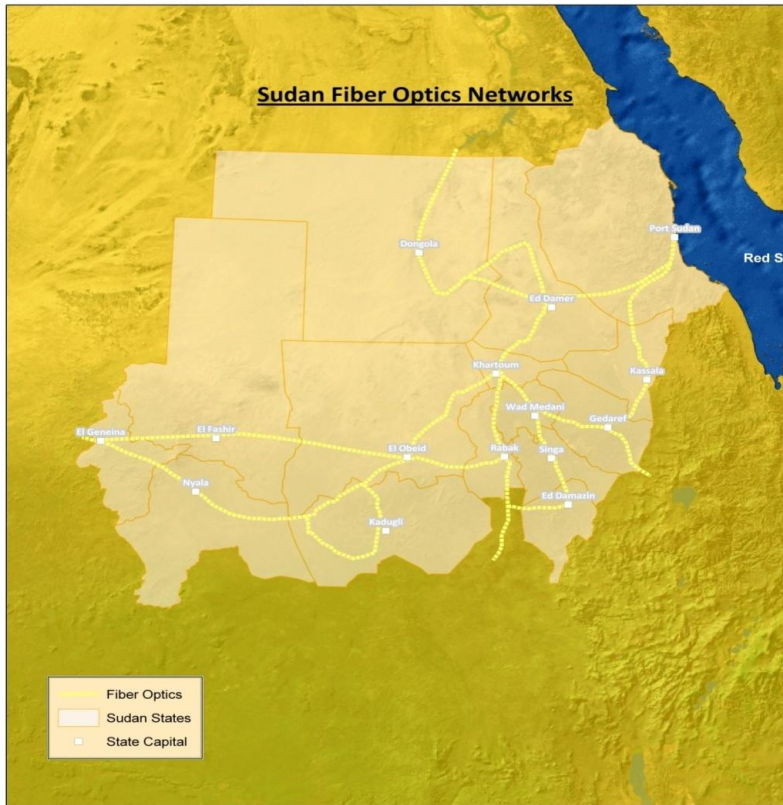
Internet services in Sudan began in 1998 as a joint stock company between Sudanese TV & Radio and SudaTel, it offered its services using dial-up technologies. After licensing private companies, they were permitted to use broadband wireless services in addition to conventional technologies. In 2007 the use of 3G services (UTMS and CMDA-EVDO) allowed a great and intensive penetration of the service all over the country, all companies now offer their services using 3.5G technologies.

This development was accompanied by providing large capacity and high speed internet services through marine cables instead of satellites as a marine cable linked to the global FLAG and EASSY cables was implemented.

Despite granting licenses to many internet service providers over the years, very few of them remain active. This is because public telecommunications networks offered high speed and multi-packaged internet services directly to subscribers, also the waning of the use of fixed line phone services and the great penetration of mobile services contributed to the decrease in the number of internet providers.

As the penetration of internet services is below the desired level, the National Telecommunication Corporation is remedying the situation through developing efficient policies and regulations which would increase the level of internet services penetration and their access at high speeds and competitive prices. IPv6 was adopted with seven training courses in addition to two workshops given in 2011-2012.

Although the fibre optics network expanded to cover all provinces of Sudan, the prices remain high even after all the successive price reductions and competition between the providers. The National Telecommunication Corporation is striving to reach a flexible formula with the operators which provide internet with higher capacities, lower prices, and wider penetration.



**Produced by National Telecom. Corporation**  
**Last Update: June2012**



In an effort to stabilize the banking systems network, most banks use more than one fibre optics network, acquiring one main lease line and another backup line from another operator, using Wi-Max at times as three phone operators own circular networks in and around Khartoum, making the connection to the other regions easy.

The Ministry of Telecommunications and the Electricity Company signed an agreement which allows the use of electricity transmission lines to transfer data over the country and to the remote regions in it.

