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The Role of Radio Surveillance in the Fight Against Deforestation in Rufiji, Tanzania

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Abstract

This paper examines the role of radio surveillance in the fight against deforestation in Rufiji, Tanzania. It presents the findings of a study that was guided by three research questions: (i) What techniques are used by radio programme producers in alerting people on the dangers of deforestation in Tanzania? (ii) How useful and helpful is forest information communicated through the radio to Rufiji community members? (iii) To what extent does the radio influence forest conservation behaviour among community members in Rufiji? Data were collected from a series of Urithi Wetu programme on TBC Taifa, and its content was analysed qualitatively to yield input that depicts the perceived role of radio surveillance. Complementary data were collected using questionnaires and focus group discussions. The findings reveal that the radio has largely failed to use instrumental surveillance function of the environment to empower community members find alternative sources of income generation and refrain from actions that are detrimental to forest conservation efforts. In fact, the findings expose the relative limitation of the success of the radio in both scope and intensity in using several techniques to make its audiences aware of impending and prevailing threats associated with TBC-Taifa tree-felling. Thus, remedial measures would include a shift in focus to solution-based programmes and integration of the views of the community members in radio programmes to optimise the impact on the target audiences.

Keywords: *radio, community members, surveillance role, deforestation, forest conservation*

1. Introduction

Forests are increasingly being valued by local communities for their environmental, social, cultural, and economic benefits despite escalating human-induced threats, particularly deforestation (Keenan et al., 2015). It is estimated that more than 13m ha of the world's forests vanish every year (Mohammed, 2014; Chakravarty et al., 2012; FAO, 2010, 2006, 2005). According to Boucher et al. (2011), about 48m ha of different tropical forests were cleared between 2000 and 2005. Moreover, the net annual loss of forest area from 2000 to 2010 in the tropical domain was about 7m ha (FAO,2016).

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Unless significant forest preservation measures are taken worldwide, the remaining forests will be reduced to 10% by 2030, and the degradation of forest resources will increase by 10% (Packiam, 2015: 1194). Packiam (ibid.) affirms that if forest preservation measures were ignored, 80% of the world's forests would have been lost, and with them the irreversible loss of hundreds of thousands of species.

Despite the on-going debates on the degree of Africa's deforestation, most researchers largely agree that Africa accounted for a net loss of more than 9% of its forests in the period 1990–2005 at an average rate of 4m ha (40,000km^2) (Rademaekers et al., 2010; FAO, 2009). Indeed, available data suggest that Africa accounts for over half of global deforestation, and most of this occurs in the tropical dry forests of eastern and southern Africa (Gondo, 2010; Katerere et al., 2009). In addition, Gondo (2010) uncovers that forest management efforts taken so far to halt and reverse the loss of forests in Africa have yet to yield the desired results.

In Tanzania, a growing scientific evidence indicates that forest loss is estimated at 403,000ha per annum (FAO, 2010). Another study by NAFORMA (2015) shows that the deforestation rate in Tanzania between 1995 and 2010 was 372,816ha per annum. Available data and studies also estimate that, if the current rate of deforestation in Tanzania intensifies due to population growth and economic pressure, the country's forest cover could be decimated in the next 50–80 years (URT, 2014).

In Rufiji District, human exploitation of forests remains high (URT & UNDP, 2010). Particularly, heavy exploitation for round wood export is widespread in Rufiji, Kilwa and Lindi districts of Tanzania (URT & UNDP, 2010). Logging, charcoal-burning, and shifting cultivation constitute the main sources of such over-exploitation of the Rufiji forests (Shabani & Yakuti, 2015; Burgess et al., 2012; URT & UNDP, 2010). According to Milledge et al. (2007), Rufiji District accounted for about 70% of all the timber harvests in the southern part of Tanzania in 2003. As such, valuable tree species such as *Afzelia quanzensis*, *Khaya anthotheca*, *Milicia excelsa* and *Pterocarpus angolensis* have been depleted through illegal harvesting (Burgess et al., 2012).

The implications of deforestation are far-reaching as they transcend national boundaries (Mohammed, 2014). Generally, the consequences include global warming, flooding, climate change, water and air pollution, and biodiversity loss (Oladipo, 2015; IEG, 2013; Adeoye et al., 2012). Due to deforestation, Tanzania has lost at least one-third of important eco-systems (URT, 2014) in the past few decades. Over half of inland water eco-systems (rivers, lakes, and dams) have been degraded and continue to be threatened in terms of changed water regimes, pollution, and conflicts over resource use (URT, 2014).

Despite the concerted effort taken by the government to conserve its forest resources, deforestation remain high in Tanzania (NAFORMA, 2015; Shabani & Yakuti, 2015; URT, 2014; URT & UNDP, 2010). Some of the efforts taken by the Tanzanian government to manage and conserve its forest resources are: the formulation of the National Forest Policy in 1998; enactment of the Forest Act in 2002; and the adoption and implementation of different approaches such as the Community Based Forest Management (CBFM), Joint Forest Management (JFM), and Participatory Forest Management (PFM). However, these concerted efforts have yet to bring forth tangible results.

