

International Telecommunication Union

ITU-T

TELECOMMUNICATION
STANDARDIZATION SECTOR
OF ITU

Technical Report

(08/2020)

TR-BSG

**Use of ITU-T Recommendations by developing
countries**

ITU-T



Summary

The International Telecommunication Union's standardization sector, (also known as ITU-T), is one of the world's leading standardization development bodies in telecommunications. ITU-T produces standards known as ITU-Recommendations covering a wide range of aspects of telecommunications. These Standards are used voluntarily, and it is therefore up to a member to use them or not.

The ITU membership took a decision to offer their standards free of charge, a decision that saw an increase in the use of the standards among members, who previously had to pay for them prior to using them. Different category of people uses these standards, the majority of them include, equipment manufacturers, network operators, innovators, research and development, application developers, solution providers academicians, regulators, policy makers, etc.

Countries with more developed information and communication technology (ICT) industries and sectors, use standards much more than those with a less developed ICT industry and sector. Therefore, the more sophisticated the ICT sector the greater the need for standards to make it function in a smoother manner.

In general, developed countries are evidently seen to be using standards more than developing countries and this is also true for ITU-T Recommendations.

Developing countries are now becoming more aware of the importance of using standards in the development of a well-functioning ICT industry and sector which has seen an increase in the use of standards by developing countries. By virtue of ITU membership it is expected that developing countries should be using ITU-T standards more than standards from other standardization bodies, especially where they exist.

This Technical Report seeks to examine the extent to which developing countries use ITU-T standards compared to those of other standardization development organizations (SDOs).

History

ITU and all its organs is aware of the importance of standardization in the development of countries' ICT industries and sectors. It has put in place a number of specific measures to ensure that all members obtain the maximum benefits from the standards that are developed and that all members are involved. This is because of the observation that developed countries are more active and are benefiting more from the ITU standardization process compared to developing countries.

TSB has activated a specific program known as bridging the standardization gap (BSG), which aims at increasing the participation, involvement and benefits of ITU-T standardization specially to developing countries. This has worked to a great degree. There are more developing countries participating and involved in the standardization activities of ITU-T.

Some members, especially from developing countries, became interested in finding out how developing countries were utilizing ITU-T standards. The interest may have possibly stemmed from the low participation in ITU-T standardization activities and therefore related to the limited utilization of ITU-T standards. It is assumed that developing countries do not participate in the standardization work because they are not using the standards and would therefore not be keen in participating in the activities and development processes.

Consequent to the foregoing Question 5 of Study Group 13, approved a related questionnaire that was disseminated and managed by TSB. The questionnaire was transmitted to every ITU Member State through a circular, although responses were mostly from developing countries. The deadline for responses to the questionnaire was initially set to the 30 November 2018, but since the number of responses received was insufficient by the time of the deadline, it was requested that the deadline be extended to 30 August 2019 in order to collect more responses.

NOTE

This is an informative ITU-T publication. Mandatory provision, such as those found in ITU-T Recommendations, are outside the scope of this publication. This publication should only be referenced bibliographically in ITU-T Recommendations.

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Technical Report ITU-T TR-BSG

Use of ITU-T Recommendations by developing countries

1 Scope

The scope of this study is limited only to some issues which relate to the utilization of ITU-T standards by developing countries. The study looks at the extent to which developing countries use ITU-T standards compared to those from other SDO standards.

It is believed that a country's level of participation in the standards development process will be reflected in the level of utilization of the standards.

2 References

This Technical Report makes reference to the following:

- a) Article 17 of the ITU Constitution which essentially requires TSB to pay particular attention to the standardization needs of the developing countries,
- b) Resolution 44 (Rev. Hammamet, 2016) – Bridging the standardization gap between developing and developed countries and other references contains provisions which, aim at increasing the participation of developing countries in the ITU-T standardization process,
- c) Plenipotentiary Resolution 71 (Rev. Dubai, 2018); and
- d) ITU Strategic Plan 2016-2019 on promoting active participation of developing countries.

At the time of publication, the editions indicated were valid.

All references are subject to revision; users of this Technical Report are therefore encouraged to investigate the possibility of applying the most recent edition of the references used in the Technical Report.

3 Definitions

None.

4 Abbreviations and acronyms

This Technical Report uses the following abbreviations and acronyms:

ARSO	African Organization for Standardisation
BSG	Bridging the Standardization Gap
ICT	Information and Communication Technology
IEC	International Electro-Technical Commission
ISC	ICT Standards Steering Committee
ISO	International Organization for Standardization
IT	Information Technology
MoU	Memorandum of Understanding
NSB	National Standardization Body
R&D	Research and Development
RSB	Regional Standardization Body

SDO	Standards Developing Organization
TC	Technical Committee
ZABS	Zambia Bureau of Standards
ZICTA	Zambia Information and Communications Technology Authority

5 Conventions

None.

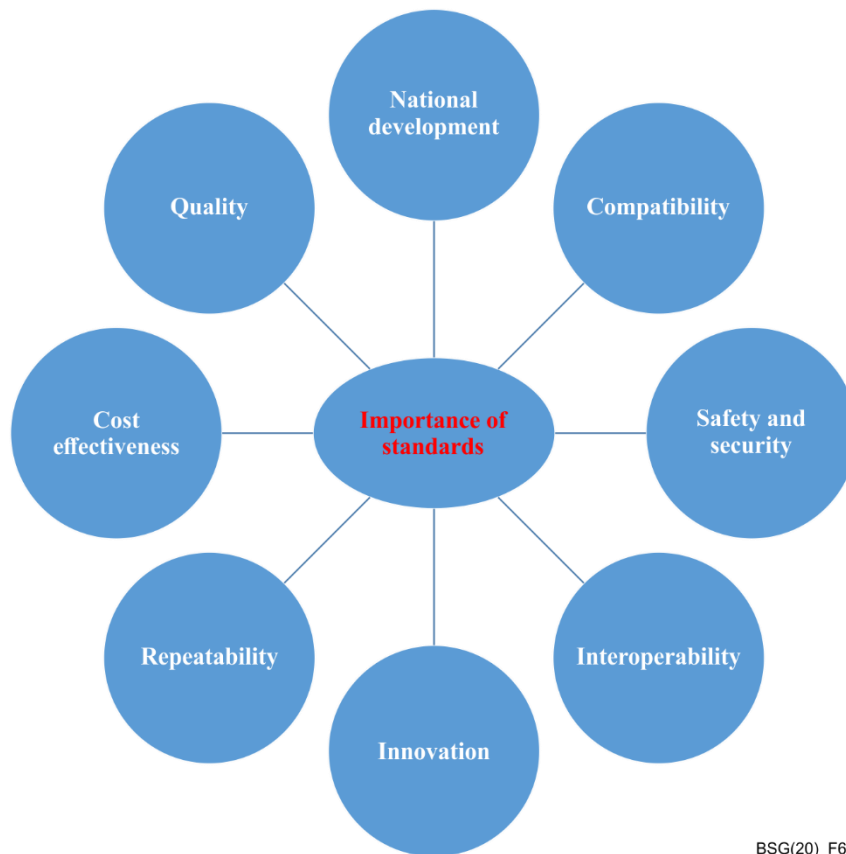
6 Importance of ICT standards to developing countries

It is now a known fact that standards are necessary for smooth operations, trade, quick roll out of products on a wider market, predictability of services and products, etc. It is even more critical in ICTs, where without standards products would not easily interwork, or even communicate to each other. The world has become a connected place where standards are no longer an option but a necessity.

Within the ITU family, it has been noticed that the ICT sector of countries which are active in ICT standards development activities grow rapidly compared to those which are not as active. This has a direct positive impact on national development. That is why it is desirable for developing countries to participate in standardization activities to grow their ICT sectors. ICT standards are equally important to both developed and developing countries as standards contribute to national development.

It is therefore important for developing countries to take issues of standardization seriously as they impact the growth of their ICT sector and their national economies.

Figure 6-1 gives a summary of the key importance of standardization for developing countries.



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Figure 6-1 – General benefits of applying standards

The following are the general benefits of applying standards:

- Improving market access,
- Facilitate compliance to technical regulations,
- Improvement of the suitability of products, processes, and services for their intended purpose,
- Serve to enhance quality,
- Promote understanding of technology by providing information,
- Prevention of technical barriers to trade,
- Facilitation of technological cooperation.

7 Use of ITU-T standards by developing countries

ITU-T is one of the most prominent SDOs in the telecommunication standardization area. It comprises 193 Member States and several other agencies which subscribe to it. Most developing countries are members of the ITU and are involved in its activities which include standardization. As such, the use of ITU developed standards is expected to be natural. Developing countries also use other standards developed by other SDOs. The extent to which developing countries, which are members of ITU use ITU standards and the reasons for their use, in a competitive standards developing environment, are so far unknown, but should be of interest to the ITU family and especially those who develop the standards.

The expectation is that, with limited financial and technical resources, developing countries, which are members of the ITU, one of the leading SDOs for ICT standards, should be using the ITU standards almost entirely wherever they exist but there is evidence to the contrary. Many developing countries are not using the ITU standard as expected, and it is important to find out why.

Most countries use ITU-T standards as the primary standards for telecommunications. However, there are other telecommunications standards which are used that are produced outside of the ITU environment. Most developed countries have a number of specialized bodies within their countries which produce various standards including telecommunications and therefore they do not only depend on ITU standards for their telecommunication standardization needs. There are other bodies besides the ITU which collaborate at an international level to produce telecommunication standards. As a result, there are a number of bodies currently producing telecommunication standards.