**(.sd) Subscribers**

| <b>Sudan Domain Users</b> |             |             |
|---------------------------|-------------|-------------|
| <b>Domain</b>             | <b>2011</b> | <b>2012</b> |
| .sd                       | 717         | 1056        |
| gov.sd                    | 210         | 295         |
| edu.sd                    | 65          | 77          |
| org.sd                    | 43          | 52          |
| com.sd                    | 188         | 245         |

### **III. ACCESSIBILITY TO INFORMATION AND KNOWLEDGE**

#### **A. PUBLIC DOMAIN INFORMATION**

In order to ensure the accessibility of public domain information, government agencies publish data which is of interest to the public on their websites, such as the Statistics Central Agency which publishes its annual statistics book on its website, and the Sudan Central Bank which also publishes its yearly report and a large number of statistics and transaction procedures on its website. The Geological Research Authority, the Ministry of Energy, the Ministry of Finance, and a limited number of government websites have become interactive.

In December 2010, the first tender for the development of the Sudan electronic portal was offered to the private sector, a survey was undertaken to determine the volume of services which can be offered electronically. Also a survey was conducted in 2012 to determine the indices of family members whose age is 15 years old and above, their internet access and ICT usage. This survey was conducted by the National Telecommunications Corporation with the cooperation of the Central Bureau of Statistics.

#### **B. ACCESS TO INFORMATION AND PUBLIC INFORMATION**

Many banks offer banking services over the phone, mobile phones, and internet portals. Private sector companies, with the collaboration of the main providers and some of the media companies have all agreed on providing media services using SMS.

In the higher education sector the virtual university library which contains the university references, dissertations, and research from 26 universities was implemented. The Central Archives began to digitize their documents to offer some of them on an e-portal. Several government administrations made laws, procedures, documents and forms available on their websites.

#### **C. INITIATIVES/PROJECTS FOR ICT INFRASTRUCTURE AND DEVELOPMENT OF NEW SERVICES**

The Ministry of Telecommunications adopted the universal service and universal access policies and purposes, embodied in offering an affordable means of telecommunications within 5-10 km of any residential agglomeration.

In order to achieve these policies and purposes, the National Telecommunications Corporation has taken the following steps:

- 1- Licensing contracts with telecommunications companies include clauses in the domain of universal service and universal access. These commitments cover cities, villages, rural areas, the coverage of the national highways, and to develop universal service centres in all the states, linking them through the suitable fixed line or wireless means;
- 2- The formation of the ICT Fund to provide the suitable financial means to adopt the programs and projects needed in this domain.

The efforts of the telecommunications companies active within the framework of the licensing contracts constructed an advanced infrastructure using modern technologies which allowed a nation-wide penetration and a steady increase in the number of subscribers as they reached 15.7 million in 2009 and more than 18 million in 2010. Tele-density increased to 84 per cent and a wide range of services and advanced electronic applications are being offered.



## **IV. ICT CAPACITY BUILDING**

### **A. ICT IN EDUCATION AND TRAINING**

The Ministry of Education incorporated the study of computers in elementary schools with the collaboration of the Ministry of Telecommunications. It established 1,200 computer labs equipped with more than 23,000 PCs for secondary schools. It also prepared an integrated curriculum for training teachers, and this, in turn, undergoes continuous development although the ministry lacks the means to develop this program.

Computer literacy projects were organized in several ministries and government administrations. The one PC per family, one PC lab per school, and one laptop per university teacher projects have made great progress as more than 100,000 computer units have been distributed within them. Four private sector companies are developing educational computer programs using multimedia technologies.

169 universal access centres were established nationwide administered by computer-related fields' graduates, and in 2010 this was handed to Sudan Post, the Sudanese mail commission.

The Sudan Open University is a pioneer in distance learning in Sudan; it uses audio-visual multimedia means to transmit its curricula to its students which are distributed all over the country. Sudan TV offers educational programs for final year students in both the elementary and secondary levels.

The curricula department had adapted the e-class system produced by the Rawaq Company for educational services in which cartoons and multimedia were used to present lessons to secondary level students. This system was tested in 2011-2012 in the South Kurdufan province. This had a great impact on the students' performance which encouraged many provinces to use it, most notably the five provinces of Darfur.

