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Factors Affecting the Use of ICT Services in Ethiopia:
The Case of Illubabor Zone - Oromia Regional State

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ABSTRACT

ICT is used to enhance the overall activities of individuals, administrative processes of businesses and various governmental and non-governmental organizations. Despite its advantage in all aspects of development, it has drawn low attention in expanding the services in general and utilizing the technology in particular. Therefore, this study was aimed to explore the main factors that affected the usage of ICT in Illubabor zone, Ethiopia. A descriptive cross-sectional study design with quantitative and qualitative data collection method was carried out. The data was collected from 195 samples by using structured questionnaires and observations by employing simple random and purposive sampling techniques. SPSS version 16 was used for data analysis. The study confirmed that lack of computer skill training for staff and lack of sufficient budget for the provision of ICT are the major bottlenecks in expanding ICT service in the zone. Major emphasis should be given in enhancing the awareness of government employees to make use of ICT services in their daily official work.

KEYWORDS

Barriers, Expansion, Governmental Offices, ICT, Utilization

INTRODUCTION

Information Communication Technology (ICT) is basically about using technology for information process and communication business. Its application ranges from collecting to disseminating or receiving information from one place to another electronically. The gathered information will be stored, retrieved, processed, and analyzed before it is communicated using ICT devices (Adigwe, 2012). In this study, ICT is considered as an electronic device that can be utilized by people to enhance or improve the administrative or overall office activities.

Nowadays, the prospective of ICT to promote overwhelming growth in the economy and reduction of poverty has got the attention of developing countries. The state of ICT access and usage in a particular country or region show both its social and economic development (Morrar, Abdeljawad, Jabr, Kisa, & Younis, 2019). As long as ICT presents opportunities for economic and social development, devising ICT policy and strategies, allocating the proper amount of budget and resource, creating a partnership with stakeholders and establishing suitable environment should be a primary duty and responsibility of a state. Governments especially the developing ones are often cash-strapped or have a multitude of other shortfalls which impact ICT development. In this case, establishing a network or partnership with private industry where some of the costs are shared along with the risks in improving the situation will be the best alternative solution. In this regard, it is essential to consider the role and contribution of NGOs in promoting ICT services (Shava & Maramura, 2016).

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In Ethiopia, ICT development has become one of the priorities and key driver of the government for the socio-economic growth and transformation since the last decade (Report from Ethiopian Ministry). According to the report from the ministry of communication and information technology, the statistics about Ethiopian communication sector until June 2017 are shown in Table 1. The estimated population of the country in the same year was about 105.0 million.

Though the overall statistics seem promising, different regions, zones, and districts have unequal ICT coverage, and utilization rate due to unknown reasons and little is known figuratively. Thus studies aiming at finding the proper statistics of the accessibility and utilization of ICT in every corner of the country will help the government bodies to early identify the main factors those are affecting the expansion of ICT and to prevail over their impediments (Akther, 2015). Moreover, it also helps the policy makers and management authority in the process of policy making and development of effective ICT expansion. In general, policies, strategies, and investments that enable to seize the benefits of ICT are better based on statistical evidence (Adam, 2012). Therefore, this paper assesses the utilization and factors affecting the expansion rate of ICT in all governmental offices within the zone and all districts of Illubabor.

LITERATURE REVIEW

ICT has become one of indicator of economic growth and transformation of society. Those countries ranked at the lower position in the world ICT index are the third world countries. The gap between the development of a society and their ICT usage rate has a direct implication in categorizing whether they are underdeveloped or developing ones. Compared to the economically advanced countries, the opportunity of enjoying life and improving economic growth is much less in the developing ones due to limited internet connectivity and shortage of ICT accessibility. Those countries like Malaysia and Singapore those heavily invested in ICT have scored remarkable achievement in their economic development.

Many scholars agree that ICT infrastructure is important in enabling fast growth in emerging economies (Karimi, 2012; Ngwenyama, & Morawczynski, 2009; Kramer, Jenkis, & Khaz, 2007; Houghton, 2010). On the contrary, other researchers argue that less attention is given to civil infrastructure (electricity, roads, clean water, etc), human capital, and health. (Zhang, Wang, & Duan, 2016).

In Nwagwu (2005), the authors described their study participants agreed that 97% of them use a computer and other ICT devices for their administrative activities in the office. In general, many people are increasingly becoming dependent on computer and other ICT equipment to carry out their work, entertainment and contact people on social media. Hence, the availability of ICT infrastructure in schools, offices, etc., improves work performance efficiency and life satisfaction (Vijaykumar, 2011).