Reports and evidences indicate that the increasing loss of forest cover in Tanzania is largely linked to the lack of/or inadequate communication, education, and public awareness (Mpokigwa et al., 2011). Thus, there is a consensus among scholars that the success of any forest conservation initiative, may—to a large extent—be facilitated using the mass media (Sayo, 2014; Setyawati & Shaw, 2015).

1.2 The Role of Mass Media in the Management of Forests in Tanzania

Mass media can informally educate local communities to conserve the environment at large, and forests in particular (Setyawati & Shaw, 2015). In this regard, empirical evidence suggests that the radio is instrumental in providing such forest conservation education and raising awareness among citizens (Roba, 2012; Familusi & Owoeye, 2014). Indeed, the radio is the principal medium for communicating environmental information, particularly in developing countries, and more specifically in rural areas (Harvey, 2011; Kalas & Finlay, 2009; Boykoff & Roberts, 2007; Luganda, 2005).

Available data show that more than any other mass communication medium, the radio speaks in the common language amenable to its target audiences in rural areas, in addition to offering both the reach and relevance to its listeners (Chapman et al., 2003). Compared to TV and newspapers in developing countries—which are often dubbed elitist as they tend to target the more affluent segments of society—the radio stands out as the most popular means of disseminating information (Familusi & Owoeye, 2014; Myers, 2008), particularly in rural and other remote and hard-to-reach areas. According to Murthy (2011), about 75% of the people with the lowest income, and over 91% of those with the highest income, have access to a radio set in Tanzania's households. In a study in Tanzania, Murthy (2011) found that whereas over 70% of the respondents found the radio very trustworthy, only 55% trusted the TV. In Uganda, about 82% of women and 73% of men trusted the radio as the most significant influence on their decision to adopt forest restoration practices (Hampson et al., 2016).

1.3 Government Interventions in the Management of Forests

To inform and educate its citizenry on the importance of conserving forests, for many years the Tanzania government has made concerted efforts to

communicate information on environmental conservation in general, and forest conservation in particular, using mass media channels such as the radio. In the 1980s, the government strived to ensure that strategic conservation information reached the populace through its two standout programmes: *Mali Asili* ('Natural Resources') and *Misitu ni Uhai* ('Forests is Life'). These two radio programmes were being produced by the Ministry of Natural Resources and Tourism; and aired by Radio Tanzania - Dar es Salaam (RTD), a public-run media outlet that has now morphed into the Tanzania Broadcasting Corporation (TBC-Taifa).

After the cessation of *Mali Asili* and *Misitu ni Uhai* programmes due to financial constraints, the government established *Makala ya Mazingira* ('Environmental Feature'), which started in the 1990s, following Tanzania's decision to sign the Rio Conventions on Biodiversity, Climate Change and Desertification. In 2015, the TBC transformed *Makala ya Mazingira* programme into *Urithi Wetu* ('Our Heritage') to cater for all matters related to the environment, natural resources, and climate change. In addition to these, well-established radio programmes on TBC-Taifa and other radio stations in Tanzania have continued to broadcast news and information on forests and other environment-related issues to inform and educate local community members on the need to conserve forests and other natural resources for the survival and sustenance of human life.

Notwithstanding the concerted efforts made so far in Tanzania to communicate environmental information in general, and forests in particular, through various channels—including the use of the radio—yet some studies have reported the persistence of deforestation in the country at rates deemed unsustainable (NAFORMA, 2015; Hamad et al., 2014). This incessant recurrence of deforestation raises critical questions on the effectiveness of the radio and other mass communication media in communicating forest and other environmental information to target communities. The paradox that emerges is soaring rates of forest depletion when mass education via the radio seeks to reverse that tide.

Indeed, in the particularised context of Tanzania, it is apparent that to-date there is a discordance between what is expected as deliverables from radio broadcasts on forest conservation, and the actual outcomes. Empirical evidences suggest that the radio is the most astute and effective mass media in reaching rural areas (Familusi & Owoeye, 2014; Myers, 2008). However, little is known about the techniques that the radio employs to alert citizens on the dangers of deforestations in Tanzania, and how to confront the problem.

1.4 The Mass Media and Environmental Surveillance Function

The idea of *surveillance* in communication theory refers to the process of observing an extended environment for relevant information on events, conditions, trends, and threats (Christians et al., 2009). In fact, growing

empirical evidence indicates that the core function of the broadcast media is to undertake surveillance of the environment (Pavel, 2010; Udeze & Chukwuma, 2013). Scholars define surveillance as "… the systematic monitoring of people or groups to regulate or govern their behaviour" (Monahan, 2011: 498). Through surveillance, the media provide information and create awareness among their heterogeneous audiences of the changes taking place around them.

There are two types of media surveillance roles: *beware / warning surveillance;* and *instrumental surveillance* (Udeze & Chukwuma, 2013). *Beware or warning surveillance* occurs when the media inform or warn citizens about threats of impending dangers from natural calamities like floods, hurricanes, erupting volcanoes, environmental degradations, outbreaks of epidemics, depressed economic conditions, and malfunctions (Udeze & Chukwuma, 2013; Pavel, 2010; Josephat, 2008; Odigbo, 2003). Reviewing Musifiky's work, Udeze and Chukwuma (2013) argue that during a crisis, this type of surveillance constitutes early warning that requires the mass media to collect, collate and analyse data to detect and identify signs of an impending crisis before it explodes.