### **B. TRAINING PROGRAMS FOR CAPACITY BUILDING IN THE USE OF ICT**

The electronic citizen project and digital literacy projects were organized in several states under the sponsorship of the ICT Fund. But the low number of beneficiaries is below the aspirations of the government. Courses for international certificates were offered. The project of appointing all new government jobs recruits only after attaining their Sudan Computer Drivers License (SCDL) was approved. The program for enabling women in the Ministry of Social Welfare has begun, having digital literacy as one of its priorities.

The National Training Program opened 94 computer training centres and 169 universal access centres in the provinces.

The program for enabling women in the Ministry of Social Care is preparing a study to identify the aspects of the shortcomings in women's training and enablement programs. In the youth development domain, the National Federation of Sudanese Youth offered more than 1,000 courses in 2010 in all ICT fields and all over Sudan.

## C.

### V. BUILDING CONFIDENCE AND SECURITY IN THE USE OF ICTS

As the government moves to using electronic systems, the sensitivity of network security becomes increasingly urgent. The National Information Centre formed the Information Security Department, and the Ministry of Telecommunications formed research centres in the domain of information security, several private sector consultancy centres held workshops about his issue.

The National Telecommunications Corporation formed the Sudan Information Security Centre (CERT) with the vision of “For a safe electronic society”, and the objective of protecting the citizens from any ICT hazard. The National Emergency Response Team sprang from this centre in 2010. It is hoped that the centre would be the first to respond to any information security incident to direct the parties involved on how to protect their networks, and to be the consultation party for the citizens and the companies concerning information security before or after any informatics crime takes place, it is part of the responsibility to track offenders and hand them to the authorities to be tried according to the present laws. This centre is also the national agency for raising security competence for companies, establishments, and all national facilities which use ICT so as to protect them from computer crimes.

This centre is the national commission charged with increasing security efficiency (data and network security) for companies, organizations and all national facilities which use ICT and protecting them from cyber crime. According to the 2007 informatics law, the Ministry of the Interior formed a commission to counter cyber crime.

#### A. USE OF ELECTRONIC TRANSACTIONS AND DOCUMENTS

After the approval of the e-transactions and the informatics crimes laws by the cabinet, and putting the technical aspects relating to it into effect, the pace of using e-transactions gained increasing momentum which made awareness of the security affairs relating to it more pressing. There are currently more than 5,000 e-purchasing points, in addition to more than 400 ATM points, and these are steadily increasing.

#### B. ONLINE AND NETWORK SECURITY

With the practical increase of internet usage in transactions, network security is a very pressing issue. The Ministry of Telecommunications formed R&D centres in information security, the Information Security Department in the National Information Centre works on security strategies, policies, standards, and plans for networks according to the quarter century development plan.

#### C. PRIVACY AND DATA PROTECTION

The Sudan Electronic Crime Law and the e-transactions law which were both issued in 2007 guarantee the protection of data from privacy, but awareness of the meaning of privacy is still mediocre with most of the amateur users in the public and private sectors, which is a serious situation which the government and the civil societies both have to deal with.

#### D. COUNTERING MISUSE OF ICTS

The government is acutely aware of the dangers of electronic crimes; in addition to the laws cited above, some agencies plan to offer a draft for a law on the procedures of electronic crimes. Civil society organizations offer awareness programs concerning IT abuse. Sudan witnessed some rare electronic crimes which were countered by the security departments, the presence of both an early alarm and a preventive body were crucial in this aspect.

## VI. ENABLING ENVIRONMENT

### A. LEGAL AND REGULATORY ENVIRONMENT

In 1993 the telecommunications sector was freed, there are four operators in the country at the moment. In 2001 the National Telecommunications Corporation was formed as a telecommunications and information and internet organizing body, the ICT Fund was founded in 2003 with great incentives for investment in the IT sector, the state lifted the customs from PCs and their accessories.

