



Maldives

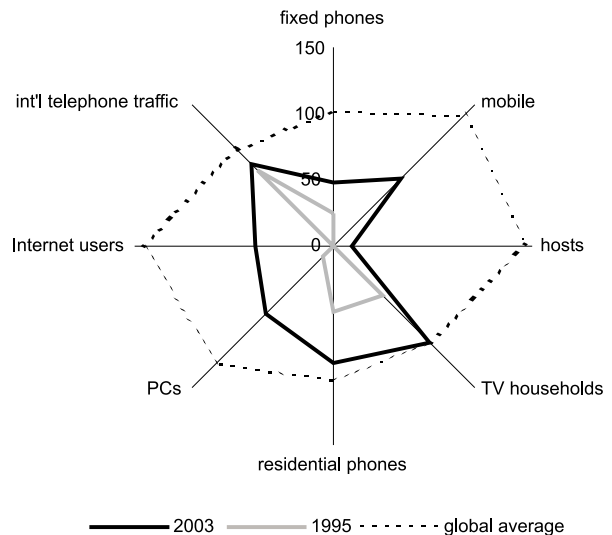
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Overview

The Maldives is an archipelago of about 1,192 low-lying coral islands, which cluster into over 20 atolls, spread over an area of 900,000 square kilometres in the Indian Ocean. A total population of about 270,000 resides on about 200 islands, and another 87 islands are exclusively developed as tourist resorts. Population density varies considerably across the country, with only 6 islands having more than 3,000 inhabitants and nearly 70 islands having fewer than 500. A quarter of the population lives on the island capital of Malé, where most of the country's facilities, services and opportunities are concentrated. Decentralisation away from Malé is hampered by a lack of basic infrastructure and a poorly developed inter-island transportation system.

The entry of computers into the Maldives can be traced back to the mid-1980s, when the first computer centre was set up at the Ministry of Planning, Human Resource and Environment (now Ministry of Planning and National Development). A minicomputer DG S120 was acquired and installed in the Computer Centre of the Statistical Section of the ministry through the support of UNDP. In the past decade or so, the Computer Centre has carried out all the data processing activities of the government. In addition, it assisted other government organisations in implementing their computerisation plans, including computer procurement, installation and maintenance as well as software selection. It also acted as the word processing centre for the Statistical Section. The responsibility for establishing a national computer centre was transferred to the Ministry of Communication, Science and Technology when it was formed in 1998. The National Centre for Information Technology was hence set up with the key role of guiding the adoption of IT standards within the government. Specifically, it will focus on four strategic directions for the government: standardisation of open systems interconnection, setting up of e-services, portability of applications, and adoption of government-wide open systems.

The partly state-owned telecommunications company Dhiraagu provides telephone and Internet connectivity across



Source: *Monitoring the Digital Divide*. © Orbicom 2004

the islands. Internet access on the remote islands is hampered by high costs and inaccessibility. In 2003, an additional licence was issued to a second ISP.

Owing to the flat terrain and the short distances between some of the islands, radio modems are often used for data transmission. Broadband services are available in Malé, while satellite services are utilised on the more remote atolls. The local script, Thaana, is used on several local websites. Websites related to the Maldives are visited extensively by tourists planning to visit the islands. Local users are mostly from the younger generation and balanced between males and females.

Given the challenges presented by the geographical dispersion of the country, the government views the adoption of e-government, along with its other initiatives to develop an ICT-enabled community, as a cornerstone of its strategy to narrow the digital divide and to deliver facilities, services and opportunities to all its people. In this regard, it has initiated a number of programmes, including the e-government initiative called the Information Technology (IT) Development Project, and is formulating a national ICT policy.

Content

Education

A number of programmes have been undertaken to deliver distance education to the people. The Non-Formal Education Centre has offered English courses through distance education for more than ten years for adults living on the atolls. The Tertiary Institute for Open Learning, part of the Maldives College of Higher Education, provides distance education programmes at the foundation and post-secondary levels. It also administers a Bachelor of Business degree and a National Diploma in Architectural Technology from the Open Polytechnic of New Zealand. Other courses include mathematics, physics and chemistry from the Indira Gandhi National Open University. Subsidised Internet access has

been provided to educational institutions, and computer studies have been introduced into the curriculum.