Instrumental surveillance helps the mass media to transmit useful and helpful information to the public in their everyday lives (Pavel, 2010; Dominick, 1990). At an individual level, instrumental surveillance of the environment function of the mass media increases personal esteem, provides base for social interaction, provides knowledge and information, and confers social status and prestige (Pavel 2010). Overall, through instrumental surveillance, the mass media plays a crucial role in creating an arena for seeking solutions and convincing others to accept and adopt them.

2. Theoretical Framework

The study employed the social responsibility theory to provide an understanding of how the mass media fulfil the surveillance of the environment obligation to inform the public accordingly and responsibly. The theory of social responsibility initially originated in 1947 from the Hutchins Commission on the freedom of the press (Tyler, 2010; Ndolo, 2005). The Commission established that the mass media were doing less than they should to provide services to minority groups, let alone empower them to take the intended action (Baran & Davis, 2009). In consequence, the Commission recommended that the mass media should redouble their efforts in serving the public (ibid.). The emphasis of the social responsibility theory is that the media's responsibility is to use their powerful position to ensure appropriate delivery of information to mass audiences (Middleton, 2009). Under this theory, the media should also serve as the voice of common citizens, and not just of the elite and dominant social groups in society.

Baran and Davis (2009) assert further that, under the social responsibility theory, the mass media ought to fulfil certain obligations to the society. One of these obligations is to discharge effectively the surveillance function (Udeze & Chukwuma, 2013). The public benefits from accessing enough information necessary to make informed decisions when the mass media execute their obligation of surveillance function as a social responsibility. Middleton (2009) contends that the surveillance function, as a social responsibility of the mass media, enables it to provide trustworthy and relevant news and information.

The theory of social responsibility is rooted in the assumption that giving analysed or interpretive report on facts with clear explanations would enable the public to make informed decisions. According to Baran and Davis (2009), the media is expected to fulfil certain obligations to society by setting high or professional standards of innovativeness, truth, accuracy, objectivity, and balance. Since the theory challenges media professionals to develop novel ways of serving their audiences, Nerone (2003) argues that it was expected in the US that integrated news staff would bring the minority agenda into the white community, keeping minority issues in front of community leaders and decision-makers.

The theory has been tested and produced positive results. The first major test of the social responsibility theory occurred during the 1950s with the rise of anti-communist sentiments at the time of the Cold War. Almost simultaneously, most of Eastern Europe was coming under communist control in a series of staged popular uprisings and coups. Media executive responded to the pressure from anti-communist groups and from the US Congress by blacklisting many people who were accused, even in the absence of evidence, of communist leanings (Baran & Davis, 2015).

Scholars who critique the theory contend that it is too optimistic. Baran and Davis (ibid.) contend that the theory is overly optimistic about the media's willingness to meet responsibility, and individual responsibility; underestimates the power of profit motivation and competition; and that it legitimises the status quo. Indeed, as per the findings of this article, instead of providing tangible solutions, most programmes of the TBC-Taifa—a national radio station with a national agenda—rely mostly on mere advice from leaders, often amounting to lip-services.

Despite the few critiques, however, the social responsibility theory was central in this study because it helped find out that the radio failed to analyse and interpret forest information to enable community members living adjacent to forests to get understandable forest news. Through this theory, it was also established that the radio was limited in scope in the presentation of truthful, comprehensive, and intelligent accounts of forest conservation issues in a context that gives meaning to rural inhabitants.

3. Context and Methods

This study was conducted in four villages and two suburbs in three wards in the Matumbi landscape of Rufiji district. Although the Matumbi land is endowed with rich forest resources (Shabani & Yakuti, 2015; Burgess et al., 2012) comprising 69,000ha of terrestrial forests and 53,000ha of mangrove forests (Shabani & Yakuti, 2015), human exploitation of these natural resources remains high (URT & UNDP, 2010). The selected wards and villages/ suburbs were Mbwara ward (Nyamwage & Nambunju villages), Mohoro Ward (Mohoro Mashariki & Mohoro Magharibi villages), and Utete ward (Kitunda and Kiwili suburbs (Figure 1). Like other parts of the Matumbi land in Rufiji district, the selected villages also suffer from deforestation, hence their selection. The severe threats to forests in these villages include illegal logging, pit-sawing, charcoal-burning, and shifting cultivation.

