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**Assessing the Coverage of Science and Technology News in
Ethiopian Broadcasting Corporation:
The Case of FM Addis 97.1 ‘Addis Mereja’ Daily News Prime Time**

**A Thesis Submitted to
School of Journalism and Communication
In Partial Fulfillment of the Requirements for the Degree of
Master of Arts in Broadcast Journalism**

**By
Yetemegnush Ayalew**

**July, 2021
Addis Ababa, Ethiopia**

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ADDIS ABABA UNIVERSITY

SCHOOL OF GRADUATE STUDIES

This is to certify that the thesis prepared by Yetemegnush Ayalew Abera, entitled: Assessing the Coverage of Science and Technology issues in Ethiopian Broadcasting Corporation: The case of FM Addis 97.1 ‘Addis Mereja’ daily news prime time and submitted in the partial fulfillment of the requirement for the Degree of Masters of Arts in Broadcast Journalism complies with the regulations of the University and meets the accepts standards with respect to originality and quality.

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Examiner_____ Signature_____ Date_____

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Chair of Department or Graduate Program Coordinator

Abstract

The main objective of this research was to assess the coverage of science and technology issues in FM Addis 97.1, particularly on 'Addis Mereja' daily news prime time. For avoiding the inherent weakens of the individual methods, the researcher used a mixed methodology; quantitative and qualitative. Content analysis and in-depth interviews were used as data collection methods using the purposive sampling technique; to get an in-depth understanding of the issue from the appropriate source of information. The finding showed that FM Addis 97.1 gives less attention to Science and Technology news compared with others. The result of the content analysis indicated that only 3.63% of news was science and technology issues; out of 2,202 from December 1, 2018, up to May 30, 2019; on the other hand, national and international current affairs (36.7%) and sport (28.2%) obtained high coverage. The result of the in-depth interview also indicated that FM Addis 97.1 was not covering science and technology news adequately because the station was not allocated enough time, and was not done in the required detail. In general, the results confirmed that science and technology news was given less coverage by FM Addis 97.1. The origins of most science and technology news were foreign 83.75%, and only 16.25% found to be local. The finding of the in-depth interview also showed that most of the news was of foreign origin because there was limited access to science and technology information at local. The knowledge of FM Addis 97.1 journalists in science and technology was less. Also, the station lacks vibrant media policy, strategy, and guidelines to cover science and technology news. The media's weak relation with scientists and science organizations was also the bottleneck problem for science and technology news. Finally, the study recommended interested researchers use this study as a baseline to investigate the relationship between media and science and technology.

Key words: Science news, FM Addis 97.1, coverage, Source, challenge

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List of Abbreviations

AIDS	Acquired Immune Deficiency Syndrome
BBC	British Broadcasting Corporation
CD-ROM	Compact Disk, Read- Only- Memory
CNN	Cable News Network
EBC	Ethiopian Broadcasting Corporation
PCs	Personal Computers
PCSS	Public Communication of the Social Sciences
SciTech	Science and Technology
STI	Science, Technology and Innovation
TVET	Technical and Vocational Education and Training
UK	United Nations
UNESCO	United Nations Educational, Scientific and Cultural Organization
WP	Word Processor

Statement of Original Authorship

I, the undersigned, state that this thesis is my original work and all the sources of materials used for the thesis have been appropriately acknowledged.

Name: Yetemegnush Ayalew Abera

Signature: _____

Date of Submission: June 2021

Place of Submission: Addis Ababa University

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CHAPTER ONE

INTRODUCTION

1.1 Background of the study

The inquiry and the development of science have immensely shaped the world. It is undeniable that the secret behind the civilization of world power is by and large their commitment and investment in science. According to G7 Academies Joint Statements (2017), investment in science, technology, innovation, and infrastructure has a strong influence on world sustainable growth. Science and technology play a vital role to reduce poverty by assisting the realization of the Millennium Development Goals in various aspects. Jones (2011) argues that a third of the United Kingdoms' Growth Domestic Product is produced by science, technology, engineering, and mathematics. Besides, scientific findings help to make good decisions on people's lives, health, and happiness (Weigold, 2016).

Knowing science is one thing; transferring the knowledge and application of science is the other key element, ignored by the concerned body. Here, comes the idea of science communication. Unless the scientific facts reach the public, there is no way by which society benefits from science. Addressing scientific findings and applications to the mass public is referred to as science communication. Slosson (1927) as cited in Benett (2013) expressed the necessity of science communication in the best possible word. He maintained that translating science was as essential as translating the language of one country into the language of another country that one might be understood but found it uneasy with the same challenges.

According to Kohlstedt et al., (1943), the world has been equally running with science communication sideline with their scientific inquiry. The competition between and among developed nations was much evident in their effort of popularizing science journalism. Countries like France, Britain, Germany, Russia, and the United States of America have been exerting their maximum to create a constructive communication platform for their scientific findings. For example, in the 19th century, America had formed an association that found the way for science journalism the North American Review (founded in 1821), Harper's Monthly Magazine (1850), Popular Monthly (1876), American (1845), and Popular Science Monthly (1872). In the early twentieth century, Russia supported science communication when it began to join the race of civilization it had started to campaign Science for the Masses: The

Bolshevik State, Public Science, and the Popular Imagination in Soviet Russia, in early, were some of the platforms which the country facilitated to initiate accepted involvement with science and; encouraging public interest and participation (Andrews, 2003).

Media is a very crucial institution, a possible and successful way of communicating the knowledge of science. The significance of media in addressing scientific knowledge is lauded by European Commission (2006). If scientists want to communicate with society; they have to be in the media, first of all in newspapers, on the radio, and on television. Not only are the media extraordinarily effective in reaching an extremely large number of people, but they are also in the arena where most of the social negotiation of knowledge and opinions takes place.

Journalists typically assume the position of intermediaries between the scientist and members of the public who are interested in a given scientific subject or issue. For this reason, according to Farr cited in UNESCO (2011), any attempt to understand the social representation of science; is accepted by the public would be incomplete without analyzing the media representation of science. The media plays a vital role in providing scientific and technological news for the public (Ashwell, 2014). Science and technology reporting is different from politics, business, or general assignment news. Science stories must compete for space and time against others from the world of business, education, conflicts, crime, and accidents. In cases, for example, where a media house has a weekly science page or program, there is a need for integrating science into every section of the media separately from the editors' daily items (Owuor, 2008). Understanding science and technology is influenced by media coverage, interpretation, and presentation (UNESCO, 2011). Therefore media institutions should improve the quality and quantity of science coverage (Owuor, 2008).

Collecting, organizing, analyzing, disseminating, and using information related to science and technology is significant for successful growth in Ethiopia. Here, mass media should take the lion's share. In Ethiopia, science reporting by itself has a half-century age. Science and Life is the first popular science radio program. The program was launched in 1964 and broadcasted three days a week (Tuesday, Thursday, and Sunday). In the 1960s, Captain Afework Yohannes and his colleagues in the public media; formed their science and

technology policies for the sake of the public rather than a few intellectual elite. The public was illiterate and uneducated; the country was isolated from the latest scientific developments, occurring in the Western World. They saw the importance of educating the public with science as a precondition for development of the country (Tenaw, 2006). However, like other African countries, research in science reporting is not promising.

There are some reasons. Technological advancement is not that much developed in Africa as well as in Ethiopia. The study focused on 'science and technology for development in Sub-Saharan Africa' by Ramos (2014) found that; technology transfer from the developed world, seen as a challenge and access to technology; generally those without financial resources; such as the rural poor. As a result, public information in general, particularly on science and technology, is less available in Ethiopia, Kenya, and South Africa than at the global level. For example, there is a lack of access to the internet and information produced at national or local levels. TECHIN (2020) strongly argued that Ethiopians did not enjoy much of the benefits of Science, Technology, and Innovation because the level of technological development in the country is less, and domestic capability to acquire and effectively use technology is very weak.

The media under investigation, FM Addis 97.1, was established in 2000. It is recognized as the first FM radio station in the country. FM Addis 97.1 Contents Reform Document stated that the station was established with the objective of creating an alternative media outlet for the people of Addis Ababa and its surroundings. As the station is part of Ethiopian Broadcasting Corporation, it shares its editorial policy with the corporation. The station currently operates 24 hours. Its daily schedules are being broadcasted in four types of formats such as talk, music, news, and programs (FM Addis 97.1 Contents Reform Document, 2017).

1.1.1 History of Ethiopian Broadcasting Corporation (EBC)

According to EBC Editorial Policy (2015), the Ethiopian mass media industry has been registering fundamental changes both in structure and content following the removal of the 'Derg' government in 1991. The media were state-owned and confined to shackles of censorship in the past systems so that they could serve as instruments of oppression. With the issuance of the press proclamation in 1993, nevertheless, they have become free forums

where the nations, nationalities, and peoples of Ethiopia freely express their views. Besides, it has created an environment wherein the private media have the opportunity to contribute their share.

Ethiopian Radio, which was launched with the coronation speech of Emperor Haileselassie in 1931, and disrupted by the Italian invasion to restart transmission in 1943; and Ethiopian Television that was established in 1965 functioned separately and under different commands, until they were organized as one institution by Proclamation Number 114/87. Ethiopian Radio and Ethiopian Television have spent several decades under different structural organizations until they established Ethiopian Broadcasting Corporation (EBC) by Proclamation Number 858/2006. Yet the merge did not change their separate functioning. As a result, they were not able to design a different editorial policy that is the cornerstone of a media institution, implement a uniform editorial policy (EBC Editorial Policy, 2015).

1.1.2 Ethiopian Broadcasting Corporation (EBC) Editorial Policy Overview

An editorial policy that guides the government-owned mass media was prepared in 2003. The editorial policies of both Radio Ethiopia and Ethiopian Television designed based on this policy were not complete, recognized by the professionals, and internalized in their editorial activities (EBC Editorial Policy, 2015).

Revising the editorial policy of EBC was necessitated not only because the organization and function of the corporation were changed, but also to broaden and deepen its service provisions and make it a clear professional guideline that helps all professionals to effectively fulfill their duties and responsibilities. Moreover, it will play a huge role in making the corporation rest on a strong foundation and grow in such a manner as to meet the pace of the growth of the modern media (ibid).

The editorial policy of EBC has taken into consideration the governing rules of Ethiopia endorsed to determine the form, contents, and management direction of the media. Besides, devising a policy that would make possible the use of improved technology created by the information and communications growth in the country and taking the Growth and transformation plan to make the country join middle-income countries as a policy basis would help EBC emerge competitive and preferred media (ibid).

EBC cannot afford to continue as its previous pace and condition when its degree of responsibility and the expanse of its accessibility, as well as the level of competitiveness of the mass media, is growing. As an old institution, it is expected to maintain good values and transform itself into a modern and efficient organization (ibid).

As pointed out in the establishment proclamation of EBC and the Broadcast Service Proclamation, fulfilling its role in ensuring the political, social, and economic growth of the nation by providing information, educational and entertaining programs as well as realizing the fundamental rights of freedom of expression and access to information and the right to elect and get elected as enshrined in the constitution are the fundamental principles of the editorial policy. The informative, educative, and entertaining information EBC gathers and disseminates through radio, television, and website news, news bulletin, and programs will be guided by this editorial policy (ibid).

According to EBC editorial policy, the corporation has its principles of specialized reporting. Specialization will help journalists to develop a close and fruitful relationship with sources, create agenda setting and enable them to have deep knowledge in their areas of specialization. Therefore, EBC will expand the areas of specialization it has started in all major areas (agriculture, environmental protection, industry, court, diplomacy, defense, police, democratic affairs, business, religion, women, children, and youth, etc.) (EBC Editorial Policy, 2015).