Sudan has known the protection of intellectual property for a long time, as was the case for trademark protection, patents are registered in the general secretary's office, with publishing the patent in the official newspaper clarifying that this patent is an exclusive investment right for the advertising party, and that legal procedures would be taken against any party which transgresses this patent. In 1971, the first patent protection law was enacted, and in 1981 the executive list was issued to organize affairs of intellectual property, author copyrights, and all similar issues.

In 2007, the laws for e-transactions and informatics crimes was passed, the law included e-transactions, e-contracts, e-signatures, e-checks, and the formation of the National Committee for Digital Certification.

|                                       |     |
|---------------------------------------|-----|
| e-transactions law available (yes/no) | Yes |
| e-signature law available (yes/no)    | Yes |
| Management of PKI available (yes/no)  | Yes |

### B. DOMAIN NAME MANAGEMENT

The National Telecommunications Corporation is the authorized party to grant licenses to ISPs and to manage Top-Level-Domain names. The Sudan Internet Society registers the Sudan domain names (.sd) under the supervision of the National Telecommunications Corporation.

|   |   |
|---|---|
| Name of ccTLD registrar   | <i>Name in English: Sudan internet Society</i><br><i>Name in Arabic: الجمعية السودانية للانترنت</i> |
| URL of registrar  | <i>(http://isoc.sd )</i>  |
| Total Number of ccTLD registered in the country for the years 2008, 2009, 2010, 2011, 2012. | <i>7,154</i>  |

### C. STANDARDIZATION IN ICT

The National Telecommunications Corporation is the party responsible for the unification of standards. The corporation prepared a number of standards for transmission networks, satellite telecommunications, frequencies, offering licenses of manufacturing and implementation permits.

The NRC organizes many workshops and forums about awareness on international and Sudanese standards.

#### **The Most Important Workshops for the year 2012**

| Workshop Name               | Place                |
|-----------------------------|----------------------|
| Hardware Standards Workshop | NTC Tower - Khartoum |
| Software Standards Workshop | NTC Tower - Khartoum |



#### D. ICT INVESTMENTS AND GOVERNMENT-SUPPORTED FACILITATION MEASURES

Sudan universities entered into partnerships with the private sector (banks in particular) to construct technological incubators. The University of Khartoum and the Sudan University of Science & Technology as well as the International University of Africa are all examples of this. The Association for Promotion of Scientific Innovation which holds an annual award for innovations and inventions launched the Africa City of Technology to be a base for business, knowledge, and technology offering infrastructure and facilitation to attract international companies working in technology-related fields, it also aims at attracting people with new and distinguished ideas to actualize their ideas and offer the environment to receive and sponsor distinguished ideas and projects.

The central bank formed a unit to sponsor small projects, directing commercial banks to do the same with no less than 12 per cent of the funds allocated in the banks to encourage innovation and productive projects.

The investment law active in the country considers IT services projects all across the provinces. Strategic projects which are exempt from profit taxes for a period of ten years, they are also exempt from customs.

## VII. ICT APPLICATIONS

### A. E-GOVERNMENT

- Computerization of Public Administrations: The Nile Centre developed ERP systems on open-source programs. several government administrations have implemented it and several companies have circulated general computer products to the market.
- Computerization of the Sudanese Customs: the Sudan Customs is currently working using the international customs system ASYCUDA and some systems for its internal processes.
- Computerization of revenues and taxes systems: the Tax Chamber began a serious study on the computerization of its operations in 2008, linking its branches in all the regions of the country and integrating this system into the e-government system, committees for development of taxation were formed and the experiences of local and foreign experts to draw a roadmap towards computerization were used.
- An ambitious plan to digitize all the documents in the Central Archives (more than 40 million documents) is being implemented; this project is expected to reach its completion within five years.
- Digitization of the judicial authority systems: All judicial authority services have been digitized and are now offered through a unified e-portal to all the provinces of Sudan. Based on this system the electronic archiving of judicial documents and land property documents has begun.

