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# PROBLEMS TO DEVELOPMENT RADIO BROADCASTING IN UGANDA

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David Ouma Balikowa

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# PROBLEMS TO DEVELOPMENT RADIO BROADCASTING IN UGANDA

Ву

David Ouma Balikowa

# A THESIS

Submitted to
Michigan State University
in partial fulfillment of the requirements
for the degree of

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1994

#### ABSTRACT

# PROBLEMS TO DEVELOPMENT RADIO BROADCASTING IN UGANDA

By

## David Ouma Balikowa

The organization and development of Radio Uganda broadcasting to supplement the development process in a multilingual context is in crisis owing to the inherently constrained centralized broadcast pattern. The dominant political factor perpetuates a technocratic programming pattern manifested in the high publicity element along the skewed content categories, which is highly at variance with the development needs expressed by the audiences. To bring into perspective problems to development broadcasting, a combination of both qualitative and quantitative research method is employed (triangulation method): focused synthesis of the radio broadcast infrastructure, content analysis of the "development program" and programming schedule," and lastly, an audience survey of radio use in the rural contexts. Findings of the thesis indicate that due to acute technical constraints, preferential and urbanized program content categories, and feedback constraints, there is a practical despite between the technocratic pattern the centralized radio has taken and the contextual audience needs. The political factor that permeates the texture of causal variables renders the constraints more intractable. Evidences presented as justification for conclusions of this research reinforce the theoretical framework for the decentralization broadcast model of radio channels in order to deal more efficiently with the diversified development needs in a multilingual social context.

Accepted by the faculty of the Department of Telecommunication, College of Communication Arts and Sciences, Michigan State University, in partial fulfillment of the requirements for the Master of Arts degree.

Director of Thesis

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DAVID OUMA BALIKOWA

1994

To my late father, Isaac Mugeni, who died while I was away in the USA studying for this degree.

# **ACKNOWLEDGMENTS**

I thank those few Radio Uganda staff who, unlike others, chose not to hide behind that insensitive bureaucratic monster and instead readily availed me "some" of the information I required.

Special thanks go to my colleague in the pursuit of knowledge since high school days, Moses Kalyango, for those brain-storming feats over my work. They often revived my working spirit even when the desperations from Uganda's economic environment dictated otherwise.

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## INTRODUCTION

## **Problem**

The title of this thesis pre-supposes two major foci: first, the organization and development of the radio medium and, second, its intervention into the audience context to elicit development behavioral responses. It is the position of this thesis from the onset that the impact of radio broadcasting on the overall development process can only be supplementary and not that of a prime mover or magic multiplier. Therefore, considerations of direct-cost benefits accruing to this service sector against investments in a quantitatively empiric perspective does not easily arise as a direct analysis in this study. It is, however, of the long view that the social value of the service, in a country where both television and the print media are confined to a few urban centers, is undeniably great as evidenced by the constant public outcry about the current poor radio services. Non investment in this sector can, therefore, be extraordinarily costly.

This thesis conceives the objective constraint to development radio broadcasting in Uganda as a function of the interactions within a texture of causal factors: namely, level of broadcast technology, the state of professionalism, political policies like finance, the degree of bureaucracy, program pragmatic, and language multiplicity.

The supplementary development role of radio broadcasting is highly dependent upon the level of organization and development of the medium's technical infrastructure (Chapter Two). This process, under the texture of causal factors above, has a direct bearing on the program content and schedule pattern. A content analysis is then imperative to determine the constraints to the efficient utilization of the "development program" in particular, and the radio medium channels in general (Chapter Three).

Conceived as an organized and developed medium, its potential as an instrument to supplement social change efforts is measured among the target audience contexts to determine the constraints along the intervention parameter (Chapter Four).

Radio broadcasting is part and parcel of the overall political, economic, and ideological process of the society in which the medium is applied. An historical analysis of the dynamics of this process of the state of underdevelopment provides the contextual background to this study (Chapter One).

This thesis has chosen the constraint perspective to the study of development broadcasting based on the strong assumption of the causal factors it brings into the limelight as a firmer basis for a consciously planned communication arrangement. It is with much hope that this study will provide critical insights to those seeking to generate policies, strategies, and new approaches urgently needed to salvage the state of radio broadcasting in Uganda.

# **Study Objectives**

The objectives of this thesis is: first, to analyze the problems to the organization and development of Radio Uganda and its intervention into the audience context to elicit development behavior and, secondly, to identify policy mix alternatives leading to a more efficient utilization of the medium broadcast capacity in the diversified social context.

The focus of the study is on problem definition gravitated towards problem resolution. As a first detailed study of this sector in Uganda, it is imperative to identify the causes of the problems to the utilization of radio in supplementing the development process and then to look at feasible alternatives to salvaging the broadcast sector.

Problem definition in this study is narrowed down to the functional constraint analysis of the broadcast sector. While it would have been possible to further narrow down the topic to one or two constraints, the great need to comprehend the entirety of

the problems to development radio broadcasting in Uganda dictates against that logic, especially when there is no sound research on the other constraints done to this point.

Comprehending the entirety of the principal constraints to this sector is conceived within my original study objectives at Michigan State University which is aimed at formulating suggestions to salvaging Radio Uganda's broadcasting services and to enhance its supplementary role in the nation's development process.

# Methodology

It is not possible to come up with any one comprehensive methodology in studying problems to development broadcasting in any given social context. The study parameters of this thesis, therefore, derive from the triangulation method of inquiry (employing a combination of various qualitative and quantitative research methods) which is basically gravitated towards the greater need for a comprehensive analysis of the problems to development broadcasting. Due to the broadness of the topic, this thesis has chosen to emphasize the horizontal program source—audience continuum as its major study parameter (see Figure 1).