1.1.3 FM Addis 97.1: In focus

FM Addis 97.1 is the first FM radio broadcasting station in Ethiopia. It provides the people of Addis Ababa, and its surroundings, with an alternative media outlet. It is a young radio broadcasting institution, established in 2000 by the government to address urban-related social and economic issues affecting the people of Addis Ababa. It was mainly established to focus on the day-to-day social issues of the people. But it also provides music and entertainment, live local and international news (FM Addis 97.1 content's reform document, 2017).

FM Addis 97.1 was basically designed to be different from the format employed by the national radio service, although both shared the same administration, and all the staff of the

station came from the national service. In other words, FM Addis 97.1 was part of Ethiopian Radio. There was no fundamental difference in their editorial policies. It also focuses on urban issues while the national radio gives more attention to rural areas. Of course, the national service also includes urban issues believed to be relevant at the national level (ibid).

The subject of this study, FM Addis 97.1, is part of the Ethiopian Broadcasting Corporation (the first official media in Ethiopia). It is the first FM radio station in the media history of the country and has 24 hours of transmission focusing on educating, informing, and entertaining the audience. FM Addis 97.1 is giving its media services on two broad categories called programs and news. The news part is dedicated to broadcast the latest happenings. FM Addis 97.1 content's reform document (2017) states that the station has three primetime news hours (Morning 'Addis Mereja' (New Information) from 7:00 am up to 9:00 am, Afternoon 'Zena Metsehet' (News Magazine) from 12:30 pm to 1:30 pm and Evening 'Addis Mereja' from 6:00 pm until 8:00 pm) from Monday to Friday. (ibid)

Even if, EBC's editorial policy says the corporation will expand the areas of specialization, FM Addis 97.1 newsroom has no culture and organization of beat reporting. It rather divided its news hour with various packages such as national and international current affairs, Business, Sport, social affairs, law and order, and science and technology. The subject area of this research, Science, and technology is treated in the newsroom under the name - ሳይ-ቴክ(Sci-Tech). As the format dictates, this package is a four-minute-long show. Introducing creative works of the youth and initiating the public towards creativity is the basic target of the news package. The program reform document of the station (2017) indicated the mode of the presentation of this specific package. It stipulated that interview, magazine, and biography.

1.2 Statement of the Problem

The contribution, challenges, and practice of media coverage of science and technology have not been given enough attention in research. European Commission (2006) showed the uncomfortable state of relation between the world of science and media. It stated that scientists generally view journalists as people who do not understand the nature and value of science, and for this reason, they do not give their attention.

The scientific community hardly trusts journalists because of the fear of being misquoted or cited out of context. Despite the reality, the media and the scientific community should have a supportive relationship (scientists as sources and the media as interpreters and disseminates of the information). One such study by Rooyen (2002) studied the state of science and technology coverage in the print media of South Africa. It concluded that there were relatively few science and technology articles in the sample of newspapers studied. While news organizations in many advanced economies are scaling back; significantly on the resources they commit to covering science and technology, interest in this field is developing in Africa. According to Irwin (2009), during a major conference on science journalism in 2009, speakers from Africa were hopeful about a surge of interest in science and science journalism in their countries as were their counterparts from the Middle East and Latin America.

Very few studies have systematically investigated the quantity, quality, scope, and perceptions of the coverage of science and technology in Africa. UNESCO (2011) stated media in Africa are not adequately covering science and technology issues. The reasons are many. Foremost among these is that science and technology issues are often considered complex or that journalists in Africa lack specialized knowledge and skill to cover them. This is compounded by the fact that despite the limited ability within many newsrooms in Africa, the media have made little investment in trying to improve the capacity of journalists to empower them give science and technology issues informed coverage.

According to Ward and Jandciu (2008), science journalists face two main challenges; individual and systemic. The individual challenges include the personal abilities, skills, and qualifications of the individual journalists interviewed. Systemic challenges include how newsrooms gather and edit science stories. Ward and Jandciu said that journalists are not given enough time to report science; hence, they depend increasingly on science journals as the main source of information. However, the findings of a recent study suggest that some science journalists may not be “slaves to journals” after all. According to Suleski and Ibaraki (2010), despite the increase in number of scientific papers published, very few articles are covered by the mass media.

Anderson, Petersen & David (2005) explained on their study that science communication plays a critical role for the desired widespread diffusion for early adoption of science and scientific innovations in Uganda but its current status in the Uganda's media industry still wants Scholars in the field of science and technology. Ananth and Karthikeyan (2014) argued that one of the main problems of science and technology development in Ethiopia is lack of effective communication on science and technology, resulting in inadequate promotion of science and technology in the society. So, the general picture showed that science is ignored by the media; and there is a disparity among regions.

FM Addis 97.1 Contents Reform Document (2017) states that the station has three prime time news transmission periods (Morning 'Addis Mereja' (New Information) from 7:00 am up to 9:00 am, Afternoon 'Zena Metsehet' (News Magazine) from 12:30 pm to 1:30 pm and Evening 'Addis Mereja' from 6:00 pm until 8:00 pm) from Monday to Friday. The newsroom has a culture and organization of beat reporting which focuses on good governance, social and economic issues. However, the station did not include science and technology issues in specialized reporting.

Ashwell (2014) studied most communication advisers and scientists who did not believe media is helping the diffusion of scientific knowledge. Tenaw (2006) also investigated Science journalism in Ethiopia, which focuses on three newspapers ("Addis Zemen", Ethiopian Herald, and "Addis Admas") and two science radio programs (science and life, and "Ke Science Mahider"). He reported science journalism practices, influenced by time constraints and lack of knowledgeable reporters in the area. His findings showed most of the stories (90%) are from foreign sources (science magazines and the internet) issues mainly focused on technology.

The subject area of this research, Science, and Technology is treated in the newsroom of FM Addis 97.1 under the name -ሳይንስ (Sci-Tech). As to the assessment of the researcher, there is no study that was conducted to investigate the practices and challenges of science and technology news coverage in FM Addis 97.1 'Addis Mereja' daily news. Therefore, the aim of this research is to investigate the practices and challenges of the coverage of science and technology news in FM Addis 97.1 'Addis Mereja' daily news prime time.

1.3. Objective of the study

1.3.1 General objective

The general objective of this research is to assess the practice and challenges of the coverage of science and technology news in FM Addis 97.1, particularly on the ‘Addis Mereja’ daily news prime time.

1.3.2. Specific objectives

The following specific objectives are drawn from the above general objectives

- To assess the coverage of science and technology news in FM Addis 97.1 ‘Addis Mereja’ daily news prime time.
- To analyze whether FM Addis 97.1 report science and technology news appropriately or not.
- To identify the main sources of science and technology news at FM Addis 97.1 ‘Addis Mereja’ daily news prime time.
- To identify the major challenges that affect coverage of science and technology news in FM Addis 97.1 ‘Addis Mereja’ daily news prime time.

1.4. Research Questions

The following research questions are designed to meet the research objectives:

1. How much coverage does FM Addis 97.1 give for science and technology news?
2. Are science and technology news reported appropriately in FM Addis 97.1?
3. What are the main sources of science and technology news in FM Addis 97.1?
4. What are the major challenges that affect the proper coverage of science and technology news in FM Addis 97.1?

1.5. Scope of the study

Ethiopian media is broad. It includes radio, newspaper, television, and online. This study is limited to the radio medium, which is the most impactful in Ethiopia. Radio communication is direct, hot, stimulating, and in-depth. Radio evokes, stimulates the imagination, and makes listeners follow more closely. It is also a medium that uses as a bridge between the scientist and the public. There are many FM radio stations in Ethiopia. FM Addis 97.1 has been selected to assess the coverage of science and technology as it is the first FM radio station in Ethiopian media history that gives 24 hours transmission to educate, inform and entertain the

audience. The station has three broad categories called news, entertainment programs, and educational programs. The news category has many components such as social affairs, current affairs, political issues, business reports, and science and technology issues. This study focused only on science and technology news; also, reporters who are directly involved in the practice of science and technology news coverage; news and current affairs chief editor and director of the station.

1.6. Significance of the Study

Given that science and technology are one of the prior agendas of the Ethiopian government and the reality of today and tomorrow determined by this field, the research will have vital importance to different stakeholders. The first beneficiary of the study expected to be the media under study FM Addis 97.1 gets important and critical insight from the conclusion and recommendation of the study. As a result, the findings can make use as input for the betterment of its science and technology reporting culture.

Moreover, scientists and science-related organizations in Ethiopia will also benefit from the study; because they will be able to identify the gaps of the media in communicating science and technology news to the public. The media are the most vital channel which scientists use to reach the general public. As their scientific innovations benefit the people, identifying the media gap; in this regard will help them work together to realize their dreams.

Journalists will also get relevant knowledge regarding science reporting. Knowing the appropriate knowledge, skill, and professional issues will improve their professional carrier. Finally, the research will have great importance for aspiring researchers who want to conduct studies in this field.

1.7. Operational Definitions

Media: is the main means of mass communication (broadcast, publishing and internet)

Science: is the knowledge of the natural world and the systematic way of acquiring that knowledge.

Technology: is human made which is determined by processing, development also an application of science used to solve problems and make easier our daily lives, management.

Scientists/ Science experts: is based on previous studies, we use the term “scientist” as encompassing a broad group of individuals from across science, technology, engineering and mathematics-related fields and working in research and non-research positions.

Science communication: is usually taken to mean the physical, chemical, biological and occasionally medical or engineering sciences, and work on public communication of the social sciences (PCSS) has been relatively sparse and scattered across several disciplinary areas.

Science journalism: is a specialized form of journalism mainly covering such as science, medicine, and technology.

Science journalist: is a person joined to a media institution to write or reports about science to the public on employment terms or as a freelancer.

Science and technology coverage in the media: is the extent to which science and technology news have been published and/or broadcast in the media compared to other news beats such as politics, sports, and business.

Beat reporting: is a specific area of journalistic reporting.

Lay public: is a uniform group of non-experts with a little allowance for any relevant expertise outside of the scientific community, or for any intermediate degrees of scientific knowledge or understanding.

1.8 Limitation of the Study

Lack of similar studies in Ethiopia, finding relevant books and materials on science and technology was a big challenge for the researcher. To solve problems researcher used accredited reports, journals, articles, and materials from the libraries.

1.9 Organization of the study

This study has five chapters. The first chapter included the background, statement of the problem, objectives, research questions, significance, scope, operational definitions, limitations, and organization of the study. The next chapter discusses the literature reviews that related to the study, including the theoretical framework. The third chapter is about the methodology of the study. While the fourth chapter deals with results and discussion, the conclusion and recommendations are in the fifth chapter.

CHAPTER TWO

LITERATURE REVIEW AND THEORETICAL FRAMEWORKS

2.1 Literature Review

In this literature review part, important and updated research findings related to this research question and objectives were reviewed. Accordingly, why science and technology issues are reported in the media, science communication, the relation between the world of journalism and world of science, Ethiopian media context, the science and technology direction of Ethiopia, and other relevant topics are reviewed and discussed.

2.1.1 Why Science and Technology issues are reported in the media?

According to TECHIN (2020), science, technology, and innovation developments are significant for initiating new activities, improving agriculture and industrial productivity, and increasing overall welfare in health and nutrition. At the same time, scientific findings and technological results bring solutions to problems related to poverty, inequality, environmental degradation, climate change, food security, waste management, and other pressing challenges.

Science is knowledge reached through study or practice, or knowledge covering general truths of the operation of general laws in particular as obtained and tested through scientific methods concerning the world. Science refers to a system of getting knowledge that uses observation and experimentation to explain natural phenomena. The term science also means the organized body of knowledge (Okaka, 2009).