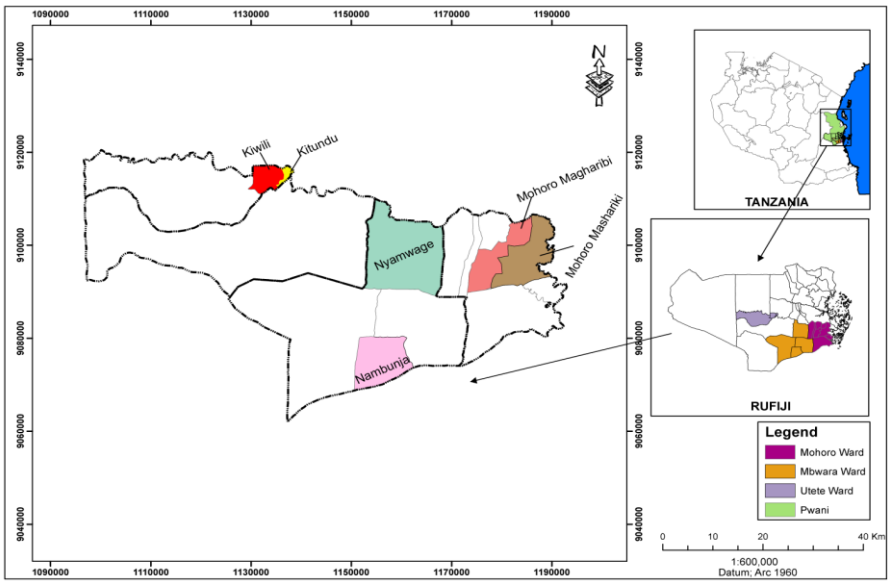

Figure 1: Selected Villages from Matumbi Landscape

Source: Map sketched with assistance from the Tanzania's administrative boundaries files developed by the National Bureau of Statistics (NBS) through the 2002 Census report.

Data were collected from a series of *Urithi Wetu* programme on TBC-Taifa, and its content was analysed qualitatively to yield input that depicts the perceived role of radio surveillance. Additional and complementary data were captured using questionnaires and focus group discussions. The *Urithi Wetu* is a 30-minute programme, which goes on air every Tuesday from 15:00 to 15:30hrs. It is re-aired every Saturday at 17:00 to 17:30hrs. Given that the data for this study were collected early in 2017, the study collected and analysed 21 programmes aired from January to December 2016.

It was envisaged that the respondents could easily remember the programme aired a few months ago than those programmes aired in the previous years. The theme of all the programmes, which were subject to analysis, revolved around forest issues. These included the importance of protecting environments and other natural resources (January 16, 2019); the importance of water resources conservation (March 15, 2016); stakeholders' efforts in fighting against environmental destruction and deforestation (April 19, 2016); stakeholders' efforts to conserve forests; the importance of incorporating the use of firewood and charcoal in the national energy policy (May 24, 2016); and the importance of land protection and sustainable charcoal production issues (December 27, 2016).

Overall, the study transcribed, analysed, and categorised the content of the *Urithi Wetu* programme based on the type of environmental, forest information aired, and how the TBC-Taifa presented such information to its audiences. Moreover, the producer of the *Urithi Wetu* programme interviewed 124 citizens as sources of information in the 21 programmed that were analysed. Male sources were 93(75%), and their female counterparts were 31(25%). Furthermore, this study administered questionnaire to the selected four villages and two suburbs in three wards located in the Matumbi landscape of Rufiji district. More significantly, the questionnaire sought to determine the percentage of respondents who were familiar with the *Urithi Wetu* programme. It also sought to find out the extent to which the radio influences forest conservation behaviour among community members.

As Kiswahili is the dominant and national language in Tanzania, the questionnaires—which were initially designed in English—were translated into the national language that is almost universally accessible in the country. The researcher and research assistants administered the questionnaires by keying in respondents' answers directly in relation to their respective responses to questions derived from the questionnaires. This method raised the response rate significantly and enabled the collection of all relevant and essential information by clarifying any difficulty, ambiguity, and vagueness.

Out of the targeted 545 respondents, only 404(74.1%) duly filled-in the questionnaires, which were then analysed. The remaining 25.9% of the questionnaires were, for different reasons, not duly filled-in, hence unqualified for analysis. Some respondents refused to finish responding to the questionnaires because they wanted upfront payments prior to finishing the task. Some got tired in the middle of responding to the questionnaires, whereas others had to attend to other more pressing responsibilities soon after starting participating in the questionnaire survey and, hence, walked away without finishing the process.

Furthermore, the study deployed FGDs to collect qualitative data from the selected three wards in Rufiji district: Mbwara ward (Nyamwage and Nambunju villages), Mohoro ward (Mohoro Mashariki and Mohoro Magharibi villages), and Utete ward (Kitunda and Kiwili suburbs). In most of the villages/ suburbs, the number of participants ranged from 6-10. Most were women due to their readiness to participate in the FGDs. Although it is generally accepted that between 6 and 8 participants are sufficient for a FGD, some studies recommend that researchers may select up to 10 participants (Ochieng et al., 2017). According to them, ten participants are considered enough to gain a variety of perspectives (ibid.).