Health

Maldives enjoys one of the highest health standards in South Asia with declining infant, under-five and maternal mortality rates and increasing life expectancy at birth.

Under the infrastructure development programme, 15 health centres have been established, and 4 health centres have been upgraded to atoll hospitals. On 26 islands where these facilities are not available, health posts have been established to provide basic health services to island communities.

During the current national development plan period, the health information system has been strengthened with a focus on improving the vital registration system. Under this programme, a LAN has been established between the Health Information Research Unit of the Ministry of Health and the central hospital, Indira Gandhi Memorial Hospital. Also, computers have been provided to all healthcare facilities except the health posts.

The Ministry of Health runs a website (<http://www.health.gov.mv>) that provides information on the nutritional content of locally available fruits, information on communicable diseases, and a forum on reproductive health. The Indira Gandhi Memorial Hospital posts its doctors' duty roster on its website (<http://www.igmh.gov.mv>).

Fisheries

Since its inception, the Marine Research Centre has focused on research activities related to the development and management of marine resources. It also provides information on maintaining the health of the marine environment. Research at the centre is organised around four areas: inshore research (mariculture development, survey of reef resources, identification and cataloguing of economically important species); coral reef research (reef monitoring, Crown of Thorns research, management of coral mining, endangered species, cataloguing of marine invertebrates); offshore research (tuna biology and stock assessment, bait fish stock assessment); and fisheries technology (market studies, fishing vessel and gear development, product quality maintenance, technology transfer).

The Ministry of Fisheries and Agriculture publishes a daily fact sheet on the five best islands for fishing on its website (<http://www.fishagri.gov.mv>). Other content includes prices at the Malé fish market, fisheries laws and regulations, fisheries statistics, and services forms.

Mass media

Maldives has three daily newspapers and several weekly and fortnightly newspapers and magazines. All the dailies carry

content in both Dhivehi (the local language) and English. Most of the major local papers also have an online presence, such as *Haveeru Daily Online* (<http://www.haveeru.com.mv>), *Aafathis News* (<http://www.aafathisnews.com.mv>), *Miadhu News* (<http://www.miadhu.com>) and *Evening Weekly* (<http://www.eveningweekly.com.mv>). These news sites publish in both English and Dhivehi. Apart from reporting on the latest happenings in the country and internationally, they also include sports, the local weather, business news, a photo gallery and some video clips of interesting events.

The national Television Maldives is operated by the government, broadcasting for most of the day and night to all the islands. The Voice of Maldives, the government-operated radio service, is available throughout the country. Both these services broadcast in Dhivehi and English. The Voice of Maldives also broadcasts via its website (<http://www.vom.gov.mv>). Several cable television operators provide entertainment, sports and news packages.

Commerce and tourism

The exquisite resort islands of the Maldives, scattered across the Indian Ocean, have established a unique place in the global tourism market in a little more than three decades of operation. The tourism sector is a major source of foreign exchange and of local employment. The existence of the resorts has also facilitated the development of the telecommunications network and the energy system in the country.

The resorts require ready and reliable Internet access to enable them to stay in touch with the global market and at the same time offer their guests good communication links to the rest of the world. Increasingly, the resorts are providing online booking facilities, a move that will attract more business while reducing their dependence on external charter operators. To be effective, such online reservation systems require the capacity for credit-card payment over the Internet, which is not currently available in the Maldives. However, local banks and the tourism sector are working to create this capacity in the near future.

Besides the information published by individual resorts, tourists can also find on the website of the Maldives Tourism Promotion Board (<http://www.visitmaldives.com.mv>) a guide to the Maldives, its resort islands and cruise boat services, as well as links to all the resorts.

Energy

The Ministry of Communication, Science and Technology is tasked with formulating policies on energy, regulating the energy sector, and promoting the development of renewable energy. One of its major challenges is to establish an energy agency that will gather relevant data from major stakeholders and convert this information into a knowledge base for the purpose of medium- and long-term national and

organisational planning. A forecast of energy demand, as well as the resulting socioeconomic impact, will be made based on the analysis of present and past energy and macroeconomic data.

The observatory of the energy agency will create and manage a database and information system of energy, economic and environmental data to keep track of variables such as energy demand by sector, major sources of energy, economic variables (e.g. GDP) and social indicators (population, households, etc.). Since the country is small and the database will not be very large, it should be possible to carry out modelling and forecasting using simple spreadsheets. Proper analysis and presentation of the data will help the government to better plan energy supply and to educate consumers on the significance of energy supply, economic and environmental indicators. This information can be made available to registered members through an electronic medium and disseminated to others via the Internet.