Active participation in as many standardization bodies as possible would be the ideal practice but that would require a lot of both financial and human resources. Developing countries are usually hard pressed to participate in several of them. That is why the general arrangement in developing countries usually follow the use of standards developed by their national standardization body and the use of ITU-T standards. It is only in the exceptional cases where standards from other SDOs are used. This makes the dependence on the ITU-T standards by developing countries very high.

Developing countries use ITU-T standards directly for products, networks, solutions, and interworking. ITU-T standards are also used as reference, by developing countries, to develop their own national standards for services, equipment, applications, and products.

Developing countries uses ITU-T standards to leverage massive standardized production to acquire cheaper products and services.

In many developing countries, there are numerous innovation hubs, R&D and scientific developments which are already heavily relying on developed and approved ITU-T standards.

According to the ITU standardization development ladder shown in Figure 6-2, different developing countries are at different levels with the majority at the participation level. However most developing countries are seeking to utilize standards to improve ICTs in their countries. Utilization therefore has become important to developing countries. Standards should play a key role in solving the countries problems. Then the importance of gaining the **Know How, Participation** and **Influencing** can come in.

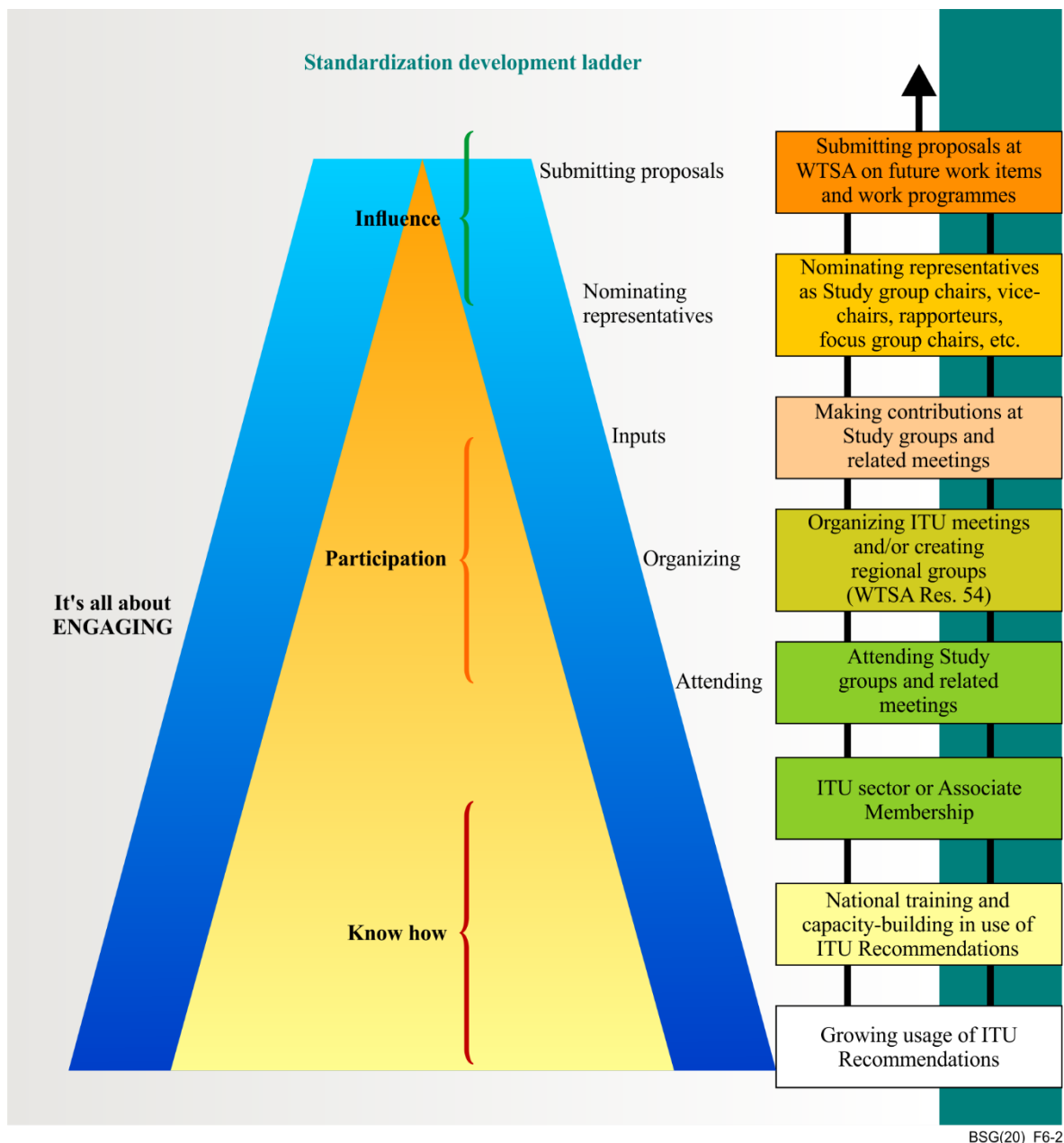


Figure 6-2 – ITU standardization development ladder

ITU Recommendations offer several advantages some of which are presented below:

- i. ITU-T Recommendations cover an array of topical issues in the ICT sector and this makes it easy to find the required standards for a particular subject area,
- ii. ITU-T is always abreast with the latest technological trends in the telecom sector and as such are very responsive in making available the necessary standards that would usher in these new technologies,
- iii. The Recommendations are easily accessible through the ITU website and are readily available at no cost,
- iv. The information contained in the Recommendations is easy to comprehend allowing for ease and swift application,
- v. ITU is a well-known organisation in the field of ICT and so there is trust in the ITU Recommendations.

8 Use of other standards by developing countries

An increasing number of developing countries which are members of the ITU are beginning to use standards other than ITU-T standards even where there is a relevant ITU-T standard. The reasons for this and the growth is not yet established but some of the indications are that, most developing countries are using technologies from developed countries and that technology has a bearing on the standards they use. Developing countries do not indicate to implementers the standard they should use, therefore technology implementers choose any standards they wish, even if the requirements are covered by an ITU standard. There could be other reasons for this, relating to cost, access, visibility, ease to use and marketing.

It has been observed that developing countries which are members' of ITU are securing membership to other SDOs, in which case they also participate equally in those SDOs activities. This also spurs their increased use of other SDOs standards.

As expected most developing countries which are members of the ITU, are still using ITU standards to a greater extent, but the use of the SDO standards, by developing countries, where ITU standards exist, is growing at a concerning rate.

9 Overview on ITU-T standards development

ITU standards are produced using one of the most streamlined processes. Members identify the need/gap and following established procedures, members agree to submit contributions towards the development of a required or identified standard. Essentially, a standardization need is identified, and members contribute towards it. It is inclusive and member driven. Once the standard has reached maturity, members agree its approval, and it comes into force. There are no costs involved in participation in the specific meetings that develop the standards. The standards are also free of charge.

This process is contribution driven, and can only go forward if contributions are made. Also, those with most interest usually take on the responsibility of having the standard go through, by producing the relevant contributions. This means that those countries that do not participate actively in the process may end up being only consumers of the standard, as opposed to those which participated in its development. Countries with more developed ICT industries and sectors are allocating more resources to the standardization process and they end up using the standards they have developed. On the other hand, developing countries are allocating relatively less resources and are consequently not being active participants in the development of standards. This, undoubtedly, has a bearing on the intensity of utilization of the developed standards.

9.1 Overview of participation of developing countries in the ITU-T Recommendation development

It is a known fact that developing countries participate less, in the ITU standardization activities compared to developed countries.

The issues that usually affect the active, consistent participation of developing countries in the standardization work of ITU include:

- High cost of participation in standardization meetings,
- Frequent change of delegates to specialized standardization activities,
- Few delegates to support specialization and broad coverage by a country,
- Few standardization activities.

These are issues that need to be addressed by the individual member states, nevertheless they contribute to the outcome of the standardization process and how it affects developing countries.

10 Survey of the use of ITU-T Standards by developing countries

10.1 ITU Questionnaire 119

In order to collect data for this Technical Report, SG13 conducted a study based on a Questionnaire, entitled "Survey on the use of ITU-T Recommendations in developing countries" in September 2018 (see TSB Circular 119 included in Appendix I).

This questionnaire included the following two (2) sections:

Section I on "**Use of ITU-Recommendation**" includes questions on:

- Whether a country has a body responsible for national standards,
- Whether a country has a separate body responsible for national ICT standards,
- Whether a country develops its own national ICT standards,
- Whether a country references other standard in the national standards,
- Of the national standards how many times on average has each standard referenced other ITU-T Recommendations,
- Whether a country adopt/adapt other standards as national standards,
- Of the national standards how many ITU-T Recommendations have been adopted/adapted.

Section II on "**Reasons for referencing standards**". The following questions were asked in this section:

- Rank the reasons for reference of ITU-T Recommendation. (1 to 5, with 1 being the least appropriate reason and 5 the most appropriate reason) in the following categories:
 - Easy to access,
 - Not costly to access,
 - Easy to understand,
 - Trust in ITU,
 - ITU member state.
- Rank the reasons for reference of other standards. (1 to 5 with 1 being the least appropriate reason and 5 the most appropriate reason):
 - Easy to access,
 - Not costly to access,
 - Easy to understand
 - Trust in other standards
 - Member of those SDOs

10.2 Countries and institutions that responded to the questionnaire

The deadline for responses to the questionnaire was initially set to 30 November 2018, but since the number of responses received was "few", this deadline was extended to 30 August 2019 in order to collect more responses. Table 1 shows the countries and the institutions of those countries that responded to Questionnaire 119.