4. Results and Discussion

4.1 Radio Techniques Deployed in Sending Deforestation Alerts

To start with, the study established that radio programme organisers used several ways/techniques to make the audiences aware of and warn them about the impending and already occurring threats associated with unplanned tree felling. In this regard, the radio used lived experience and knowledge-based information to communicate and warn citizens about the impacts of deforestation. It used two types of sources of information: (i) environmental and forest experts appearing on the programme to report environmental and forest information based on their expertise and knowledge; and (ii) non-environmental experts and ordinary people to report on the provision of information on environment based on their lived experiences over a sustained period in the affected area. In the programme aired in January 5, 2016, for instance, the Chairperson of Mikoyan village, Liwale district in Lindi region said:

> *"We used to drink water from natural wells when I was growing up and we had no shortage of water at all. Rainfall seasons used to begin in October to April, but nowadays due to the increase of deforestations, we do not even know when the rains start and the rainfall season ends" (*Urithi Wetu, January 5, 2016*).*

On the same programme, the Chairperson of Mpului Canal in Malomboi village, Lushoto district in Tanga region, said:

> *"Colonialists discovered this Mpului Canal more than 200 years ago and it is the main source of water for both domestic uses and agricultural activities here in Malomboi village. Before the increasingly unplanned cutting of trees down, the canal used to supply water in all of its surrounding farms. However, since 1999, with the increase of timber harvesting around the canal, which resulted in massive cutting down of trees, the canal's water has tremendously decreased"* (Urithi Wetu, January 5, 2016).

The forest experts, on the other hand, expounded on how the destruction of forests relate to the disasters that community members were experiencing. The experts underscored the importance of conserving forests for citizens to overcome the problem of scarcity of fresh water, change in rainfall patterns, and droughts.

In one of the programmes, the Director of Environment in the Vice President's Office said:

> *"You will never find water in a deforested area because it is only trees which have a tendency of absorbing water from the ground and when the absorbed water reaches the earth's surface, they normally form wellsprings. These wellsprings cannot be found in a deforested area, that is why we urge the communities to conserve forests" (*Urithi Wetu, March 15, 2016).

The radio also used experts to help citizens visualise and understand the link between droughts and temperature rise, and haphazard tree-felling. Shading more light on surveillance, Josephat (2008) and Chukwuma (2012) contend that the surveillance function of a media presupposes that the mass media are the eyes and ears of the public. On 19 January 2016, the *Urithi Wetu* programme featured the Water Engineer of Korogwe District Council, who explained the relationship between indiscriminate cutting down of trees and the recurrence of droughts. The engineer said that when people cut trees down and encroached upon water sources through farming, they contribute to the reduction of the overall vegetation cover. As a result, the lack of vegetation cover paves the way to the solar radiation to hit directly the earth's surface, a factor that contributes to the reduction of soil moisture, hence leading to droughts.

Odigbo (2003) asserts that the media further exercises surveillance over the environment and alert members of a society to the realities of their environment. In relation to Odigbo's assertion, the *Urithi Wetu* programme aired on 24 May 2016 featured a retired Director of Forest and Beekeeping Division in the Ministry of Forest and Tourism, who said:

> *"Since most of the areas in Tanzania are deforested, when the rain comes, it fills our rivers and dams with sand and turbidity. As a result, our rivers and dams lose their ability to handle the load of water they are required to carry. If rain continues, the rivers and dams become so full and water rises above the rivers and on the banks of the dams, which causes floods"* (Urithi Wetu, May 24, 2016*)*

Specifically, the *Urithi Wetu* programme used experts to describe the correlation between citizens' indiscriminate cutting of trees and freakish weather, as well as the changing of rainfall patterns. In this regard, in one of the programmes aired on 23 March 2016, the Director of the Tanzania Meteorological Agency (TMA) described how the global weather system witnessed warmer temperatures. She said that when temperatures keep on changing, they affect rainfall patterns, resulting in unusual delays or early rainfall seasons. Because of the shift of rainfall patterns, it is now common to find long sunny patterns during rainfall seasons. She continued to elaborate that:

> *"In general, climate change is altering rainfall patterns worldwide to the extent that wet areas get dry and dry areas get drier. However, the impacts of climate change tend to be minimal in forested areas, which continue to receive enough rains and soil wetness"* (Director, TMA in Urithi Wetu, March 23, 2016).

In addition, the study found that the radio warned citizens to refrain from detrimental deforestation activities by instilling fear in them. For example, the radio featured some citizens in the *Urithi Wetu* programme with genuine fear of their areas—and the country at large—eventually turning into a desert in the future if immediate actions were not taken to minimise the rate of deforestation. In the programme aired on January 5, 2016, the Chairperson of Pakaya Culture and Environmental Group in Rufiji district, observed:

> *"Sooner rather than later, Tanzania as a whole and Rufiji in particular, which is endowed with natural vegetation land cover and forests, will become a desert because of the increasingly illegal and massive harvesting of forest products for charcoal, timber, logs, poles, and other uses"* (Urithi Wetu, January 5, 2016).

Similarly, in a programme aired on August 2, 2016, the sources of information remained uncertain about getting water for themselves and their livestock soon if no remedial measures were taken to curb environmental destruction in their area. A resident of Kideleko village in Handeni, Tanga, said on the TBC-Taifa programme:

> *"In the few coming years Handeni will turn into a desert because of the worsening habit of unplanned tree felling. All the wellsprings, which used to provide water throughout the year, have dried up. We had a Kizigua well here, known as 'ngolo', that used to have plenty of water, which is now dry. We had another wellspring called 'Kolijolozi', which had pure and clean water, but it is also now dry because of our failure to adhere to traditional customs"* (Urithi Wetu, August 2, 2016).