Online services

The geographical dispersion of the Maldives makes the provision of basic services to all the inhabited islands a major challenge. The government, which is leading the initiation of online services, is therefore exploring the feasibility of providing online public services through the IT Development

Project. E-government will enable the provision of the same online services to the people living on the numerous islands, even remote ones, and allow them to participate in the policy-making processes.

The project will also explore the possibility of offering distance education and telemedicine to the atolls. To improve IT literacy, IT courses have been introduced in secondary schools. In addition, the Maldives College of Higher Education conducts ICT-related courses in its Faculty of Management and Computing. At present, a private hospital is offering telemedicine services to the public. However, its effort has been hampered by the lack of Internet connections that are fast enough to support telemedicine applications and are affordable.

E-commerce has enormous potential for this popular tourist destination. It can also help to enhance the operations of local businesses and promote industry development. To facilitate e-commerce, the IT Development Project is investigating the feasibility of an e-payment gateway to be operated in collaboration with local banks. Almost all the local tourist resorts have a website providing information on their services, but few offer online reservations. This is an area that needs improvement as it will give the resorts an edge.

Another initiative, the Digitally Empowered Development in the Island Communities, will see the provision of e-community services to the atolls.

Portals of empowerment

Most of the islanders of the Maldives are particularly isolated because of the wide expanse of ocean separating the islands. The islands are still economically dependent on Malé. As there is limited travel between islands, local traders and small businesses have little information about the resources, products, services and needs of the other islands. Furthermore, telephone calls between the islands are expensive. Internet access is not readily available, and even in Malé the cost of access can reach up to US\$3 an hour. Island dwellers therefore have few avenues to market their goods and services. The *dhoni* (local boat) schedule is often disseminated only by word of mouth. Similarly, information about educational opportunities and events on neighbouring islands is not readily available.

The Digitally Empowered Development in the Island Communities project is one of the initiatives designed to meet the information needs of islanders. The plan is to establish web portals that focus on community-related content: island profiles with basic statistics, profiles of small enterprises, art and handicrafts, events and activities, local resources, employment opportunities, and development programmes. Experiences of the communities will also be shared on the websites, and a bulletin board service will provide news about the communities. The establishment of public information kiosks on the atolls by the IT Development Project will enable more people to access the portals. The websites will give local businesses national and international exposure and enhance their access to external markets. They will also create awareness about the potential social and economic benefits of ICT use.

In order to ensure sustainability of the portals, the communities on two participating atolls are being trained in information and website management so that they can eventually update the websites locally. Stakeholder workshops for content development and capacity building are also conducted. The communities are informed about the portals through advertisements, discussions and meetings. The portals are expected to be sustained after the project period by funds generated from advertising and other services provided by the portals.

Industries

Hardware and software

Both internationally recognised computer brands as well as clones are sold in the country. Computer network solutions and services, mostly in the form of LANs, are also available.

Most computers use the Microsoft Windows platform. Indigenous software programs have supported the Thaana script for some 15 years. Now, Windows XP also supports the script, thus considerably increasing the potential for developing indigenous software and local content. Local software developers provide customised programs to both the government and businesses. The most common type of solutions developed is the software for operating retailers' point-of-sale machines.

Maldives IT Village

A feasibility study has been completed on the concept of an IT Village in the Maldives. It looked at the revenue that can potentially be generated through software development and IT-enabled services. Maldives is regarded as a good venue for IT investment because of its political stability, resort island environment, reliable telecommunications infrastructure and low crime rates. Additionally, it is an attractive tourist destination. The country has a young, educated population with 99 percent literacy. The plan for the IT Village is to provide the infrastructure and the environment required for IT companies to operate locally, regionally and globally from the Maldives.

Infrastructure

Telecommunications

Maldives has seen considerable development in its telecommunications infrastructure and services over the past decade or so. Beginning with virtually no telephones outside the capital, it has now developed a backbone infrastructure covering the whole country. Telephones are now available on all the inhabited islands.

Prior to 1988, the government provided national telecommunications services, while a foreign operator provided international telephone and telex services under a franchise agreement. This arrangement caused many problems, the most significant being the lack of funds to invest in infrastructure. The small market size and the dispersion of the population over a large area separated by the ocean posed great risk to any commercial investor.

