

# **Digital Access in the Amhara National Regional State**

*A Benchmark Document  
Studied on Government Offices of Six Zones*

*Capacity Building Bureau  
ICT Unit, Bahir Dar  
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## *Introduction*

The paper takes indicators of Millennium Development Goals and International Telecommunications Union as the basic frameworks for the analysis. These indicators have helped to shade light on the major concern of this paper. The major concern is to answer the following question:

*“Is electronic infrastructure of the State Government practically ready to interact with its bureaus and citizens online by assuring the State Bureaus their part in the new ICT setup<sup>1</sup> with PCs and access to the internet?”*

The development of information society and ICT in the region is the reflection of the development of ICT in households, business, government and education. Each of these four fabrics of the whole picture could not be left aside in ICT strategies. Recently, ICT is gaining one of the top priorities in the country. The government has programs aiming at all the four fabrics of the whole picture.

The Capacity Building Bureau has established an ICT unit to fasten the development of ICT in the region. This paper focuses on one of the four parts of ICT fabrics – State Government. The survey was made by the ICT unit to understand the status of ICT in bureaus at zone and woreda levels in depth. This is because “as shown in numerous country examples, expanding ICT use in government has a major impact on enhancing efficiency, accountability and transparency of processes in the public domain”, ITU<sup>2</sup> (2003).

Because of lack of tangible information at the level of the ICT unit on issues like benchmarking, standardization, resource utilization and cost effectiveness, and other parameters, the survey was conducted almost on government offices in the region.

The survey used more than 118 parameters to evaluate the status of ICT in government offices. These parameters could be analyzed from various interests and problems. However, this paper analyzed issues that were pertinent to the ICT unit. These issues are outlined in the table of contents. The paper suggests that since all the variables surveyed have not been analyzed, interested groups could further participate by taking a database in SPSS format from the bureau.

The information from this survey is hoped to give a benchmark of the status of ICT in the region. Digital access to government bureaus is an outcome of the abstraction on ICT status. The agenda on Standardizing Amharic font in the region was one of the outcomes of this study. The paper tries to add depth on electronic government side of the State.

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<sup>1</sup> New ICT setup refers to mobile phones, personal computers and access to the internet, though mobile phones are not included in this paper.

<sup>2</sup> [http://www.itu.int/ITU-D/ict/publications/wtdr\\_03/material/WTDR2003Sum\\_e.pdf](http://www.itu.int/ITU-D/ict/publications/wtdr_03/material/WTDR2003Sum_e.pdf)

The capacity building bureau has benefited from consultant studies, one of which is *ICT INFRASTRUCTURE SURVEY FOR AMHARA NATIONAL REGIONAL STATE*<sup>3</sup>. Being dependent on sample size, good statistical data and analysis had been obtained from such document for those interested to have coverage on government, non-government, schools etc. However, the need for sector specific ICT study is justified by the fact that the government intention of Business Process Re-engineering (BPR) is taking place on all government bureaus. BPR questions the efficiency of the work environment. In this regard the ICT part has a role to play. This requires full understanding of the status of the ICT in all the government offices. Besides to the interest of the bureau, ICT today is taken as a means to achieve the Millennium Development Goals by 2015. The Millennium Declaration has its own indicators that require periodic performance evaluation. In this scenario, the State required to evaluate its status of electronic government and make timely adjustment. It is with this hope that the analysis and recommendations of this study are made to show areas that need emphasis in creating an enabling e-government.

### *Techniques*

This study is a cross-sectional survey which is carried out for laying descriptive benchmarks to qualify policy issues. It is hoped that with similar studies coming, the uptake and usage of ICTs and the changes in our working environment is would be analyzed with a longitudinal study. Therefore, this document should not be expected to answer questions related to benefits and changes of our working environment due to ICT. It is simply a study on penetration and access of ICT (or Digital Access) in our government offices. This is well addressed. Universally speaking, this document is an assessment of e-Government (e-bureau) the State at one point in time. At a large scale, this document provided a critical analysis of the impact and effectiveness of the country's information policies.

The State Statistics and the Capacity Building bureaus should create an on-going study over same bureaus<sup>4</sup> over time for maximum benefit of such type of studies. Such type of longitudinal study will clearly show the impact, gross and net patterns of change due to ICT. Assessment on digital access, as some authors put it, conducted over time can also be a vital tool for judging the impact of ICT having parametric data for comparison.

In general, this study lays down the first benchmark and will serve as a base year for future longitudinal studies that should follow, year-to-year. For such to happen, the indicators have been parallel to indicators used by the International Telecommunication Union, Geneva and MDG to keep up good national and international standards in the study that could help comparisons locally, at national and international levels.

Both ITU and the Millennium Declaration<sup>5</sup> have agreed-upon indicators to keep track of our development goals towards 2015. Concerning ICT, three indicators have been

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<sup>3</sup> By consultant Fikre Y. Wondimu

<sup>4</sup> see Annex 2

<sup>5</sup> [http://www.wicej.addr.com/mdg/SEC\\_06.pdf](http://www.wicej.addr.com/mdg/SEC_06.pdf)

identified. These are *total number of subscribers per 100 inhabitants, personal computers per 100 inhabitants and internet users per 100 inhabitants*<sup>6</sup>. Keeping track of these indicators throughout our surveys and measuring progress periodically<sup>7</sup> will help the State to analyze ICT strategies, penetration, access, impact and net benefits.

Parallelism of ICT surveys in the region with MDG and ITU indicators facilitates MDG monitoring of the state as well as the country by UNDP and other development agencies in the future.