Table 1 –Countries and agencies that responded to ITU Questionnaire 119

Responding country	Responding entity
Qatar	Ministry of Transport and Communication
Jordan	Telecommunication Regulation Authority
Cuba	Ministry of Communication
Zambia	Zambia Information Communications Technology Authority
Jamaica	Office of Utilities Regulation
Bosnia Herzegovinian	Communication Regulation Authority of Bosnia Herzegovina
The Gambia	The Gambian Public Regulatory Authority
Lao PDR	Ministry of Information Telecommunication Technology
Uganda	Uganda Communications Commission
Ghana	Ghana Standardization Authority
Ghana	The National Communications Authority
Nigeria	Nigeria Communications Commission
Zimbabwe	Dandematande Investments
Mexico	Federal Telecommunication Institute
Lesotho	Lesotho Communications Authority
Tchad	Autorite de regulation des commuications electroniques et des postes (ARCEP)
Guinea	Ministère des Postes, Télécommunications et de l'Economie Numérique
Nigeria	9 Mobile Nigeria Ltd.
Nigeria	Natcom Development & Investment Ltd.
Tunisia	Tunisie Telecom
Mali	SOTELMA (Telecommunications Society of Mali)
Kenya	Communications Authority of Kenya
Rwanda	Rwanda Utilities Regulatory Authority
Mozambique	Mozambique Postal and Telecommunications Regulatory Authority
Benin	Ministry of Digital Economy and Communication
Eswatini	Eswatini Communications Commission

Responses were received from countries from all continents except South America. Twenty-six (26) responses from twenty-four (24) countries were received and analyzed. The countries are from Africa, Asia, and Latin America. Table 2 shows the total number of responses from the entities in the responding countries.

Table 2 – Number of the survey's respondents by country

Number of countries which responded	Number of entities that responded	Regulators that responded	Government Ministries that responded	ICT operators that responded
24	26	15	06	05

10.3 Response to the questionnaire

As it would be expected, most responses came from Africa, which has a large number of developing countries. It is also expected that issues of utilization are critical to developing countries, because they register low usage of standards.

Figure 10-1 shows a consistent trend in respect of the number of responses. The responding countries from North America are not classified as developing countries.

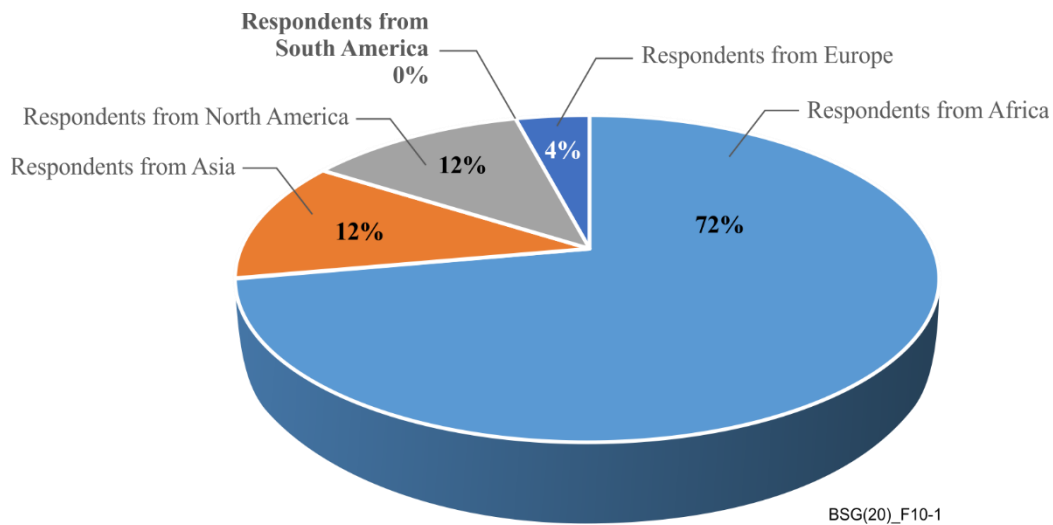


Figure 10-1 – How countries responded to the questionnaire

The results of the analysis of the responding entities are in line with the participation pattern of ministries, operators and regulators involved in the work of ITU. Figure 10-2 shows that 54% of the responses came from regulating entities. This is typical especially for developing countries, where most participation in ITU activities is the regulatory agencies. This also speaks to who regularly receives the ITU correspondences such as questionnaires. It is still difficult to get responses and information from operators or entities, which are not members of the ITU.

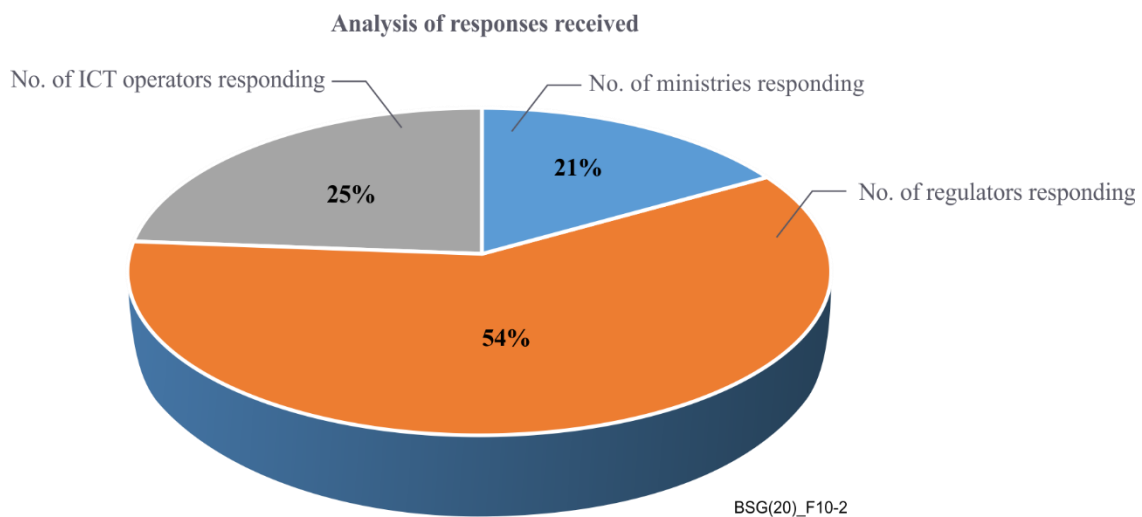


Figure 10-2 – How entities responded

There is an issue of general observation and concern on responses to questionnaires in TSB. The responses are usually low compared to the membership. When a questionnaire is developed and approved, it is sent to all members but only few often respond. The drawback is a loss of the credibility of the process and results. It is difficult to pass as credible an analysis generated from 26 responses out of the expected 190 responses. Nevertheless, the analysis is done, and the results generated. ITU is a science driven organization which should follow the requirements of science. It is important that the issue of response to ITU Questionnaire and other related research tools are given the attention they deserve in order to make the related outputs credible.

10.4 Responses to the questions

Two sets of questions were sent out. The first set contained questions intended to gauge the presence of national standardization bodies and how entities used the ITU-T Recommendations and other SDO standards.

Figures 10-3 to 10-7 show the questions in Set 1 of the Questionnaire with the results of the outcomes.

1.1 Does your country have a body responsible for national standards?

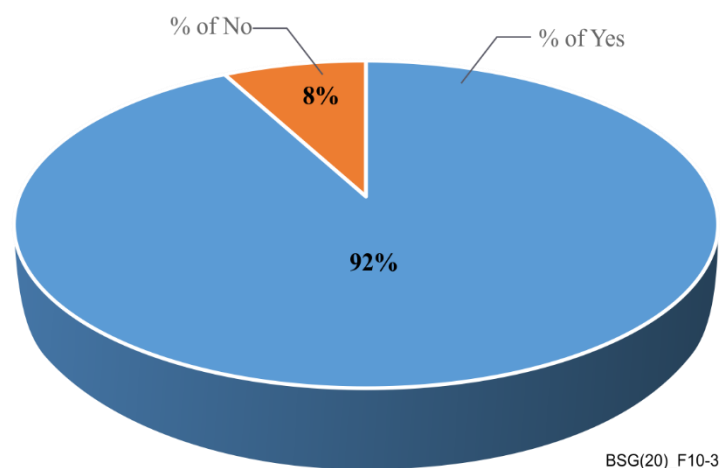


Figure 10-3 – Question 1.1: Countries with a responsible body for national standards