In 1988, a joint venture company, Dhiraagu, was formed between the government and Cable and Wireless of the UK to provide national and international telecommunications services. The aim of this joint venture was to obtain the necessary expertise, experience and support from the foreign

partner to jumpstart and modernise the telecommunications operation so that the new company could be run commercially. The result has been an overwhelming success. The company started making profit and the quality of service improved with basically no additional financial support from the government.

The responsibility of providing universal service rests with Dhiraagu in return for exclusive rights to provide basic telecommunications services in the country. The company completed development of a nationwide infrastructure by May 1999 to provide basic access to every inhabited island. The backbone network comprises largely microwave radio links. However, one stretch of sea is too wide for a microwave radio link and a satellite connection was deployed. Some radio links stretched the technology to its limits with very tall transmission towers. The backbone includes what is believed to be the world's longest over-water microwave link. Despite these challenges, basic telecommunications services were rolled out to all the inhabited islands ahead of schedule.

To ensure that services are offered to the public at an affordable price while, at the same time, maintaining a reasonable return to the company, every tariff proposed by Dhiraagu is carefully assessed before it is approved by the regulator.

Mobile telephony

A cellular mobile service was introduced to the country in 1997 using AMPS technology on a trial basis. Because of high demand, it was upgraded to GSM in 1999. As is the case almost everywhere in the world, the growth of mobile telephony in the Maldives has been phenomenal. Within a few years, mobile telephony has overtaken the fixed-line base of 27,000. The mobile customer base is now in excess of 100,000. Mobile coverage is currently available in the central areas of the country covering 40 percent of the population. Plans have been made to extend the service to other parts of the Maldives.

The country has a teledensity which is one of the highest in the South Asian region. Beginning with a teledensity of less than 2 in 1995, it now has over 10 fixed-line telephones per 100 people. The figure improves to 1 telephone for every 5 people when mobile phones are included. However, access can be improved further, especially on the islands outside the capital. Even though Malé enjoys a teledensity of 1 fixed telephone for every 4 people, in rural areas the figure drops to about 1 telephone for every 32 people. Residential lines are available in the capital and on a few other islands where the size of the population can support a commercial service. Since some of the islands have expressed interest in developing their own telecommunications network, there may be potential for private participation in extending the infrastructure to homes on these islands. New technologies and efficient utilisation of technologies such as GSM could help to improve access.

Non-telephony services

Until 2000, the focus of the telecommunications sector was to develop and expand the national telecommunications infrastructure to achieve universal access. This goal was accomplished before the target date. The network was designed to provide basic telephone services. However, demand is now increasing for more advanced services and better access to global information. An example is the rising demand for higher bandwidth to accommodate information-based services. Since the existing network was designed mainly for voice communication, the infrastructure will need to be upgraded to enable data communication.

The current backbone network comprises 155-Mbps SDH and 34-Mbps PDH links with circuit switching at 64 Kbps. International connections are only available via satellite. The cost of installing a submarine fibre optic cable is still prohibitive considering the existing limited volume of traffic. The present infrastructure will not be able to support a wideband data network that transmits nationwide multimedia services. Ways of upgrading the network are being studied.

Internet access

Internet services have been available in the Maldives since 1996. They are now available throughout much of the country, mainly via dial-up. Leased-line access is also available, targeting large businesses and government offices. Recently, ISDN and ADSL access has also been introduced. However, their access charges are still considered high.

There are two ISPs in the Maldives, one of which is Dhiraagu. The second ISP licence was issued to Focus InfoCom Private Limited (<http://www.rol.net.mv>) in May 2003. The new ISP introduced true non-line-of-sight nomadic/mobile broadband access at a flat monthly rate within a coverage area of 20 km. The mobility offered by the technology has revolutionised the way people access the Internet. The flat-fee structure has also revolutionised the usage-based tariff regime introduced earlier by Dhiraagu. Additionally, in order to provide affordable Internet access to the island communities, the company has successfully tested two-way satellite broadband services which can serve as low-cost backhaul connections to the island networks. It has also deployed a WiFi network based on the IEEE 802.11b standard to distribute services to customers within a radius of 30 km. This network has created the possibility of establishing hotspots at resorts, the airport and other population centres within its coverage area, enabling cheaper Internet access to a wider range of users.