The main purpose of science is to develop useful models of reality. Science are usually classified as natural sciences (the study of the natural world), and social sciences (the systematic study of human behavior and society). Science is knowledge obtained through a systematic study of the behavior of nature and materials in a specific environment. It is also an academic discipline. Science communication is also a very debatable area. The following tips for science communication language would: use simple language, motivate readers, avoid scaring the reader off, aim at the target, avoid formulas, use humor, be concise, avoid jargon, always explain, use five 'W's (Who, What, Why, Where and When) plus 'H' (How),

write out acronyms once, and do not encourage false hopes. The form of science story should follow: the space-time dictatorship, go for or the right lengths, suggest titles, give the reader a break, and make illustrations when you can, caption that image, and take into account the intellectual property(ibid). So, the above assumptions indicate that science and technology issues are must give coverage in the media.

2.1.2 Challenges of science and technology reporting

UNESCO (2011) stated science and technology should be of great interest to the media because of the import of such issues to society. Unfortunately, there is a widely held view that this is hardly the case because journalists and the media often do not have enough knowledge and related interest to cover science and technology.

However, technological issues such as the impact of innovations and computer and mobile technologies have captured media attention in many serious issues relating to science and technology are hardly understood and not given adequate coverage. Especially in Africa, there is no critical mass of journalists with specialized scientific and technological expertise. There is a lack of skills necessary for understanding and interpreting science and technology information for dissemination to different audiences as news, features, and other texts (ibid).

Stocking (1999) argued that journalists' lack of scientific knowledge or training is one of the most commonly mentioned reasons for reporting patterns that media critics define as problematic. Agreed on this lack of knowledge, many journalists do not possess the skills to question scientific and technological innovations, particularly when the innovators or scientists seek to hide their negative aspects. For this reason, Bubela and Caulfield (2004) argue that when scientific findings are negative results, either de-emphasized or simply not published. This bias is picked up by the popular press and conveyed, largely uncritically, to the public. It led to claims by Bubela and Caulfield (2004) that even though the media play a critical role in providing information about scientific issues, some reports are often inaccurate or exaggerated.

From their review of the body of research on which this study draws, Anderson, Petersen, and David (2005) also concluded the challenges that journalists faces in selecting their sources, are influenced by factors such as professional and rational demands, existing

knowledge of an issue, the existence of contacts in the field, and commercial pressures. Potential sources of material for journalists include press releases, news conferences, information, and public relations officers, professional society meetings, scientific journals, and expert interviews. On the other hand, journalists often do not have the time, means or expertise to seek independent verification of facts, and are sometimes too dependent on pre-packaged information over which they have little control (ibid).

From the journalists' perspective, news coverage of science and technology is by and large shaped by a whole range of reasons that may include: level of understanding of the issues; time and space limitations; news format requirements; editorial control; human interest; policy activity on an issue; commercial pressures; resonance with and relevance to audiences; dramatic occurrences; and controversy. Such factors, argue Anderson, Petersen, and David (2005), serve to 'frame' stories in ways that are likely to connect with readers' interests, but sometimes appear to non-journalists to 'distort' or 'misrepresent' science.

As sources, scientists, in particular, have tremendous power to shape, as well as control over, the news production process. Even when the subject of a news story is the journalist's choice, scientists are well-positioned to set the parameters for the journalist's decisions about other sources, focus, and conclusions. Many stories are source-generated some estimates put it as many as half or more of newspaper stories so scientists can strategically package news items for journalists (Anderson, Petersen & David, 2005).

2.1.3 Scientific Illiteracy

According to Kennedy & Overholser (2010), the uneducated coverage of science may lead to scientific illiteracy. The argument is that because journalists often value timeliness, speed, simplicity, and clarity stories about science and technology may be long-building, complex, and without dramatic, time-pegged events. Yet, as Kennedy and Overholser (2010) contend, the need to grab and hold attention, to write tight stories or produce short segments, can come at the cost of context and nuance, which leads to public misunderstanding of complex scientific and technological issues.

The outcome is that the media often dumb down complex issues because they want to attract the largest number of people, especially when commercial media, which privilege profit, are

involved. According to Russell (2010), it created mistrust between the scientific community and journalists. This doubt has arisen because scientists rarely well-versed in how to deal with the media.

Scientists viewed the media with suspicion and the prospect of being interviewed by a reporter as a visit to the dentist. Such interviews often felt like pulling teeth, as unwilling researchers measured their words and feared being misquoted. Part of the tension stemmed from the scientific tradition of presenting research first to colleagues at scientific meetings and later to the scientific world through peer-reviewed journals. Only then was it considered appropriate to talk to the public through news media translators. Many scientists have felt uncomfortable with press coverage, worrying about being misquoted or having their research taken out of context. However, they blame the media and its shortcomings, a large part of the problem is that many prominent scientists do not see this as part of their job and are not trained to deal with the media (Russell, 2010).

The suspicions which Russell (2010) mentions above indicate that science and technology were often given little coverage framed within the ‘juicier’ issues of politics or other more appealing news and information. Hence, science and technology are often covered but within the heading of politics, which visibly is more interesting to most media consumers. This claim has led to the conclusion by Science and Media Expert Working Group. They said that many important scientific issues only get media coverage when they are picked up first by politicians” (Science and Media Expert Working Group, 2011).

The above argument can be illustrated by the youngest Kenyan, Evans Wadongo, who had invented a solar lamp. He did not receive much media coverage until rewarded by former Russian leader Mikhail Gorbachev for transforming the lives of rural Kenyans using a solar-powered light. Wadongo was recognized for providing an alternative source of lighting energy and the lamp is considered, a clean and healthy alternative, compared to wood and kerosene (UNESCO, 2011).

Kenyan example tells us the media are selective in what they cover and how they cover it. Whereas the public interest is often promoted as the key cause of media coverage of issues, other underlying factors determine how and why an issue is covered.

Considerations of negativity (the man-bites-dog and bad-news-is-good-news conditions), relevance, locality, novelty, timeliness, magnitude, the severity of the impact, visual appeal, among others, determine what is newsworthy, worthy of coverage, and onward dissemination to audiences (Galtung & Ruge, 1965). In short, to capture the attention of news; reporters, correspondents, journalists, and ultimately the media, the issues must be of significant interest to the audiences. If scientific and technological news does not fit the mentioned categories, it will hardly make news, even they are important to society. Established the growth of media around the world is increased specialization, and some media organizations, as well as journalists, are increasingly interested in single issues. Which they either feel passionate about or in which they possess expert knowledge. As such, the issue now is whether they can frame science and technology and prime the interests of audiences in ways that can advance public understanding and appreciation of the subject and the issues it raises (ibid).

2.1.4 Scientists Vs. journalists

European Commission (2006) advised scientists to work with the media so that scientific knowledge could bring about impact. In its research, the commission guided scientists saying “Journalists are your way into the media”. Not only do they know how to pick out the right words and arguments, but their professional experience has also made them experts at listening to society, and consequently identifying its interests, opinions, moods, and values. For this reason, they should be considered as potential, unexpected allies, rather than intermediaries that must be put up with, or even worse simple targets of critical explanations. Even if it is not always easy to work with them, scientists generally view journalists as people who do not understand the nature and value of science. So, they do not dedicate their attention to it or they distort it normally in an attempt to make it more sensational. From their point of view, journalists accuse scientists of not being clear, and often they do not believe that scientists or their work might be of interest to readers or viewers.

It is necessary to learn to accept journalists for what they are and find acceptable compromises with their way of seeing things. Journalists also have good reasons for what they do. To do this successfully it is important to clearly understand how the interests, goals, values, and routines of researchers and journalists differ. European Commission (2006) has put the following major difference between scientists and journalists. Journalists, like public opinion, expect science to give answers and certainties, while science chiefly produces doubts and questions that it tries to answer.

The first thing journalists look for in a story is emotion, while scientists attempt to see things as neutrally as possible. At times what the scientist sees as sensationalism is sensationalism at others, only the spices needed “to sell” the story. Journalists look for results, even if they are only partial or temporary and at least potentially sensational. On the other hand, scientists rarely leave the laboratory shouting “Eureka!” and prefer to tread carefully. Journalists love writing about single scientists that have made a revolutionary discovery, while scientists see science as a cumulative and cooperative enterprise. Even Newton admitted standing “on the shoulders of giants (European Commission, 2006).

2.1.5 The consequence of public understanding on science

News framing has been defined as the selection of issues to make them more relevant (Entman, 1993). This is related to the issue of agenda-setting, which is considered one of the key functions of the media. The agenda-setting role of the media relates to the notion that the media are often successful in telling people what to think about (McCombs & Shaw, 1972; Lang & Lang, 1983) by selecting what content to publish, where to publish it (placement), and what language (framing) to use. These media processes are relevant to the coverage of science and technology; they are to the coverage of all public affairs.

An Australian study on climate change (Harriet, 2000) explains clearly the contribution that the media can make to the public understanding of science. However, it is not directly implicated in the study that would be impossible, without working through the media. To deal fully with the concern that public ignorance and illiteracy about global environmental issues are leading to misinformed views, unconcern, irresponsible calls for government action, and little change in personal behavior (Harriet, 2000).

As mentioned earlier, the media can affect the scope and form of public knowledge, values, and action via its agenda setting, issue framing, and audience priming functions. The media can propagate better public knowledge of scientific and technological matters by providing more information that reflects an accurate understanding of issues and problems in any particular field: health, environment, genetically modified crops, etc. The media in Uganda are, for instance, widely credited for transforming public knowledge about HIV/AIDS by persistently, consistently, and accurately conveying basic scientific information about the transmission of the disease.

As the preceding arguments have indicated, although the media should ideally be interested in science and technology, there are numerous challenges to contend with regarding the coverage and presentation of scientific and technological issues. Most of these relate to the notion that science and technology are complex issues requiring technical or expert knowledge. Even though this may be true, there is also the idea that the scientific community often fails to trust journalists because of the fear of being misquoted or quoted out of context.

Therefore, scientists and the media ought to have a symbiotic relationship (scientists as sources and the media as interpreters and disseminators of the information), the fact that many science and technology issues in which the public has a genuine interest are sometimes complex, thus denying them the priority they deserve on the media agenda

2.1.6 Mediums of Science Communication

The process of science communication can be interwoven into five principles. Science communication incorporates efforts for the popularization of science, promotion of scientific temper, technological temper, and diffusion of technology and innovations. The mediums of science communication include print, audio/video, folk, interactive and digital media. Print Media includes newspapers, magazines, wallpaper, books, posters, folders, booklets, etc. Audio/Visual Media encompasses mainly radio and TV, besides, films, slide shows, bioscopes, etc.

Folk Media has been a common observation, that through folk media, it is possible to achieve penetration to the segments where other media have limitations. Puppet shows, street plays

skits, stage performances, folk songs, and folk dances like nautanki and other traditional means of communication belong to this category. This media is cost-effective, entertaining, and offers two-way communication (Intodia and Rekha, 1991).

Interactive Media includes science exhibitions, science festivals, seminars, workshops, lectures, scientific tours, conferences, etc. The advantage here is being a man-to-man and two-way communication.

Recently, information technology has given birth to comparatively a new media, known as digital media. It includes Internet, CD-ROM, multimedia, simulations, etc. This is proving to be an effective medium and it can illustrate difficult concepts through text, audio, graphics, video, animation, and simulation.

Various forms for presentation are being used to make science communication more interesting and enjoyable, such as science news, report, article, feature, story, play, poem, interview, discussion, lecture, documentary, docu-drama, scientoon (science + cartoon), satire, etc.

2.1.7 Guidelines for Science Communication in the Media

European Commission (2006) has put the following nine guidelines for science communication. Do not confuse demonstrated research results with speculation about where research might lead; Avoid the clichés of science communication; Evaluate how media releases you get to send and evaluate their newsworthiness; Use terminology accurately, and provide a science style guide or ensure ready access to one; Be forthright with the bad or good news; Seek the place of information in context. This will decrease instances of misunderstandings, maximize clarity, minimize is the interpretation of the message, and take into account social and cultural concerns relevant to the issue in ways that will inspire trust and take the focus off the ‘individualistic ethic’ such as allocation of blame; Include appropriate media training and induction for staff; Build relations with special science, environment, technology, and medical journalists/scientists/practitioners; Develop an in-house set of written induction procedures, guidelines and standards develop a stylebook.