1.2 Does your country have a separate body responsible for national ICT standards?

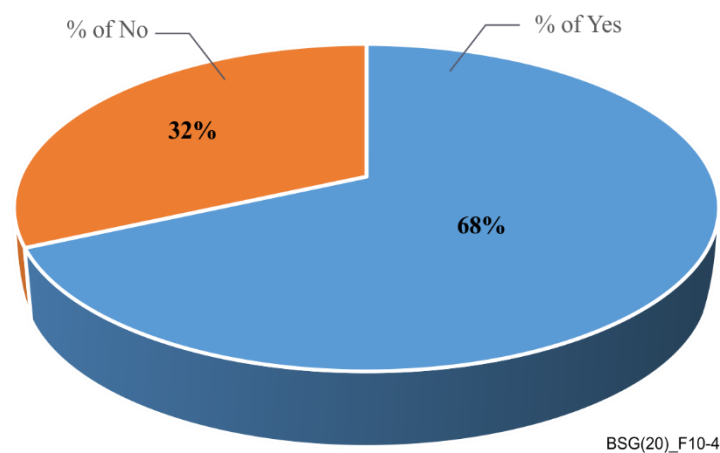


Figure 10-4 – Question 1.2: Countries with a separate national ICT standards body

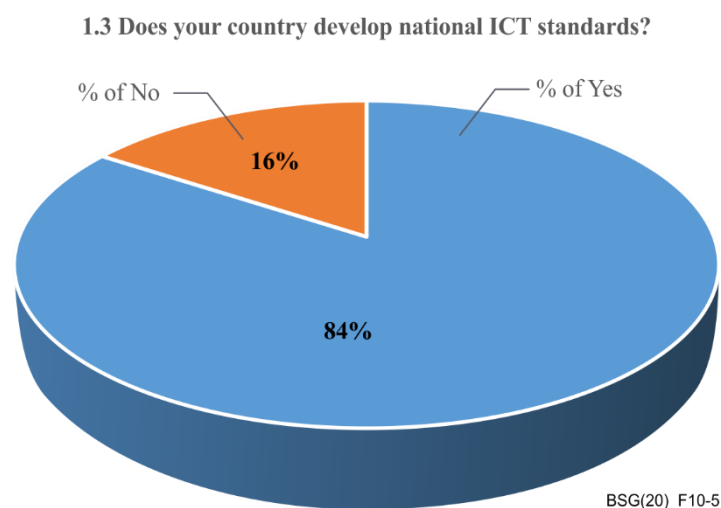


Figure 10-5 – Question 1.3: Countries that develop their own standards

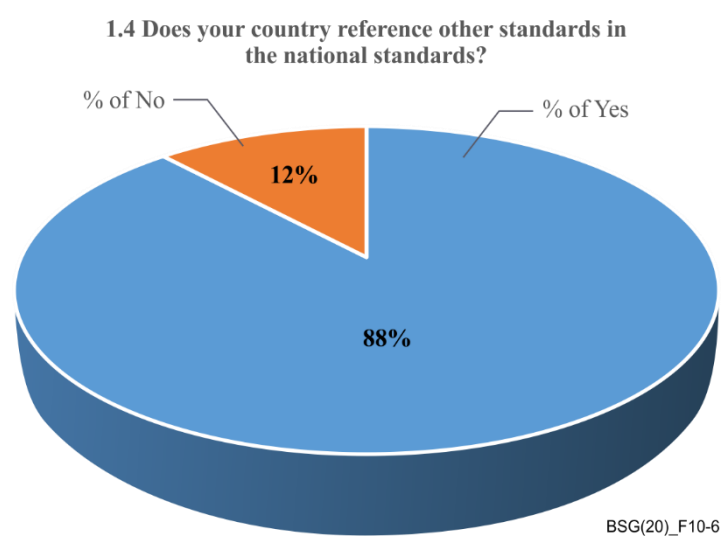


Figure 10-6 – Question 1.4: Countries that reference other standards

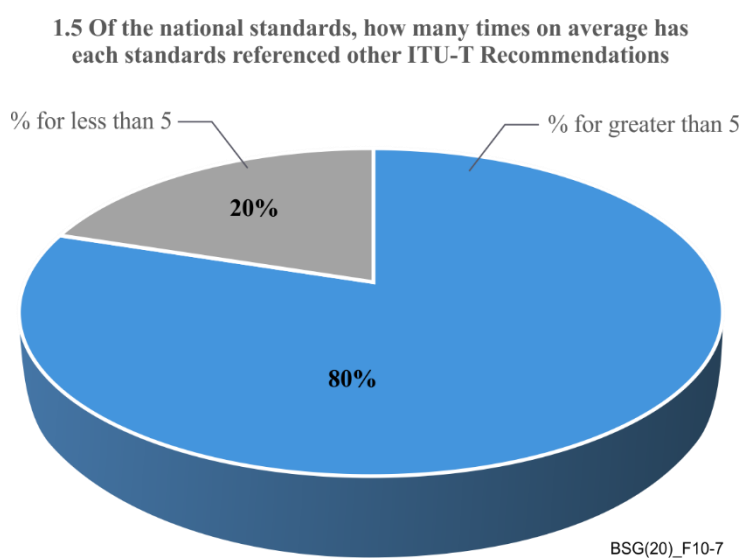


Figure 10-7 – Question 1.5 – Number of times ITU-T Recommendations are referenced

Observations

- A. Most respondents (92%) indicated that they have a national body responsible for standards. The majority of those (68%) indicated that such a body for ICT is indeed separate from other standardization bodies.
- B. Over 80% of the respondents indicated that they reference ITU-T standards and the same percentage (over 80%) indicated that they referenced ITU-T standards, over five times. Referencing ITU-T standards should be at 100% if not close to 100%. There is need to understand and address the reasons why developing countries are not referencing ITU standards at 100%.
- C. The majority of the respondents (84%) indicated that they develop their own standards. This is a good development.
- D. It is intriguing to find out why some countries have not referenced ITU-T Recommendations at least more than 5 times.

The second set contained questions intended to measure how easy it is to access the standards and preferences for either ITU-T or SDO standards.

Figures 10-8 to 10-12 show the questions in Set 2 of the Questionnaire related to ITU-T standards with the results of the outcomes.