#### *Assumptions on ICT development in the region*

The following assumption has derived from policy perspective, whether ICT strategies and policies require a blanket-modality or disaggregated across woreda or zone, bureau types, etc.

*Bureaus at zone and woreda are at different stages of development as far as digital access is concerned and therefore, interventions on digital access may not necessarily be uniformly applicable to all bureaus.*

### *Part I: Policy*

#### *1.1 Government Commitment*

E-readiness<sup>8</sup> and the commitment of the State Government for the development of ICT in the region are shown by current year budget of Br. \_\_\_\_\_ Solely allocated for ICT. This is \_\_\_\_\_ percent of the total state budget.

At bureau level, projects on information systems are underway in Bahir Dar. Eight bureaus have projects on system automation and four of them on a local area network. Apart from installations, wide range of training programs on ICT is on the action plan of the current fiscal year. Much of the PSCAP budget is allocated to ICT

Compared with the past years' budget, the states commitment is better off. E-Readiness in terms of budget allocation helps one to see the preparation of the state bureaus for networked ANRS and Ethiopia. Therefore, there is a clear commitment of the government on developing the ICT level in the region.

#### *1.2 E-Readiness in the State Bureaus*

Availability, cost and quality of networks in term of bandwidth have been assessed. However, the level of networked bureaus in the state are very much few in the state, let alone to discuss on the quality and bandwidth issues.

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<sup>6</sup> Indicators on PCs and the internet users have been assessed in this study.

<sup>7</sup> Every two fiscal years

<sup>8</sup> Government becomes e-government or E-Ready when the public sector digitizes its processes and interactions, whether internal or external with business or the public (Source: Budhiraja R. and Sachdeva S., *E-Readiness Assessment*. <http://www. ...>

The cost of establishing an enabling network at offices seems affordable. This affordable system could have mail exchange, anti virus, database management services with in the office and an outlet for wide area network. What is usually neglected is the cost of the overhead in most of the financial budget plans of most bureaus even for maintaining a simple cost for accessories, anti virus, software updating and maintenance of computers.

The quality of network whether LAN or WAN is very much dependent on the bandwidth the telecommunication authority has. It is a sad fact that this issue is limiting the quality of the highway in the country hitherto. Along with bandwidth, obtaining a dedicated line is difficult to most of the state governments in the country. The State government, in this regard, should do its level best in strengthening the efficiency of the telecommunication authority. One way could be series of negotiation on alternative ways that could bring about major changes in the area. Decentralization and privatization could be one are to study. Options like school net, woreda net could also be tested as a highway for other e-government communications in the state.

#### *Part 2: Survey Coverage (Area, bureaus, sectors, etc)*

The unit of analysis is at bureau level of zone and woreda (Annex 2). Though the questionnaire sometimes goes to the level of individuals with questions like “training level” etc, this is with the intention that the points targeting expert individuals will reflect the status of the human resources of the bureaus.

The level of analysis could be classified into two levels. Bureaus that are at regional level and at zone and woreda levels. This survey coves 6 zones, 113 woredas, and 311 bureaus in the region. This shows that almost all the bureaus in each woreda are included in the analysis, which makes this survey more of a census type.

#### *Part 3: ICT Access and Penetration*

##### *3.1 ICT Infrastructure*

One of the factors necessary to measure in ICT access and penetration is the availability of infrastructure. In studying access, it is necessary to look into device densities of radio, television, fixed telephones, cell phones, personal computers and the internet. This study concentrated on *new ICTs*, which are the latter three with the exception of cell phones. Studies made on *old ICTs (radio, television and fixed telephones)* are out of the scope of this paper and are dealt with publications released by Ethiopian Telecommunication Authority.

The planning, provision and growth of ICT is very much dependent on the availability of these IT infrastructures. Studies by ITU (2003) show that *electricity* is a key indicator for measuring the potential for ICT access in developing nations. Though the questionnaire for this study did not include the availability of electricity in all 311 bureaus of the state government, it is important to know its availability in accordance to the results obtained in each of the following sub-headings. Fikre (2004) found out that 46 percent of the woredas are with out electricity.



### 3.1.1 Teledensity

Table 1 show that 21 percent of the bureaus do not have any type telephone services. Whereas 54 percents of zone and woreda level bureaus have a digital telephone. Information communication technology is much dependent on the availability of digital telephone. The availability of the technology in terms of internet is constrained by almost 54 percent of the telephone density in the region. Bureaus in South Gondar are having relatively the highest number of both digital and analog telephone lines in the region, 50%.

**Table 1 Is telephone Service Available?**

zone	Is telephone service available			Total
	Digital is available	Manual is available	No telephone service is available.	
N. Gondar	5	4		9
S. Gondar	50	28	24	102
N. Wollo	18	2		20
S. Wollo	12	4		16
E. Gojjam	5	5		10
W. Gojjam	13	3	16	32
Total	103	46	40	189
Percentage	54%	24%	21%	

### 3.1.2 PC density

There are 311 bureaus surveyed at zone and woreda levels this study. These bureaus have a total of 179 computers, out of which 72 percent of the brands are Dell. Table 2 shows that 94 percent of the computers are desktop while 6 percent are of laptops. PC by zone is an important indicator to make comparisons and targets for growth in this statistic.

Graph 1 shows the statistics on PC across zone. It shows that 35 percent of the available 179 PCs are found in W. Gojjam zone (i.e. 63 PCs) with lowest rate of 7 percent recorded in N. Wollo.