In addition, the radio cautioned citizens that environmental destruction, and forests in particular, would also affect their financial status. The *Urithi Wetu* programme warned that deforestation had started to burden innocent common *wananchi* with costs for buying water. According to Josephat (2008), in discharging their surveillance function the media usually scout around the environment and bring news pertaining to socio-economic developments. In this regard the *Urithi Wetu* programme shows how citizens were now forced to dig deep into their pockets to get a bucket of water. In one of the programmes, a resident of Gairo Morogoro, who is a student of the Tanzania Education College, is on record saying: "*A bucket of water at Gairo is now being sold at up to TZS1,500. So, if you have a family size of eight or nine people, obviously you cannot afford such a high living cost*" (*Urithi Wetu*, October 4, 2016).

Furthermore, in a programme that went on air on 23 March, 2016, some citizens complained about how fresh water was increasingly becoming scarce; and how droughts and temperature rise had severely affected their lives and stunted their socio-economic development. In particular, a resident of Kibaha district complained about how the scarcity of water had affected women's lives; making them spend sleepless nights hunting for hardly available water in wells:

> *"We are facing such a big challenge of scarcity that one bucket of water is now being sold up to TZS800. Women spend the whole night scouring and scrambling to fetch the hardly available water in some wells. I would like to call upon my fellow citizens to stop forest fires and cutting down trees to rescue us from this suffering"* (Urithi Wetu, March 23, 2016).

In one of the August broadcasts, the *Urithi Wetu* programme described how deforestation threatened the national well-being and stability. This is consistent with the media's exercising its surveillance role. Indeed, the mass media ought to reveal to the public all factors threatening national stability and public welfare (Josephat, 2008). As such, the radio aired an insert of the retired President of the Fourth government of Tanzania, Jakaya Mrisho Kikwete, urging all respective authorities in every region, district, council, and valleys to take full responsibility and ensure that they conserve the natural vegetation land cover and water sources in their areas of jurisdiction:

> *"If we continue dilly-dallying without taking action, soon we will all experience severe scarcity of water than now. The scarcity of water, in turn, will threaten our national peace and harmony. So, let us all take action and stop environmental destruction for the betterment of our country"* (Urithi Wetu, August 2, 2016).

Through this politically-charged and motivated rallying call, the retired President provided a timely reminder to listeners.

4.2 Usefulness and Helpfulness of Forest Information Communicated Through Radio

Before uncovering how useful and helpful was the forest information communicated to rural inhabitants through the radio, this study investigated the extent to which the respondents were familiar with the *Urithi Wetu* programme (see Figure 2).

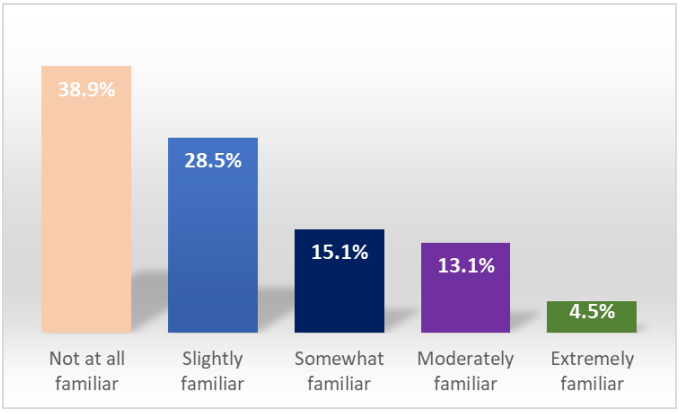

Figure 2: Respondents' Familiarity with Urithi Wetu Programme
(Source: Field data**)**

The findings presented in Figure 2 suggest that generally over 61.2% of all the respondents were familiar with the programme in terms of: slightly familiar (28.5%); somewhat familiar (15.1%); moderately familiar (13.1%); and extremely familiar (4.5%). In fact, most of the respondents who regularly listened to the radio indicated that they had heard about the *Urithi Wetu* programme. As a participant in FGD from Nambunju village said:

> *"I have a radio set at home and I usually get forest information through the radio. They are telling us to stop voluntary harvesting of forest resources"* (FGD Participant No.6 at Nambunju village, December 12, 2016).

It was also established that the radio was the primary source of information to most of the respondents. A participant from Nambunju village said in an FGD:

> *"Personally, I have a radio set at home and my neighbours depend much on the radio as their basic source of information on various matters. I am also a good listener of radio stations. I have heard several times radio stations informing us that deforestation lead to droughts"* (FGD Participant No.7 at Nambunju village, December 12, 2016).

Furthermore, the study findings indicate that, despite the use of several techniques to alert citizens on the environmental dangers associated with human-induced activities, the radio largely failed to provide relevant and useful information to the Rufiji community members' everyday lives. The study established that the radio largely failed to use the instrumental surveillance function of the environment to empower community members to find alternative sources of income and refrain from acts detrimental to forest conservation. In fact, the radio focused much on imploring people to regulate their behaviour instead of telling them what to do to make a living without destroying forests.