Chapter One relies mostly on literature review and secondary analysis in providing a qualitative analysis of the historical background to the state of underdevelopment in Uganda. This serves as the contextual background to this study.

While Chapter Two employs focused synthesis on top of the above method to provide a technical analysis of the radio transmission infrastructure and pattern, it relies basically on reports across institutions involved in implementing the broadcast infrastructure, interviews of staff, and observation at the various installations.

Chapter Three is based on content analysis of programs (news program) and the programming schedules for the year 1977 and 1990.

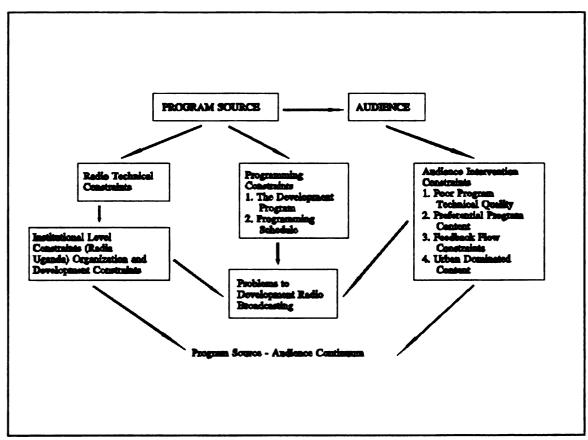


Figure 1. Constraints Study Design

Chapter Four relies on an audience survey of four typical Ugandan rural communication environments and the capital city to assess radio intervention constraints in the audience environment.

Data analysis in both Chapters Three and Four is by percentage frequency distribution to describe differences and correlation analysis in the latter chapter to determine the magnitude of relationships between independent and dependent variables in measuring the radio broadcast audience intervention constraints.

## CHAPTER ONE

# HISTORICAL BACKGROUND

The analysis of the internal and external forces, historical and present, and how they bear on the socioeconomic and political developments in Uganda is imperative in comprehending the converging forces to the organization and development of radio broadcasting and how its increased manipulation could bring to bear on the overall development process.

Uganda is a landlocked country in East Africa with an area covering 236,036 sq. kms (147,522.5 sq. miles) and a population of 17 million people. The economy is essentially agricultural with about 90% of the labor force engaged in agriculture which contributes 70% of GNP and 95% of export earnings.

This thesis intends to assess the performance of radio broadcasting in Uganda since its inception in 1953 during the colonial era. Regarded as a symbol of power in a country characterized with political instability since independence in 1962, the national radio station has witnessed decisive battles for control of power.

# Colonial Era

At the time of state formation, when the British introduced boundaries to form what is today known as Uganda, there were already established nationalities often referred to as tribes at different stages of formation. These nationalities engaged in constant battles of conquest and extension. Class differences were already in existence (Mamdan Mahmood, not dated). Taking advantage of these contradictions, the British established colonial rule by taking sides with better organized nationalities whose pre-

existing administrative structures eased the entrenchment of colonial rule. The British introduced hierarchical administrative structures, demarcating the new state into districts as administrative units. The demarcation attempted as much as possible to approximate the multiplicity of language groups and nationalities into viable administrative units.

The development of the colonial economy in Uganda was a result of internal and external factors. Internally, coffee (1903) and cotton (1930s) were introduced as export crops to provide a tax base for the colonial administration. Externally, America's independence created a cotton famine in British textiles, forcing her to turn to her colonies which had suitable cotton-growing climates for the supplies. This process annexed Uganda into the international capitalist economy as a supplier of raw materials. The prices offered to the peasant farmers were, however, not commensurate with the human effort put into growing of the export crops. The level of industrialization was also limited to the processing of raw materials for export. The same applied to copper exported in its raw form. This checked the level of technology and skills transfer to the colonial state.

Land was congested with export crops with very limited local demand, making the colonial economy vulnerable to external demand and pricing systems. The colonial economy made it mandatory for every household to plant cotton and coffee, leaving little room for any economic, agricultural diversification. Information on agricultural development was limited to that which elevated a coffee and cotton farmer as the right model of a progressive farmer.

The colonial state and its export economy were also strengthened by the institutionalization of human resources along the geographical and cultural lines. The South, endowed with better climatic conditions, was mapped out as a cash crop growing region; whereas, the Northern region, whose inhabitants were considered as naturally ruthless by Southerners, was designated as a reserve for recruiting soldiers. The South, exposed earlier to education than the North, was not considered a fertile ground for

recruiting the army. The British deliberately avoided creating an army intelligent and politically conscious to question the colonial legitimacy. This practice contributed to the underdevelopment of the North at the expense of the South.

The introduction of religion by missionaries introduced another contradiction where the Roman Catholic, Anglican Protestants, and Islamic denominations battled it out to gain dominance among the population. The colonial authorities often took sides in these conflicts, sowing intimacy between politics and religion—a legacy that afflicts the country to date.

A civil service was also set up to administer the export crop economy and to organize the repatriation of economic surplus to Britain (Wiebe, P.D. and Dodge, C.P., 1987, p. 11). Trade unions and cooperative societies, like the army, were fashioned to serve colonial interests. The 1952 Trade Unions Ordinance banned the organization of general trade unions, placing them under the leadership of petit-bourgeoisie with directives to steer them away from politics (Karugire, S.R., 1988, p. 28). Under the 1946 Co-operative Ordinance, cooperatives like trade unions, were marginalized. Control of cooperative affairs were cut off from members while involvement in politics by the managers was prohibited.