Relatively high proportion of PCs in W. Gojjam should be associated with high proportion of internet connectivity. However, the reality is not as expected. There are only 6 computers connected to the internet (Table 4) out of 99 bureaus surveyed. PC is important information device in its own right and it is the main tool to internet access. In this regard relatively high concentration of PCs with low internet access triggers questions beyond like availability of telephone line, internet permits, budgets, awareness etc.

Taking into consideration the number of professional experts that require PC, ratio of expert-to-computers is . This means that for every 10 professional there is PC either desktop or laptop type. This is a very low PC density in the region. To curb this problem,

a combination of fat- and thin-client<sup>9</sup> computers could be used. Besides, a move from branded PCs to clone/assembled once could solve the problem.

The findings above should further be tested with availability of electricity in zone or woreda bureaus. Especially those bureaus with no electricity might not have capacity to possess PCs and internets.

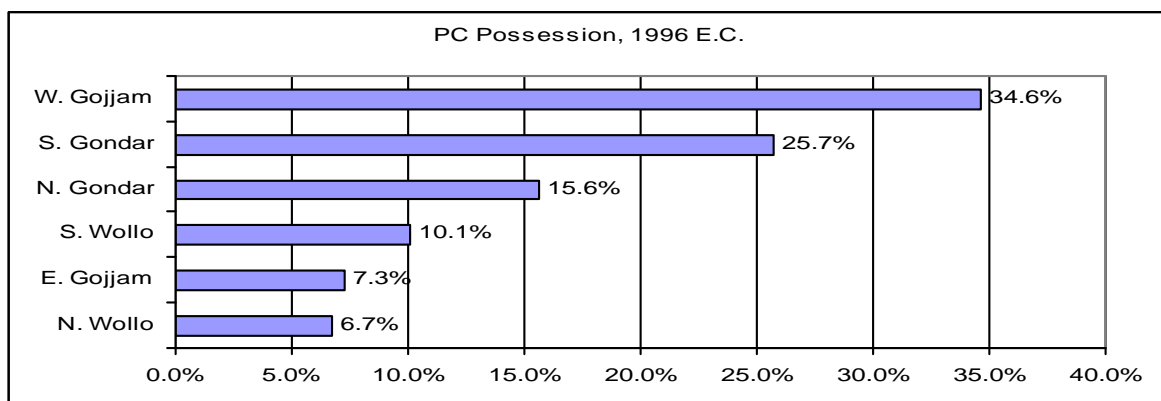
### 3.1.3 Supporting Office Equipments

Looking into supporting office equipments like LCD projectors, fax machines, scanner and photocopy machines, Table 3 shows that the number of fax machines is 24, which is very much low compared to 311 bureaus. This supplements the finding in telephone density where most of the bureaus in the region are not electronically ready to establish internet access or fax. This is due to lack of a digital telephone line. This calls for link between the State Government and ETC to upgrade or install landlines of digital types to government offices.

**Table 2 Type and Brands of Computers in the Region**

	Number of Functional Computers			
	Desktop	Laptop	total	percentage
Dell	123	5	128	71.51%
Acer	27	0	27	15.08%
Compaq	7	2	9	5.03%
Gateway	2	1	3	1.68%
Toshiba	1	1	2	1.12%
IBM	9	1	10	5.59%
Apple	0	0	0	0.00%
Total	169	10	179	100%
Percentage	94%	6%		

**Graph 1 Computer Possession by Zones, 1996 E.C.**



<sup>9</sup> though low in price, thin-clients require network and server infrastructures.

**Table 3 Supporting Office Equipments**

Functional IT equipments	Quantity
LCD projector	29
fax machine	24
scanner	13
photo copy machine	60

### 3.1.4 Internet Density

The indicator used in this section is the *number of computers connected to internet rather than the number of subscribers*. Since network facilities allow a number of users to be connected to the internet with just one subscription, the former indicator is taken as a better one. Besides, the number of *internet users* direct from offices is not included within the questionnaire.

Use of Internet in the government offices is one indicator for E-Readiness. As shown by Table 5, the use of Internet is 4 percent which is very low compared with the amount of information needed to browse and correspond through e-mail. The value of internet penetration is not satisfactory to say that the state is E-Ready on the ICT arena.

There is full understanding that the number of digital lines and internet connectivity is not expected to be one-to-one ratio, it is wise to expect those bureaus with digital lines to have internet connectivity. Bureaus in South Gondar are having relatively the highest number of digital lines. However, the connectivity ratio is relatively the lowest according to Table 4.

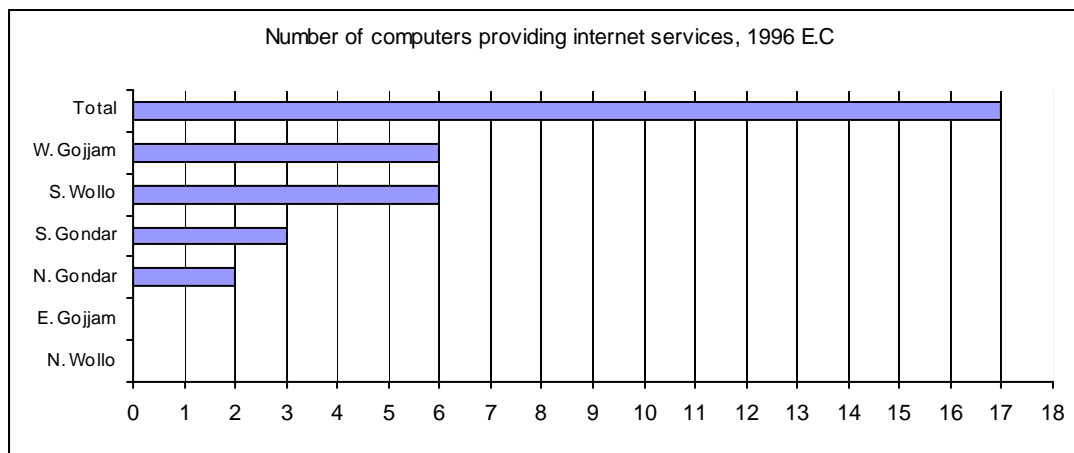
Result of Table 4 could be interpreted from internet user's side. Taking the assumption that at least there will be one user for each internet connection, the result could give meaning as; there are 17 employees using the internet direct from government offices in the region. Recall that this user-number does not include those who have access from internet café or otherwise. In bureau setups with no network infrastructure, the result is convincing.