Table 1. Ethiopia's communication sector statistics – until June 2017

Number of customers	June 2017
Mobile telephone	58,080,626
Data and internet	16,505,225
Broadband (EVDO, WCDMA, LTE, ADSL)	6,902,902
Narrow band (1x, ADSL<256K)	276,294
GPRS	9,326,029
Fixed line telephone	1,169,625
Total customer	59,899,089

From the finding of the study conducted in Kiambu Sub-County Kenya (Adam, 2012), it was verified that ICT plays a great role for school administrators in carrying out administrative tasks. Nevertheless, the rate of using the available computers and important equipment was very slow. Furthermore, the study outlined that literacy towards the use of computer within the school staffs was very poor. Thus it was required to offer basic computer training to improve their skill to make use of the technology efficiently.

In Shava and Maramura (2016), the authors presented the challenges faced by NGOs in the development and expansion of ICT in Zimbabwe. They tried to address the role of ICT in rural communities of Zimbabwe towards achieving sustainable development, the challenges facing NGOs in implementing ICT for sustainable rural development and to what extent have NGOs implementation of ICT in most vulnerable rural communities of Zimbabwe increase the technological literacy of rural people. The study concluded that poor civil and ICT infrastructure financial problem, the effect of HIV/AIDS and less number of ICT expertise were some of the impediments for NGOs to accomplish sustainable development in terms of economy and culture.

According to a qualitative study conducted in Pakistan (Nyang'au, n.d.), a gap is obtained between the ICT policy and the actual problem on the ground to be addressed. There are several reasons for the existence of gaps between policy design and actuality. Lack of citizens' involvement in policy design, inter-agency coordination, and inconsistent policies, and political instability, i.e., changes in government interests are some of the outlined reasons for the design-actuality gaps in Pakistan.

In Palvia, Baqir, and Nemati (2015), the author outlined the significance of ICT in alleviating poverty and increasing local economic growth in Zimbabwe. The study also explained how to set up a feasible ICT industry which can sustain for longer period with the same or better performance. Moreover, it also briefed about what ICT can provide in alleviating the hindering factors that most Africans face while putting their full effort to be part of the global information society and knowledge economy.

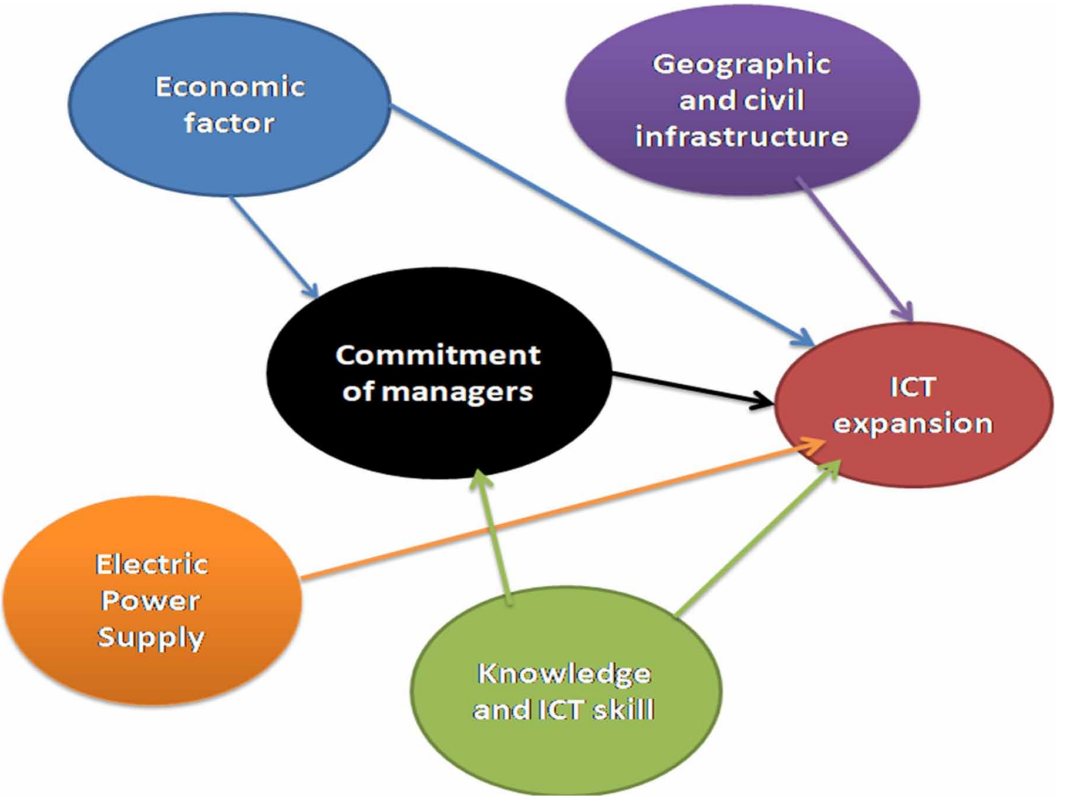
As outlined in Kundishora (2014) and Manochehri, Al-Esmail, and Ashrafi (2012), the adoption and expansion rate of ICT services in various governmental institutions will be affected by factors like GDP per capita of a particular society. In addition to this, separating ICT infrastructure from civil infrastructure is the key drawbacks and severe problem of many governments (Roberto Evaristo, 1998).