#### *E-Government Solutions*

- G2G Solutions: The government network is highly efficient, linking ministries and states and government forces which all communicate using e-mails and video conferencing, the government portal offers information concerning government performance and the news in addition to links to all the government administrations in the country. A unified e-government portal is being built now to offer information about Sudan and its government's bodies.
- G2C Solutions: for more than 10 years, the elementary and secondary school certificates exam results have been announced through the Ministry of Education's website. Four years ago, university registration began to take place through the Ministry of Higher Education's website, in addition to paying fees through banks.
- G2B solutions: Sea ports began dealing through their electronic portals to inform cargo owners of the status of their cargo and to clear the cargo electronically through the website for the companies and clearance firms subscribing to this service.
- E-procurement systems have not been used yet.

|   |                    |                       |
|---|--------------------|-----------------------|
| URL of e-government portal: <a href="http://www.Sudan.sd">www. Sudan.sd</a> |                    |                       |
| Information   | General            | Yes                   |
|   | Laws               | Yes                   |
|   | Directories        | No                    |
| Services  | Static Info        | Yes                   |
|   | Downloadable Forms | No                    |
|   | Interactive        | No                    |
| e-payment   |                    | No                    |
| Online account  |                    | Yes                   |
| Bilingual   |                    | Yes (Arabic, English) |
| Citizen Participation   | Blogs              | No                    |
|   | Polls              | Yes                   |
| Social Media  | Facebook           | No                    |

|                     |                                      |     |
|---------------------|--------------------------------------|-----|
|                     | Twitter                              | No  |
|                     | LinkedIn                             | No  |
|                     | YouTube                              | No  |
|                     | Other                                | N/A |
| Additional Services | RSS                                  | No  |
|                     | Web Statistics                       | No  |
|                     | Search                               | Yes |
| Mobile version      | Support for Smartphone/tablet        | No  |
|                     | Dedicated App (iOS or Android based) | No  |
| Other features      |                                      |     |

|  |   |
|--|---|
| Name of Authority in Charge of ICT in Public Administrations (in English and Arabic) | وزارة الاتصالات وتقانة المعلومات<br>The Ministry of Telecommunications and Information Technology |
| Name of e-Government authority (in English and Arabic)                               | المركز القومي للمعلومات<br>National Information Center  |

#### B. E-BUSINESS

E-business is still at its beginning stages in Sudan. No e-payment system is yet in effect, except through credit cards and those enabling citizens to pay some bills such as electricity bills, mobile fees bills, and university fees. The e-transactions law provided the legal coverage for many aspects of these transactions.

|   |     |             |      |
|---|-----|-------------|------|
| Availability of e-banking services (yes/no) | Yes | Law number: | 2007 |
| Availability of e-commerce law (yes/no)     | Yes | Law number: | 2007 |
| Availability of e-transactions law (yes/no) | Yes | Law number: | 2007 |
| Name other laws on e-services               | Yes | Law number: | 2007 |

#### C. E-LEARNING

Four companies, in addition to the Ministry of Education, participated in the computerization of school curricula using multimedia technologies, more than one company made them available online (such as Rawaq), a number of private schools formed their own websites.

All private schools contain computer labs for the elementary level education; public schools have computer labs for the secondary level.

|  |                                      |
|--|--------------------------------------|
| Student to computer ratio                  | 2.5 per cent for the secondary level |
| Percentage of schools with Internet access | 35 per cent for the secondary level  |

As for the universities, Sudan Open University uses the internet as a means to communicate with its students who are scattered all over the country applying distance learning in this respect, the Ministry of Higher Education approves its certificate. Due to the development of the university networks the virtual university library was developed, containing millions of references and research materials.

#### D. E-HEALTH

The University of Khartoum and teaching hospitals began using telemedicine in 2006 with health centres and medicine schools in distant states through fibre optics networks, the universities virtual library offers masters and PhD thesis (or at least their abstracts) online.

There are a number of medical websites which allow forums for doctors and health related university students. TV and radio stations offer health awareness interactive programs.