Again questions of internet lines arise. Though telephone lines are say, available, the internet lines are controlled by ETC. Along with telephone and internet lines, budget allocations for fees on telephone and internet should be available. These three areas should be given due consideration if we want practically develop the region in connectivity, access to information and the technology. Therefore, the State Government commitment in budget allocation, its collaborative efforts with ETC to enhance digital lines and internet connections are very important. Up to now, ETC's growth has been the responsibility of federal government. The state governments on their behalf should show interest and their stake on ETC through forums, dialogs, pressure, etc.

**Table 4 Internet Density**

Zone	Number of computers providing internet services
N. Gondar	2
S. Gondar	3
S. Wollo	6
W. Gojjam	6
N. Wollo	0
E. Gojjam	0
Total	17

**Graph 2 Number of Computers Providing Internet Services**



### 3.1.5 Synopsis on PCs, Internet and Website at Bureau Level

Percentage issues in number of PCs, internet connection and availability of websites are indicators used at international level. These indicators are shown on Table 5 and Graph 3 summarizes the values. With respect to the number of bureaus surveyed with in each zone, we find the following comparable indicators:

- Percentage of bureaus having personal computers
- Percentage of bureaus connected to the internet
- Percentage of bureaus having a website

Graph 3 shows that the State value for possession of PCs among 311 surveyed bureaus shows beyond a halfway mark, 57 percent. However, since this is not compared with the number of professional experts needing PCs much can not be said except comparison purposes with other state governments.

Access to internet is about 4 percent. This also does not take into account the percentage of employees who use the internet in their jobs.

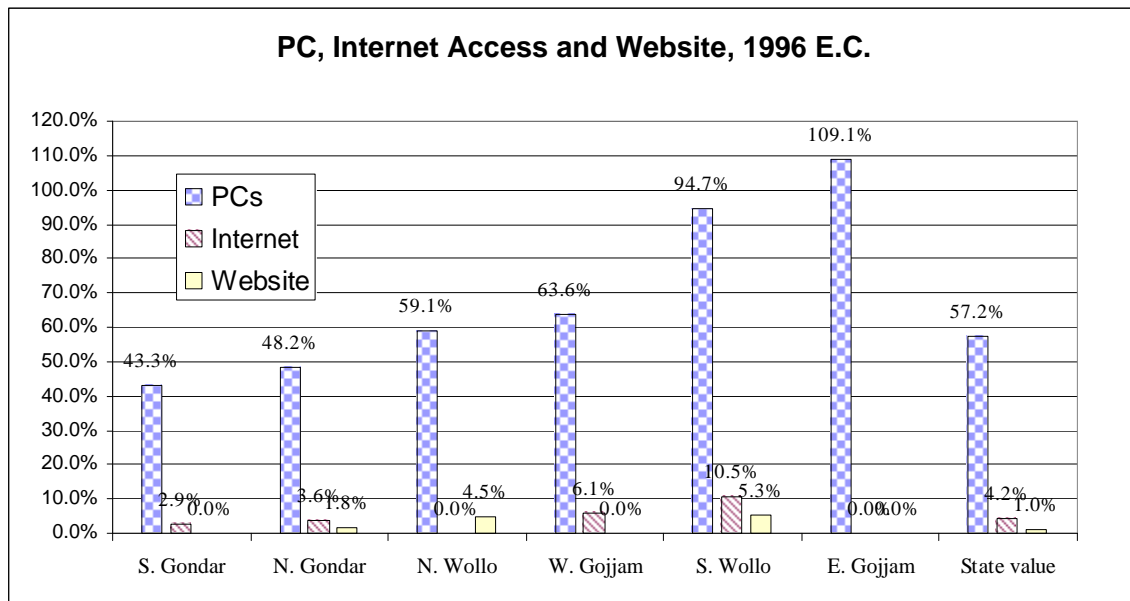
Website availability is about 1 percent. This is reported from three bureaus in the region.

These three percents, 57-4-1 of PC-internet-website percentages in the region would support to analyze the level of ICT penetration. These low levels of ratios should be further analyzed in relation to electricity, training, budget etc. However, the sad fact is that the level of ICT as a means to achieve the State's MDGs especially in areas of good governance, transparency, accountability, efficiency etc is far below acceptable levels. Much work on ICT is needed.

**Table 5 Summary on Number of PCs, Internet Access and Possession of Websites**

Zone	Number of Bureaus with			Number of Bureaus in Zone Level	Penetration		
	PCs	Internet	Website		PCs	Internet	Website
N. Gondar	27	2	1	56	48.2%	3.6%	1.8%
S. Gondar	45	3	0	104	43.3%	2.9%	0.0%
N. Wollo	13	0	1	22	59.1%	0.0%	4.5%
S. Wollo	18	2	1	19	94.7%	10.5%	5.3%
E. Gojjam	12	0	0	11	109.1%	0.0%	0.0%
W. Gojjam	63	6	0	99	63.6%	6.1%	0.0%
Total	178	13	3	311	57.2%	4.2%	1.0%

**Graph 3 PC, Internet Access and Websites in Amhara Regional Government, 1996 E.C.**



### 3.2 PC Quality, Availability and Affordability

Another important factor in ICT access and penetration is the level of affordability of IT equipments. Affordability in this study has been assessed from past procurement of the State.