In Minges (2015), Peña-López (2016), and Olalekan (2013), the significance of academic institutions in acquiring technological competence as an economic and societal growth enabler and its necessity in the expansion of ICT services in developing countries is explained briefly. In Francophone West Africa (Shakeel, Khan, & Malik, 2012), the main reason for ICT infrastructure expansion was found to be human capital. According to Yoon and Na (2013), the rate of ICT expansion increases as the GDP per capita of Latin American countries increases.

From the finding of a research done in South Africa (Modimogale & Kroeze, 2011), the study participants enumerated various barriers those hindered the expansion of ICT ranging from technological to socioeconomic issues like electric power cut, high cost of ICT devices (perceived), technology intimidation, lack of money, possibility of fraud, and lack of knowledge.

Figure 1 illustrates how geographic and civil infrastructure economic factors, power line, knowledge, and skill of ICT, and commitment of managers affect the ICT expansion. According to the diagram, geographic and civil infrastructure and power line have a direct influence on ICT expansion whereas economic factors and knowledge and skill of ICT affect ICT expansion directly and indirectly through the commitment of managers. Furthermore, these two factors have a direct influence on the commitment of managers towards ICT expansion.

Figure 1. Conceptual framework



METHODS AND MATERIAL

Study Design

A descriptive cross-sectional study design with quantitative data collection method was carried out.

Study Area and Period

This study was carried out in Illubabor zone of Oromia Regional State located in the South West part of Ethiopia. Illubabor is one of the 18 zones of Oromia regional state with its capital Mettu 600 km away from Addis Ababa. The zone has 24 administrative districts.

Source Population

The source population for this study was all governmental organizations located in Illubabor zone in the year 2013 to 2014.

Study Population

The study population was all governmental organizations located in the seven selected districts from Illubabor zone.

- **Inclusion**: All governmental offices under the zonal administration.
- **Exclusion**: All governmental offices not under the zonal administration.

Sample Size Determination and Sampling Technique

All governmental organizations which are located in the selected district were included in the study. For this study, we used purposive sampling technique to select two districts from the twenty-four zonal districts purposely. The selected two districts were Mettu and Bedele. In these two districts, ICT access was comparatively higher than the others. Since the remaining districts were assumed to have a similar setup and ICT access, we employed simple random sampling technique to select five representative districts, i.e. Gore, Hurumu, Yayo, Darimu and Yanfa.

Data Collection Instrument

Data were collected using a structured questionnaire by interviewer lead administer and observation methods. The tools were adapted from different kinds of literature and modified according to the investigator concern. Observation method was employed to verify the trustworthiness of the information provided by the study participant.

Data Quality Assurance

- The questionnaire was pretested in Nopa district exclusive of the selected sample units.
- The training was given for data collectors and supervisors on how to collect the proper information
- The questionnaire was reviewed and cross-checked daily, and corrective measures were taken by the investigator.
- The questionnaire was translated to Afan Oromo language (the local language in the zone) and then back-translated to English to verify its consistency.
- Data were cleaned, edited and checked for the outliners and missed values or variable.

Data Analysis

Data were coded, entered, edited, cleaned and analyzed by Statistical Program for Social science (SPSS 16.0). A descriptive analysis was carried out to check missed values and outliners to verify consistency.

