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Co-decided Agriculture Information Radio Program Needs: A Case Study of Women Crop Farmers in Dodoma City, Tanzania

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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ABSTRACT

The shift from top-down radio programming to co-decision-making, aimed at capturing listeners' needs, has been significant. However, there is a notable gap in studies assessing how gender considerations factor into radio programming for listeners' needs. This study addresses this gap by investigating co-decided agricultural radio program needs, specifically focusing on women crop farmers in Dodoma City, Tanzania. Utilizing a sample of 32 participants selected purposively for in-depth face-to-face interviews, supplemented by Focus Group Discussions (FGDs) and key informant interviews, the study employed content analysis to analyze the collected data. The findings reveal variations in co-decided agricultural information radio programs among radio programmers, indicating a lack of alignment with the specific needs of women crop farmers. In light of these findings, the study recommends that the Tanzania Communications Regulatory Authority

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(TCRA) should address financial constraints hindering the co-decision approach to work accurately. With the accurate working of the co-decision approach intended listeners' needs will be identified.

Keywords: Co-decided agricultural radio programs; women crop farmers; information needs.

1. BACKGROUND

Radio, with its extensive coverage frequencies, is a preferred communication device for providing crucial information to farmers in developing countries, particularly in addressing their daily challenges. To capture the interest of listeners, radio programs need to tailor information based on the needs and problems of the audience, engaging them in a co-deciding process rather than relying on one-way content preparation [1,2,3].

Co-decision, defined as decisions made collectively rather than by isolated individuals, plays a pivotal role in involving listeners in expressing their views on daily problems and proposing solutions [4]. Despite the potential of co-decision, a notable research gap exists regarding how gender considerations factor into the development of listeners' needs by radio programmers. Gender dynamics, encompassing distinct roles, needs, feelings, concerns, power positions, and contributions of men and women, are crucial in these initiatives [5].

For instance, in Tanzania, gender inequality in the division of household labor is evident, with women often burdened with more responsibilities, making them time-poor [6]. Recognizing these gender dynamics is crucial for tailoring agricultural radio programs to address the specific needs of women crop farmers, allowing them to effectively use their limited time to access relevant agricultural information.

This paper contends that by incorporating co-decision in addressing the agricultural information needs of women crop farmers, limited time can be utilized effectively for receiving pertinent information. The research focuses on investigating co-decided agricultural information radio program needs among women crop farmers in Dodoma City, Tanzania.

The study's findings have the potential to guide decision-makers and stakeholders in agricultural information communication, helping them identify and rectify existing weaknesses. Ultimately, empowering women crop farmers with the necessary knowledge and technologies can lead to their professional engagement in agriculture, contributing to sustainable development at both local and global levels.

1.1 Theoretical Framework

Crop farmers in the Central Zone of Tanzania engage in agricultural activities primarily for income generation. To enhance the adoption of agricultural technologies, both governmental institutions and non-governmental organizations (NGOs) have been disseminating agricultural information through radio and television to these farmers [7,8]. However, the majority of these organizations have not tailored their information dissemination to the specific needs of male and female crop farmers. The information required is crucial for the successful adoption of technologies by both genders. Information need is the type of information individuals seek and desire through written or vocal means [9].

Furthermore, individuals' information needs are influenced by their level of expertise, ignorance about a subject, and cognitive processes for interpreting information [10]. People control their definition of information through various means, encompassing all possible avenues [11]. The content of the information is of primary concern, and information is considered objectively necessary if it serves a specific function [12]. This definition empowers individuals to shape their information requirements and desires, which are intricately connected to their work activities [13]. In media representation, stakeholders may hold power by controlling access to information that aligns with their needs, with co-deciding on program content being a significant means to address crop farmers' information needs [14,15].

A co-decision approach is essential to accurately identify the needs of intended listeners, given the differing needs of males and females for agricultural information [13]. The absence of women's voices in defining and creating radio program content hampers their access to information [16], (Bertolini, 2004).