Majority of the Dell branded computers are bought during 1994-1996 E.C., which means that they are up-to-date Pentium IV computers. Taking about Br. 8,000 per Dell PC, a total of about Br. 984,000 had been spent on 123 desktop Dell PCs in the region. This means that the bureaus do not have quality problems except adequacy of the technology.

Comparison between quality and penetration of PCs (Table 2 and 5) show that there is a paradox between quality and quantity of PCs. The study shows that there are quality-PCs accessible to few employees.

In a state where most of the bureaus do not have access to keyboard, which issue should be addressed first in our procurement plan? This is in line with the idea that the State could not buy BMW cars for its professional experts but can buy bicycles as it is practically doing.

Therefore, the procurement plan on computers should first address availability/access of computers with existing budget. The methodology could be to look into clone/assembled PCs for few years to come if budget persists to be the major constraint.

**Table 6 When Did the Computers start giving services?**

Duration	Number of Computers					total
	Dell	Acer	Compaq	Toshiba	Gateway	
before 1985	2	1	1	1		5
1985-90	4	1			1	6
1991-93	3	3				6
1994-96	108	17	5	3	1	134
Total	117	22	6	4	2	151

### 3.3 Efficiency and Quality of Services from PCs

Efficiency and quality of work by the bureaus is assumed to directly associate with availability of up-to-date computer technology. Efficient use of the existing technology could be analyzed from the available services rendered by the computers. Though efficiency is the product of training and technology to work with, which maximizes the input and output cycle, available services is taken as a measure here. The existing services rendered by the PCs are inherently the reflection of the *demand* by the work.

Table 7 shows that the PCs are not efficiently used to the scale they could provide. Statistically, most of the bureaus in the state provide word processing services. This rate

goes to 91 percent of the offices using computers compared to 98 percent of the state value (Fikre, 2004). This is due to lack of demand on user side, lack of training, etc. However, the sad fact is the existing expensive computers in the State are not providing services more than word processing.

Ninety-one percent shows that PCs in the zone and woreda levels are simply substituting type writers but with huge amount of replacement cost. This finding qualifies on procurement plan of PCs in the state. Too much expense should not be spent on expensive computers as most of the usage is mostly on word processing. The procurement plan of the state should, therefore, pragmatically take into consideration the level of IT usage.

**Table 7 Types of Services Rendered by Existing PCs**

Offices Providing the following services	Frequency	Percent
word processing services	60	90.9%
data analysis services	6	9.1%
network services	0	0.0%
Total	66	100.0%

### 3.4 Emerging Environ

There are 245 type writers in total in the region<sup>10</sup>. The number of type writers tells that there are write-up and word processing activities which are not very different from manual. It is clear to guess that even such typing activities are not fast, clean etc. Tremendous work on word processing by the bureaus requires for the introduction of computers if efficiency, speed and quality are required. This calls for huge and cost effective procurement of desktop computers in the region. This could be tackled through buying clone or assembled PCs so as to cover wide range of bureaus with limited budget.

The IT environment in the region shows that the bureaus at zone and woreda levels are still in a very infant stage, where the emphasis would be to avail the IT gadgets and training of manpower as first step on ICT agenda. Therefore, the question of “access/availability” should be answered in our ICT strategy.

Encouraging commitment on the government side, clear and devoted strategy on ICT, huge training programs etc are foundations that show good ICT environment is coming to the State. The digital divide so much pertinent in the state needs emphasis. Various bureaus in the state today have projects on system automation, networking etc. These positive signs should be kept alive to make the state government contactable, transparent. Their cumulative impact will create a networked and electronic government in ANRS. Tomorrow’s vision of an electronic government in which ICT is practically a means to achieve MDGs is the outcome of ICT seeds planted today.

<sup>10</sup> The regional concept here refers to solely to the government bureaus at zone and woreda levels, studies under this survey. This concept is taken with same meaning through out the paper.

## Part 4 ICT Knowledge

### 4.1 IT Literacy of Employees

Another indicator of E-Readiness of the state is the number and level of skill and human resources with respect to ICT literacy. On Table 2 it is shown that there are 179 computers in the region. Table 8 shows that among the computer users 64% of them have taken IT training, where 36% of them do not have an IT training of any sort. South Gondar shows relatively highest number of trained employees (35 employees) compared North Gondar (7 employees), the lowest on record.

The responsibility of assessing the need and providing on-job training lay on the bureaus themselves. This could be done by training for trainers, large scale training during late hours, week ends, sub-contract computer centers etc. A number of good practice could be mentioned.

**Table 8 Training Levels of Computer Users**

zone	Does the technician working on the computers have computer training?		Total
	yes	no	
N. Gondar	7	4	11
S. Gondar	35	30	65
N. Wollo	9	2	11
S. Wollo	12	3	15
E. Gojjam	6	2	8
W. Gojjam	18	7	25
Total	87	48	135
Percentage	64%	36%	100%

### 4.2 Type of IT Training

The questionnaire presented three choices on type o IT training: software, hardware and network Administration. None of the respondents reported training on hardware and network administration. Ninety-nine percent of respondents reported training on software. Table 8 shows the report.

It should not be considered that maintenance training is important to each bureau. Maintenance issues could be out-sourced to private computer centers with periodic contracts.