Ethical Clearance

Ethical clearance letter was taken from Mettu University Research and Community service Directorate, and oral informed consent was also taken from the study subjects and confidentiality was secured after introducing the purpose of the research.

RESULT AND DISCUSSION

Description of ICT Utilization

All governmental sectors which were located in all selected seven districts were included in the study. The total size of the study units were 195 and making the response rate 100%. In the analysis below, all the collected data from the study participants were supported by observation for their presence and functionality of ICT devices in the respective offices.

Desktop Computer, Laptop, and Printer

In all selected districts 190 (97.4%) governmental offices have desktop computer ranging from 0 to 32. The mean desktop distribution among the study subjects was found to be 2.86 with a standard error of 0.25. The total number of desktop computers was 558, but the total required amount is 1203 with a mean of 6.17 and the standard error of 0.48. Of the total computers available, 472 (84.59%) were functional during the study time.

In the case of a laptop, 76 (39%) of the study subjects have laptops ranging from 0 to 13. The mean laptop distribution was 0.9487. The total number of laptops was found to be 185 (182 are functional), but the required amount is 835 (4.58 times the number of the existing laptop).

One hundred and eighty-nine (96.9%) of the offices have printer out of which 382 (77.37%) are functional. However, the number of required printers is 773. The mean distribution of printer among the offices is 1.95 with a standard error of 0.115.

Scanner, Photocopy Machine, and LCD

Thirty scanners from all the study subjects were available, and only 18 (60%) are functional. Among the study subjects, 51 (26.2%) have a photocopy machine with mean distribution 0.159 and standard error of 0.029. Out of the currently existing 67photocopy machines, only 31 are functional. However, the number of a required photocopy machine is 257. Out of the 20 liquid crystal displays (LCDs) currently available 4 (20%) are non-functional. The mean distribution was found to be 0.082 with a standard error of 0.022. The required number of LCDs is 227.

TV, Fixed Line Telephone, Internet

There are 73 televisions available, and 4 (0.05%) of them are non-functional. However, the number of televisions required is 302. Out of the total respondents, 72.8% of the zonal offices have fixed line telephone, and 92.05% of them are only functional with the mean distribution of 1.3 and standard error of 0.095. According to the respondents, the number of required fixed line telephone is 532. Regarding internet access, only 18 (9.2%) offices have an internet connection. Among them only seven offices use CDMA-1X, eight offices use the Broadband connection with a bandwidth of 512KB, and three offices use a dial-up connection. The available connection is even being utilized by the office managers especially for their purposes. Since the computers in the offices are not networked with the manager's system, sharing the connection is impossible. Around 8 (44.4%) offices use broadband connection, and the rest 3 (16.6%) use dial-up connection. From this, we can conclude that there is less internet coverage in the zonal and district offices. Table 2 shows the internet coverage.

This finding agrees with the study conducted in India where internet access was very poor in most governmental schools. However, it disagrees with the finding of developed countries in Europe where governments through the Ministry of Education purchase computer hardware and software and provide access to the internet (Nwagwu, 2005; Vijaykumar, 2011).

Fax, Digital Photo, and Video Camera

There are 58 faxes available in the offices during the data collection time out of which 39 (67.2%) are functional. A number of fax lines required is 218 with a mean distribution of 1.11 and standard error of 0.509. There are 82 digital cameras currently available, and 14 (17.07%) are non-functional. The mean distribution of digital camera is 0.348 with a standard error of 0.06. The amount of required digital camera is 350. The number of video camera currently found is around 15, and 6 (40%) are non-functional. The amount of required video camera is found to be 215.

The summary of the result is illustrated using Table 3 and Figure 2.

The study indicates that the required number of ICT devices in each type is much higher than the existing one. This shows there is a high demand for ICT utilization, but no adequate supply of