On some islands where there is no public access to the Internet, cyber stations are being set up. Special offers are also given to island communities in the form of preferential rates for telephone lines for operating cyber cafés and other public Internet services.

Level of digital access

In November 2003, ITU published the world's first global ICT ranking – the digital access index – in its 2003 edition of the *World Telecommunication Development Report*, in time for the World Summit on the Information Society. To determine the overall country score, the index combines eight variables covering five major areas. These areas are identified as availability of infrastructure, affordability of access, educational level, quality of ICT services, and Internet usage. The index is an indicator of the potential challenges for the country in adopting ICT. It also helps countries to identify their strengths and weaknesses in the ICT area. Maldives scored 0.43, which is classified as medium access. In UNDP's *Human Development Report 2002*, which focused on ICT as the main area of analysis, Maldives was ranked 72 with low access.

In order to improve digital access in the Maldives, several key issues need to be addressed. Firstly, although telephony services are available nationwide, the telecommunications infrastructure is still not fully developed. The trunk network consists mainly of 34-Mbps digital connections, which are narrowband and do not support broadband applications. Secondly, the country's geography does not economically justify laying a fibre optic backbone network. Therefore, radio systems will dominate the network for the conceivable future, limiting the bandwidth available in many parts of the country. Thirdly, except in the capital, the population is thinly distributed over many islands, making the nationwide provision of broadband services very costly. Fourthly, the provision of international connections solely via satellite again imposes limitations on bandwidth and the speed of access to the global information infrastructure. It also restricts the deployment of time-sensitive applications.

Key national initiatives

Acknowledging the potential of an “interconnected” government in improving efficiency, transparency and accessibility, the government is developing through the IT Development Project a common government network that will provide the desired level of interconnectivity. The project, which is funded with a soft loan provided by the Asian Development Bank, will establish a network that connects all government and parastatal agencies in Malé as well as in the capitals of 20 atolls. This network will enable electronic delivery of public services, including public health services, application for national identity cards, and registration of vessels, vehicles and aircraft. Public Internet kiosks will be built on the islands to provide easy access to government information and services.

The government network is designed to support communication through VPNs within government organisations to facilitate information exchange between organisations and to provide a secure gateway between the government and

the Internet. It will comprise two separate components to be developed in two phases: a metropolitan network serving government offices in Malé and a WAN extending from Malé to serve the atoll capitals and eventually the island administration offices.

The WAN is expected to meet the following objectives: enhancing the effectiveness and efficiency of public administration; improving the quality, availability and timeliness of public services; facilitating the delivery of government information to the citizens and to the international community; and stimulating participation of citizens in public affairs and building a sense of partnership between the government, citizens, communities and businesses.

The metropolitan network will be a high-speed backbone that interconnects the independent LANs of about 66 government and parastatal organisations in more than 40 locations within Malé.

Since very few government organisations at present have access to a developed ICT infrastructure, both the physical infrastructure and applications need to be developed before they are in a position to use the government network for purposes other than email and Internet access. Among the network applications to be developed are a set of databases for the sharing of commonly used information resources among government agencies; organisational communication systems including email, document transmission, video and audioconferencing, and net-meeting facilities; broadcast and webcast services for the dissemination of news and information; and websites for publishing information for citizens, investors, entrepreneurs, traders and tourists.

The National Centre for Information Technology has been tasked to manage the network. It will also lead the computerisation of government organisations and the development of their information systems. The centre will centrally coordinate IT policies, strategies, standards and practices for government agencies as well as the development of the required skills for government staff.

The success of the network will depend partly on the applications running on it. In order to complete any process or procedure that requires inputs and decisions from different organisations, standardisation is needed, including standardising the format of the information that is collected and shared.

In addition, the lack of government personnel with ICT training will have to be addressed urgently. ICT specialists will be needed to provide internal and external support essential for making effective use of the network. Moreover, the role of ICT in government has to be understood at the highest organisational level. High-level officials should not only support the adoption of ICT but also be able to use the technologies in their work.

Dhivehi content will constitute the bulk of the information that will be used over the network. Existing documents will need to be converted into electronic formats that are retrievable by the various applications.