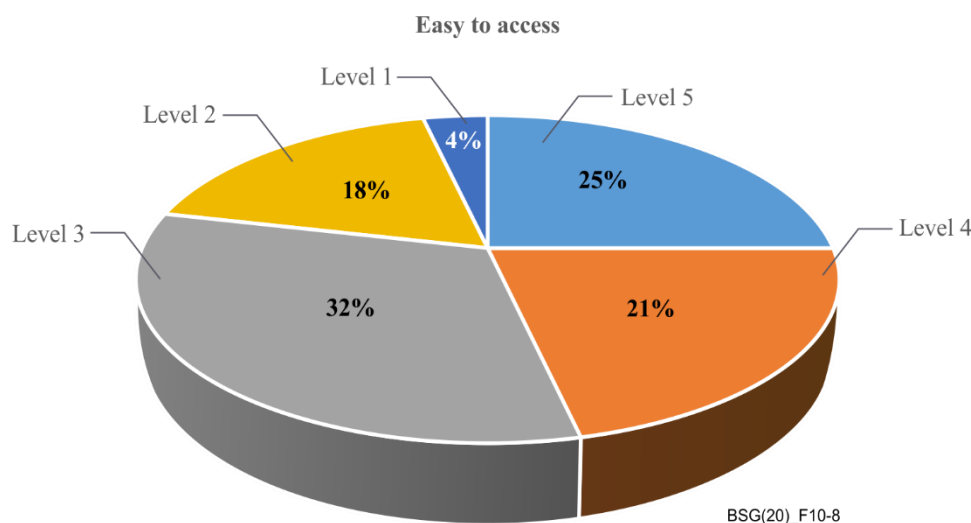


Figure 10-8 – Use of ITU-T Recommendation due to ease of access

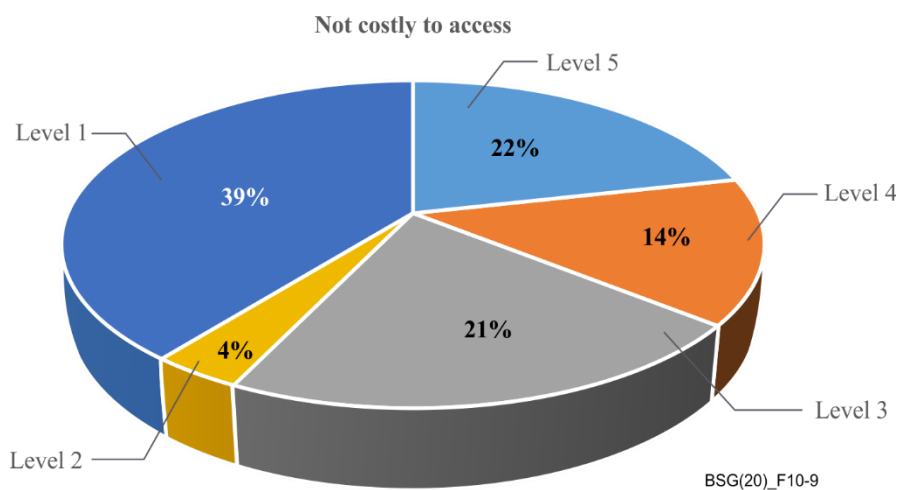


Figure 10-9 – Use of ITU-T Recommendation based on low cost accessibility

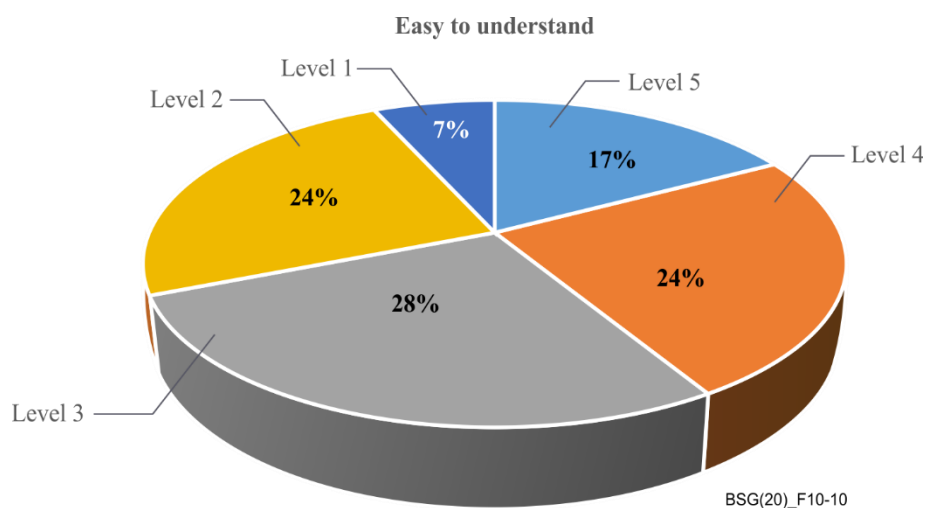


Figure 10-10 – Use of ITU-T Recommendation because they are easy to understand

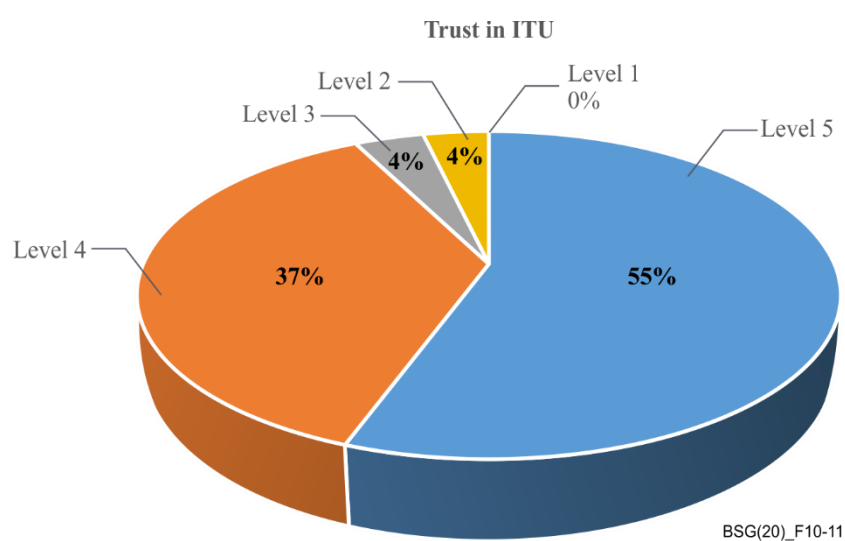


Figure 10-11 – Use of ITU-T Recommendation based on trust in ITU

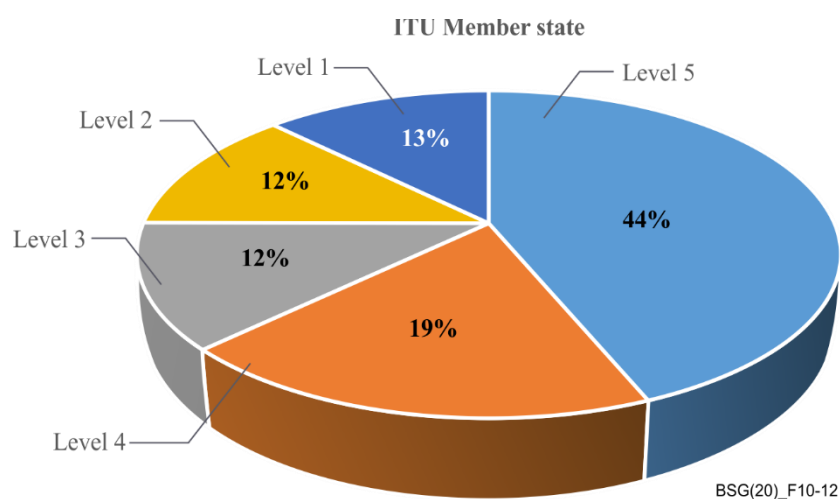


Figure 10-12 – Use of ITU-Recommendations based on Membership

Observations

- A. Most respondents (32%) indicated that ITU-T Recommendations are not so easy to access. Only 25% thought they were easy to access.
- B. 21% of the respondents indicated that ITU-T Recommendations were not costly to access. The cost here does not relate to the cost of the Recommendations, those are free to access, but may be other areas like, Internet, etc.
Only 17% of the respondents indicated that ITU-T Recommendations were easy to understand. That is a very low number and a point that is worth looking at again.
- C. 55% of the respondents indicated that they had trust in ITU-T Recommendations.
- D. 44% of the respondents used ITU-T Recommendation mostly because they were ITU Members.

Figures 10-13 to 10-17 show the questions in Set 2 of the Questionnaire related to other SDO standards with the results of the outcomes.