The foregoing analysis provides a historical perspective of the contextual factors and forces responsible for the nature of development in the colonial era. At the time of independence, Uganda's economy had already been unfavorably drawn into the international capitalist economy as a supplier of raw materials. Nationalities were compartmentalized into district administrative units dominated by nationality and national petit-bourgeoisie. The deliberate denial of political organization and less participation at production level curtailed peasants and worker's participation into any distinctive national movement. The small political parties that did surface were polarized along the existing religious and nationality contradictions.

## Neo-Colonial Era

On the eve of independence, two major political parties emerged: The Uganda People's Congress (UPC), which identified itself with the Anglican Church, and the Democratic Party (DP), affiliated to the Roman Catholic Church. The Kabaka Yekka (KY), a small feudal-oriented party, drew its support from the Ghanda nationality.

The UPC, which came to power with independence following an alliance with Kabaka Yekka, inherited a neo-colonial power and economic structure essentially designed to fit colonial interests. The UPC manifesto was strongly in favor of defending the country's sovereignty; involving people in the running of the country's day-to-day affairs; fighting poverty, ignorance, and disease; and neo-colonialism. However, all these goals were abandoned, in the long-run, by the UPC in a frantic effort to keep itself in power by force. The political contradictions were further sharpened by the rise of the national petit-bourgeoisie which used the political army to crush monarchism and to install the 1967 republican constitution. The crisis was heightened by an attempt to move to the left, a move that strongly threatened foreign interests in Uganda. To some extent, this explains why Britain was among the first countries to laud Amin's seizure of power in 1971.

Amin's seizure of power brought Uganda more into the international arena, mainly due to his wild anti-imperialist rhetoric stance. His infamous "economic war" at home saw the expulsion of Asians and the redistribution of their properties and businesses to his royal soldiery and close associates. This state of affairs coupled with political ineptness and repression, mismanagement, and insecurity sent the economic infrastructure crumbling.

The struggle for democracy entered another phase with the armed struggle against Amin launched from Tanzania. Exiles belonging to the different political groups tried to bury their differences under the Uganda National Liberation Front (UNIF) and together with the Tanzanian army ousted Amin from power. Efforts to govern the

country under UNLF, however, gave way to the old "sectarian" differences. Political parties, religious differences, and the army once again bounced back on the scene, with the former being manipulated to rig the 1981 elections in favor of the UPC, bringing Obote again in power. This plunged the country further into a "state of blood," with the army being used to suppress the uprisings among the Southern and West Nile population. External loans acquired between 1981 and 1986 were not put to much economic use, making the war-torn country more indebted to the outside world.

The media was also a target of the repression. Some newspapers were banned, journalists were arrested or exiled, while radio as a major state information organ was extensively used to launch disinformation campaigns against any form of opposition. Radio transmitters set up in the early 70s to facilitate rural broadcasts were instead constantly "cannibalized" to provide spare parts to the National Service Channel to enable UPC's unending political rallies.

This, however, proved ineffective in the face of a much stronger and reliable interpersonal communication network popularly known as "Radio Katwe" which sprung up in the wake of the excessive disinformation on the national radio service. News about the heightening political crisis often spread all over the country very fast. Efforts to suppress what the government termed "rumor" instead gave the interpersonal network more credibility nationwide.

# Revolutionary Era

The rigging of elections in 1981 sparked off a protracted armed struggle—the National Resistance Movement (NRM/NRA) led by Yoweri Museveni against the Obote II regime, giving the struggle for democracy in Uganda a revolutionary dimension. From the onset, the NRM conceived Uganda's problem as being largely political and not economic. Guided by the "Ten Point Program" (Museveni, K.Y., no date, p. 51), the

NRM sought to redefine democracy in the Ugandan context and also to redress the sectarian politics that had dominated the past.

By introducing Resistance Committees (RCs) at the village, sub-county, and district level representatives to the National Resistance Council (NRC), the Movement sought to enhance popular participation and parliamentary democracy. Security and sectarianism were defined as major problems to deal with by its administration. Under the NRM administration, fundamental changes in the political sphere seem to be taking place. High level cadre intelligentsia and politicization are replacing ruthlessness as a basis for recruiting the national army.

The legislating body of the NRM, the NRC is a broadbased compository of representatives affiliated to different political parties but not elected on party platforms. The biggest challenge to the NRM government now seems to be how to untangle the economic crisis resulting from the misrule and wars that destroyed the infrastructure, productive capital, and private property. The heavy borrowing between 1981-89 that characterized the International Monetary Fund (IMF and World Bank-administered economic programs) have resulted in an external debt of over US\$1 billion. The country's revenue base is critically dependent on the world coffee market prices which fluctuate a lot. The fall of the prices in 1989 grossly affected the country's foreign revenue.

The foregoing scenario clearly depicts the converging internal and external economic, political, and technological forces which the NRM government has had to contend with and has in the process lost a great deal of its revolutionary thrust. The promised fundamental changes have not been easy coming. Security granted, people are now questioning the government's ability to deliver economic goods. The economic infrastructure, whether agricultural, trade and commerce, industry, and social services are decimated, disorganized, and fatally incapacitated.

This brief but comprehensive historical analysis of the dynamics of the underdevelopment process in general provides the contextual texture of the causal factors of the problems to radio development broadcasting in Uganda.