To facilitate access to the government network and the Web by island communities, multipurpose community telecentres are being built on the islands to offer another option to the Internet kiosks. In addition, community portals have been set up on two atolls as part of the Digitally Empowered Development in the Island Communities programme. Business models are being studied for both the telecentres and the portals to ensure their sustainability and success in the long term.

Enabling policies

National ICT policy

The formulation of the national ICT policy is underway. To make the formulation process consultative and participatory, all stakeholders are involved from the early stages. An initial draft of the policy has been prepared. Work is continuing to finalise this draft and to design the strategies and actions required for implementing the policy. The formulation of the business models for the multipurpose community telecentres, the Digitally Empowered Development programme and the digitisation of the information from key sectors, such as health, fisheries and agriculture, are components of the ICT policy.

Science and Technology Master Plan

The Science and Technology Master Plan identifies key sectoral issues and opportunities for the application of existing and emerging technologies. Three major sectoral issues have been identified, and they are private sector participation, the environment, and equality. The government can facilitate private sector participation by creating a conducive environment that boosts investor confidence with enabling macroeconomic policies, good social and physical infrastructures, efficient public services, and a favourable business climate. Both the environment and equality are clearly areas of national importance where technologies can play a developmental role, such as the use of GIS for environmental planning and the development of information infrastructure and applications to bridge the urban–rural divide as well as income and gender disparities.

The master plan also addresses the issue of IT application, in particular the role of ICT in public services. A synopsis of ICT applications in several public agencies was prepared and the establishment of the national computer centre and the government network proposed. The master plan also considers the telecommunications sector and identifies the need for sectoral reform through the enactment of appropriate laws, the establishment of a regulatory body, and the liberalisation of the telecommunications and Internet markets. Also addressed are technology issues relating to other sectors, including fisheries, tourism, transport, energy, education, and health.

Multipurpose community telecentres

The multipurpose community telecentre is a technology hub that provides a variety of services to different user groups within a community. It may simply be a “telephone shop” which provides local and international call facilities. It may also offer Internet access and email services, and sometimes even fax and photocopying services. Larger centres may even undertake secretarial services, business card and stationery printing, computer training courses, and newspaper publishing. The telecentres are run on a not-for-profit basis and are usually community owned and managed.

The establishment of telecentres on sparsely populated remote islands with limited transportation links presents a great challenge. Operating costs are usually high and technical support difficult to obtain and expensive. The islanders’ low incomes limit their ability to meet the cost of operating the telecentres. It is also hard to find people with the skills needed to manage and operate the facilities. Most of the islanders have never operated a computer before, let alone use Internet and email services. Hence, it is important to consider the options for sustaining the telecentres prior to their establishment.

In the capital, Malé, most people access the Internet from public access points such as cyber cafés. Some of the other islands have taken the initiative to develop their own Internet access facilities. They include the atolls Lhaviyani, Baa, Laamu, Dhaal, Meemu, Addu and Fuah Mulak. The community initiatives of these atolls became the subject of studies on the feasibility of telecentres.

A 2001 survey conducted by the government sketched a profile of ICT users and identified their needs, the facilities they used, and their perception of the value derived from using these facilities. It found that the telecentres were used by a small number of users and a large proportion of the people on the islands were not aware of the Internet, its uses, and the potential benefit it may give them. However, a large number of people were ready and willing to take advantage of this new technology. It was observed that usage of the telecentres increased on those islands which conducted public awareness and training programmes in their communities.

The survey deduced that the telecentres may be sustained based on three models of operation. The main factor determining the most suitable model for a particular island is the purchasing power of the community. This factor is closely related to the size of the population on the island. Islands with a population larger than 5,000 people may adopt a commercial business model for operating their telecentres. Islands with a moderate population size of approximately 3,000–5,000 people should adopt a community-operated model. Islands with small populations of fewer than 3,000 people should adopt a “mixed” model, sustaining their telecentres partly with contributions and input from members of the community and partly with subsidies from external sources.

Telecommunication Policy

The Maldives Telecommunications Policy 2001–2005 is aimed at the development of the telecommunications sector towards achieving the targets of the Sixth National Development Plan and, ultimately, the economic and social developmental objectives envisaged in Vision 2020. It also guides the sector in developing ICT services to link the dispersed communities and reduce the impact of geographical isolation and physical separation on the island communities.