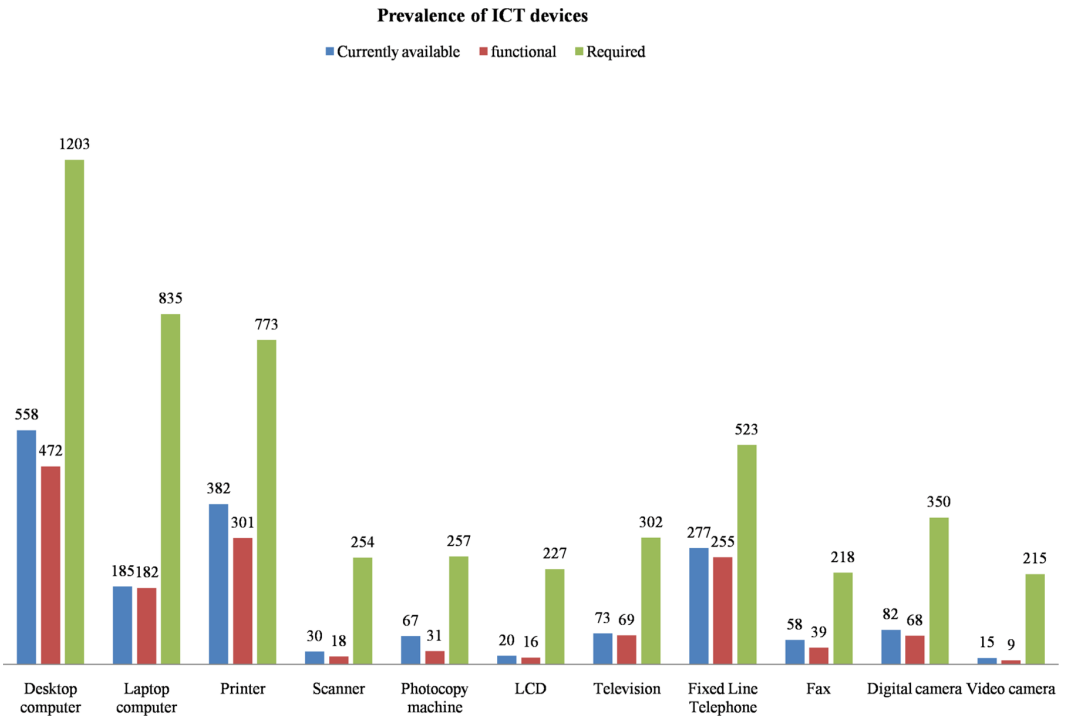
Table 2. Internet coverage

Office status	No. Of offices	Percent (%)
Offices with an internet connection	18	9.2
Offices with no internet connection	177	90.8

Table 3. Prevalence of ICT devices

Variable	Currently available		Functional		Required
	Quantity	Percent	Quantity	Percent	Quantity
Desktop computer	558	46.38	472	84.58	1203
Laptop computer	185	22.15	182	98.37	835
Printer	382	49.41	301	78.8	773
Scanner	30	11.8	18	60	254
Photocopy machine	67	26.07	31	46.26	257
LCD	20	8.81	16	80	227
Television	73	24.17	69	94.5	302
Fixed Line Telephone	277	52.96	255	92.05	523
Fax	58	26.6	39	67.34	218
Digital camera	82	23.24	68	82.9	350
Video camera	15	6.97	9	60	215

Figure 2. Prevalence of ICT devices



these devices in each office. In addition to this, among the existing devices, some of them are non-functional. Moreover, a problem like lack of ICT professional in each district has its role. Generally, this can hinder the ultimate efficiency and performance of the government regular activities.