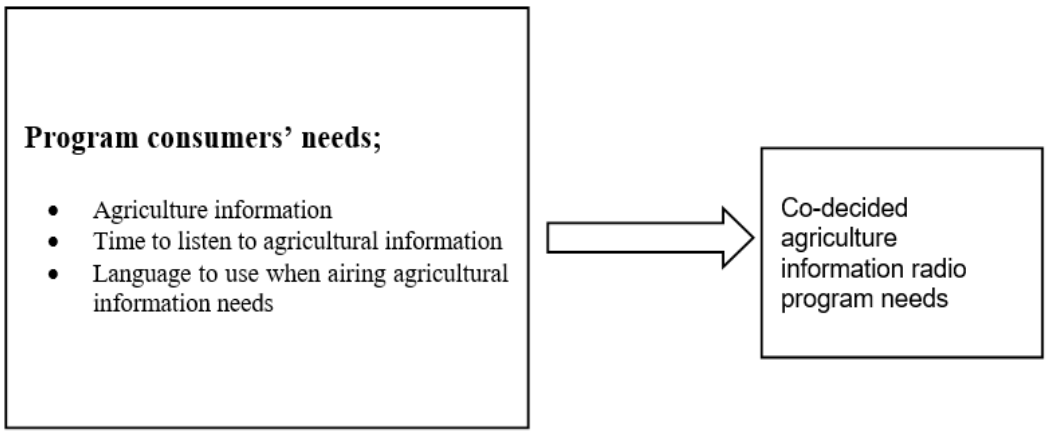

Fig. 1. Conceptual framework

The study utilized Feminist Theory (FT) in communication to address gender issues, particularly focusing on the underrepresentation of women in media. According to feminist theory, the persistent gender gap in media representation is attributed to women's limited authority in shaping media content [17]. Moreover, the study made use of Democratic Participant Media Theory to guide the study. The theory emphasizes universal media access and freedom of expression, advocating for the inclusion of diverse voices in media content creation. It encourages the engagement of community members in planning broadcasts, utilizing local resources, and incorporating diverse perspectives into the content creation process [18,19]. The theory also insists on the decentralization of the media where all groups, communities, and individuals can own, have access to, and operate small media organizations. Moreover, the theory insists on interaction between program producers and consumers of the programs in planning the programs. The theory assumes that; with consumers of the program's participation in program planning their needs will be taken into consideration by program producers.

2. EMPIRICAL LITERATURE REVIEW

Haumba and Kaddu [20] conducted research examining the information-seeking behavior patterns of family farmers and household food security. Their findings revealed that farmers express a need for information on Good Agronomic Practices (GAPs), encompassing topics such as improved seeds, marketing strategies, fertilizer use, post-harvest processing, and preservation techniques. Similarly, Agwu and Anugwa [21] explored the information-seeking behavior of rural women in Bayelsa State, Nigeria, concerning household food security. The study highlighted women's demand for information on productive resources like land, inputs, and capital, as well as crop management activities including irrigation, weeding, fertilizer application, planting distances, and pest and disease management involving herbicides and insecticides.

Furthermore, Roja [12] investigated the information needs of rural women farmers in Garani village, Tumkur District, Karnataka. The study disclosed that a significant proportion of women farmers sought information on seed availability (39.58%), pesticides (18.75%), and fertilizer (16.67%). The majority of the women farmers emphasized market-oriented agricultural production in their information needs related to farming activities.

Jira's study in 2020 found that 45% of women preferred listening to the radio in the evening, while 35% favored the morning times. Additionally, Kalamkar et al. [22] explored the listening behavior of community radio listeners, revealing that approximately 53.33% of respondents tuned in daily during the morning, afternoon, or evening. The study indicated that about 70% preferred listening at home, compared to 37% who listened in the fields.

Moreover, Kamala's research in 2021 assessed women's participation in community radio in Iringa Municipality, Tanzania. The findings showed that women had preferences for morning (69%), afternoon (19%), evening (5%), and night (7%) sessions. In terms of language preferences, Jira [23] discovered that 79% of women preferred the local language. This observation emphasized

the advantage of using local languages on radio programs for effective communication with the audience.

Contradictory to these studies, Mogambi and Ochola's [24] research on community radio and women's empowerment among pastoralist communities in northern Kenya found that many women rely on a communication medium that utilizes the local Samburu language. The study emphasized that a station exclusively using the local language proved to be an appropriate medium for women, especially when deeper explanations were needed to enhance their participation in the program.

Despite the varying results of these studies, the present research aims to focus on women crop farmers in Dodoma City, specifically addressing their agricultural information needs, the optimal broadcast times, and the preferred language for effective communication.