The most prominent aspect of the policy in relation to closing the digital divide concerns the opening up of the telecommunications market. It also recommends improving accessibility to ICT and making ICT use extensive, reducing telecommunications charges, expanding telecommunications services to close the gap in service provision between Malé and the other islands, strengthening the authority of the regulator and improving the legislative framework, and making government revenue from the telecommunications sector less dependent on the profits derived from the sector.

The policy encourages private sector participation in providing services to the islands outside Malé. It also encourages competition especially in Internet service provision.

Sixth National Development Plan

The Sixth National Development Plan 2001–2005 provides the framework for the development of sectoral plans and programmes. It recognises the need for the private sector to play an increasingly substantive role in the socioeconomic development of the country, and thus recommends the establishment of an enabling environment to stimulate private sector growth. Its broad development objectives cover the diversification of the economy; the improvement of educational, health and social services; the enhancement of human capacity and productivity; the reform of the legislative, regulatory, governance and administrative systems; the development of sustainable and cost-effective transportation and telecommunications infrastructures; and the maintenance of sociopolitical stability and national unity.

Vision 2020

Vision 2020 sets a challenging development target for the Maldives to become one of the top-ranking nations among middle-income developing countries by 2020. It envisages moving the country into the knowledge-based economy via an educated, knowledgeable and competent citizenry. The vision's economic goals include the development of the Maldives into a regional free trade hub, adoption of an export orientation, service and industry strengthening, employment creation and wealth distribution.

Vision 2020 also sets a number of goals for social development and quality-of-life improvement by addressing issues of equality, security, healthcare delivery, education, gender disparities, the environment, work ethics and a caring society.

Regulatory environment

The government has established an independent entity, the Telecommunications Authority of Maldives, which is empowered to strengthen the regulatory framework for the ICT sector. The framework will aim to enhance services through private sector participation and competition.

As noted earlier, a private company has been licensed to provide Internet access. This is expected to make Internet services more affordable and accessible to the public. Efforts are also being made to liberalise the mobile telecommunications market.

Meanwhile, a national committee has been constituted to help the liberalisation of the services sectors according to WTO recommendations. The experience in the country shows that even in a very small market with many physical and geographical constraints, the telecommunications sector can be successful if properly managed and if a conducive environment can be created for investors.

Open source movement

In the Maldives, awareness of open source software (OSS) and its potential benefits is growing. The use of Linux is also becoming very popular among the youth. However, there is no active promotion of OSS. Hopefully, this will change with the National Centre for Information Technology having been set up.

The new ISP is using Linux at the core of its network as well as Linux-based applications for various other Internet services. It is also using OSS for securing its network and other computer systems. Additionally, it is helping its customers to adopt similar solutions in the belief that it will have better control and flexibility in maintaining its network software, besides significantly reducing the cost of maintenance in the long run. The availability of global support for OSS over the Web also influenced its decision to adopt Linux.

Research and development

Maldives at present has three research centres: the Marine Research Centre, the Environment Research Centre and the National Centre for Linguistic and Historical Research. A research centre exclusively for ICT has not been established so far. Private sector research into ICT is also almost non-existent. However, as part of the Science and Technology Master Plan, a National Research Foundation for ICT will be established. The foundation's main role will be to promote innovation and technology transfer to meet the specific, and often unique, needs of the nation.

Trends

E-government and the use of mobile technologies seem to be the future of this geographically dispersed country, as the provision of public services to all the inhabited islands has always been a challenge to the development of the country. The IT Development Project will ensure that online public services will be made available to the remotest of islands through the establishment of information kiosks. These kiosks will be complemented by the multipurpose community telecentres. The feasibility of providing local content from these telecentres is also being explored. Meanwhile, the enactment of appropriate laws to create an enabling environment for e-government services is under consideration.

Besides e-government, distance learning, telemedicine and e-commerce also have enormous potential in this nation of atolls. Education is a priority area in the Maldives, which has one of the highest literacy rate in South Asia. The tourism industry, one of the largest economic sectors in the Maldives, will probably benefit from wide-scale introduction of e-commerce to link the resorts and tour operators to tourists around the world and to enable online reservation and payment.

Mobile telephony is another area with tremendous potential. To promote media convergence, an infrastructure that supports both voice and multimedia services has to be developed. An IP-based infrastructure, instead of the legacy telecommunications infrastructure, may be the foundation of future networks, which must be able to support multiple services with better utilisation of available bandwidth.

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