## CHAPTER TWO

# TECHNOLOGICAL CONSTRAINTS

Radio broadcasting is an electronically driven mass medium to purvey social effects. The evaluation of its technical apparatus constitutes the base line for the analysis of the problems to the organization and development of radio and its application in the development process.

The appraisal of technological constraints to the radio broadcast medium thus assumes an evaluation perspective of its application in varied social contexts. This process of technical rationalization (in the case of Radio Uganda) aims at exploring ways how the broadcaster's capabilities can be maximized given a technical capacity. Technical broadcast capabilities are thus measured against program reach under certain technical standards along the geographical and time coverage space. In this frame of analysis, signal reach and quality must be measured against the optimal utilization of the broadcast spectrum as a public resource in general and the broadcast technical infrastructure in particular.

The constitutive causal effect of the technological constraint on the objective constraint function to development broadcasting is dependent upon a number of interacting variables, such as: (1) political and financial policies, (2) the degree of bureaucracy, (3) ethnic-language, and (4) geographical diversity. Broadcast objectives to transcend the latter three barriers is dependent upon the magnitude of the former two policies. The rate at which these policies are translated into broadcast objectives is dependent upon the degree of bureaucracy across the constitutive institutions of the executing state policy.

# **Equipment Survey**

Basically, radio transmission pattern is dependent upon four major components which constitutes the technical appraisal and rationalization baseline for this study. These are: recording and transmission studios, program links, transmitter systems, and training of manpower. Poor signal reception and constant blackouts plus the high rate of equipment "cannibalism" result from the constant malfunctions along the technical coverage components.

Audio engineers at the station have argued the importance of maintaining sound linkage between these technical components as central to the source functioning of the radio technical structure. It is pointless to have excellent transmitters if the links are too incapacitated to relay the programs. Without well-trained personnel to carry out maintenance services, the linkage between studios, relay links, and transmitters cannot be efficiently sustained (Sound Broadcasting Rehabilitation Report, 1982, Radio Uganda). Technical problems can be simply enumerated as contained in the annual reports by audio engineers. This synthesis must, however, be analyzed within a wider contextual perspective, scanning the contours of the interacting causal variables.

Studios. At the Broadcasting House in the capital, Kampala, there are 23 studios with only 10 of them functional. Only four of the 13 recording studios and three of the 10 transmission studios are functional. With air conditioning facilities completely broken down, the equipment is exposed to excess heating.

The news studios located at the Ministry of Information and Broadcasting headquarters, a distance of about 1.5 km from the Broadcasting House, are in skeletal shape with only a microphone and a line amplifier connected directly to the PTT line providing a very unreliable link with Broadcasting House.

Transmitters. The entire national broadcast pattern is composed of both SW and MW transmitters, with the former receiving much emphasis given its wide technical coverage advantage. Short wave transmitter stations have in a span of a decade been undergoing rehabilitation from war destruction, equipment cannibalism, and years of long neglect. Two 10KW SW and one 1KW SW transmitters at Bugoloobi were commissioned in 1987. The former serves about 87% of the nation and the latter, Kampala City and its neighborhoods with programs on the National Red Channel. This is further supplemented with one 300-watt FM transmitter serving the capital and its neighborhoods (see Figure 2).

The SW transmitting pattern is also supplemented with "regional" 100KW MW transmitters, two of them constituting independent channels (Bobi in Northern and Butebo in Eastern Uganda). Bobi Channel also provides the signal for the Gilgil transmitter in Northwestern Uganda (West Nile) and will be linked from Kampala either through planned PTT microwave or directly via HF link. The station, destroyed in the 1979 liberation war that ousted Idi Amin, will now be replaced with a 10 KW MW transmitter. Kabale Transmitter Station (Kyeriba) in Western and Mawaga in Southern Uganda carry the same program on the Blue Channel.

Installation of most transmitters was done on "redundance principle," running two transmitters in parallel. Two 50KW MW transmitters combine to form a 100KW MW station. The rationale behind the "redundance principle" basically being reliability in terms of transmission continuity when one of the two transmitters encounters technical mishaps.

With the exception of Mawaga Station, now reduced to 50KW MW, the other regional MW stations remained closed down most of the time for over five years now. They have been rendered inoperative at full capacity due to destruction by war, equipment cannibalism, and vandalism. Equipment like PIE, studios, aerials, feeder systems, plus test equipment tools are in a state of disrepair due to lack of spare parts.

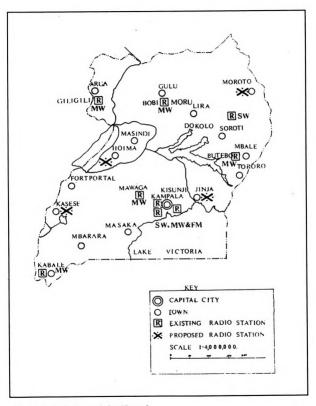


Figure 2. Radio Transmission Network.

Power supply also varies a lot at the transmitter sites, unequal phase voltages resulting into trouble with transmitter fan motors and AVRS, i.e, Mawaga Station. Butebo transmitter station is intermittently operational with one transmitter or "redundance principle." HT voltage constantly varies from about 7KV to 9KV due to variations on the incoming main supply. Kabale transmission station has not had power since 1987 due to lack of capacity at the local generating plant which is not connected to the national grid.

Cannibalism also took a heavy toll on the External Service Station commissioned in 1975. One of the two 250KW SW (Brown Boveri) is reported in working order, while the other that was never commissioned is now incomplete with most of the parts cannibalized. External service ceased six years ago and presently there are no plans to revive it. A government that cannot provide the entire population with radio services has no moral other than political justification to invest in external broadcast services.