Whereas Monahan (2011) asserts that surveillance can be mobilised to bring about conditions of collective empowerment, the study findings indicate that the radio played a dis-empowerment function by giving orders to the poor ordinary *wananchi,* without necessarily giving them alternatives. For example, when the District Commissioner of Kondoa appeared on the *Urithi Wetu* programme in January 5, 2016, he told farmers to get rid of the traditional farming methods outright, embark on modern agriculture, and adhere to the professional advice of extension officers. Such harangues, which were intended not only to the farmers in Kondoa but also to all farmers throughout the country, including those in the study area, often fall on deaf ears because they neither help citizens find solutions to the immediate challenges they face, nor empower them to find eco-friendly alternative sources of income generation. Inevitably, many citizens continued to over-rely on tree felling to eke out a living. In this regard, during an FGD held at Nambunju, one villager said:

> *"We cannot accept the media's blind instruction on the forest issues because they always treat us as inferior people so much that they see no reason of coming to us and listen to our views and concerns. Nevertheless, I want to tell them that we are also citizens of this country who would also want to be heard by our leaders"* (Participant No.4, FGD, December 12, 2016).

In another FGD at Nyamwage village, a participant reported that, instead of just telling the citizens to stop cutting down trees, journalists should also tell the government and other stakeholders to improve agriculture and empower citizens to practise irrigation agriculture because improved agriculture can draw many citizens into agricultural production and thus stop them from destroying forests.

> *"Poverty contributes largely to deforestation and environmental destruction. Thus, thinking of providing forest conservation education through the radio without improving other sources of income and expecting the citizens to stop cutting down trees is deceiving oneself. The best way is to empower the citizens economically first and then educating them. First of all, farmers need support to get modern agricultural production implements such as tractors and other agricultural inputs before being informed about stopping unplanned cutting down of trees"* (FGD Participant No.3 at Nyamwage village, December 8, 2016).

Similar sentiments emerged during FGDs conducted at Utete Township. Some of the participants said that the cease of cutting down trees depended on whether a person who was listening to such a programme had another source of income. The participants said that if that person had no alternative source of income, then the radio education on forest conservation would never change him/her to stop cutting down trees.

> *"I have the same opinion to that of the previous speaker: if citizens can be informed about alternatives sources of income, they will automatically stop cutting down trees. Short of that, the radio's education on forest conservation issues will not bring any positive result"* (FGD Participant No.6 at Utete Township, December 5, 2016).

Briefly, it was established that the most relevant and useful information that citizens needed from the radio programme was information on viable alternatives that could allow them to engage in alternative eco-friendly activities to earn a living without necessarily destroying forests. During an FGD held at Mohoro Magharibi, one participant commented thus:

> *"You guys just sit in Dar es Salaam and give orders to the citizens;* kata mti panda mti *[cut a tree – plant a tree]. Do you really think it is possible for the citizens to plant trees because of such slogans? We need to be informed about how we can earn a living without necessarily destroying the forests"* (FGD Participant No. 3 at Mohoro Magharibi, December 5, 2016).

The implication is that they need alternative sources for them to abandon the forest destructive means of survival. Chapman et al. (2003) assert that radio

can offer both the reach and relevance to its listeners when it generates programmes in a community-based and participatory fashion. This appears to be a missing link in TBC-Taifa radio broadcasts, which could otherwise add value and sensitise people in Rufiji on being proactive in forest conservation.

Indeed, there was generally a lack of inclusion of citizens' views and concerns in the *Urithi Wetu* programme. It was established that this constitutes an obstacle to the radio's effective dissemination of useful information to the public. The lack of inclusiveness of the local community's views and concerns in the radio programmes made many community members reluctant to utilise forest information communicated to them through the radio. In fact, the study established that, at times, citizens dismissed journalists who broadcast forest conservation issues as 'fat-cats' with hardly any clue about the survival challenges they daily faced, as put by one participant during an FGD held at Nambunju village:

> *"The media has never incorporated our views in their programmes. We always hear journalists broadcasting from Dar es Salaam, instructing us to do this and do that. They have never trickled down to the villagers"* (Participant No. 2; FGD, Nambunju village, December 12, 2016).

Another participant in the same village also echoed a similar sentiment: "*I also believe that the journalists' physical visits to us are important because we will be glad to see them and this will prompt us to pay more attention to their reports*" (Participant No. 4, Nambunju village). Writing on the social responsibility theory, Nerone (2003) argues that the mass media can play a significant role to bring minority agenda into the mainstream community and, hence, help keep minority issues in front of community leaders and decision-makers. Moreover, Setyawati and Shaw (2015) contend that the mass media should provide educational information as well as collect feedback from the community on the most suitable ways of managing forests.

A content analysis of the *Urithi Wetu* programme also revealed that the producer of the programme lacked radio-programme packaging skills that could have helped broadcast useful and helpful information to the public. For instance, on 8th November, 2016, the programme brought on air a resident of Mgwashi ward in Lushoto district who says, "*In fact TFCG [an NGO] has played a significant role in providing us with proper education on the importance of shifting to improved wood-fuel saving stoves and improved charcoal stoves.*" However, the findings of this study show that the most useful and helpful information to the public was the education on how to make improved wood-fuel saving stoves and improved charcoal stoves. Thus, the radio was supposed to broadcast the whole episode on making improved wood-fuel saving stoves and improved charcoal stoves instead of airing unsubstantiated testimonies to audiences.