3. METHODOLOGY

A qualitative case study research design was employed in this study due to its ability to study in-depth and detailed information using a variety of data collection procedures such as in-depth interviews, key informant interviews, observations, FGDs, and face-to-face interviews [25,26]. The data were collected until a data saturation point was attained. Data saturation is a qualitative data collection technique originating from grounded theory, referring to collecting qualitative data until no newer information is obtained [27]. A limited range of interviews (9–17) or focus group talks (4–8) can achieve saturation [28].

The researchers observed the following steps. In the first step, the researchers conducted a Key Informant Interview with the Dodoma City Urban Farming Officer. The interview focused on obtaining general information, including the agriculture sector, across the city. With the assistance of the Officer, the researchers purposively selected three out of forty-one wards in the city. The selection was based on the characteristics of being marginalized with arable land for agricultural activities compared to other nearby wards. The second criterion was that farmers in the wards could receive agricultural information broadcasted through community radios available in the city. The third criterion was the engagement of some of the inhabitants of the ward in agricultural activities. The selected wards were Makutupora, Chihanga, and Hombolo Bwawani from the Hombolo division (see Fig. 2). The selected streets include Mchemwa, Azimio, Maendeleo, Chihanga, and Hombolo Bwawani B.

In the second step, the Dodoma City Urban Farming Officer communicated with Agricultural field officers in the identified wards to collaborate with the researcher in contacting study participants. Before going directly to the respective wards, the researcher coordinated logistics with Agricultural field officers in the respective wards on how data would be collected on different days.

In the third step, data were collected through in-depth face-to-face interviews, lasting about 25-35 minutes per participant depending on the speed of the study participants' replies and how the researcher probed to gather more information. In-depth face-to-face interviews were used to understand what women crop farmers' agricultural information needs (theme 1), women crop farmers' time to air agricultural information needs (theme 2), and women crop farmers' language to air agricultural information needs (theme 3).

On the first day of the third step and under the assistance of the Makutupora ward Agricultural field officer and the first research participant, the researcher used purposive and snowball sampling to identify other study participants. On that day, six women crop farmers from Mchemwa village were interviewed. The participants interviewed had engaged in agricultural activities for at least two years. Moreover, one Focus Group Discussion (FGD) with eight experienced women crop farmers in agriculture from the village was conducted to supplement the data before moving to another village.

On the second, third, fourth, and fifth days of the third step, data were collected from Azimio, Maendeleo, Chihanga, and Hombolo Bwawani B, respectively, using the same procedures. A data saturation point was reached after interacting with 28 women crop farmers individually. However, the researcher continued to interview four more participants to check for any new information. Moreover, an additional three Key Informants, radio programmers broadcasting agricultural programs located in Dodoma City, were contacted individually to supplement the data on the study topic. Key informants who participated were Dodoma FM (98.4), Alternative FM (92.9), and Mwangaza FM (90.8).