Radio Links. The quality and reliability of signal propagation and reception depends on the overall quality and dependability of the broadcasting system. In a centralized broadcast system, radio links become vital components of the transmission pattern. In the Uganda situation, links have suffered significant technical problems, rendering upcountry transmitters redundant most of the time. The traditional relay units have proved very unreliable and need frequent service. This is further compounded by the location of these units in remote locations which are difficult to service in view of the serious administrative and transport problems. The power subsystems are also inadequate for any kind of reliable service expected of a centralized broadcast system. The outdated system engineering based on traditional and fragile radio links has thus significantly degraded broadcast service in the last three decades and, therefore, needs overhauling, especially in the face of the emerging, efficient modern link technology like microwaves and satellite.

Traditional radio links have presented acute problems in attaining national radio continuity while relaying programs from the Broadcasting House in Kampala to the regionally located transmitters. The problem has been so tempting that in Amin's rule (1970s) satellite had to be used to link television and radio programs to Gilgil Transmitter Station in Northwestern Uganda (West Nile). Both the 10KW radio and 25KW television stations in Arua received signals from Kampala (800 km) via Intelsat at an annual cost of US\$1 million. With the fall of Idi Amin, this arrangement was abandoned for its prohibitive costs.

The northern link to Bobi Station (583 km) is very erratic without standby facilities like power, etc. It follows the Butebo leg on its long journey up north via the east: Soroti, Dokolo, and Moru. Dokolo link station was hit by lightening and the equipment was brought back to Kampala. The link is not operational and will not be revived as the use of PTT microwaves continue to be explored.

The eastern leg link to Butebo transmitter station (250 km) had its repeater link at Kisunji near Jinja vandalized and is beyond repair. The problem to reach Butebo Station has been so tempting that (SW) programs have been re-broadcast from signals monitored on a SW communication receiver. For almost five years now, Bobi and Butebo channels have been off air with the latter intermittently repeating Blue Channel programs using crude methods as seen above. The southwest link to Kabale (423 km) comprising of five stages through Masaka and Mbarara was entirely destroyed by the 1979 liberation war and equipment "cannibalism."

The Outside Broadcasting (OB) and Mobile Recording Unit (MRU) originating live broadcasts from sites other than the studios at Broadcast House is poorly equipped. The Unit, which also provides coverage with public address system and recording facilities, has for a long time had only one OB van for direct outside broadcasts from short distances in Kampala and from such sites reasonably near post office telephone lines. The Unit is, however, ill-equipped with only six functional Nagras to handle

outside recordings. Plans to buy three recording vans have since 1986 been successful through the Central Tender Board (CTB).

# **Technical Constraint Analysis**

From a broad technology transfer perspective, decisions to adopt a given type of technology are greatly dependent upon the interaction of political, financial, and deployment patterns. Technical constraints along the transmission pattern stretch this interaction to include other factors like the degree of bureaucracy and polylingualism, plus the geographical factor (see Figure 3). It is beyond the scope of this study to investigate in depth the causal context of each of the interacting factors. Instead, the focus in this chapter will be on how this causative interaction reflect on the technical broadcast goals.

For a great part of time, the basic technical question centers around the centralized network's ability to cover the entire population with programs originating from the capital city. In the face of financial constraints, some audio engineers have constantly urged concentrating rehabilitation resources on SW transmitters exhorting that the two 20KW SW transmitters at Bugoloobi will cover 87% of the nation with two broadcast programs. This is despite the signal quality trade-off of using SW for domestic broadcasts.

From a purely technological perspective, the rehabilitation of SW transmitters is fascinatingly cheaper than reviving the MF transmitting stations to attain almost a similar signal coverage area. It, however, overshadows the greater social assignment of the medium in the development process which is dependent upon the flexibility brought by MF and FM under the varied ethnic and language social environments.

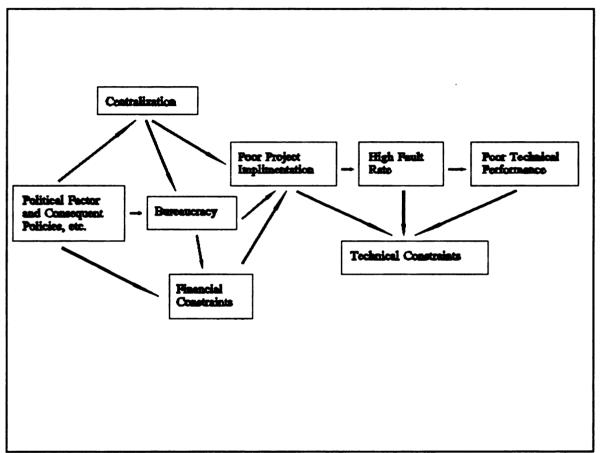


Figure 3. Technical Constraint Analysis

This technological perspective tends to limit the generation of solutions to more funds for equipment, spare parts, maintenance, and training of technical personnel. An exhaustive problem analysis of these constraints must, however, explore the contextual causative factors imposed, in part, by the political power structure and the consequent policy formulation.

Centralized Technical Infrastructure. The political factor permeates the technical structure and prognosis of Radio Uganda. The centralization of the medium at its time of inception was a false start. Conceived in a centralized political framework, the medium design and application pattern and its consequent organization and development has tended to replicate the centralization media concept, built on the colonial political structure promoting the politics of the core center at the expense of integrating the rural periphery along the development message continuum. Structured to serve essentially political interests of a centralized power structure, the transmission pattern surfaces with inherent burdens in addressing the diversified social needs of the development process in a diversified social context. This complexity makes it likely that technical problems would occur, hence the widespread decay of the equipment along the transmission pattern.