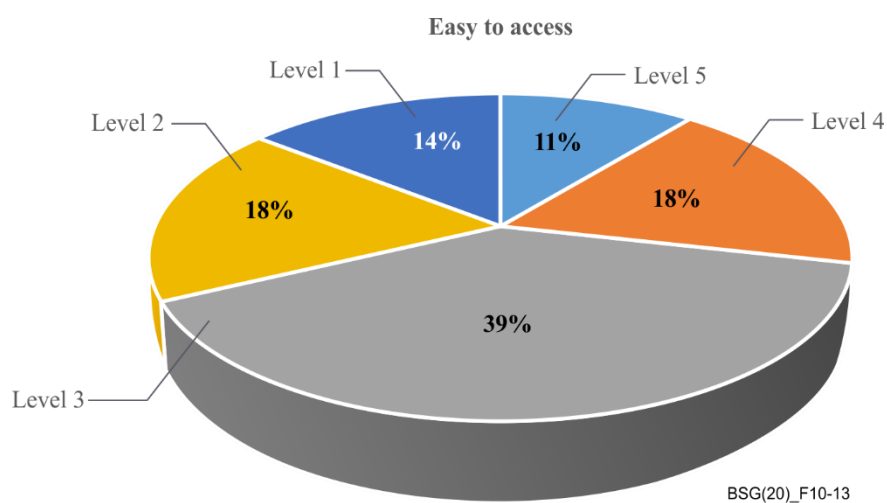


Figure 10-13 – Use of other standards because they are easy to access

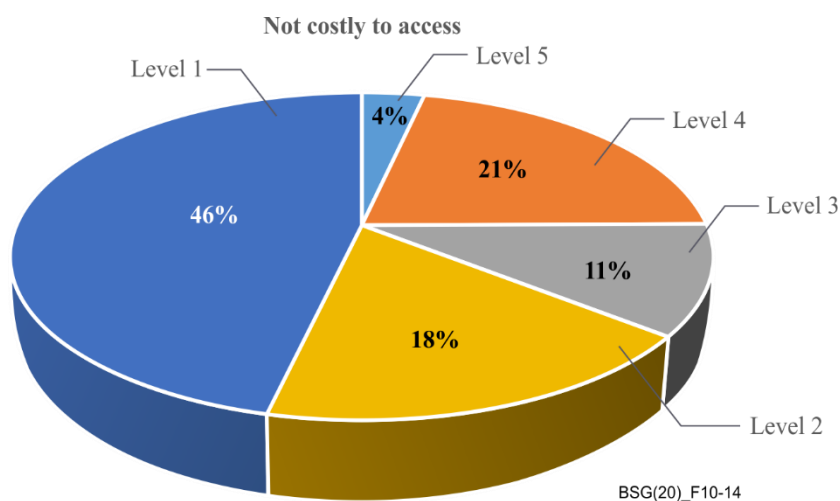


Figure 10-14 – Use of other Standards because they are not costly to access

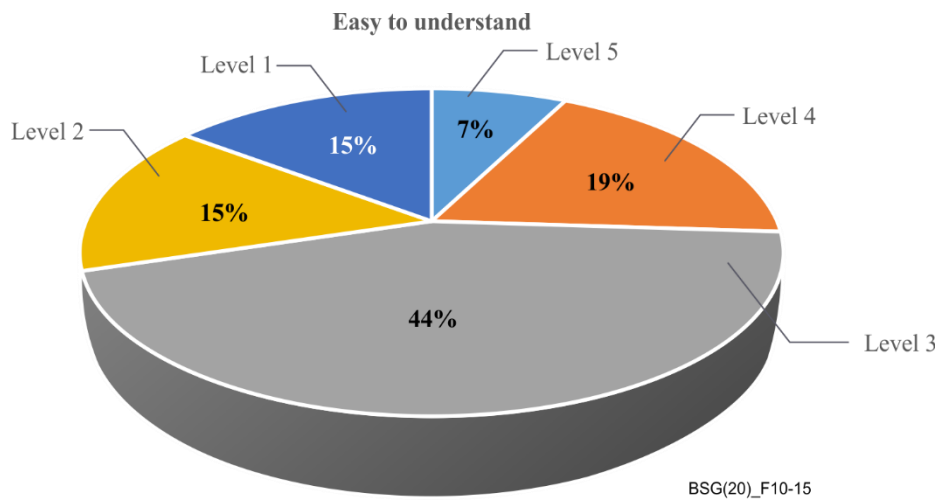


Figure 10-15 – Use of other standards because they are easy to understand

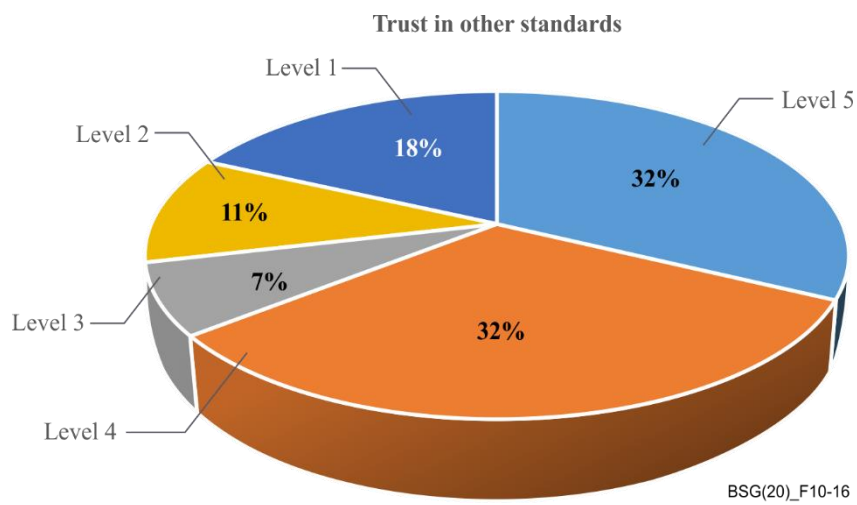


Figure 10-16 – Trust in other standards

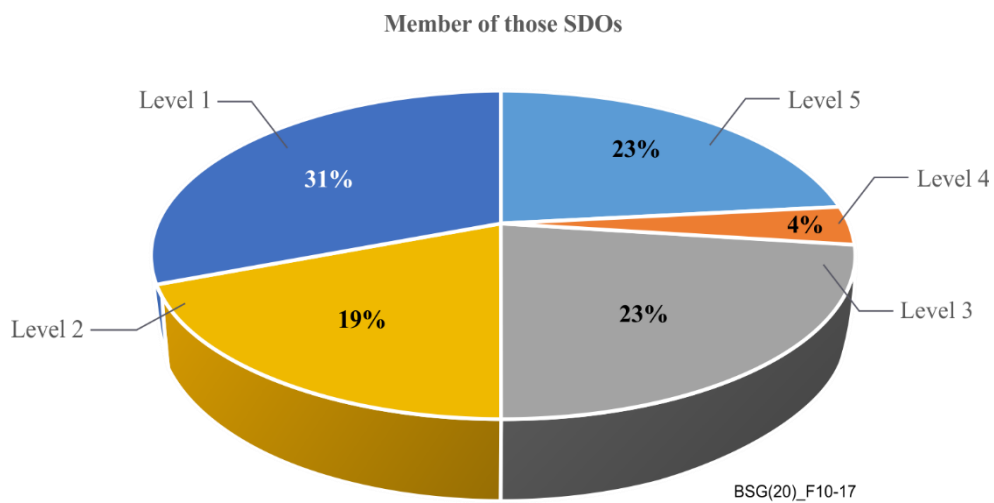


Figure 10-17 – Use of other standards based on membership

Observations

- A. Most respondents (39%) indicated that they use other standards because they are easy to access. Only 25% thought that ITU-T standards were easy to access.
- B. 46% of the respondents indicated that they use other standards because they are not costly to access.
- C. 44% of the respondents indicated that they use other standards because they are easy to understand.
- D. 32% of the respondents indicated that they use other standards because they had trust in the other SDOs.
- E. 31% of the respondents indicated that they used other standards mostly because they were SDO members.

10.5 General observations from the responses

I. National Standardization Bodies (NSB)

As a matter of fact, almost all countries, and especially developing countries, have a body responsible for standards (general standardisation). Furthermore, a new development is the growing number of specialized bodies in developing countries specifically responsible for telecommunication standardization. This is an opportunity ITU-T needs to pursue and utilize.

II. Development of national standards

There is growth in the local efforts in developing countries to produce national standards to meet their local needs. This may be a matter of national sovereignty or a genuine lack of an appropriate standard to meet the local need. Whatever the motivation, like in (I) above, this is an opportunity to be utilized by ITU-T to promote the use of ITU-T standards and the development of local capacity in standardization.

III. Referencing ITU-T standards

Many developing countries reference ITU-T standards while creating their own. This is good news, and it should be used to promote the utilization of standards, but a significant number of countries indicated that they have only referenced ITU-T standards less than five (5) times. That is very low. It may point to lack of understanding, or not finding them relevant to their needs.

IV. Easy to access

A significant number of respondents indicated that they find ITU-T standards not "Easy to Access". This mostly relates to the ease to navigate the website to access the standards. Other SDO's access is much worse but not very far off from that of ITU-T. This may be indicating that maybe some developing countries are not utilizing the standards due to difficulty in accessing them.

V. Costly to access

Most countries indicated that they find ITU-T standards costly to access. This mostly relates to paying for the standards, cost of access, etc. On the side of ITU-T this may be pointing to lack of awareness relating to ITU-T standards. ITU-T standards have been free of charge for a long time, and it is expected that every member is aware of that. But it appears not to be the case.

There is need for ITU-T to increase the level of awareness.

VI. Easy to understand

A fairly low percentage, that is, 17% of respondents reported that ITU-T standards were easy to understand. This is better than the report for other standards where only 7% indicated that the other standards are easy to understand. On the other hand, having only 17% of developing countries

indicating that the standards are easy to understand is worrying as that alludes that a greater percentage finds them difficult to understand. This is critical as no one will use a standard when they do not understand it.

VII. Trust in ITU-T standards

A fair percentage, i.e., 55% of respondents reported that they use ITU-T standards because they trust them. On the other hand, only 32% use the other standards because they trust the organization which produce them.

Trust in ITU-T should be higher than that for members. Necessary steps need to be taken to increase members' understanding of ITU-T standards.

VIII. Use of ITU-T standards because of membership

At 44% respondents indicated that they used ITU-T standards because they were members of ITU. 23% of the respondents indicated that they use other standards because they are members of those SDOs.

ITU can do little about increasing its membership since most of the countries are members, but ITU-T needs to do something to increase the number of members who use ITU-T standards as they actively participate in the standardization process of ITU-T.

10.6 Lessons from the Zambian case study

The MoU between ZABS and ZICTA and the creation of the ISC

Zambia realized the need and importance of growing and improving its national and international information and communication technology (ICT), through improving its ICT standardization capabilities.

Zambia then undertook scoping study to review the state of ICT standards adoption and usage in Zambia. Together with the publication of "Guidelines on the establishment of a National Standardization Secretariat for ITU-T"¹ in 2014 under the ITU-T Bridging the Standardization Gap programme, Zambia set up the Zambia ICT Standardisation Structure through a MoU between Zambia Information and Communications Technology Authority (ZICTA) the ICT regulator and Zambia Bureau of Standards (ZABS) the national standards body. The MoU established a collaboration between the two parties in the development of ICT standards as well as the possible joint standards monitoring mechanisms of ICT products and services.

The MoU also created the ICT Standards Steering Committee (ISC), with the main responsibility of identifying and standardization work areas, and establishing Technical Committees (TCs), where relevant stakeholders' carryout the standardization work.

Motivations for national standardization

Zambia realized the need for increased enforcement of standards within ICT and responded to local market requirements for standards that cannot be addressed by any existing international standards.

The need for increased enforcement of standards within ICT

Only national standards that have been approved by ZABS are enforceable in Zambia. As such the best way to have more ICT standards to be enforceable in Zambia was to have them easily adopted through a national process.

National standards have a lot of local input by internal stakeholders, and they easily respond to the national environment, hence they are easy to implement and to be utilized compared to international ones. This simplifies implementation and utilization of standards.

¹ Guidelines on the Establishment of a National Standardization Secretariat for ITU-T (ITU, 2014) (<http://www.itu.int/oth/T0B1F000002/en>)

The process of standardization in Zambia

As a first step an identification of the standardization work area is carried out by experts under a specific Technical Committee. Once the work is completed, the standard is approved and then gazetted as required by the law under ZABS, then the standard is now enforceable and utilizable by the sector. Figure 10-18 shows the steps of the standardization process.

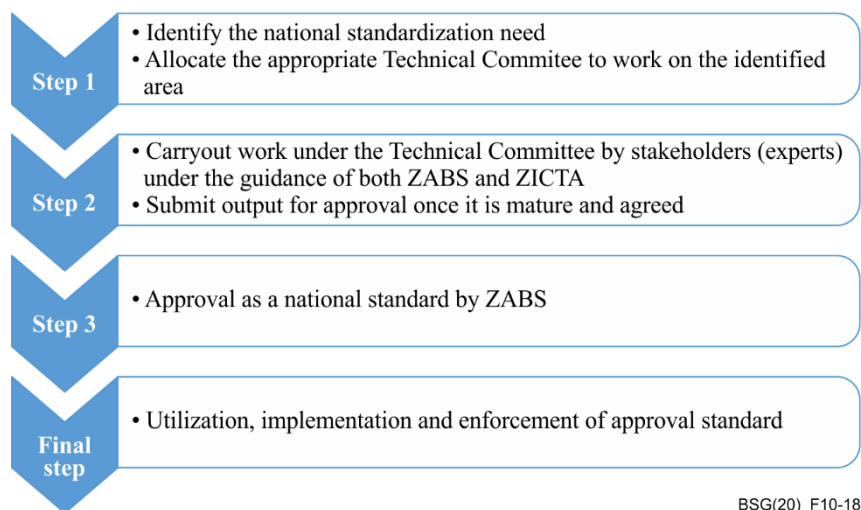


Figure 10.18 – Process of standardization in Zambia

Much of this standardisation process involves adoption and adaption of international standards developed by international standards development organisations (SDOs) such as the Telecommunication Standardization Sector of the International Telecommunication Union (ITU-T), the International Organization for Standardization (ISO) and the International Electro-Technical Commission (IEC). However, to respond to market needs for standards that cannot be addressed by any existing international standards, new standardization activities are initiated to develop national standards by the national experts that form part of these TCs.