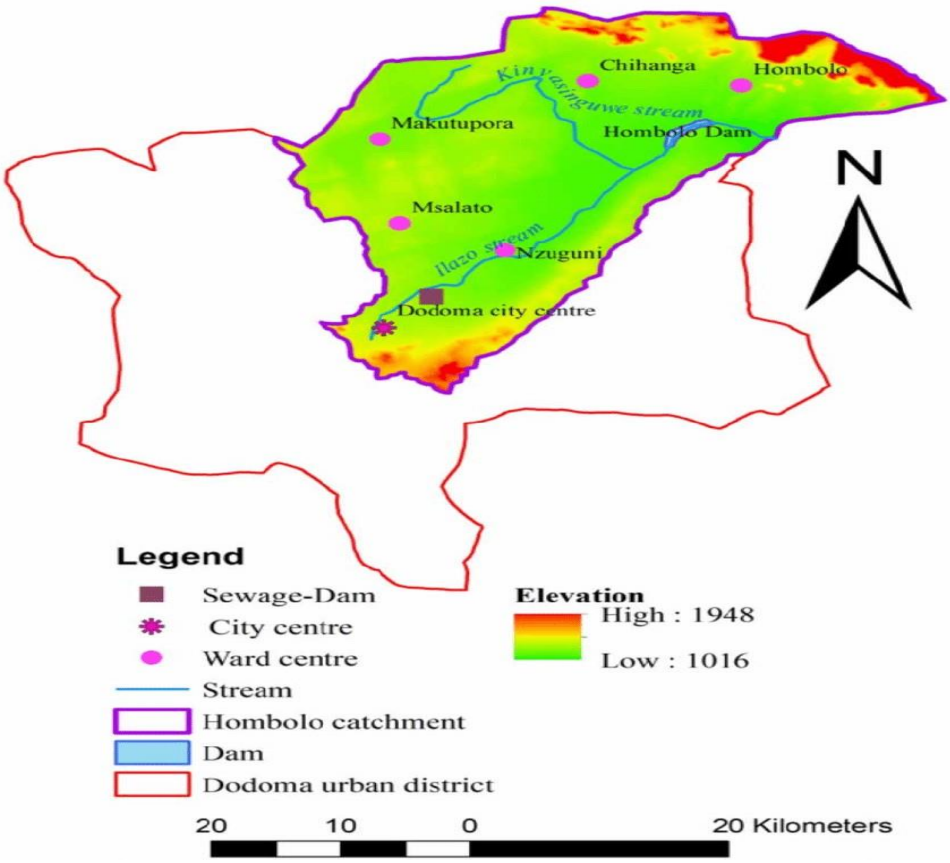

Fig. 2. Dodoma City map showing the studied area (Hombolo Division with green color)
Source: Mwendamseke, [29]

The fourth step, involved data analysis. Overall, the collected data were qualitative, leading the researcher to use content analysis to analyze the data according to the study objective and themes [25,26]. The researchers focused on making propositional generalizations of the findings involving making a summary of interpretations and claims of the participants of the study. The generalization was further complimented through researchers' personal experiences referred to as "naturalistic generalizations." Afterward, the two theories were used, as a lens, to further analyze the study findings [26].

4. RESULTS AND DISCUSSION

4.1 Demographic and Socio-Economic Characteristics of the Study Participants

The study participants exhibited a diverse range of educational backgrounds, spanning from formal education to no formal education, and their marital statuses varied between being married, widowed, and divorced. Moreover, the number of household members among the participants ranged from 2 to 8. Agricultural activities were identified as the primary source of income for all participants. In addition to agriculture, small businesses such as selling vegetables, livestock keeping, and charcoal burning were reported as supplementary sources of income.

The commonly cultivated crops served multiple purposes, including providing cash, serving as staple food, and being used as leguminous crops. Notable crops grown included pearl millet, sunflower, groundnuts, sorghum, maize, cowpeas, cassava, Bambara nuts, and grapes. These crops were cultivated across different acreages, ranging from 1/4 acre to 4 acres. The selection of these crops was influenced by their ability to withstand drought conditions and their widespread cultivation, making access to seeds easier.

Table 1. Demographic characteristics of the study participants

Participants Age	*Frequency*	Education Level	*Frequency*	Marital Status	*Frequency*	The main source of income	*Frequency*
20-39	10	No Education	13	Married	22	Crop Farming	32
40-59	20	Primary	18	Widowed	7	Supplementing the main income source with other activities	22
60-79	2	Secondary	1	Divorced	3		

Various sources of agricultural information were reported by the participants, including the Government, Non-Government Organizations (NGOs), radio stations, personal experiences, and learning from neighbors. Government agricultural information sources included Agricultural Field Officers (AFOs) and researchers from institutions like TARI (Tanzania Agricultural Research Institute). Among NGOs, the Diocese of Central Tanganyika (DCT) was highlighted as a significant agricultural information source in the study area.

4.2 Co-decided Agriculture Information Needs

Respondents were inquired about the agricultural topics that would motivate them to listen to radio programs. The findings indicate a distinct preference among women crop farmers for educational content related to Good Agricultural Practices (GAPs) and weather conditions. When it comes to good agronomic practices, participants highlighted concerns regarding fertilizer application, the use of improved seeds, horticultural knowledge, optimal plant population, marketing strategies, and post-harvest information.

Explanations on preferred good agronomic practices were as follows;

4.2.1 Fertilizer Usage

Participants in the study who expressed a preference for this information clarified that they possess a small plot of land. They mentioned cultivating for every season, which led to soil infertility. Additionally, they highlighted the challenge of maintaining a limited number of animals that generate insufficient organic fertilizers. Consequently, they emphasized the need for guidance on using inorganic fertilizers to complement the limited organic fertilizers currently available to them.