2.1.8. What makes news for science and technology?

Scientists and journalists often have very different opinions on how important a fact is. In the newsroom, much is based on the perception of character developed with experience and handed down from generation to generation, but some studies have attempted to identify the components of a good piece of news more precisely. The following main points are extracted from the European Commission's suggestion of elements that make up science and technology news (European Commission, 2006).

2.1.8.1. Threshold

First of all, there is a size threshold or the beginning of the news. Something “big” must be big, or at least look so. “A small earthquake tremor in Sicily” does not make for much news, while “Thousands of people seek safety from an earthquake in Sicily” is a little better. Where journalists tend to magnify, scientists tend to tone down: this is fine for academic environments, but it does not help with the media.

2.1.8.2. Meaningfulness, relevance, and consonance

To the public, good news also has meaningfulness, relevance, and consonance. It must have a meaning about what they know; it must be relevant and possibly not contradict what they already know or think. A new measure of Hubble’s constant, for example, is a problem that the general public does not know or understand; it has no impact on their life and perhaps contrasts with their religious convictions. A title like “Cellular phone waves are hazardous to your health” responds to the requirements: it refers to something very familiar, raises a problem that concerns owners of cellular phones, thus all of us, and is in tune with the climate of suspicion surrounding new technologies. But “Chocolate stimulates because it contains anti-depressive substances” also works well. The journalist’s angle on the applications or consequences of discovery is what will make a particular piece of news relevant.

2.1.8.3. Frequency, unexpectedness and continuity

Another value appreciated by journalists is frequency, which allows them to prepare themselves to cover an event beforehand— just as they do with sports every Monday. This happens rarely in scientific fields; by definition, discoveries are not predictable. In the same way, the possible continuity of a news item is appreciated; meaning that it will be discussed for a while. An example might be the so-called “mad cow disease” or climatic changes. Thus, for the journalist, it is worth investing time to collect more information or find the right contacts.

2.1.8.4. Competition

The opportunity of reporting news exclusively, thus reporting a story, is cause for professional pride in a newsroom, but scientists and scientific institutions are not comfortable providing exclusive news (or they are not yet, since it is beginning to be required by some large scientific magazines).

2.1.8.5. Nothing is better than bad news

In a newsroom, the very good news is welcome (“a wonder drug against colon cancer found”), but even more, so is very bad news (“the Earth was skimmed by a large asteroid”). The most common scientific news, unfortunately, is moderately good

2.1.8.6. Reliability

Fortunately, scientific news is very often reliable. Journalists only need, in fact, to cite the fact that the news was published in *Nature* or the *New England Journal of Medicine*, or that it was announced by this scientist or that university, to have a clear conscience. This is a real advantage compared to other fields.

2.1.8.7. The power of fame

One last important component in “good” news is the fact that it can be linked to an important or famous place or a person, a celebrity. For this reason, the awarding of Nobel prizes always makes the news, even if the research the prize is awarded for usually dates back to many years before.

2.1.8.8. Many factors come into play in deciding what makes the news

The most important has to do with public demand, rather than the desires, advantages, or the possible ignorance of journalists. Before contacting a journalist it is important to consider carefully how to present your news, trying to make the most of it using the criteria listed above. In other words, it is a matter of adding a bit of spin, something that can attract attention to it.

2.1.9. Beat reporting as important ingredient for science reporting

Historically, the development of beat reporting stands on the professionalization of newspaper journalism and its transformation into a mass product. In a way, the development of the beat system was a response by media organizations to the growing differentiation of society. It helped them to keep the social complexity around them manageable. In addition to general assignment reporters and desk editors working with beat reporters, helped media organizations to structure the news agenda, fill the daily news hole, and to make the flow of news predictable (Magin and Maurer, 2019).

According to Keeble as cited in Dick(2012), when local beat reporting was flourishing in the 20th century; it coupled with a reliance on official sources such as councils, police, fire brigades, ambulances, hospitals, local industries, and their bodies, members of local parliaments, and others. Approaching these sources through the beat system regularly helped local newspapers to produce factually accurate, authoritative news and to make the newsgathering predictable and efficient. On the other hand, the selection of official sources, which reporters regularly turned also, limited the diversity of the perspectives in the news.

In other words, the invention of beat reporting was an important condition to make newspapers an attractive product for sale on the market. It corresponds with the displacement of the old creed of the newspaper business according to which, as noted by Benjamin Franklin, “the business of Printing has chiefly to do with men’s opinions,” with a new belief according to which a paper’s proper business was to publish the fact, the Times Model of 1860. In Great Britain and other European countries, beats were introduced in the 1880s to enhance efficient newsgathering (Manning, 2001). At about the same time in the United States, beat reporting ended an era when journalism was a form of political writing and

newspapers were primarily partisan, directed by politically engaged editors who were often former politicians. Therefore, given that the papers were perceived more as propaganda leaflets than trustworthy information carriers at that time, a lack of accuracy and objectivity in the reporting was no real concern (Magin and Maurer, 2019).

However, with the beginning of beat reporting, newspapers acquired a new utility for the audience that was interested in objective accounts of important events taking place in their community, and at different levels of government. So while beat reporting and political writing is not contradictions (both can take place in the same outlet), the introduction of beat reporting was a condition to make newspapers more marketable (ibid).

According to Morris (2003), the idea of creating news beats was developed by newspaper editor Charles E. Chapin at the end of the 19th century in New York. He was thinking of ways to give his papers an advantage over the newspapers published by William R. Hearst. Chapin took a map of New York City and drew a checkerboard pattern on it, with each square the equivalent of three or four blocks. Then he assigned reporters responsibility for each of the square areas and instructed each reporter to gather everything important that happened within its boundaries. He also had the reporters and the paper's star writers in the newsroom connect with telephone. Reporters had to file their reports with the writers, who transformed them into appealing articles based on facts. The system of beat reporting was thus a way to make newsgathering more efficient and reliable and less partisan and create a different news product. At the White House, beat reporters emerged at the end of the 19th century in 1896, there was a minimum of three reporters (Kumar, 2008).

Beat reporting refers to thematic specialization and routines (places to go, people to see) in journalism. The term reflects the distinction between general assignment reporters and specialized (beat) reporters covering a specific area (beat) as well as the subject matter or geographic divisions between areas of reporting by which media organizations seek to structure the social environment they cover. Beat reporting marks the beginning of modern journalism. It was invented at the end of the 19th century in the United States to increase the efficiency of journalistic work. Thus, it relates to the professionalization and rationalization

of newspaper journalism and the transformation of newspapers into a mass product (Marchetti, 2005).

In everyday work, beat reporting has undeniable advantages. It saves resources since beat reporters are very experienced on their beat and know well where and how to get exactly the information they need. Due to their long-term relationship of trust with relevant sources, beat reporters obtain exclusive, trustworthy, and newsworthy information. Along with this specialization come, however, several challenges; for example, the diversity of views represented in a beat might be limited, which can also affect the diversity of news coverage. At the extreme, this can even lead to pack journalism as a form of groupthink. Concerning the reporter–source relationship, there are three risks of losing professional distance: (a) If beat reporters become too loyal toward their sources, they can be instrumentalized; (b) being too adversarial toward their sources might entail a loss of trust and an increasing cynicism of the audience; (c) if beat reporters start feeling like advocates of their interests, they might behave as activists rather than detached observers. Most recently, online journalism has changed the understanding of beat journalism (e.g., data journalism, local online beat) compared to the traditional understanding. Research on beat journalism has so far focused on stable, high-income democracies and the political beat as the most fundamental and prominent beat (McCluskey, 2008).

2.1.10. Science and Technology in Ethiopia

The issue of science and technology has long been accepted and implemented by the successive governments of Ethiopia. Recently, The Ethiopian government established the Ministry of Science and Technology; and formulated a national science, technology, and innovation policy in 2012. The strategic directions to be pursued for enhancing science and technology development in the country are to identify technology demand, organize and analyses the relevant value-adding technological information to provide services, establish the supporting system and develop a monitoring system for technology duplication and adoption processes (Ministry of Science and Technology, 2012).

Research and technology capacity building will focus on establishing research centers in economically beneficial sectors, strengthen research infrastructure development, and support

research and technology projects. Human resource development aims to train high-quality human resources having technical skills and scientific knowledge and to create capacity to enhance research and technology at the national level. Moreover, quality and standardization, conformity assessment sector, science, technology and innovation information development, protection and development of intellectual property rights are also the other strategic directions of the sector (ibid).

Eleven critical policy issues are identified, based on the national STI problem analysis and assessment of the characteristics of countries selected as benchmarks for their best practices. These are technology transfer, human resource development, manufacturing and service providing enterprises, research, financing and incentive schemes, national quality infrastructure development, universities, research institutes, TVET institutions, and industries linkage, intellectual property system, science, and technology information, environmental development and protection, and international cooperation (ibid).

According to the information from the Ministry of Science and Technology (2012), environmental protection and development are crucial to maintaining continual and sustainable economic growth. The major issues of the environment in Ethiopia are desertification, deforestation, and soil erosion. In big cities lack of solid waste disposal and sewerage system are critical environmental challenges. Therefore, to address these and other environmental problems prevailing in the country, appropriate technologies will be applied in the course of natural resource utilization and implementation of various development activities. Collecting, organizing, analyzing, disseminating, and using information related to science and technology is of significant importance for successful technology transfer. In Ethiopia, there is no well-organized science and technology information source or system as required by manufacturing and service providing enterprises, higher education, research institutes, and other entities.

Even though there are certain types of information that are prepared and kept in the form of statistics, databases, indicators, and bibliography, there are no mechanisms to publish and update them regularly. Therefore, it is imperative to develop and establish a national science

and technology information system to fill the gaps and bring expected results, including the acceleration of technology transfer. Establishing and strengthen such a system will create a capacity that accelerates technology transfer through identifying, gathering, organizing, analyzing, disseminating, and proper utilization of science and technology information (Ministry of Science and Technology, 2012).

2.2 Theoretical Framework

2.2.1. Agenda Setting Theory

According to Lippmann cited in Zain (2014), the beginning of agenda-setting theory can be traced as far as 1922 when Walter Lippmann states his concern on the fundamental role that mass media can do in influencing the setting of the certain image on the public's mind. In portraying the power of mass media, Lippmann gives an example of individuals who are supposed to be enemies while their countries are at war. Instead of becoming enemies, without having access to information about the war through the media, those individuals can live harmoniously on a quiet island. Lippmann indicates how mass media can set a particular agenda that can influence the opinions of the public. However, he never uses the term 'agenda-setting theory' in his book. Nevertheless, he did generate the foundation for the agenda-setting theory.

Then the years later from Lippmann's time, agenda-setting theory is popularized. McCombs and Shaw (1972) are some of the most important researches which contribute to this theory, their view on the capacity of mass media in influencing the voters' opinion on the presidential campaign of 1968. From their study, McCombs and Shaw found out that the mass media did have a certain percentage of those members of the public who frequently referred to information as provided by the media. Such percentage is increased for those who are driven with the excitement in following up the presidential campaign's information.

McCombs & Shaw (as cited in Baran & Davis (2006)), after conducting studies on the effect of media campaigns on USA political voting decisions, expounded on the theory, observing that by choosing and displaying news, media gatekeepers play a key role in influencing political reality: readers learn not only about a given issue but how much importance to attach to that issue from the amount of information in a news story and its position.

Proponents of the theory argue that the issues the mass media decide to emphasize inevitably take a central place on the public agenda. Nkurunziza (2006) reported that the agenda-setting capacity of the mass media determining “what is important and what is not; what is normal and what is unusual; what is the agreement and what is not; what is important or newsworthy and what is insignificant” and concludes that “the media can form or manipulate the public conscience”. Concerning this, Berger (1995) noted that those issues not emphasized are consigned “secondary status or, in some cases, relative obscurity”.