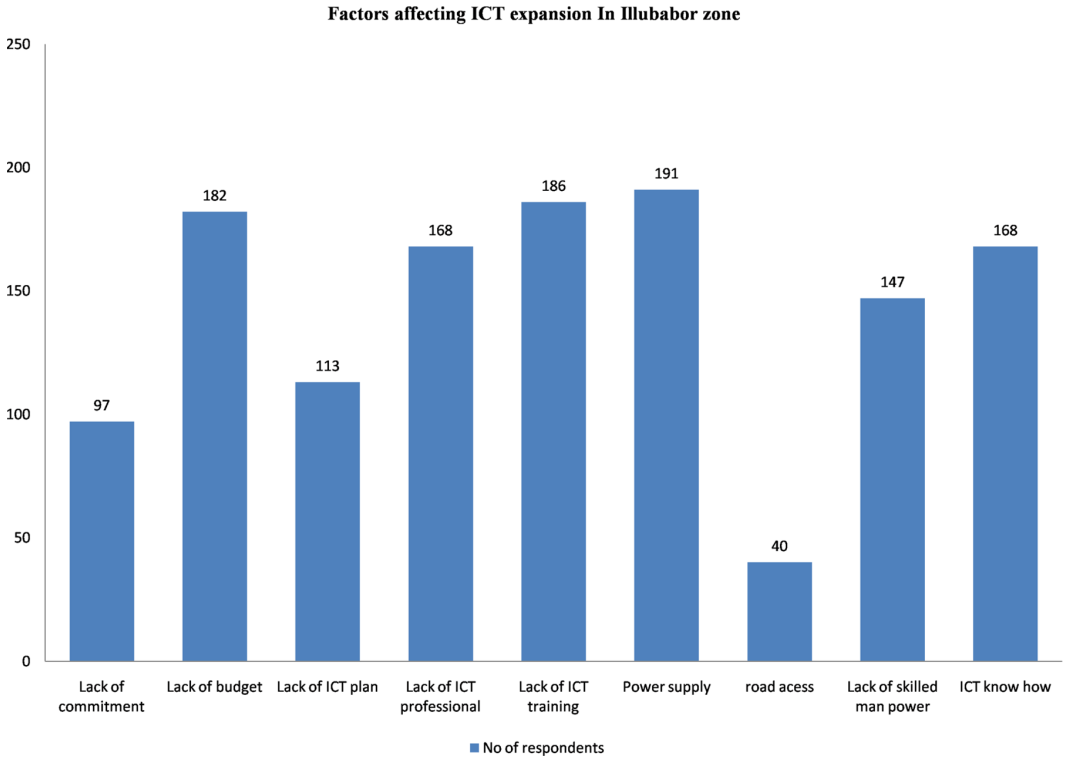
Barriers for the Expansion of ICT

Based on the analysis of the survey conducted, we obtained the following major factors that hinder ICT expansion within the zone.

- Lack of sufficient budget: is mentioned by 182 (93.3%) of respondents as factors that hinder ICT expansion in the zone. In some districts, the computers even available were donated by NGO's which indirectly confirm as a proper budget for ICT is not allocated.
- Lack of commitment by the government was also mentioned as hindering factors by 97 (49.7%) of the respondents.
- Absence of updated ICT strategy plan was the other reason explained by 113 (57.9%) of respondents as one hindering factor for ICT expansion.
- Power supply irregularity in the zone is also mentioned as the main challenge for the provision of ICT by 191 (97.9%) of respondents.
- Technical literacy was also frequently mentioned as an impediment for the growth of ICT within the districts. Moreover, 147 (75.4%) of respondents (officers) were persons with no necessary computer skill ranging from 0 to 39 with an average of 5.58 people per office. The primary reason for this is the lack of short term computer training institutes in the zone and being reluctant by office managers to coordinate a training session for the workers. The essential typical constraints are shown in the chart below.

From Figures 2 and 3, the dominant barrier for ICT expansion in the zone is found to be a lack of training for the employees and lack of adequate budget for fulfilling the required devices. Lack of ICT literacy has indirectly influenced the zone and district employees not to utilize even the already

Figure 3. Factors affecting ICT expansion in Illubabor zone



existing ICT equipment properly. All factors explained in the result of the current study were in line with the factors listed in the conceptual framework of the study. As the framework was adapted from the findings of different literatures factors like lack of knowledge and skill regarding ICT, economic factors which affect the supply of ICT materials, lack of commitment from a person on the managerial area to influence the situation, irregular power supply and problem associated with poor infrastructure were hindrance factors for the expansion of ICT in many developing countries. The findings of this study also share the same things as barriers of ICT expansion in Illubabor Zone of Ethiopia.

CONCLUSION AND RECOMMENDATIONS

This study investigated factors responsible for the reduced use of information and communication technologies in the Illubabor zone of Oromia region, Ethiopia. Literature was reviewed extensively. From the finding, it is clearly shown that lack of computer skill training for government employees accounts the significant percentage in the weak expansion of ICT. Secondly, the amount of budget that is allocated for ICT is less and irregular power supply in the districts contribute to the underutilization of the technology. The other main factors are the lack of commitment by institutional leaders; lack of ICT strategy, lack of qualified ICT professionals who will be responsible in maintaining and installing all the available ICT devices and infrastructures in the offices. The following recommendations are derived from the findings of the study. The Illubabor zone:

- Should provide adequate fund for the acquisition of appropriate ICTs.
- Must ensure that satisfactory training in the use of ICTs must be organized and given to all staffs in the zone and district level
- Must put ICT strategy in place.
- Should install a standby generator to ensure the continuity of work in the case of a power outage for districts according to their needs.
- Create a partnership with private industry where some of the costs are shared along with the risks in improving the situation in the country

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