4.2.2 Improved seeds and their proper sources

Study participants expressed the need for enhanced seeds as they currently experience low yields. Those who sought improved seed information clarified that they resort to using local seeds for farming because the improved seeds available through agro-dealers are both expensive and counterfeit. Participants emphasized the preference for local seeds over incurring unnecessary costs. One participant highlighted the problem of low yield associated with the use of local seeds, specifically addressing the issue of "*Mapungu*" and "*Mabarwe*" in the local vernacular, referring to infertile seeds in pearl millet and sorghum. The participant explained that these seeds have a low germination percentage, leading to reduced plant populations and consequently lower yields.

4.2.3 Proper plant spacing

Participants in the study revealed that they previously employed a method of broadcasting seeds, particularly maize while cultivating extensive fields with oxen-driven plows. The cited reasons included a lack of awareness regarding the optimal plant spacing and the urgency to save time. The participants clarified that excessive seed usage sometimes led to suboptimal yields due to an incorrect plant population.

Furthermore, two participants in the Makutupora and Chihanga wards emphasized the importance of this knowledge. They clarified that their familiarity with appropriate plant spacing was limited to pearl millet, as they had received training through the Conservation Agricultural initiative (Kilimo hifadhi) facilitated by the Dioceses of Central Tanganyika. These participants noted that currently, the majority of farmers in their wards are well-versed in proper

plant population for pearl millet, thanks to the efforts of DCT in disseminating pearl millet production technologies through lead farmers.

In contrast, the situation in the Hombolo Bwawani ward, where the Diocese of Central Tanganyika is not active, is quite distinct. Participants from this ward expressed the need for knowledge in nearly all crop categories, highlighting the disparity in agricultural awareness and practices between the two areas.

4.2.4 Agricultural Market Information

Agricultural market information was found to be lacking among participants, as they expressed a lack of awareness regarding suitable avenues for selling their agricultural produce and determining recommended prices. Consequently, they have been selling their products to local buyers at undervalued prices.

4.2.5 Weather condition information

Participants expressed satisfaction with receiving agricultural information from radio stations regarding crop selection based on expected weather conditions. This information was deemed essential for adapting to changing weather patterns. Similarly, in focus group discussions at Azimio and Mchemwa villages, participants unanimously highlighted their need for information on Good Agronomic Practices (GAPs), including improved seeds, agricultural markets, weather conditions, and adaptation strategies.

Key informants were queried about the agricultural information broadcasted to meet the specific needs of women crop farmers. In response, radio programmers stated that they broadcasted agricultural information with a broad approach, aiming to reach all farmers irrespective of gender. One key informant mentioned, "*We used to align our broadcasts with the cropping calendar, sharing information on planting seasons, improved seeds, and fertilizer during specific periods, while market prices were addressed during off-seasons*" (Mwangaza FM radio programmer, March 14, 2023). Another key informant highlighted the profit-oriented nature of their radio, stating, "*As our radio is driven by business goals, we broadcast agricultural information based on stakeholders who want to promote their inputs, irrespective of the cropping calendar. For instance, an agro-dealer might pay us to create awareness about the seeds they sell, and that becomes our agricultural information focus*" (Alternative FM radio programmer, March 15, 2023).

The study's findings suggest a lack of consideration for the specific needs of women crop farmers by agricultural radio programmers when planning information broadcasts. Consequently, these programmers tend to broadcast general agricultural information throughout the value chain, assuming it caters to the needs of all farmers, including women. This oversight results in women crop farmers missing out on pertinent information related to productive resources like land, inputs, and capital, as well as crucial crop management practices such as irrigation and meteorology. This discrepancy has been noted as a crucial need in previous studies [20,21,12].

4.3 Co-decided Time to Listen to Agricultural Information Needs

Participants in the study were asked about the time they would prefer to tune in to radio broadcasts containing agricultural information and the reasons behind their preferences. Two distinct time sessions emerged as popular choices: night-time and afternoon. Out of the 32 participants, 30 expressed a preference for listening to radio programs between 20:00 and 22:00 hours at night. The rationale behind this choice varied, with some mentioning the convenience of being at home with their entire family during that time. Conversely, others favored the afternoon slot from 14:00 to 18:00 hours because they were available at home and not returning to their farm fields in the evening. Those opting for afternoon and evening sessions cited the opportunity to relax at home during those times.