At the macro level of agenda-setting lies what Baran & Davis (2006) refers to agenda building; described as “a collective process in which media, government, and the voters reciprocally influence one another in areas of public policy”. The exceptional feature of this perspective is that it adds an element of circularity to the theory since the role of extra-media sectors such as the public and government in influencing the media’s agenda is recognized. In the same vein, Perry (2002) observed that the mass media, as part of society, often conforms to the issues that society has chosen to emphasize, which would have in effect emerged as the social agenda.

At the micro-level, an acceptable level of agenda-setting is the role played by individual journalists who by way of their biases and prejudices interpret events and pass on their subjective perceptions of the public. Rukhsana (2010) pointed out that at the time of reporting, it is “journalist-the-individual whose words are being read or heard, whose images are being seen and whose interpretation of the events forms the ‘first draft of history’”. In addition, Scheufele (2000) says this process is associated with what is referred to as the gate-keeping role of the media; the view that individuals in media organizations (reporters and editors) decide what issues or personalities would make news and the importance to accord to each.

Bringing the theory to bear on the specific practice of Peace Journalism, Lynch & McGoldrick (2005) define the model in agenda-setting terms as “when editors and reporters make choices about what to report, and how to report it that create opportunities for society at large to consider and to value non-violent responses to conflict”. This definition implies that the agenda of society is dependent upon the choices made by the journalists reporting on conflicts and the editors who decide on what to include in the reports. Writing about his relationship with the mass media during the 1994 Rwandan genocide, a Canadian General and former commander of the United Nations Mission in Rwanda (UNAMIR), Romeo Dallaire (2007) noted that while the media can play a negative role, they can also be used in equal, if a not better measure to promote peace: “I felt that one good journalist on the ground was worth a battalion of troops because I realized they could bring pressure to bear”.

Shinar (2007) argued that while the mass media “can contribute to war, genocide, terrorism, oppression, and repression”, they also have the potential to contribute to “security, dignity, growth, and decision-making by citizens based on accurate, credible, and manageable information”. But in her study to assess the application of the Peace Journalism model the peace process in Northern Uganda, Birungi (2009) established that the potential of the mass media to impact the agenda-setting process had been overstated; noting how the conflicting parties set the agenda by fine-tuning their messages to attract the attention of the media since they knew what stories the journalists wanted. Her work highlights the influence news sources have on the process of determining which issues are to be fronted to journalists for eventual dissemination.

2.2.2. Framing Theory

A media framing is a central organizing idea or storyline that gives not only meaning to explain stripes of events but also indicates the context of an issue. The selection of a restricted number of thematically related attributes for inclusion in the media agenda when a particular object is discussed (Scheufele, 1999). In light of this, Lai Fong (2009) explained that frame is to select some aspects of a perceived reality and make them more salient in a communicating text. This signifies that media frames are connected with real-time events. Besides, Stawicki (2009) mentioned that frames are related to what exists, what happens and what matters.

Baran & Davis (2006) revealed that framing theory is grounded on the notion that people use expectations to make sense of everyday life. Resse (2010) also defines frames as organizing principles that are socially shared and persistent over time, that work symbolically to meaningfully structure the social world. As a mass media theory, Entman (1993) conceptualized framing as to select some aspects of a perceived reality and make them more salient in a communication text, in such a way as to promote a particular problem definition, causal interpretation, moral evaluation, and/or treatment recommendation. Besides, Resse (2010) highlights the role journalists play in frame construction and calls for a good understanding of journalism routines and values, which would inevitably help explain how and why certain frames are favored over others.

Framing has been explored by various scholars and has been defined in various ways. According to Chong and Druckman (2007), an individual's attitude has a major influence on how one interprets media. In addition to attitude, selection and salience are categorized within the framing. Entman (1993) explained that to frame a story is to "select some aspect of a perceived reality and make them more salient in a communicating text, in such a way as to promote a particular problem definition, causal interpretation, moral evaluation, and/or treatment recommendation". The media highlight a certain piece of information about the main topic of a news story, which raises the salience of the issue. The term salience means making a piece of information more noticeable, meaningful, or memorable to the audience. An increase in salience improves the probability that the audience will remember the information. Information can be added or taken out according to the message that the media want to communicate to the public.

To assist in the understanding of media framing, Entman (1993) explained four illustrations of theoretical debates in the study of mass communication. The first illustration discussed is audience autonomy. One of the key concepts to the framing concept is the notion of dominant meaning. From a framing perspective, dominant meaning consists of the problem, causal, evaluation, and treatment interpretations with the highest probability of being noticed, processed, and accepted by most people. The dominant meaning can be identified by a

particular framing of a situation that is frequently mentioned in the text and is the most common opinion among the audience.

Next, journalistic objectivity is discussed. Journalists may follow the rules for 'objective' reporting and yet convey a dominant framing of the news text that prevents most audience members from making a balanced assessment of a situation. Because some journalists lack an understanding of framing, they can unknowingly impose their dominant frames on the news. They might be better prepared to build news stories that make each issue equally salient if they had a better understanding of the difference between including scattered oppositional facts and challenging a dominant frame. A better understanding of this concept could result in more balanced reporting throughout the media environment (Entman, 1993).

The next item discussed is content analysis. Entman (1993) stated that content analysis has "the major task of determining textural meaning" and the identity of frames in the media. He warns that coders need to be aware of concluding dominant meanings. Proper coding instruction and agreement can result in valid results about the issues and the frames that are being portrayed in the media.

Finally, Weaver (2007) noted that the frame can be studied using systematic content analysis or more interpretive textual analysis. He also mentioned that framing is not concentrated on how issues or other objects like people, groups, organizations, or countries are depicted in the media rather it identifies prominence of them in the media. In the same ways, Ishak and Yang (2012) highlighted four major dimensions of the framing which are identified by Wong. These are the presentation of news items (size and positioning), issues that need to be included in the news items, cognitive attributes (specific details of the issues need to be included), and effective attributes such as tone of the picture. That is, these four indicators will be essential to identify the way media frames a particular issue/event/incident. These dimensions will lead us to analyze the size and positioning of news related to print media which will be studied by using content analysis.

Therefore, as per the theory, a quantitative researcher will get an opportunity to understand the domination of media frames in a situation. News about conflict is regarded as one of the

dominant frames, which suggests the core issue of controversy. The conflict frames are particularly common in news, coverage which can intensify the conflict dynamics by framing, various perspectives such as relationships among parties involved in the issue. For example, Stawicki (2009) study focused on studying coverage of the Israeli-Jordanian peace process and he remarked that the news media are much better suited for the conduct of war than the pursuit of peace. Besides, Shoshanna Blum-Kulka and Liebes (2003) throw light into another dimension of the media frame is the use of language as the terms of addresses and references are well-known linguistic indicators of attitudinal stance.

Van Gorp (2010) asserted that the enterprise of journalism entails a dynamic process of meaning construction and a constant process of creating social reality in which the role of the journalist is to “present additional layers of interpretation of issues and events in the form of a news story”. Resse (2010) also highlights the role journalists play in frame construction and calls for a good understanding of journalism routines and values, which would inevitably help elucidate how and why certain frames are favored over others. In its framing role, the media play a key function of assisting citizens to determine what is common sense or socially normal through both regular repetition and a preference for particular framings of events (Scott, 2001). In addition, D’Angelo & Kuypers (2010) said that the important dialectical relationship that exists between news sources who frame topics to make information interesting and pleasant to journalists, and the journalists who adopt such frames or often overlay their own set of frames to come up with the final hybrid framing of the events.

CHAPTER THREE

METHODOLOGY OF THE STUDY

3.1 Introduction

This section shows the design of the study, population, sampling and sampling techniques, data gathering instruments, as well as method of data analysis in which the data has been collected and analyzed.

3.2. Design of the study

This study used a mixed methodology; quantitative and qualitative. Dornyei (2007) noted that the mixed research method helps to reduce the inherent weaknesses of individual methods, by compensating them with the strength of the other. These two methods are not antagonistic but are useful when they are used in combination (Newbold, 1998).

On the other hand, Wimmer and Dominick (2006) indicated that qualitative research methods as those that permit the researcher to study selected issues in-depth and detail, and it is flexible and allows a researcher to view behavior in a natural setting thereby increasing a researcher's depth of understanding of the phenomena being investigated. That is, while quantitative one explains findings based on numerical data, qualitative research methodology seeks to qualify, explain, interpret or explain findings descriptively by using theoretical/conceptual frames as a base. Both qualitative and quantitative methods were used in the study.

3.3 Population, Sampling and Sampling Techniques

The study was conducted to assess the coverage of science and technology news in FM Addis 97.1, particularly on the 'Addis Mereja' daily news prime time. The Radio Station has 43 employees, including journalists. However, for this specific study, the researcher selected those employees of the Station whose duties and responsibilities are relevant to the objectives of the study. Accordingly, all employees who are directly involved in science and technology reporting i.e. 2 reporters, editor of news and current affairs as well as the director of FM Addis 97.1 were included in the study by using the purposive sampling technique. The researcher used purposive sampling to get an in-depth understanding of the issue from the appropriate source of information.

Since, this study focused only on science and technology news, the researcher selected only two of the three prime time news hours (Morning 'Addis Mereja', 'Zena Metsehet' and Evening 'Addis Mereja'), namely, 'Addis Mereja' daily news prime time by using a purposive sampling technique. This is because that while the two news hours provide coverage of science and technology news regularly; 'Zena Metsehet' has no science and technology package at all.

The study has made use of the purposive sampling technique to collect data in the year 2019. It is mainly because of the availability of complete data, recently and the non-existence of special factors affecting the pattern of news coverage like covid-19. This researcher selected six consecutive months from December 1, 2018, up to May 30, 2019, by using the purposive sampling technique. It is because the data that the researcher got within these six months was found to be rich, complete, and timely. Also, these six consecutive months were selected to accurately investigate the stations' approach to science and technology stories. Had such fortunes been in existence, the routine approach of the station towards science and technology issues would have been influenced. Such as, Ethiopian innovation week was marked from June 6- June 12, 2019, and world telecommunication and society day was celebrated in November, 2019. During these six months of the period of total of 2,202 news on varieties of issues has been broadcast, of which 80 are on science and technology news. So, the study has considered all 80.

3.4 Data Gathering Instruments

Content analysis and in-depth interview were the two data collection tools that the researcher employed to assess the coverage of science and technology news in FM Addis 97.1.

3.4.1. Content analysis

The content analysis was done through coding important categories such as number of science and technology news in the bulletin, the type of science and technology news covered, news language, the duration, frames, sources, format, and the origin of science and technology news. Hence, as indicated in the above section, news aired in FM Addis 97.1 Addis Mereja daily news prime time from December 1, 2018, up to May 30, 2019, has been coded and analyzed in this research.

3.4.1.1. Unit of analysis

The unit of analysis for this study was the science and technology news in ‘Addis Mereja’ daily news prime time. This division was included to all kinds of news that falls under the science and technology category. Therefore, it is a default that all stories which were entertained under this division can exactly be taken as a unit of analysis. The coding sheet was prepared in a way that can answer the research objectives.

3.4.1.2. Categories of content analysis

All category systems should be mutually exclusive, exhaustive, and reliable. A category system is mutually exclusive if a unit of analysis can be placed in one and only one category. If the researcher discovers that certain units fall simultaneously into two categories, then the definitions of those categories must be revised (Wimmer and Dominick, 2011). The study was aimed at examining to assess the coverage of science and technology news in FM Addis 97.1, particularly on the ‘Addis Mereja’ daily news package.