It seems that lack of networked environment in almost all bureaus has not yet called for training on network administration. With a network environment in the future, most bureaus will need experts on the field as such issues would not perform well with out-sourcing.



**Table 9 Type of IT Training in the Region**

zone	Type of Training			Total
	software	hardware	networking	
N. Gondar	6	0	0	6
S. Gondar	34	0	0	34
N. Wollo	14	0	0	14
S. Wollo	11	0	0	11
E. Gojjam	5	0	0	5
W. Gojjam	20	0	0	20
Total	90	0	0	90

#### 4.3 Type of IT Credentials

Most of the trainees have certificate-level trainings, which is mostly a user level training to work on softwares. This group covers 88 percent of the IT users in the region.

A bit “higher” credential is diploma level trainings. This group of trainees covers 12 percent of the respondents. However, it should be clear that credentials given by most computer training centers do not clearly distinguish the difference between *certificate* and *diploma*.

**Table 10 Type of Credentials**

Type of Credentials	Number of Trainees	percentage
certificate	75	88%
Diploma	10	12%
Total	85	100%

#### 4.4 Bureau Contact-ability to Public

Contact-ability is a reflection of information infrastructure between public and each bureaus in the region. In this regard, a lot of means could be used for establishing a one-way or two-way communication. In terms of modern IT, existence of webpages have been taken as indicators of contactability and transparency of e-governments.

Table 11 shows that only three out of 133 bureaus reported to have a webpage. These bureaus are Dessie town (South Wollo), Zone Information Bureau (woldia, North Wollo) and zone administration (Gondar). However, most of the offices are not contactable electronically. Therefore, the degree of transparency of the state government electronically is only 0.9 percent taking 311 bureaus surveyed. This benchmark value shows much work have to be done in automating government systems.

**Table 11 Does Your Bureau Have a Webpage?**

Zone	Number of Bureaus having webpage
N. Gondar	1
S. Gondar	
N. Wollo	1
S. Wollo	1
E. Gojjam	
W. Gojjam	
Total	3
Percentage	0.9%

#### 4.5 ICT Management

ICT management is a question of sustainability of ICT in the State. Bureaus could have a very well established ICT infrastructure, good automated system, networking facility etc at one time and some time later all good aspects of the ICT become non functional, obsolete. Such bureaus are ones that have either never thought of the sustainability issue or having financial constraint to sustain their E-Infrastructure. One of the major constraint in sustaining the system is lack of human resource. Along with the huge amount of activities to create a digitally accessible government, the development of human resources should be given paramount importance.

Plans like establishing an ICT institute alone or jointly with other already established institutes will play a vital role in supplying maintenance engineers, network administrators, developers etc. However, before going into content designs, thorough analysis of the need assessment should be made.

#### *Part 5: Bottlenecks and Opportunities*

This part deals with the bottlenecks and opportunities related to the usage of ICT to come up with an improved action plan. The approach of this part is; pose questions, outline objectives, leave out incomplete answers.

##### *5.1 Clearer Action Plan:*

The state's ICT objective should be put clearly with having a chronological order. Though the vision and mission is set, which is a great opportunity, the five year plan should set objectives with definite goals and implementation hierarchy. One modality of implementation hierarchy for the five-year ICT plan could be: E-infrastructure, E-Governance, E-Society, and E-Economy. Each objective could have its sub-divisions and may even overlap with one another. The main issue here is to determine "*which step to take when which step is accomplished*". In this manner, the strategic document for the five-year ICT plan should be evaluated in terms of the above variables taking into

account their chronology could change as discussion go by. Therefore, rolling action plan every two years might help.

Currently, implementations are taking place in accordance with the annual plans of 1997 fiscal year. The activities, conducted by the Bureau of Capacity Building, are in the following manner: E-Awareness, E-networking and E-System. These objectives have overlapped during implementation in many instances. These three major objectives could be categorized in the E-Infrastructure objective mentioned above.

### *5.2 ICT Training:*

The number and level of skilled human resources with respect to ICT literacy is very low. Decentralization of powers and responsibilities to woreda levels should be grasped as an opportunity in this regard. Since woreda level administration has a say on budgets, attachment of budgets for on-job training for experts and defending this is very important on the side of woreda administrators. Otherwise, the problem associated with human resources could not be expected to be tackled from region administration only.

### *5.3 Confinement of Activities at Region level at Bahir Dar:*

What is actually being done in other major towns of the state like Gondar, Dessie, Woldiya, D. Markos are not clearly planned at least for the current fiscal year, 1997 E.C. or plans have not been tailored to these areas in terms implementations currently taken place by capacity building bureau at Bahir Dar.

## *Part 6: Steps Forward*

### *6.1 Standardization*

This section is presents the analysis on the type of Amharic softwares used in the State and suggests the type of fonts that would standardize word document transfers and exchange among the bureaus in the state. This sensitive issue is very different from standardizing Amharic “software”. The reader should give due attention to the distinction of the two issues. Two Amharic Softwares could share the same type of font. The standardization activity is on the type of “font” only and for file transfer. Simply the recommendations of this section is to have a state-wise *file transfer protocol of Amharic documents (FTPAD)*.

FTPAD is dependent on answering “What is the common type of font widely used in the region?” This is very much related to the type of font most of the users are accustomed to. Therefore, the only factor used to standardize Amharic font in the region is “common type of Amharic font in the region”. This approach might be wild for some. However, the steps are not without their justifications.

1. Problems on file exchange through floppies: Most word documents are widely “transferred” using floppies horizontally across bureaus. These line bureaus are facing compatibility when reading Amharic fonts.
2. Problems on text features: Formal letters, correspondence and formal documents are produced and reported to regional bureaus with various types of fonts.