Interestingly, none of the study participants indicated a preference for morning sessions, attributing this to their busy household responsibilities during that period. These responsibilities included preparing children for school, cleaning utensils, and tidying up their homes before heading to the farm fields.

During focus group discussions in Azimio and Hombolo Bwawani B streets, participants unanimously agreed on their preference for the night-time slot (20:00-22:00 hours) due to the presence of all family members at home.

Key informants were also queried about the timing of agricultural radio programs and the reasons for their choices. One informant mentioned broadcasting information in the morning to target energetic farmers in their fields. Another informant highlighted a Sunday broadcast at 6:00 in the morning, repeated at noon, assuming people would be at home before and after church.

The study revealed that the current timing of agricultural information broadcasts did not effectively reach all women crop farmers due to divergent time preferences. Those not taking radios to their fields missed out on crucial information. This finding aligns with Kalamkar et al. [22] study, emphasizing that most radio listeners prefer tuning in at home rather than in their fields.

The study suggests that radio programmers air agricultural information at times not favored by women crop farmers in the study area. It echoes Megerssa's (2020) findings that night is optimal for radio tuning when farmers are fatigued. However, it contradicts Jira's [23] study, which indicated a preference for morning and evening listening among women, and Kamala's [30] research, which found preferences across all times of the day.

4.4 Co-decided Language to Use when Airing Agricultural Information Needs

Study participants were asked about their language preferences for agricultural radio programs, revealing three primary groups: those who liked both Swahili and the vernacular (gogo), those who exclusively preferred Swahili, and those who opted for the vernacular (gogo) alone. Among the thirty-two participants, fifteen expressed a preference for both Swahili and the vernacular, thirteen favored Swahili only, and the remaining four leaned towards the vernacular (gogo) exclusively.

Those desiring both Swahili and the vernacular pointed out challenges in understanding agricultural terminology in Swahili alone, underscoring the need for the vernacular language for translation. Conversely, those favoring Swahili exclusively cited its status as a national language and their better comprehension. Participants showing a preference for the vernacular (gogo) language emphasized the sense of connection and understanding when information was presented in their mother tongue.

During focus group discussions at Hombolo Bwawani B, Azimio, Mchemwa, and Maendeleo streets, participants unanimously expressed their appreciation for agricultural information broadcast in both Swahili and the vernacular (gogo). They suggested the presence of language interpreters during agricultural programs to translate Swahili words into the vernacular for those less proficient in Swahili.

Key informants were asked about the language used for broadcasting agricultural information and the rationale behind the choice. One informant explained that their radio station was authorized by the Tanzania Communications Regulatory Authority (TCRA) to broadcast in Swahili only, citing legal restrictions on using any other language [31].

These results imply that not all women crop farmers receive agricultural information via radio, as the preferred language may differ from that used by radio programmers. Therefore, it is recommended that radio programmers consider incorporating both Swahili and vernacular languages in agricultural broadcasts to effectively reach all women crop farmers in the area. This aligns with Ochola's (2015) findings, emphasizing the use of local languages alongside the national language for a more profound explanation of issues, and is supported by Jira's [23] study, highlighting the advantage of using local languages on the radio for effective communication [32,33].

5. CONCLUSION

The study highlights a significant gap in addressing the agricultural information needs of women crop farmers within the radio programming landscape. The current approach by radio programmers, aiming to reach all farmers without specific consideration for gender differences, results in overlooking the unique requirements of women engaged in crop farming. As a consequence, critical aspects such as the content of agricultural information, the timing of broadcasts, and language preferences are not adequately addressed for women crop farmers.

To bridge this communication gap, agricultural information program stakeholders need to ensure the co-decision approach is working accurately to identify the needs of intended listeners. The study recommends that the Tanzania Communications Regulatory Authority (TCRA) should address financial constraints hindering the co-decision

approach to work accurately. With the accurate working of the co-decision approach intended listeners' needs will be identified

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COMPETING INTERESTS

The authors have declared that no competing interests exist.

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