Challenges identified under the Zambian case study

Application of ITU Recommendations in Zambia's ICT sector presents some challenges. These are as follows:

- i. Difficulty in referencing ITU-T standards,
- ii. Issues of selecting the right ITU-T standard to reference,
- iii. Editing the text to suit local needs,
- iv. Issues of copyrights, etc.

Proposals for ITU-T to consider

- I. ITU-T needs to take note that referencing ITU-T standards to create national standards, by especially developing countries, is on the increase. From the developing countries' view, it is positive, and it should be supported, grown and improved because it increases utilization of ITU-T standards, it creates capacity and provides an opportunity for ITU to collaborate with the user countries.
- II. As a proposal, ITU-T may consider developing guidelines that will define clear procedures on how to adapt the ITU-T standards to be developed and tailored to cater to the needs of developing countries. This will also present an opportunity to document the needs of developing countries. Such documents could easily be accessed and referred to as requirements that recommendations could address as they are being developed.

- III. A contact within ITU-T to provide assistance on related issues utilizing ITU-T standards by especially developing countries, should be established to provide that much needed assistance as required.
- IV. A live linkage should be created between ITU-T and the NSB to increase collaboration and create awareness during the process of developing a national ICT standard.

11 Recommendations on the use of ITU-T standards by developing countries

11.1 Increase utilization of ITU-T standards by developing countries

The utilization of ITU-T standards by developing countries is not where it is expected to be. Whenever possible, developing countries would rather spend the few resources they have working in ITU-T instead of shopping around for standards in various places. The evidence so far shows that some developing countries have become members of other SDOs, and they are meeting their standardization needs there other than in ITU. Other countries are not showing any preference, but they use whatever is available.

Utilization is one strategy that can be attempted to encourage developing countries to actively participate in the ITU-T standardization activities (see Figure 11-1). This is based on the common understanding that it is easier to actively participate in developing something one is going to use. So, if developing countries start utilizing the standards developed under ITU-T they will increase their participation in the standards activities.

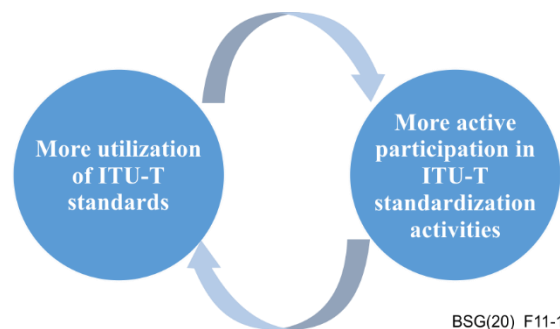


Figure 11-1 – Strategy to increase active participation in ITU-T standardization activities

11.2 Proposals on increasing utilization of ITU-T standards among developing countries

I. Further Collaboration with National Standardization Bodies (NSB) and Regional Standardization Bodies (RSB)

It is observed that collaboration with NSBs which are well established and well-funded by their governments can help increase the utilization of ITU-T standards by developing countries, if these standards are partially or fully adopted in the national standards. The NSBs enforce national standards in their countries, so standards that are approved by the NSBs will be enforced. If the national standard is partially or fully based on an ITU-T standard, then this increases the utilization of the ITU-T standards.

The more national stakeholders collaborate with ITU-T, the more they will strive to participate in ITU-T standardization activities.

The collaboration can be governed by a standard MoU and through the MoU, ITU-T should strive to maintain established contact with the NSBs. Also, ITU-T through the MoU should express its interest in developing the capacity of national stakeholders involved in standardization activities.

ITU-T should take this collaboration as an opportunity to influence NSBs towards ITU-T standards and standardization process. In addition, through this collaboration, ITU-T could have the opportunity

to identify, study and work on new standardization areas initiated by the stakeholders in a local setting.

Most regions have established regional standardization bodies. Like NSBs, regional bodies bring together many stakeholders who have the need for joint standardization. Active collaboration with such bodies will certainly increase utilization among other things.

For the continent of Africa, with a large amount of developing countries, there is the African Organization for Standardisation (ARSO) which currently has a membership of 39 African countries (representing 72% of African countries). ARSO works to promote the coordination of all standards work undertaken under by African governments. Interestingly there are many such organizations that bring together a number of countries with similar standardization interests.

II. Active engagement of ITU-T in the development of national standards

The development of national standards is a matter of national interest but the active engagement of ITU-T, its assistance and collaboration can go a long way in driving up capacity, quality and utilization. ITU can assist developing countries to build capacity to identify and articulate their national standardization needs and requirements. Also, ITU-T can help with technical resources, especially where referencing is needed.

III. Referencing ITU-T standards

Many developing countries reference ITU-T standards while making their own. This is a good development. ITU-T should make the process much easier and should provide guidelines to avoid infringement of intellectual property issues.

IV. Simplified access and ease to understand ITU-T standards by developing countries

ITU-T should have a process to check the simplicity of ease to access and understand ITU-T standards. For example, user's manual should be considered for each standard developed by ITU-T. Obviously an investment will be required, but this will translate to making the products to be more user friendly and increase the likelihood to be of service to interested parties.

V. Focus on marketing for awareness of ITU-T standards

A number of developing countries are not fully aware of basic facts about ITU-T standards. There is need for ITU-T to study the strategies relating to marketing the ITU-T standards far and wide, certainly intensely among members. This should be done in general and specific ways taking into consideration that the standards produced by ITU-T should be marketed to a wide audience for maximum consumption. All the membership of ITU should be targeted whenever a new standard comes into force, and non-members as well with a view to raise awareness and increase utilization and the likelihood of new membership. Some investment might be required but it will be worth it.

VI. A more detailed study on utilization of ITU-T standards by countries

This study was limited to developing countries. It is very possible that the utilization in developed countries shows different trends and there will be more enrichment of information as the scope is widened. In this context it is proposed that a more detailed study should be undertaken by TSB, to cover as many countries as possible and to identify issues with utilization of ITU-T standards in member states.

VII. Trust in ITU-T standards and understanding ITU-T standards

A number of developing countries seem to report that they have limited "Trust" in ITU-T standards. Similarly, a number of developing countries report that they do not "Understand" ITU-T standards. Trust in ITU-T standards and understanding ITU-T standards should be at 100%, for members. Anything less would mean that countries do not trust and do not understand their own outputs.

Lack of utilization by developing countries may be due to limited trust and understanding of ITU-T standards. That is why it is being proposed that ITU-T should take the necessary steps to increase members' trust and understanding of ITU-T standards.

VIII. Use of ITU-T standards based on membership

A number of countries reported using ITU-T standards mostly because they are members. This may not be the most encouraging reason but nonetheless the same countries once involved in the process may start utilizing the standards because they find them to be appropriate for their needs. This should be adopted at the level of TSB to encourage membership to use the organization's standards produced for them.

As stated previously, ITU can do little about increasing its membership since most of the countries are already members, but ITU-T needs to take measures to increase the number of members who use ITU-T standards based on the fact that they are integrated in ITU and are active participants in the standardization process.

IX. Some indicative comparisons from the study

Aspect of measurement	Details	ITU-T standards	SDO standards	Tips for ITU-T
Easy to access	Members who find it "easy to access"	25%	11%	ITU-T shows a higher level, but it is still very low. Improvement to access should be developed
Not costly to access	Members who find it "not costly to access"	22%	4%	For ITU-T it is an issue of awareness. ITU-T standards are free of charge. 22% shows that many countries are not aware of the fact.
Easy to understand	Members who find it "easy to understand"	17%	7%	For high ITU-T standards utilization understanding should be at 100%
Trust in standards	Members who "Trust" in the standards	55%	32%	For high utilization of ITU-T standards trust should be at 100%
Member of other SDOs	Members who "use because they are members"	44%	23%	For ITU-T all members should use ITU-T standards since they participate in their development.

11.3 Proposals on implementing Resolution 44 (Rev. Hammamet, 2016) – Bridging the standardization gap between developing and developed countries

The Resolution in Section 9, *instructs the Director of the Telecommunication Standardization Bureau, in collaboration with the Directors of the Telecommunication Development Bureau and the Radiocommunication Bureau*, to "provide support and assistance to Developing Countries, if requested, in drafting/developing a set of guidelines on the application of ITU-T Recommendations at the national level in order to enhance their participation in ITU-T study groups, with assistance of the ITU regional offices, for bridging the standardization gap."