Regional bureaus have faced difficulties and raised concerns about standard fonts in recent years.

Therefore, taking commonly used Amharic Softwares in the region, fonts accrued to this particular software are recommended to be a standard Amharic Fonts in the region.

Table shows that 72 percent of the computer users responded that they use Visual Geez Software. Therefore, to encourage compatibility and avoid conversion problems in the state, Fonts attributed to Visual Geez Softwares have to be taken as standard fonts for Amharic word processing. Besides, training for experts, secretaries etc on Amharic software should consider Visual Geez fonts as a prime target.

**Table 12 What Amharic Softwares Does Your Computer Use?**

Amharic Software	Frequency	Valid Percent	Cumulative Percent
Visual Geez	23	25.0	25.0
Visual Geez 2000	31	33.7	58.7
Visual Geez 2002	12	13.0	71.7
Power Geez	26	28.3	100
Total	92	100	

## 6.2 Conclusion

ICT infrastructure is very much correlated with good governance, efficiency, transparency and above all in building up capacity at lower levels. Access and penetration of ICT is at a very infant stage in all the government bureaus at woreda and zone levels.

This study revealed a number of facts that could stand as benchmarks. As it is the first of its kind fully devoted to electronic governance, low values in many indicators showed the low level of the state government concerning ICT. This is one fact the state should start with.

The main causes for low level of ICT need further investigation. Electrification, budget, training, ETC and so on should be further investigated to know the real causes. However, we all agree that ICT in the state needs much work and effort on all sides.

The following findings show some of the missing links that need attention. The recommendations are derived from the findings of this paper. They recommend what could be possibly done at State, Zone and woreda levels. It is expected that they are useful for all trying to bring about e-government in the Amhara National Regional State.

### 6.3 Summary of Findings

1. 21 percent of the bureaus do not have any type telephone services. Whereas 54 percents of zone and woreda level bureaus have a digital telephone.
2. Bureaus in South Gondar are having relatively the highest number of both digital and analog telephone lines in the region, 50%.
3. These bureaus have a total of 179 computers, out of which 72 percent of the brands are Dell.
4. 94 percent of the computers are desktop while 6 percent are of laptops.
5. 35 percent of the available 179 PCs are found in W. Gojjam zone (i.e. 63 PCs) with lowest rate of 7 percent recorded in N. Wollo.
6. Relatively high proportion of PCs in W. Gojjam (63 PCs) are observed which should be associated with high proportion of internet connectivity. However, the reality is not as expected. There are only 6 computers connected to the internet out of 99 bureaus surveyed
7. State value for possession of PCs among 311 surveyed bureaus shows beyond a halfway mark, 57 percent
8. Access to internet is about 4 percent.
9. Website availability is about 1 percent. This is reported from three bureaus in the region.
10. The value of penetrations on PC, internet and website is not satisfactory to say that the state is E-Ready on the ICT arena.
11. Taking about Br. 8,000 per Dell PC, a total of about Br. 984,000 had been spent on 123 desktop Dell PCs in the region. This means that the bureaus do not have quality problems except adequacy of the technology.
12. Statistically, most of the bureaus in the state provide word processing services. This rate goes to 91 percent.
13. There are 245 type writers in total in the region.
14. among the computer users 64% of them have taken IT training, where 36% of them do not have an IT training of any sort. South Gondar shows relatively highest number of trained employees (35 employees) compared North Gondar (7 employees), the lowest on record.
15. None of the respondents reported training on hardware and network administration. Ninety-nine percent of respondents reported training on software.
16. Most of the trainees have certificate-level trainings, which is mostly a user level training to work on softwares. This group covers 88 percent of the IT users in the region. A bit “higher” credential is diploma level trainings. This group of trainees covers 12 percent of the respondents.
17. three out of 133 bureaus reported to have a webpage. These bureaus are Dessie town (South Wollo), Zone Information Bureau (woldia, North Wollo) and zone administration (Gondar).
18. 72 percent of the computer users responded that they use Visual Geez Software.

#### 6.4 Recommendations

1. ICT planning should take into considerations the enhancement of infrastructure availabilities in terms of digital telephony
2. The State government should open up discussion forums with ETC for the enhancement and installation of Telephones. This calls for link between the State Government and ETC to upgrade or install land lines of digital types to government offices.
3. To curb low density in PC availability, a combination of fat- and thin-client computers could be used. However, though low in price on thin-clients, they call for network and server infrastructure.
4. Emphasis should be given on purchase of desktop computers in the region. This could be tackled through buying clone or assembled PCs so as to cover wide range of bureaus with limited budget.
5. The question of “access/availability” should be answered in our IT policy directive. The “access issue” should have focus mainly on procurement and training.
6. The State Government commitment in budget allocation, its collaborative efforts with ETC to enhance digital lines and internet connections are very important. Till today, ETC growth has been taken as federal government interest. The state governments on their part should show interest and their stake on ETC through forums, dialogs, etc.
7. The procurement plan on computers should first address availability of computers with limited budget of the State. Br. 800,000 spent branded Dell PCs would have bought twice the computers if it had been invested on assembled PCs.
8. Bureaus should be encouraged to out-source maintenance issued to computer centers in their premises. This will have its own positive externalities in encouraging ICT in the State by attracting commercial IT firms.
9. To encourage compatibility and avoid conversion problems in the state, Fonts attributed to Visual Geez Softwares have to be taken as standard fonts for Amharic word processing. Besides, training for experts, secretaries etc on Amharic software should take into consideration Visual Geez fonts as a prime target.
10. The Capacity Building Bureau should make regular internet users surveys (RIUS) to parametrically assess the level of digital divide in the States governance.
11. Electrification of the woreda bureaus through hydro power or generators is the first step in the efforts to bring about ICT in the region.
12. The State Statistical Bureau should include questions on ICT access at household, business, government and education levels to enhance penetration, impact and international comparability since meaningful policies for enhancing access to ICTs in the State can not be designed without detailed statistics.
13. Unlike the assumption, significant variation is not observed across bureaus in the region. Therefore, centralized thinking and strategy on digital access, procurement etc is important during the current five year plan.
14. NGOs, Donor Agencies, Welfare Organizations etc should come into the picture in narrowing the digital gap of the state so as to facilitate highly transparent, accessible e-governance.