Coding process

The coding process was carried out by two journalists, who were trained on how to code articles. The training was given by the researcher. The coders were provided with the coding sheet along with coding guides (See Appendix A). Then; they filled out the coding sheet which developed from the literature and current facts of science and technology issues in Ethiopia.

Explanation on the coding items:

Title of story: Write down the title of the story.

Radio Station: Choose the number beside the name of the radio station that is being coded

Date of the news aired: This indicates the date the news story was aired. The dates should be designated as day followed by month and year as in the sample below: Date of story: for example 30/07/15

Number of stories in the bulletin: write down the number of stories, both science and non-science stories that make up the bulletin e.g. “10” means ten stories altogether.

Number of science and technology news in the bulletin: this indicates the number of science and technology stories only with respect to all the other stories. For example “1” means out of all the stories in the bulletin there is just one science story.

Duration of science and technology news: this is the length of time measured in seconds used in reporting each story.

Sources of news: This part indicates who is quoted or referred to as the source of the news story. The story must be attributed to a person, an office or an agency.

Origin of the science and technology news: write 1 if a particular news stories are collected from Ethiopia and 2 if the story is from abroad and meant to be broadcasted for outside.

The news language: This part investigates the presentation of the science and technology story. Therefore write 1 if it simply state facts without making sense of elaboration, write 2 if it tries to explain the facts and write 3 if the story is presented in kind of human interest, which means in a way that can enable the audience to themselves in the news.

Type of science and technology news Covered: This topic asks you to select the kind of stories. Some lists such as environment, health, energy, agriculture, astronomy and general science are put to the list. Choose from 1-6 if you think the story fall under these categories. If the kind of the story doesn’t match with the list put the kind of story by your own word.

The format of the science and technology news: In this case you are required to show the format of the news. Three alternatives such as hard news, feature and interview are given as choice. Choose hard news if the science and technology news is more of protocol news. Here, the story is written in usual news format like lead, body and background. It is time and format bounded. Choose feature is the story is written in relaxed manner with considerable

time taking news writing. Finally choose interview if the story is produced by taking the words of the interviewee.

3.4.2. In depth interview

Scholars Beale et al., (2004) wrote as in-depth interviews “are an effective qualitative method for getting people to talk about their personal feelings, opinion, and experiences”. The person-to-person discussion involved an in-depth interview lead the researcher to yield rich qualitative data through a deep exploration of the respondent’s impressive perspectives in a given area. Natasha et al., (2005) also stated as an in-depth interview is an opportunity for us to gain insight into how people interpret and order the world.

According to (Wimmer and Dominick, 2006), in-depth interviews provide detailed background about the reasons respondents give specific answers. Elaborate data concerning respondent “opinions, values, motivations, recollections, experiences and feelings are obtained”. In-depth interviews in this study have helped the researcher to investigate the responses and reflections of journalists who work in science and technology reporting, chief editor of news and current affairs, and director of FM Addis 97.1 where all of them were selected to be the participants for this research.

Hence, in this method, four members of FM Addis 97.1 news and current affairs department were participated (journalists who work in science and technology reporting (2), chief editor of news and current affairs (1), and director of FM Addis 97.1 (1). The interview was also used to supplement the finding of the content analysis. The in-depth interview questions mainly focused on the coverage, source, challenge, and the media relation with scientists and science-related organizations. The general framework of the in-depth interview has been included for reference (See, Appendix B).

3.5. Method of Data Analysis

The data gathered from the respondents through in-depth interview and content analysis have been transcribed and translated into English before analysis of the data begun. During data collecting time, interviews were recorded, notes were taken, and responses were collected. The data gathered through coding lists are first presented quantitatively by using numbers

and percentages in tables. Each table has its thematic descriptions and the results were argued. Data obtained through interviews was analyzed qualitatively and combined into the discussion. This helped the researcher to come up with a certain conclusion regarding the practice and challenges of the coverage of science and technology news in FM Addis 97.1, particularly on the 'Addis Mereja' daily news prime time. In general, the researcher applied a mixed method of data analysis to analyze the data. The data which were gathered through the quantitative method were tabulated and a percentage was made. Interpretive analysis was used for the qualitative data obtained through in-depth interviews.

3.6. Ethical Consideration

Throughout all the research stages, the researcher considered all ethical and confidential issues as much as possible. In particular, issues such as giving official letters to concerned bodies, asking permission from the stakeholders, informing all the participants about the objective, and keeping their confidentiality were respected.

CHAPTER FOUR

FINDINGS AND DISCUSSION

4.1 Findings

The major objective of this study is to assess the practice and challenges of the coverage of science and technology news in FM Addis 97.1, particularly on the ‘Addis Mereja’ daily news prime time. The previous chapter outlined the use of both quantitative and qualitative methods. In-depth interviews and content analysis were tools applied to gather the relevant information. Six months of news of FM Addis 97.1 aired from December 1, 2018, up to May 30, 2019, was investigated and out of the total 2,202 pieces of news, 80 sciences and technology news was identified in consideration with the unit analysis and time frame of the study. The news was quantitatively coded and textually analyzed to figure out the practice. Besides, two journalists (who work in science and technology reporting), chief editor of news and current affairs, and the director of FM Addis 97.1 were interviewed to supplement the data gathered from the content analysis.

The findings of the content analysis are presented first. This described relevant data of the subject under study such as number of science and technology news in the bulletin, the type of science and technology news covered, duration of the science and technology news, frames, sources, the news language, the origin of the article, and the format of the science and technology news. Apart from such issues, the interview has explored lots of investigations that were used as supplementary data for the content analysis. It mainly focused on the coverage, source, challenge, and the media relation with scientists and science organizations. The findings of the in-depth interview were presented next to the content analysis.

4.1.1 Findings of the content analysis

In this section, the quantitative findings are presented. Accordingly, number of science and technology news in the bulletin, the type of science and technology news covered, duration of the science and technology news, frames, sources, the news language, the origin of the article, and the format of the science and technology news are investigated and presented.

4.1.1.1 Number of science and technology news in the bulletin

The finding of the content analysis clearly showed that current affairs got special attention from the media whereas science and technology got the least coverage.

Table 4.1 Number of science and technology news in the bulletin

Types of news	Number	Percentage (%)
National and international current affairs	808	36.7
Business	312	14.16
Sport	621	28.2
Social affairs	268	12.18
Law and order	113	5.13
Science and technology	80	3.63
Total	2,202	100

As shown in the above table 4.1, FM Addis 97.1 covered national and international current affairs (36.7%), sport (28.2%), and business (14.16%) with due attention while it gave less emphasis for social affairs (12.18%), law and order (5.13%) and science and technology (3.63%). From the above table, one can understand that least attention is given to Science and technology news when compared with National and international current affairs news. There is a big gap in covering this news. Moreover, it is possible to say that still sports news is given more coverage than Science and technology news. Relatively Law and order news coverage is a little bit higher than that of science and technology news.

4.1.1.2 Types of science and technology news covered

Different types of science and technology issues have been covered by the studies conducted with the types of electronic media. However, all media have not similar focus. Accordingly, the types of science and technology issues based on the subject covered by FM Addis 97.1 are presented in Table 4.2.

Table 4.2 Type of science and technology news covered

Type of stories	Number	Percentage
Environment	18	22.5
Health	32	40
Energy	7	8.75
Agriculture	8	10
Astronomy	7	8.75
General science	8	10
Total	80	100

Source: Survey data, 2020

As shown in Table 4.2, health (40%) and environment (22.5%) were the dominant types of stories covered by FM Addis 97.1. Next, comes agriculture and general science stories, 10 %. Finally, energy and astronomy-related news had 8.75% coverage. From the above table, it is possible to say that more science and technology issues coverage has been given for health-related issues which account for 40% when compared to General science and Agriculture where each occupies 10% of the news package.

4.1.1.3 Duration of science and technology news:

In this section, the duration of science and technology issues has been investigated. Accordingly, the result is presented in Table 4.3.

Table 4.3 Duration of science and technology news

Duration of news	Number	Percentage
Below 60 seconds	2	2.5
between 61 and 120 seconds	56	70
Above 120 seconds	22	27.5
Total	80	100

Source: Survey data, 2020

As presented in Table 4.3, the majority of science and technology news has time duration of one minute to two minutes, numbered 70%. Secondly, the news with duration of above 120 seconds was 27.5% of the total news sample. Finally, only 2.5% of the news was below 60 second time duration. Hence, most of the time, science and technology news have a length of 61 and 120 seconds.

4.1.1.4 Sources of news

The source of science and technology news of FM Addis 97.1 was one of the key areas of investigation. The result is presented in Table 4.4 below.

Table 4.4 Sources of news

Sources cited	Number	Percentage
Government officials, Politicians, Interest Groups/ NGOs	16	20
Science professional (expert source)	25	31.25
Wire Services/ in house journalists ,Celebrity , Patient	6	7.5
Technologists	24	30
Others	9	11.25
Total	80	100

Source: Survey data, 2020

The above Table 4.4 showed the sources cited by FM Addis 97.1. According to the result, science professionals (expert sources), technologists, government officials (politicians, interest groups, and NGOs), other and wire services (in house journalists, celebrity, and patient) covered 31.25 %, 30%, 20%, 11.25% and 7.5 respectively. Most of the science and technology news is done in FM Addis 97.1 Addis Mereja news package from Science professional (expert) source sources. Government officials, Politicians, Interest Groups/ NGOs are put in second place as a source in science and technology news package in the aforementioned media.

4.1.1.5 The format of the science and technology news

This study also investigated the format of FM Addis 97.1 covers science and technology news. The result is presented in Table 4.5 below.

Table 4.5 Format of the science and technology news

The format of news	Number	Percentage
Hard news	57	71.25
Feature news	19	23.75
Interviews	4	5
Total	80	100

Source: Survey data, 2020

According to the above table, hard news was said to be the dominant type of the news format (71.25%). Followed by feature news with 23.75% and finally interviews covered 5 % of the format. Most science and technology news are done in hard news than in Feature news as well as Interviews respectively.

4.1.1.6 The news language

The language used by the media was the other significant area of investigation. The finding of the content analysis is presented in Table 4.6 below.

Table 4.6 News language

The news language	Number	Percentage
Stating the facts/scientific/	42	52.5
Deliberative/which makes sense of the facts	29	36.25
Epideictic which reacts to facts and concerns feelings and outcomes	9	11.25
Total	80	100

Source: Survey data, 2020

The above Table 4.6 displayed the language of science and technology news. It indicated that most of the language of the news was static facts, 52.5%. Deliberative kind of language usage covered 36.25%. Finally, epideictic language had the share of 11.25%.

4.1.1.7 Origin of science and technology news

The majority of the origins of FM Addis 97.1 science and technology reporting were depending on outside sources. The result is presented in Table 4.7 below.

Table 4.7 Origin of science and technology news

Origin of the news	Number	Percentage
Local	13	16.25
Foreign	67	83.75
Total	80	100

Source: Survey data, 2020

As shown in Table 4.7, almost 84% of sampled science and technology news of FM Addis 97.1 were from foreign while only 16.25% were found to be local.

4.1.2 Findings of the in-depth interview

In addition to supplementing the data collected from the content analysis, interviews were conducted to obtain key and relevant information which couldn't be obtained through content analysis. The interview part investigated the organization's routines, policies, the practice as well as the challenges of FM Addis 97.1 in its practice of science and technology news. In this specific section of the data presentation; the editorial policy, guidelines, coverage, source, challenge, the relationship between scientists and media professionals and beat organization of science and technology reporting were assessed.

4.1.2.1 Emphasis for the Coverage of science and technology news in FM Addis 97.1.

In addition to content analysis, in-depth interviews were conducted to investigate the status of the editorial policy. With regards to the status of the editorial policy in supporting the science and technology news, all of the respondents said the policy is not vibrant enough in addressing the issue of science and technology. In this regard, one of the in-depth interview participants the chief editor noted.