In the domain of early alert, the International University of Africa began a preliminary study to develop GIS early alert and disaster prevention systems.

In 2010, the electronic health network linking hospitals and providing patient affairs administration, and elementary health databases was launched.

#### E. E-EMPLOYMENT

Several websites are active in employment announcements with the cooperation of large employers in the economic field, the private sector companies active in telecommunications and the oil sectors recruit new employees through their websites. The government represented by the cabinet is registering Sudanese experts to make use of their expertise in their respective fields.

To make application for government jobs easier, and for increased transparency, The National Civil Recruitment Board automated application and competition for government jobs through its website ([www.sudarecboard.gov.sd](http://www.sudarecboard.gov.sd))

## **VIII. CULTURAL DIVERSITY AND IDENTITY, LINGUISTIC DIVERSITY AND LOCAL CONTENT**

### **A. USE OF ICT IN SUPPORT OF CULTURAL AND LINGUISTIC DIVERSITY**

Based on an initiative by the civil society organizations, several activities were held in 2008 with the purpose of digitizing the Sudan content. The objective of this initiative is to expand the presence of the Arab content on the internet through establishing an action plan for the Sudanese content, then devising standards to regulate this content, then to invent and encourage initiatives to this effect. Some of the initiatives in this direction are:

- The digitization of the Sudan newspapers initiative;
- The higher education initiative;
- The national archives digitization;
- The Media Production City.

### **B. LOCAL AND NATIONAL DIGITAL CONTENT DEVELOPMENT**

Social forums contributed to the development of the Sudanese digital content on the internet, there are weak initiatives to use CDs for this, but they are below the desired level.

Since 2000 there has been a consistent effort to turn university curricula into the Arabic language in Sudan, this greatly developed the academic content but it still needs plenty of refinement, the divisions relating to translation in the faculties of literature increased steadily, foreign investments in the country aided the demand for translators.

To extend culture into the poorer segments of society, administration units in the impoverished rural regions established satellite receiver equipped TV watching clubs, and universal access centres proliferated all over the country's states for internet services, photocopying, and training.

### **C. ICT SOFTWARE, TOOLS, AND R&D PROGRAMS IN ARABIC LANGUAGE PROCESSING**

Based on an initiative from the Ministry of Telecommunications, the Nile Centre for Technical Research was formed as a specialized search centre to encourage open source software production, designing several systems in the data secrecy and network security field.

## IX. MEDIA

### A. MEDIA DIVERSITY, INDEPENDENCE AND PLURALISM

There are no government owned newspapers, all newspapers are owned by independent establishments or political parties. The government administers the national TV and radio broadcasts; there are several satellite channels and independent radio channels.

| Media outlets         | Number | Language(s)      | Ownership |       |            |         |
|-----------------------|--------|------------------|-----------|-------|------------|---------|
|                       |        |                  | Private   | Mixed | Government | Foreign |
| News papers           | 24     | Arabic + English | 24        |       |            |         |
| Electronic newspapers | 2      | Arabic + English | 2         |       |            |         |
| Magazines             | 9      | Arabic + English | 9         |       | 2          |         |
| News agency           | 2      | Arabic           | 1         |       | 1          |         |
| Radios                | 34     | Arabic + English | 6         |       | 26         | 2       |
| Televisions           | 35     | Arabic + English | 7         | 1     | 27         |         |

The press law guarantees the freedom of the press according to the professional codes agreed upon in the media circuits. Social newspapers met a successful market as all segments of society discuss and comment on topics placed in them. Cultural columns discuss social phenomena carefully.

In terms of gender, a large percentage of active journalists in the country are women.

### B. THE MEDIA AND ITS ROLE IN THE INFORMATION SOCIETY

Each of Sudan's 17 provinces has its own TV and radio stations to cover local news, heritage and activities. The ratings these channels have are high within their local provinces.

Each newspaper, TV station, and radio station in Sudan has its own website, and the Sudanese people are generally ardent readers, this is why the rate of reading each copy of any newspaper is high, radio broadcasts has penetrated the entirety of the country, and there are watching clubs in the poor rural areas as already mentioned.