The aim of installing the five MW transmitter stations to repeat centralized broadcasts was basically a consequence of the need to address the problem of language diversity. Otherwise, as has been argued by audio engineers, SW would have attained the desired coverage area with two SW programs. From a technological point of view, MW transmitters present a technical diversity to address both language and program diversities; this is still done in a centralized context with a high frequency of joining channels.

This MW technological choice is tightly conceived in a political prism to address the diversities in a centralized pattern. Political considerations in designing policies to

exploit broadcast technology thus constitutes a major factor in the interaction of interrelated variables of technical constraints.

Information Sector Budgeting. In a centralized broadcast structure, technology tends to be exploited in a rigid and technocratic manner. Causal variables to the technological constraint in radio development broadcasting thus trickle down to the finance factor constraint to purchase equipment, to carry out maintenance, and to develop manpower. While decisions to adopt a type of technology depends, among others, on the mix of both political and financial factors, the former surfaces as the prime factor conditioning financial decisions. It is thus imperative to explore how this centralized political factor translates into financial commitments to the organization and development of the radio medium in terms of political decisions, sectoral prioritization, and policies.

Research carried out in different parts of the globe now show that benefits accruing to the information sector cannot be empirically quantified in monetary values given that development as a measure of social change has multifaceted causal factors. Investments to this sector need not, however, be hampered by the lack of this empiricism in the investment and social benefit considerations. It is imperative that the political importance equated to the radio medium be reflected in the national budget sectoral prioritization process, a factor that has been ignored in the past by successive governments.

The Ministry of Information and Broadcasting (MIB), which controls both the only national television and radio services on top of other information services, receives less than 0.5% on average of the government Recurrent Expenditure each financial year while other ministries like Finance and Defense take lion shares (see Table 1). Only about 0.1% of the 0.5% goes to finance Radio Uganda. The expenditure on defense to finance wars during the two decades of political chaos has depleted national resources at the expense of other service sectors.

Government Recurrent Expenditure by Ministry 1984/85-1988/89 Table 1.

	(Millions of Uganda shillings)	Uganda shi	(lings)								
Code	Min/Dept.	84/85 %		85/86 % 86/87 %	%	86/87	%	84/88	%	68/88	%
18	Information	11.9	0.7	20.6 0.5	0.5	62.0 0.8	8.0	75.0	0.3	231.1	0.4
9	Foreign Affairs	50.0	2.8	106.4	5.6	385.9	8.4	655.3	2.4	822.8	3.1
41	Health	6.59	3.7	88.3	2.1	180.4	2.2	622.0	2.3	1833.5	3.1
10	Agriculture	29.9	1.7	38.6	1.0	168.5	2.1	443.0	1.6	963.0	1.7
21	Defense	356.3	20.1	1026.9	24.8	2212.4	27.6	356.3 20.1 1026.9 24.8 2212.4 27.6 6383.1	23.5	16781.4	28.8

Source: Ministry of Finance

**Project Implementation.** Radio projects implementation have to go through the treadmill of the bureaucratic decision-making process across a number of institutions outside the MIB. The bureaucratic red tape has often constrained the rate of project implementation resulting in both time and cost overruns. Implementation of projects is often characterized with fragmented responsibility leading to inadequate implementation and consequent interface problems.

Projects often involve more than four government institutions outside MIB which is the broadcasting authority executing the plans. The Ministry of Finance provides the funds and is responsible for the Central Tender Board (CTB) through which government purchases are made. The Ministry of Transport and Telecommunications (controlling PTT), which is the technical communications regulatory body, provides broadcast frequencies and program links. The Ministry of Housing carries out repair, building, and construction work on the sites at the transmission units all over the country.

This devastating feature to broadcasting kin to political control is often in the hands of the old and insensitive guard often characterized with corrupt tendencies. The uninnovative bureaucracy created to serve the colonial economy has outlived its usefulness and is, instead, constraining the development and organization of the radio medium. After the commissioning of transmitters at Bugoloobi station in Kampala in 1987, the installation of standby power generators component of the transmitters dragged on for another one and a half years because the civil works for generator rooms was delayed. Even when ready, the Ministry of Housing and Urban Development responsible for the installation of the generators was not ready to start.

Fund disbursement budgeted for Radio Uganda is often delayed with unexplained reasons. In the 1989/90 financial year, Shs. 524,043,000.00 was budgeted for MIB in June 1989 but the actual figure received by November was only Shs. 169,129,208.00. Out of Shs. 524,043,000.00 budgeted for MIB 1989/90, only Shs. 93,880,000.00 was for Radio Uganda and again only Shs. 27,831,837.00 was disbursed by November 1989

(MIB proposed estimates 1990/91). This has partly contributed to the delay in the purchase of equipment and spares. Plans to purchase OB recording vans in 1986 have still not, after four years, materialized through the Central Tender Board (CTB). Plans to replace teleprinters circuits linking the MIB headquarters with up-country news gathering centers has suffered a similar fate with CTB turning down selective tendering in favor of problem-ridden open tendering.

The economic crisis resulting from years of misrule and wars that has hurt the implementation of government projects is further compounded by the high level of corruption across the institutions involved in implementing radio projects. The delays inflate the costs of project implementation.

This is further compounded by the prevalent lack of accountability even at higher levels in the implementation process. The 1987 Auditor General's Report found that funds allocated to the MIB under the International Development Agency Program (IDA) to purchase radio and television equipment were instead partly used to import personal effects for a former minister in Obote II government who had personally handled the importation of this equipment (Auditor General's Report, 1987).