4.3 The Extent to Which the Radio Influences Forest Conservation Behaviour Among Community Members

This study also assessed the extent to which the TBC-Taifa's *Urithi Wetu* programme had influenced citizens living adjacent to forests in Rufiji to conserve forests. In their responses, the respondents indicated the degree to which they thought the radio had contributed to their participation in forests conservation. The results, as presented in Figure 3, indicate that a comparatively large proportion of the respondents (35.9%) were confident that the radio had influenced communities to take initiatives of conserving forests, but only to a moderate degree. Some reported that the radio had influenced the community members living adjacent to forests to conserve such potential natural resources, but to a small degree.

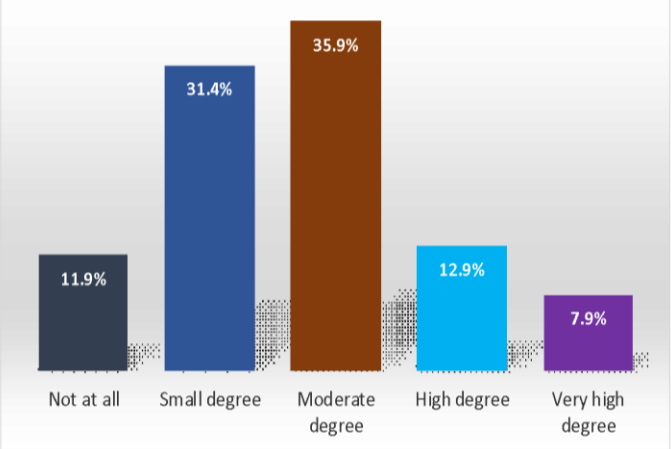

Figure 3: Extent of Radio Influence on Communities to Conserve Forests

Source: Field data, 2017.

Respondents who reported that the radio had influenced communities to take initiatives of conserving forests to a higher degree accounted for only 12.9%, whereas those who said it had managed to fulfil such important task to a very high degree accounted for a merely 9.7%. About 11.9% of the respondents indicated that the public radio had not at all influenced communities to take any initiative to conserve forests in Rufiji. In general, these findings suggest that the radio had succeeded to influence community members in Rufiji to stop cutting down trees and take initiatives of conserving forests only to moderate and small degrees.

These findings further suggest that the radio only played a moderate and small degree influence on the community members to conserve forests. These findings are not similar to those of other researchers, for example, Hampson et al. (2016) who found that over 82% of women and 73% of men in Uganda rated the radio

as the most influential in shaping their decision to carry out forest landscape restoration practices. In Ethiopia, Roba (2012) found that the mass media that mostly played a significant role in creating environmental awareness were the radio, television, and newspapers, primarily because they were the most widely and frequently used modern mass media in the country. Similar findings were observed in the studies of Hoerisch (2002) in India and Germany. Hoerisch (ibid.) further explains that, over half (52%) of the interviewees in the two countries acknowledged the power of the mass media in making them aware of environmental challenges, and in influencing them to take initiatives. In the context of Tanzania, the apparent limited influence of the radio on the community in Rufiji could partly be attributable to the packaging and lack of active engagement with the target audience when producing the programmes.

In fact, the content analysis of a series of the *Urithi Wetu* programmes revealed that the success of the radio in influencing community members in Rufiji to cease cutting down trees and take initiatives of conserving forests to only a moderate and small degree was due to its limitation when it comes to framing forest issues based on solutions. Asplund et al. (2013) advise that mass media's framing should communicate how and why an issue is a problem, and how to handle it. In other words, a mass media frames should define problems, diagnose causes, and promote specific solutions. The content analysis of the *Urithi Wetu* programme, however, established the contrary: that instead of providing tangible solutions, the programme relied mostly on mere advice provided by leaders, often amounting to political lip-services.

Against this backdrop, the current study posits that, for the radio to communicate better and enhance forest conservation among community members in Rufiji and elsewhere, it must focus on solution-based programmes, and to incorporate views of the target community members in the programmes. Writing on surveillance, Monahan et al. (2010) argue that the mass media should strive to interpret the collected environmental data to create social meaning from the data. In fact, the study established that the use of a combination of channels of communication such as the radio, TV, newspapers, village meetings and cinema/video would help to make a difference when it comes to wining over the hearts of the majority, and transforming their behaviour towards a positive embrace of forest conservation.

5. Conclusion

Contrary to the growing scientific evidence that the radio plays a significant role in influencing and shaping the decisions of community members to carry out forest conservation practices (see, e.g., Hampson et al., 2016), this study's findings indicate that the public radio only played a moderate to small degree role in influencing community members in Rufiji towards conserving forests. It

established that the radio failed to analyse and interpret forest issues to inform and educate community members on alternative sources of income-generation so that they could desist from further indiscriminate felling of trees to ease human pressure on natural resource. In fact, the radio failed to serve as a forum for exchange of forest conservation-related information among the villagers in the study area. It is also established that, without improving other economic activities such as agriculture and empowering rural inhabitants to get modern agricultural production implements and inputs, radio communication for forest conservation is doomed to fail in bringing about the desired outcome of steering people from forest depletion to conservation, while at the same time earning meaningful livelihoods.

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