“Our news for science and technology comes from the nation's policy. The country's Education policy is 70/30. As a result, we try to focus on science and technology. Moreover, we are producing detailed policies and guidelines to appropriately cover science-related issues. The 21st century also enforces us to find ourselves in a place where we effectively produce and transmit science and technology news. However, for the time being, we are covering such news in a short news format, not in a detailed and elaborated way.

Similarly, another in-depth interviewee reported that the editorial policy and guidelines don't support the effort of addressing science and technology issues. The respondent mentioned that the journalists didn't learn how to cover science and technology issues in the university. They don't even know the proper vocabulary for such issues. They try to obtain such skills just by reading a magazine and using a dictionary at the office.

However, one respondent has given the following a bit different response.

“Our editorial policy has detailed content regarding development and democracy issues. Science and technology are also one of the development

issues which are entertained in the editorial policy. As a result, we have a daily air time for science and technology. Moreover, the issue is also treated in other weekly programs. Therefore, the editorial policy has no gap in this regard. Our editorial policy is also designed by the country's development strategy of agriculture-led industrialization. Our policy is very supportive in this regard, but I can't say we go deep inside to science and technology stories (Director of FM Addis 97.1).

4.1.2.2 Journalists' views on major science and technology issues to which they give more Coverage

The result of the interview also supported the findings of the content analysis. Through the interviews held with journalists, efforts have been made to explore what particular issues are often emphasized in FM Addis 97.1 "Addis Mereja" daily news package. Accordingly, all respondents stated that health and agriculture issues are mainly covered.

"Most of the time, I focuses on health stories. This is because most of the international science and technology news don't fit with our audience. They talk about issues which have low proximity to the society. One of the science and technology issues which are relatively covered in the foreign news is a health issue." (Reporter)

"I think technology related news stories are not relevant to our society. I mainly focus on health and agriculture. As much as possible, I try to select news that has relevance to the lives of our people." (Senior Reporter)

4.1.2.3 Views on the Adequacy/Inadequacy of Coverage of science and technology news in FM Addis 97.1

All of the respondents believe that FM Addis 97.1 covers science and technology news inadequately. In this regard, the station seems to fail to effectively implement the ambition of Ethiopian science and technology strategy.

“FM Addis 97.1 is not covering science and technology issues adequately. Enough time is not allocated to covering these issues and the reporting is not done in the required detail” (Reporter).

“FM Addis 97.1 is giving increasing attention to science and technology issues; however, the coverage is not wide enough. Given the greatness of science and technology issues, a lot remains to be done.” (Chief Editor).

4.1.2.4. Challenges of science and technology news reporting in FM Addis 97.1

Journalists’ knowledge and experience is one of the main factors which enable them to appropriately and effectively cover science and technology news. Accordingly, the result of this study showed that most journalists do not have adequate knowledge on the matter. In this regard, one of the in-depth interview participants said,

“Because we didn’t learn about science and technology reporting, we don’t have proper knowledge of science and technology. But through our personal effort, we try to do our level best. For example, in political affairs and sports journalism, some efforts are made to train journalists so as to enable them their responsibility effectively. However, there are no similar efforts on our case (reporter)”.

Translating foreign news to local languages is very important in order to reach the audience with their own local language. However, translation of foreign news is one of the challenges for many journalists. In this regard, one of the in-depth interview participants shared her experience as follows:

“Translation of foreign news is one of the difficult tasks for us. Whenever we are dealing with science and technology news, we do care for clarity and proximity to our audience. I don’t think that our audience could understand our news clearly. We devote our time from selection to perfect translation to avoid jargons. We usually translate three to four news stories per week to produce one science and technology package (reporter).

Science and technology is one of the dynamic fields in our world. As a result, professionals who cover the issue need to have the necessary as well as up to date understanding and

knowledge of science and technology. With this notion, the research investigated the efforts made to scale up professional competency in the field. All of the respondents agreed that the organization is not making any effort. Here are the respondents' responses,

Our institution rarely facilitates training regarding science reporting. To further increase and update my knowledge, I read science and technology news. I update myself through personal reading. I expose myself to such news (reporter).

So far, I haven't got any training that improves my understanding of science and technology. I usually watch science and technology news from different media. I also read literatures and books to broaden and update my understanding of science (senior reporter).

The media has not done a satisfactory job regarding excelling the professional competency in the field of science. We only tried to assign science and technology reporters based on their exposure and knowledge of the issue. (Chief Editor).

4.1.2.5 Practice of beat reporting in FM Addis 97.1

Lack of training in special field may be a big challenge to practice beat or specialized reporting in the media. The research also asked the presence and practice of beat reporting with regard to science and technology in FM Addis 97.1. The finding showed that beat reporting was not practical in FM Addis 97.1.

We have no professionals in the area of science and technology. We have no beat reporting. We face problems when we cover foreign news. Some terminologies are not translated and I think people might get problem in understanding the news. I believe the problems came from lack of training. Professional support is important. We don't give specific training in science and technology. Institutions are also not willing to work with us. We try our best to arrange specific training for journalists of science and technology. But this is not at the desired level (Chief Editor).

The beat is not organized. As a result, we have no plan, discussion and editorial routines. This has largely impacted the quality of our science and technology news (reporter).

We have tried, but we lack the necessary human resource. Since our media is engaged with current affairs, we couldn't fully organize journalists in a single beat. It is difficult to address science and technology issue within three to four minutes. Our target here is to give short tips. Given that our country is in the infant stage of science and technology, reporting foreign news is not something irrelevant (Director of FM Addis 97.1).

4.1.2.6. The relationship between scientist and media professionals

The relationship between scientists and media professionals was one of the important points which were investigated through interviews. The finding showed that the relation is very low.

There are various stakeholders with regards to science and technology like Ethiopian Intellectual Property Right institution. However, these institutions are very weak to introduce their innovations and innovators. The bureaucracies of institutions are not promising. It is so tedious and boring. I give due care in selecting relevant news. I try to find a story that can solve community's problem (reporter).

We have no special relation to these institutions and people. But we cover their news when they ask for coverage. To have information from these institutions, there are challenges (senior reporter).

One of the problems that limit us from reporting national issue is our institutions tiresome and bureaucratic nature. The institutions have no clear guideline to work with media. Lack of appropriate knowledge is the other problem. The institution of science and technology are not collaborative to media (chief editor).

4.1.2.7 Sources of FM Addis 97.1 to cover science and technology news

Such finding of the content analysis was equally shared by the result of the in-depth interview. The respondents explained that foreign news sources such as BBC, CNN, and

Aljazeera were the origin of their science and technology news. The respondents further explained that the inconvenience of scientists and science organizations was the major reason for not covering national science and technology news. They also said that lack of ongoing innovation in the field might restrict the availability of local science and technology news. The responses of the interviewee are highlighted below.

Basically, we use international media of our science and technology Such as BBC, CNN and Aljazeera. We have an interest to use our nation source, but there is no organized news source in our country. Moreover, we ignore national sources because our station didn't have clear guidelines. Besides, sometimes we ignore national source to avoid accountability (reporter).

Most of the time, we cover foreign news. We get such news from international sources. We are not supporting our national policy of science and technology. These come from several factors. First, our scientists and institutions are not consistently produce scientific innovations. Secondly, they are not also willing to work with the media (Chief Editor).

We basically use two kinds of sources; national and international. I use the ministry of science, innovation and technology (now becomes a ministry of innovation and technology) official website, the Ethiopian News Agency and the Ethiopian Broadcasting Corporation. However, most of the time, I use international news sources. This is because I couldn't get science and technology news from the country. Innovations are rare in Ethiopia. However, foreign media have sufficient access to such stories (senior reporter).

4.2. Discussion

Assessing the practice and challenges of the coverage of science and technology news in FM Addis 97.1 particularly on 'Addis Mereja' daily news prime time was the objective of this study. Both quantitative and qualitative methods were followed for the gathering of data and purposive sampling technique was used to select samples.

The content analysis was done through important categories such as number of science and technology news in the bulletin, the type of science and technology news covered, duration

of the science and technology news, frames, sources, the news language, the origin of the article, and the format of the science and technology news. The interview was also used to supplement the finding of the content analysis. It mainly focused on the coverage, source, challenge and the media relation with scientist and science organizations.

Both quantitative and qualitative findings show similar results for the type of the science and technology news, which FM Addis 97.1 select to broadcast. It revealed that health and environment were the most selected issues. The findings of the content analysis showed that health covered 40% of the sampled science and technology news. Besides, most of the interviewee assured that health is the issue dominantly selected by the journalists for news story. The interviewee further maintained that they prioritized health stories they believe that health is the most relevant issue which the audiences want to listen. Such selection of news is in line with the basic ethics and guidelines of journalism. Journalists have to select news which has relevance and meaningful to their audience. Shoemaker (1991) said that journalists consider the significant impact of the event to select the news when they cover various news events and issues; the more the news item is unusual and socially significant, the more it is likely covered as a news story. European Commission (2006) also suggests that to the public, good news has meaningfulness and relevance.

Environment (22.5%) was put in the second place, according to the findings of the content analysis. The interviewee also responded that FM Addis 97.1 gives a focus for the environment and agricultural stories as the editorial policy dictate them to emphasize the environment and agriculture. Director of FM Addis 97.1 clearly said that the heart of the media editorial policy is supporting the agriculture led industrial policy of the country. In relation to this, the Ethiopian Ministry of Science and Technology under its national science, technology and innovation policy (2012) pointed out that environmental protection and development is crucial to maintain continual and sustainable economic growth.

It was able to know from the response of the interviewee that such issues were dominantly chosen for various reasons such as their relevance to the public, the editorial guidelines and the general national policy of science and technology. However, the discussion of the finding further highlighted that FM Addis 97.1 was not treating science and technology issue as per

the expectation of the editorial guidelines and the national science and technology policy. Many of the country's science and technology policy and strategy (2012) such as technology transfer, human resource development, manufacturing and service providing enterprises, research, financing and incentive schemes, national quality infrastructure development, universities, research institutes, Technique and Vocational Education Training institutions and industries linkage, intellectual property system, science and technology information, environmental development and protection, and international cooperation were not touched by science and technology news of the media.

The adequacy of science and technology news in FM Addis 97.1 assessed through quantitative and qualitative methods. The finding of the content analysis showed that FM Addis 97.1 gives less attention to Science and Technology (3.63%) compare with national and international current affairs news (36.7%). There is a big gap in covering this news. Moreover, it is possible to say that sports news gets more coverage (28.2%) than Science and technology news. The majority of Science and technology news was one minute to two minutes, numbered 70%, while 27.5% of the total news sample found to be having above 120-second duration. The result of the in-depth interview also indicated that FM Addis 97.1 was not covering science and technology news adequately. Because the station was not given enough time to cover these issues and the reporting is not done in the required detail. In general, the results affirmed that science and technology news was given less coverage by FM Addis 97.1.

Moreover, lack of necessary and adequate knowledge of journalists in science and technology is one of the major challenges which were assessed through in-depth interview. Respondents replied that the organization's effort to excel their knowledge of science and technology is very low. They said that because they were not updating and excelling their knowledge, they became short of appropriately treating science and technology stories. As a result, lack of appropriate knowledge was the major problem that holds back their practice of science and technology. Similar with the findings of this study, a number of past studies have found that lack of scientific knowledge was one of the big challenges among journalist. For example, Stocking (1999) study showed that journalists' lack of scientific knowledge or training is one of the most commonly cited reasons for reporting patterns that media critics

define as problematic. Given this lack of knowledge, many journalists do not possess the skills to question scientific and technological innovations particularly when the innovators or scientists seek to hide their negative aspects.

Science and technology is one of the dynamic fields in our world on the matter. As a result, professionals who cover the issue need to have the necessary as well as up to date understanding and knowledge. With this notion, the research investigated the efforts made to scale up professional competency in the field.