### C. CONVERGENCE BETWEEN ICT AND THE MEDIA

This convergence has become a reality since there are many entertainment and debate programs on the TV or the Sudanese radio, viewers interact using phone calls, SMS, or e-mails.

## **X. INTERNATIONAL AND REGIONAL COOPERATION**

### **A. FINANCING OF ICT NETWORKS AND SERVICES**

Sudan was able to attract several investments in the ICT domain, companies from Kuwait, China, India, and Korea invested more than US\$ 10 billion in infrastructure and services. Further investments in the telecommunications equipment and content are expected. Sudan launched several research centres and cities such as the Africa City of Technology which attracted several investments. A US\$ 44 million contract was signed with the Chinese company, Huawei, to implement projects relating to the National Information Centre.

### **B. INFRASTRUCTURE DEVELOPMENT PROJECTS**

Sudan has one of the best ICT infrastructures in the region, the government plans to make full use of this infrastructure through achieving as much internet penetration as possible, reducing its cost so that it would be feasible to all citizens, intensifying training, developing the rural regions and integrating people with special needs into the information society according to a number of initiatives with the participation of telecommunications companies and civil society organizations.

### **C. WSIS FOLLOW-UP**

Both the five year plans, ,2007-2011 and ,2012-2016, includes steps in preparation of the e-government plan completed in 2008, the current situation in terms of ICT equipment is being evaluated to ensure that the millennium goals are met.

Field surveys are being used to evaluate the digital gap, and research into the current situation in government agencies has been conducted (results did not yet appear), there are plans to survey ICT indicators and internet home use, then comparing these results to the requirements of the national action plan for building the information society.

The Central Bank is active through its arm, Electronic Banking Services Company (EBS) in offering mobile payment solutions.

### **D. PARTICIPATION IN INTERNET GOVERNANCE ACTIVITIES**

Sudan participated in the internet governance forum, and it began to publicize awareness of relative issues at an early stage through a number of specialized workshops and forums.





## XI. BUILDING THE ICT SECTOR

### A. ICT FIRMS

As already mentioned, four telecommunications companies are active in Sudan and the government owns 15 per cent of only one of these companies (SudaTel). A decision to sell the government's share so that it would completely separate from this sector has already been issued.

There are 800 companies working in the software development and computer services sectors, but these sectors are still weak. The government encourages them through a number of policies such as the IT investment law which is being prepared and which includes great incentives and facilitations. The e-government directives plan has approved the participation of the local private sector in a share of this project. The government also encourages the building of local alliances and foreign partnerships to support and develop this sector.

### B. GOVERNMENT FACILITATION

The ICT Fund finances the technical incubators and the ICT research centres; ICT project for Sudanese individuals takes place through the Sudan banks.

### A. CONTRIBUTION OF ICT SECTOR IN THE NATIONAL ECONOMY

The revenue of the telecommunications companies in Sudan reached US\$ 3 billion which attracted local, regional, and international investments to this domain. Some of the important, albeit indirect, effects of this sector on economic growth include the increase of employment opportunities, studies show that 6 per cent of the individual's increase in income comes as the result of using the internet and ICT related technologies. There are more than 8,000 individuals working in the telecommunications sector in 2011, other than the foreign workers benefiting from this sector.

### D. R&D AND INVESTMENTS IN THE ICT SECTOR

Sudan began constructing IT related research centres, the quarter century development plan includes plans to build distinction centres in universities, and to activate and support the work of incubators. Research centres, with European and Asian partnerships, produced their first products and are striving to develop and market them locally and internationally.

|  |     |
|--|-----|
| ICT research facilities (existing or planned?) | Yes |
| ICT industrial clusters (existing or planned?) | Yes |
| ICT incubators (existing or planned?)          | Yes |

### E. INVESTMENTS IN THE ICT SECTOR

The investment law has exempted IT companies in all of Sudan's provinces from customs and profit taxes for five renewable years, considering them strategic projects.