#### Technical Innovation/Possibilities

In the context of technology transfer, new innovations render previous maintenance costs prohibitive as in the case of the traditional program links. Innovations like fiber optics, microwaves, and satellite present increased alternatives to salvage radio transmission systems. Transition, for example, to the compressed microwave technology is not only tempting, but cost-effective in the long run, the transition costs withstanding. Microwaves have yielded fast to compression telecommunication technology, allowing more capacity for many channels to be squeezed on one single circuit. Radio Uganda already has to reach the "regional" transmitters via PTT microwaves radio bearers.

Microwaves links would eliminate the need for the costly and maintenance-intensive radio links.

Microwave technology being deployed by the PTT all over the country provides hope for Radio Uganda to discard the traditional links that are now beyond repair. It, however, simply does away with the link constraint while continuing to replicate the politically conditioned centralized transmission pattern. It also tends to overshadow the cost consideration of renting channels for the entire 17 broadcast hours channels to the five different "regional" transmitters. The PTT microwave project is funded with assistance from foreign organizations and is run on cost-revenue basis. Radio Uganda would, therefore, have to foot the market price for the channels on PTT microwaves.

Transition costs would include acquiring "T-off" from the nearest PTT points in the five regions. Radio engineers have also envisaged a problem with the available PTT channels since broadcasting need wide band channels. Multiplexing/interface equipment at both ends of the PTT circuits will be required.

Medium wave transmitters will also, in face of the new innovations, continue to be expensive for its high power consumption among other inputs. In a decentralized broadcast alternative, FM offers a far cheaper and efficient transmission pattern given its smaller transmitter and power advantage. Its overall costs are lower than MW. Decentralization also reduces the program link costs from the Broadcasting House in Kampala.

#### CHAPTER 3

#### PROGRAMMING PATTERN CONSTRAINTS

The concept of development broadcasting presupposes using radio to purvey prosocial change-oriented behavioral content. The programming factor and the audience context constitute radio's eliciting potential of the valued social responses. Emphasis in this chapter is on how the development aspect manifests in the content categories against efficiency in channel utilization. The audience context, under the scope of program intervention, will be treated in the next chapter.

Programming, measured against broadcast objectives, is dependent upon the interaction of technological, political and policy environment, polylingualism factors, and the broadcasters' state of professionalism. The foregoing chapter has already demonstrated how the technological shortcomings constrain the broadcast capability. Emphasis here will be on the remaining three factors. This chapter will also demonstrate how these factors affect the efficient utilization of the available radio channels.

## The Development Program

Development broadcasting (a specific use of development journalist) is the practice of mobilizing available media in support of specific nation-building programs like health or literacy campaign (Howell, W.J., 1986, p. 186). Emerging in the era of information societies in the West and owing to the varying practical application of the concept in the varied three world contests, its study has not been very definitive. For purposes of this study, we shall, however, define development broadcasting from the point of view of its substance--as information, analysis, comment and interpretation

aimed at motivating people and policy towards issues which concern development (Chopra, P., 1977, p. 9).

In a development perspective, the design and production of broadcast programs is dependent upon specific programming concepts based on analysis of needs and characteristics of the target audiences. This perspective, however, is dependent upon the textured information model in place: the authoritarian, libertarian, totalian, or social-responsibility model. Broadcast policies as influenced by the political power structure is a major ingredient in the programming pattern process.

Content Categories. The new program was chosen as a unit of analysis on account of the prominence both government and the Uganda population attach to it. Radio ranks as the major source of news since both TV and print media are incapacitated by both technical and finance constraints and are, therefore, confined to a few urban centers.

Objectives. The purpose of the content analysis was to identify program content design and packaging as a constraint to integrating rural issues into development broadcast programs. While the objective was to determine the proportion of development content categories in news broadcasts on Radio Uganda.

Three hypotheses guided the content analysis:

- 1. The news program on Radio Uganda has more political than economic news content.
- 2. Political leaders are still the dominant news makers.
- 3. News programs are dominated by urban sources than rural activities.

Methodology. News program content was categorized at two levels. Three coded story variables: (1) political, (2) economic (agriculture, finance, health, trade, education, etc.), and (3) social (human interest, art, and leisure) content were analyzed against the newsmaker at two coded variables: (1) newsmakers—the "politician" and "others" (rural people, opinion leaders, religious leaders, etc.) and (2) news sources—"urban" and

"rural" sources. All these categories were coded in terms of number of stories broadcast.

"Hard news" broadcasts for 10 days were randomly chosen across the four weeks of November 1989 with each week having a "minimum" of three days. This sampling method was chosen due to the difficulty of getting complete files of the news broadcasts. Poor documentation at the newsroom was responsible for this anomaly.

Results and Data Analysis. Data analysis was limited to descriptive level as indicated by percentage frequency distribution (Table 2).