The language used by the media was also another important area of investigation. The finding of the content analysis showed that static facts kind of language was dominantly practiced. However, only 11.25% of the news language was produced through epideictic language usage. Literature and theoretical based analysis of the finding spoke that FM Addis 97.1 had not presented the news in human way. Human interest frame had not been used which would have increased the attractiveness of the news. As far as the practice of framing is concerned, science and technology news of FM Addis 97.1 were largely framed through episodic framing. Thematic framing was employed in little amount. The analysis of which leads the research to say that the science and technology news of the media couldn't let the audience to look the societal dimensions and couldn't also make policy-based analysis. The news was very low to show the impact and the meaning of the story from different dimensions.

Regarding the source selection, the finding of the content analysis revealed that science professionals (expert sources) and technologists were used in relatively high amount. The finding couldn't come as a surprise or kind of unique finding. As far a different literature on the field is concerned, science professionals and technologists appeared in the first place of science news. Supporting this, Anderson, Petersen & David (2005) agreed that even the subject of a news story is the journalist's choice, scientists are well positioned to set the parameters for the journalist's decisions about other sources, focus, and conclusions. They also concluded that journalists, in selecting their sources, are influenced by factors such as "professional and realistic demands, existing knowledge of an issue, the existence of contacts in the field, and commercial pressures".

Moreover, the study was assessed the origins of science and technology news in FM Addis 97.1. It investigated that the origins of most of (83.75%) science and technology news was foreign and only 16.25% were found to be local. The finding of the interview also discussed that the majority of news was foreign origin because there was very limited access to science and technology information at the national level. Moreover, it was identified that FM Addis 97.1 lacks vibrant media policy, strategy, guidelines and organization to approach science and technology issues. With regards to the origins of the news, it was figured out that the majority of the news was originated from foreign.

Interview was conducted to point out the status, focus and challenges of FM Addis in its coverage of science and technology news. It was learnt from the interviewee that the media lacks adequate and strong policy, strategy and guidelines to facilitate the production of science and technology news. To begin with journalists had no expertise in the field nor did they get the necessary training in the field. The editorial policy and other specific guidelines have no detailed plan, guidance and evaluation of science and technology news. Finally, it was identified that the media relation with scientists and science organization was very poor. While weak relation between the stakeholders was the general problem of science reporting, the case of FM Addis 97.1 was indicated as ‘very serious’.

CHAPTER FIVE

CONCLUSION AND RECOMMENDATIONS

5.1 Conclusion

The main objective of this research was to assess the coverage of science and technology issues in FM Addis 97.1, particularly on 'Addis Mereja' daily news prime time. For avoiding the inherent weaknesses of the individual methods, the researcher used a mixed methodology; quantitative and qualitative. Content analysis and in-depth interviews were used as data collection methods using the purposive sampling technique; to get an in-depth understanding of the issue from the appropriate source of information.

The media under investigation, FM Addis 97.1, also did not achieve its goal. The finding showed that FM Addis 97.1 gives less attention to Science and Technology news compared with others. The result of the content analysis indicated that only 3.63% of news was science and technology issues; out of 2,202 from December 1, 2018, up to May 30, 2019; on the other hand, national and international current affairs (36.7%) and sport (28.2%) obtained high coverage. The result of the in-depth interview also indicated that FM Addis 97.1 was not covering science and technology news adequately because the station was not allocated enough time, and was not done in the required detail. In general, the results confirmed that science and technology news was given less coverage by FM Addis 97.1.

The origins of most science and technology news were foreign 83.75%, and only 16.25% found to be local. The finding of the in-depth interview also showed that most of the news was of foreign origin because there was limited access to science and technology information at local. The news was from international media such as BBC, CNN, and Aljazeera. These media are disseminating information for relatively developed nations, which have a different context to Ethiopia; this is quite contrary to the responsibility and desire of the station. Therefore, it could be said that; FM Addis 97.1 less serving its people other than being a pipeline for foreign media which want to extend their global reach.

Moreover, lack of necessary and adequate knowledge of journalists in science and technology is one of the major challenges which were assessed through in-depth interview. Respondents replied that the organization's effort to excel their knowledge of science and

technology is very low. They said that because they were not updating and excelling their knowledge, they became short of appropriately treating science and technology stories. As a result, lack of appropriate knowledge was the major problem that holds back their practice of science and technology.

Additionally, FM Addis 97.1 reform document (2017) designed a package called SciTech. The aim of which was to introduce local and national innovations which initiate the youth for similar innovation. However, FM Addis 97.1 didn't have a well-organized policy, guideline, and human power to cover science and technology news in 'Addis Mereja' prime time

Finally, it was identified that the media relation with scientists and science organization was very poor. While weak relation between the stakeholders was the bottleneck problem of science reporting, the case of FM Addis 97.1 was indicated as 'very serious'.

5.2 Recommendations

The research has made the following recommendations for the improvement of science and technology news coverage.

- FM Addis 97.1 should develop science-related knowledge of its journalists to solve the problem; inadequate and less coverage of science and technology news.
- FM Addis 97.1 should work with scientists and science organizations to explore the innovations of these professionals and organizations.
- FM Addis 97.1 should have a clear editorial policy that can address science and technology news. And should be treated in a scientific and organized manner.
- FM Addis 97.1 should invest in research to study media coverage of science and technology news.

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Appendices

Appendix A: Coding Sheet

1. Title of news _____

2. _____ FM 97.1 station

3. ____/____/____ Date of telecast

4. _____ Number of stories in the bulletin

5. _____ Number of science and technology news in the bulletin

6. Type of science and technology news Covered: _____

1. Environment

2. Health

3. Energy

4. Applied science Agriculture

5. Construction

7. Duration of science and technology news/ second-----

1. below 60 seconds

2. between 60- 120 seconds

3. above 120 seconds

8. Frames _____

1. Thematic

2. Episodic

9. Sources of news _____

1. Government officials 2. Politicians 3. Interest Groups/ NGOs

4. Science professional (expert source) 5. Wire Services/GNA, in house journalists

6. Celebrity 7. Patient 8. No source

9. Technologists 10. Other

10. The format of science and technology news

1. Hard news

2. Feature news

3. Interviews

11. The news language

1. Stating the facts/forensic/

2. Deliberative/which makes sense of the facts

3. Epideictic which reacts to facts and concerns feelings and outcomes

12. Origin of science and technology news

1. Local

2. Foreign.....

Appendix B: In-depth interview guideline questions

(1). For journalists of FM Addis 97.1 (journalists who work in science and technology reporting)

1. How do you see the coverage of science and technology news in FM Addis 97.1?
2. What are your regular sources of science stories?
3. Why do you always make the source from the internet? Why not the Ethiopian scientists?
4. How do you see your communication with scientists, do you think they are voluntary?
5. Have scientists ever criticized your media report of scientific knowledge and facts? For what reason and how they criticize you?
6. Do you have a challenge to get science news?
7. Do you think you have the appropriate knowledge to deal with science news?
8. Do you think your audience understands scientific issues easily?
9. What things are done to excel your knowledge of science?

(2). For editor of news and current affairs

1. What are your regular sources of science stories?
2. How do you see your communication with scientists, do you think they are voluntary enough to work with you? Why do you think you have such state of relationship?
3. Have scientists ever criticized your media report of scientific knowledge and facts? For what reason and how they criticize you?
4. Do you have a challenge to get science news?
5. Do you think you have the appropriate knowledge to deal with science news?
6. Do you think your audience understands scientific issues easily?
7. What things are done to excel your knowledge of science?

(3). For director of FM Addis 97.1

1. Does your media organization have an explicit policy for or a special interest in covering science? If yes...What is the policy and what is the basis of that special interest?
2. What have you done to excel your journalists' knowledge of science?
3. Have scientists ever criticized your media report of scientific knowledge and facts?

ለኤፍ ኤም አዲስ 97.1 የሳይንስና ቴክኖሎጂ ምድብ ጋዜጠኞች የተዘጋጀ ቃለ-መጠይቅ

1. በጣቢያችሁ ለሳይንስና ቴክኖሎጂ ዜና የሚሰጠውን ሽፋን እንዴት ታዩታላችሁ?
2. በሳይንስ ዘገባችሁ ውስጥ መደበኛ የመረጃ ምንጮችሁ እነማን ናቸው?
3. በአብዛኛው የኢንተርኔት /ድረገፅ/ መረጃዎችን የምትጠቀሙ ለምንድን ነው?
4. ከሳይንቲስቶች ጋር ያላችሁን ግንኙነት እንዴት ታየዋለህ/ ታይዋለሽ? ለመረጃ ፈቃደኛ ናችሁ?
5. ሳይንቲስቶች የእናንተን የሳይንስና ቴክኖሎጂ ዘገባ ተችተው ያውቃሉ? በምን ጉዳይ የሰራችሁትን ምን ብለው ተቿችሁ?
6. የሳይንስ ዘገባዎችን ለመስራት ምን ችግር ያጋጥማችኋል?
7. የሳይንስ ዘገባዎችን /መረጃዎችን/ ለመጠቀም /ለስራ ለማዋል/ የሚያበቃ እውቀት አለኝ ብላችሁ ታስባላችሁ?
8. አድማጮቻችሁ የሳይንስ ዘገባዎችን በቀላሉ ይረዳሉ ብላችሁ ታስባላችሁ?
9. የሳይንስ እውቀታችሁን ለማሳደግ ምን እየተሰራ ነው?

ለዜናና ወቅታዊ አርታኢ የተዘጋጁ ጥያቄዎች

- 1- በሳይንስ ዘገባችሁ ውስጥ መደበኛ የመረጃ ምንጮችሁ እነማን ናቸው?
- 2- ከሳይንቲስቶች ጋር ያላችሁን ግንኙነት እንዴት ታየዋለህ/ታይዋለሽ? ለመረጃ ፈቃደኛ ናችሁ?
- 3- ሳይንቲስቶች የእናንተን የሳይንስና ቴክኖሎጂ ዘገባ ተችተው ያውቃሉ?
- 4- የሳይንስ ዘገባዎችን ለመስራት ምን ችግር ያጋጥማችኋል?
- 5- የሳይንስ ዘገባዎችን /መረጃዎችን/ ለመጠቀም /ለስራ ለማዋል/ የሚያበቃ እውቀት አለኝ ብላችሁ ታስባላችሁ?
- 6- አድማጮቻችሁ የሳይንስ ዘገባዎችን በቀላሉ ይረዳሉ ብላችሁ ታስባላችሁ?
- 7- የሳይንስ እውቀታችሁን ለማሳደግ ምን እየተሰራ ነው?

ለኤፍ ኤም አዲስ 97.1 ሀላፊ የተዘጋጁ ጥያቄዎች

1. ጣቢያው የሳይንስ ዘገባዎችን የሚያስተናግድበት የተለየ አሰራር /ፖሊሲ/ አለ? አዎ ከሆነ መልሱ ፖሊሲው ምን ይላል? ይህ የተለየ ፍላጎት ከምን ይመነጫል?
2. የጋዜጠኞችን የሳይንስ እውቀት ለማሳደግ ምን ሰርታችኋል?
3. ሳይንቲስቶች የእናንተን የሳይንስና ቴክኖሎጂ ዘገባ ተችተው ያውቃሉ?

Appendix C: In-depth interview participants

Name	Gender	Education Background	Job title	Work Experience / Year	Organization
Fasika Zewdu	F	BA in Journalism and Communications	Reporter	4	EBC / FM Addis 97.1
Melat Sine	F	BA in Law	Senior Reporter	7	EBC / FM Addis 97.1
Bereket Shimeles	M	MA in Journalism and Communications	Chief Editor of news and current affairs	13	EBC / FM Addis 97.1
Ermias Getachew	M	MA in Business Administration	Director of FM Addis 97.1	16	EBC / FM Addis 97.1