This provision should be used to study and start a project where ITU-T Recommendation guidelines on utilization and other aspects can be developed. ITU-T SG17 has been working with Burkina Faso, Benin as well as other developing countries to produce implementation guidelines on certain cybersecurity standards.

11.4 Proposals on expanding the BSG programme to cover ITU-T Recommendation utilization

From the discussion in this Technical Report, it is clear that issues of utilization of ITU-T Recommendations in developing countries may be contributing to the limited participation of developing countries in the standardization activities of ITU-T.

It is proposed that TSB considers to expand the BSG programme to also cover the issues of utilization of ITU-T Recommendations by developing countries.

Appendix I

Questionnaire 119 on use of ITU-T Recommendations in developing countries

Responder's information

Country:
Sector:
Organization:
Name:
Title:
Address:
Telephone:
Fax:
E-Mail:

1. Use of ITU-Recommendations

1.1 Does your country have a body responsible for national standards? ☐ Yes ☐ No

1.2 Does your country have a separate body responsible for national ICT standards? ☐ Yes ☐ No

1.3 Does your country develop national ICT standards? ☐ Yes ☐ No

1.4 Does your country reference other standards in the national standards? ☐ Yes ☐ No

1.5 Of the national standards how many times on average has each standard referenced other ITU-T Recommendations

Number []

1.6 Does your country adopt/adapt other standards as national standards? ☐ Yes ☐ No

1.7 Of the national standards how many ITU-T Recommendations have been adopted/adapted

Number []

2. Reasons for referencing standards

2.1 Rank the following reasons you reference ITU-T Recommendations. (1 to 5, with 1 being the least appropriate reason and 5 the most appropriate reason):

- ☐ Easy to access []
- ☐ Not costly to access []
- ☐ Easy to understand []
- ☐ Trust in ITU []
- ☐ ITU member state []

2.2 Rank the reasons you reference other standards. (1 to 5 with 1 being the least appropriate reason and 5 the most appropriate reason):

- ☐ Easy to access []
- ☐ Not costly to access []
- ☐ Easy to understand []
- ☐ Trust in other standards []
- ☐ Member of those SDOs []

Appendix II

Case Study: Zambia

Background

ITU Recommendations form an integral part of standardisation of the ICT sector in Zambia. These Recommendations not only cover an array of topical issues in the ICT sector but are also easily accessible and easy to understand. This document presents the ITU-T Recommendations that have so far been adopted for the Zambian ICT sector, areas where these Recommendations are being used as well as the benefits derived from and challenges experienced with applying these Recommendations. A proposal has been put forward to consider the development of guidelines that will indicate the standard form of adapting ITU-T Recommendations.

Introduction

Zambia has been taking several strides to grow and improve its national and international information and communication technology (ICT) standardization capabilities. Development of standards for Zambia's ICT sector is accomplished through collaborative efforts between Zambia Information and Communications Technology Authority (ZICTA) the ICT regulator and Zambia Bureau of Standards (ZABS) the national standards body. The two institutions have in place a memorandum of understanding (MoU) which formalises the collaboration between the two parties in the development of ICT standards as well as the possible joint standards monitoring mechanisms of ICT products and services. It is through this relationship that the ICT Standards Steering Committee (ISC) was constituted whose responsibility is among other things to establish Technical Committees (TCs) in identified key standardisation areas such as future networks, quality of service (QoS), Internet of Things (IoT) applications and cybersecurity to mention a few. Much of this standardisation process involves adoption and adaption of international standards developed by international Standards Development Organisations (SDOs) such as the Telecommunication Standardization Sector of the International Telecommunication Union (ITU-T), the International Organization for Standardization (ISO) and the International Electro-Technical Commission (IEC). However, to respond to market needs for standards that cannot be addressed by any existing international standards, new standardization activities are initiated to develop national standards by the national experts that form part of these TCs.

Following the study undertaken to review the state of ICT standards adoption and usage in Zambia and the publication of "Guidelines on the establishment of a National Standardization Secretariat for ITU-T"² in 2014 under the ITU-T Bridging the Standardization Gap programme, Zambia was able to identify critical gaps and areas requiring immediate action and devise steps needed to effectively address these gaps through a unifying national structure under the ISC. Standards gap analysis is a continuous process that is constantly evolving to make certain that national ICT standardisation programmes that are derived are reflective of what is presently pertaining to the sector. The ISC, through the responsible TCs therefore develops annual standardisation programmes consistent with current technological trends as well as national projects. This also provides an opportunity for the ISC to take stock of what is trending in the sector and skew standardisation activities towards this.

² Guidelines on the Establishment of a National Standardization Secretariat for ITU-T (ITU, 2014) (<http://www.itu.int/oth/T0B1F000002/en>)

Use of ITU-T Recommendations

ITU-T Recommendations form an integral part of the standardisation of the ICT sector. Various ITU-T standards have been adopted for use in different areas of the ICT domain. Some Recommendations though are having been earmarked for adaption in order that the information it provides responds to government and market needs. The table below provides a summary of the Recommendations that have been accepted for use in Zambia's ICT sector.

TC	Area of Standardisation	Application	No of adopted standards
TC 1	ICT and the environment	Green ICT including e-waste	26
		ICT safety and protection	38
TC 3	QoS and performance	QoS	60
		Broadband	28
		Multimedia QoS and performance	12
		TTMS	4
TC 4	Networks, technologies and numbering	ICT accessibility	10
		Numbering	5
TC 5	Cybersecurity and future networks	Cybersecurity	16
		Cloud computing	9
TC 6	IoT and multimedia applications	e-Health	6
		IoT	13
	Other	Normative references	31
	TOTAL		<u>258</u>

Of these standards, only about 20 have been approved as mandatory standards most of which are being applied in QoS monitoring.

Prospective standardization activities

As the information sector continues to progress, many subject areas still benefit from application of ITU-T Recommendations. The table below gives a synopsis of some noteworthy areas that have been identified to potentially benefit from the application of ITU-T Recommendations. The table also provides information on the rationale that motivated these standardisation activities and also highlights the focus area of standardisation that will support and enable effective implementation of these technological applications.

Sn	Topic	Rationalisation/Use cases	Standardisation areas
1.	Tele-biometrics	<ul style="list-style-type: none"> – Roll out of the national digital ID – e-Government – Biometric SIM card registration – e-Services – IoT applications 	<ul style="list-style-type: none"> – Security and reliability of biometric data – Health and safety – Interoperability – Privacy protection of the users, etc.
2.	Big data	Support the implementation of: <ul style="list-style-type: none"> – National digital ID – SIM card registration – Road traffic monitoring systems – Transactional data: mobile money, e-commerce, etc. – Telecommunication Traffic Monitoring System (TTMS) 	<ul style="list-style-type: none"> – Security and data protection – Data exchange – Data quality and veracity – Data analytics – Common requirements and use cases – Data ownership, etc.

3.	IoT and Smart Applications	<ul style="list-style-type: none"> - Smart grids - Smart agriculture - e-Health - Smart water systems 	<ul style="list-style-type: none"> - Data processing - QoS and performance - Identification, privacy, security and trust - Connectivity and interoperability
4.	ICT Infrastructure installations	<ul style="list-style-type: none"> - Fibre optic installations - Data centres - Universal access/Rural connectivity - Communication tower installations 	<ul style="list-style-type: none"> - Fibre optic installation - Co-location - Energy efficiency - Health and safety - Protection against interference, etc.

Benefits

ITU Recommendations offer several advantages some of which are presented below:

- ITU-T Recommendations cover an array of topical issues in the ICT sector and this makes it easy to find the required standards for a particular subject area.
- ITU-T is always abreast with the latest technological trends in the telecom sector and as such are very responsive in making available the necessary standards that would usher in these new technologies.
- The Recommendations are easily accessible through the ITU website and are readily available at no cost.
- The information contained in the Recommendations is easy to comprehend allowing for ease and swift application.
- ITU is a well-known organisation in the field of ICT and so there is trust in the ITU Recommendations.

Challenges

Application of ITU Recommendations in Zambia's ICT sector presents some challenges. These are as follows:

- It is sometimes necessary to make some selected ITU-T Recommendations mandatory for a particular subject matter in order for it to be beneficial for that purpose. This entails that the vocabulary used in some of these Recommendations need to be edited or modified to make them mandatory provisions and thus ensure compliance. Furthermore, some technical parameters in some of the Recommendations may not be ideal for the Zambian scenario and would thus need modification. This process of adapting the Recommendation to suit a particular purpose is however unclear as the ITU Recommendations have copyrights.
- Some ITU Recommendations may contain information that is not applicable to developing countries and/or it may miss out information that is pertinent for developing countries. This also necessitates modification of the Recommendation.
- The process of adapting ITU-T Recommendations can be a costly venture as this requires experts to avail themselves and to invest time in revising the content of the Recommendations.

Way forward

As a way forward, it is proposed that guidelines that will define clear procedures on how to adapt the ITU-T Recommendations be developed and tailored to cater for the needs of developing countries. This will also present an opportunity to document the needs of developing countries. Such documents could easily be accessed and referred to as requirements that Recommendations could address as they are being developed. The following items could be considered in the development of these guidelines:

- i. Channel of communication in the ITU-T when there is an intent to modify a Recommendation.
- ii. What information in a Recommendation can and cannot be modified.
- iii. The approval process of such modifications.
- iv. What form the reference or document number of the modified document would take.
- v. How and where the modified document can or should be published or distributed.
- vi. Can an adapted Recommendation be sold?

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