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**Annex 1 Indicators and Their Associated Variable Codes on SPSS Database**

<b>A. TECHNOLOGICAL INFRASTRUTURE AND ACCESS</b>		
<b>INDICATORS</b>	<b>Codebook</b>	<b>PURPOSE</b>
<b>ENABLING ENVIRONMENT</b> No of bureaus with computers telephone intranet internet TV/VCR/VCD/DVD radio	TELE, TA11, TA13, TA15, TA21, TA23, TA25, ... TA71 TE21, TE31, TE41, TE51	Context of ICT development
Emerging environ	TE11, TE12, with number of Computers	
Number of computers per 10 employees		measure of implementation
Percentage of bureaus using the following equipments scanner printer computers LCD projector digital camera	TD11, TD12a, TD13 with ORG	
<b>B. INTERNET CONNECTIVITY</b>		
<b>INDICATORS</b>		<b>PURPOSE</b>
Number of computers connected to the internet	TB41,TB42, WITH ORG	Measure of connectivity
Percentage of bureaus with broadband, narrowband, wireless		Measure of quality
<b>C. SYSTEMS, SOFTWARE AND HARDWARE</b>		
Pre-Pentium	TA12, TA14, TA16, TA22,TA24,TA26, ...TA72	Measure of efficiency and quality, up-to-date technology
Service efficiency	TB12, TB21,TB22, TB 31, TB32, with ORG	efficiency
OS platform efficiency	TC1, TC2,	
Network Efficiency	TD15, TF1, TF2, TF3,TF4, TF5, TG1	
Network Status	TG2, TG3, TG4, TG5, TH1, TH2, 3,4,	indicator for E-Readiness in term of Network Access, Networked Government
Cost efficiency in printing	TD14,	
Existence of ICT unit as a separate entity		
<b>E. BUREAU HEADS</b>		
AKAP of IT by heads (percentage of heads)		Measure of resistance to change/incorporation of system automation, LAN etc to improve the work environ



<b>D. ICT TRAINING</b>		
Number of IT Training Per Year (on-job, formal)		
trainees on computers	<i>training</i>	
Percentage of experts who acquired pre-service ICT training		<i>to determine the skills, knowledge and attitude of the workforce to ICT to serve as a basis for improving staff's efficiency and effectiveness</i>
Percentage of experts who received ICT training in the last 3 years		
Type of ICT training (basic, advanced)	<i>TIII,</i>	
Length of training a. Less than 10 hours b. 10 to 30 hours c. 31 to 70 hours d. More than 70 hours	<i>TH2, 13, 14, 15, 16, 17, 18,</i>	
5. Percentage of experts who use computers for day-to-day activity		
6. Existence of technological development plan on various levels		
<b>F. STANDARDIZATION ISSUE</b>		
Amharic software	<i>TC3 WITH ORG</i>	
<b>G. BUREAU CONTACTABILITY TO PUBLIC</b>		
web page and its update	<i>webpage</i>	

**Annex 2 Surveyed Bureaus and Corresponding Zones, 1996 E.C.**

<i>Bureaus</i>	<i>zone</i>						<i>Total</i>
	<i>N. Gondar</i>	<i>S. Gondar</i>	<i>N. Wollo</i>	<i>S. Wollo</i>	<i>E. Gojjam</i>	<i>W. Gojjam</i>	
administration office	7	10	2		1	8	28
Justice Office	2	7	1			3	13
Health Office	5	9	1		1	5	21
Information Office	2	8	3		1	6	20
TVET					2		2
Capacity Building Office	8	9	4	8	1	8	38
Pool Office	1			2	1		4
Public Participation and Organization	3	6				5	14
Police	2	8				2	12
Admin, Justice and Economic Development		4	1			1	6
speaker of the house	1	2				1	4
Agriculture and Rural Development	3	6	1		1	10	21
Court	6	4			1	5	16
Education Office	4	6		1	1	5	17
Finance and Economic Development	2	7		2		8	19
ASSIP	2					2	4
Hospital		1				1	2
Prison	1	2	1			1	5
DPPC			1			1	2
All Offices				3		8	11
Industry and Urban Development		2	1			3	6
Youth, Culture and Sport Office	3	5	1	1		4	14
Labour and Social Affairs			2			1	3
Transport		1	1				2
Municipality	1					2	3
water	1					2	3
Micro and Small Trade Enterprise		1				2	3
Sanitation Office		2					2
SAAIP		2					2
Militia Office		1					1
Bahir Dar Zuria						1	1
Preparatory	1					1	2
HIV/AIDS control			1				1
not clear		1	1	2		3	7
not mentioned					1		1
trade and industry	1						1
<b>Total</b>	<b>56</b>	<b>104</b>	<b>22</b>	<b>19</b>	<b>11</b>	<b>99</b>	<b>311</b>

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