Table 2. Frequency Distribution in Percentages of Story Categories in Radio Uganda News Bulletin for 10 Days in November 1989

		Politica	1		Econom	ic		Social	
	L	cal	_	L	ocal	_	Lo	cal	_
Newsmakers	Urban	Rural	Foreign	Urban	Rural	Foreign	Urban	Rural	Foreign
Political Leaders	28.3%	17.6%	6.8%	25.7%	16.2%	1.4%	2.7%	1.3%	0%
Others	4.1%	2.8%	49 %	11%	6.9%	4.8%	11%	6.9%	3.5%
Total		54.8%			29.7%			15.5%	;

The frequency distribution of story categories showed that there was more political (54.8%) than economic (29.7%) and social (15.5%) news coverage. The political category, however, was greatly weighted by the foreign news coverage without which the economic category (56.0%) was more than the political (44.0%). At the level of political leaders as newsmakers, there was more political (52.7%) than economic (43.3%) and social (4.0%) news coverage. "Political leaders" (50.7%) as newsmakers accounted for more than "others" (49.3%) of the news content. At the economic category level, the political leader (54.4%) accounted for more than others (45.6%). The news program was also dominated by urban (61.5%) than rural (38.5%) sources.

News sources compared as follows: urban (36.5%), rural (22.9%), and foreign (40.6%), while local coverage alone was composed of more urban (61.5%) than rural (38.5%) sources. Foreign stories are predominantly political (85.4%) and then economic (9.0%) and social (5.6%).

The difference between political and economic is not very significant at the descriptive statistics level. The hypothesis that there is a significant frequency of political news coverage appears to be more significant than the difference between the two categories as assumed at the beginning of the study.

The dominance of the political content also provides an indicator of the intensity of the political factor in the programming pattern. With the "political leader" (54.4%) accounting for more than "others" (45.6%) of the economic news, the complimentary function of radio in the development process seems to make more political than economic logic. The significance of the hypothesis that political leaders are the dominant newsmakers is that radio then becomes a one-way medium for issuing directives and orders or statements on government policy.

In analyzing the news content, the level of categorization, of which this quantification is based, is not exclusively exhaustive in the strictest sense of the lines between political and economic content cannot be more explicit. It, however, approximates the manifest categories of the program. Shortfalls in the exclusivity of the levels of categorization in isolating the political factor is compensated for by the analysis of other manifest variables like the political leader as a dominant newsmaker.

# **Qualitative Analysis**

Interpretation and analysis of factors underlying the programming constraints based on the above descriptive data, however, needs to be supplemented with qualitative analysis based on personal interviews of Radio Uganda staff and others and secondary

resources. This will reinforce the explanations provided by the generalized manifestation from the programming content analysis identified above in the study.

While the number of foreign political stories are relatively many in comparison to the local political stories, the latter are often longer in length taking more air time than the former. The local political factor in the news program is, therefore, a major ingredient.

The flow of local stories from rural areas is erratic owing to the poor communication infrastructure like the nonfunctioning teleprinters mentioned in the previous chapter. Political content, especially from rural areas, is treated with maximum delicacy for its inclusion in the news program. Where doubt is felt, stories are simply held. On the other hand, foreign wired stories easily fill in this gap.

Political leaders, often city bound, influence the newsmaking process in a number of ways. By evoking their positions in government and facilitating news staff, their activities are given extensive coverage in the news programs. The majority of programs also lack any flexibility considered vital in the development program perspective.

Rigid Programming. The presentation of news and information on radio is still too rigid and formal based on selective publicity of the government perspectives on social change. While the political content dominance could be explained by the need to promote and heighten the political consciousness of the population, the rigid program packaging renders the process ineffective, blurring the distinction between "politicalization" and the essential "politicalization." The latter is action-oriented but is often mistaken for the latter which is more rhetoric oriented.

Emerging media research today is emphasizing the complexity of the communication process, and findings are in disfavor of government's control of information whose preoccupation is more gravitated towards painting the political image than addressing themselves to people communication needs. It is, however, imperative

to note that "Human beings are not information processors, but code crafters. They do not think straight, if 'straight' is taken to adhering standards of right thinking predetermined by some higher authority. This ambiguity is the most subtle and useful quality we bring to the task of fashioning a creative information environment" (Dizard, W.P., Jr., 1989, p. 11).

The prominence of political content in this case is then at variance with the concrete needs of the target rural population. Publicity programming skewed against rural content promotes the image of the state polity and core at the expense of the greater rural periphery. The temptation by political leaders to use radio as a public megaphone is greater than the case that would promote audience participation. "Emphasis in most developing countries is always on publicity. For authorities in such countries, there is no difference between information (provision of facts and figures) and communication (exchange of ideas) . . . . Provisions are usually made for publicizing development plans and objectives, but very little is done for feedback and for discussions" (Moemaka, A. 1989, p. 19). Broadcast policy reform is an imperative in this context to enable radio supplement the development process. "Radio broadcasts have a zero effect on the listeners if its messages are rejected, if programs are not planned to meet the communication needs of listeners. Publicity is rejected if it is identified as such. Thus, the imperative need for skilled and intellectual program planning" (Amjad Hussain, 1989, p. 4).

Broadcast Policy Reforms. The importance of adequate policy to guide radio in supplementing the development process has been compromised by lack of policy research. The role of broadcasting is simply defined by MIB as that to inform, educate, and entertain. These policy guidelines, while simply generalized and allowing flexibility and creativity on the part of broadcasters, have, instead, been exploited by successive regimes for their simply ambiguity; complicating the program decision making process.

For a great part of Radio Uganda's broadcast time, interpretation of such policy guidelines as in the case of most Third World countries is compromised by such circumstances which make programs that are less likely to invite criticism from various policy makers—the political powers that may be (Katzel and Wedell, 1977, p. 5). This situation stifles the broadcaster's freedom to reflect on society as any information analysis or commentary is likely to be more politically motivated and, hence, individual leaders appointing themselves the "sole interpreters of the national interest, (and) chauvinism is compounded with a single, unquestionable political line" (Ibid, p. 5).

The above practice has further promoted only the vertical rather than the horizontal role of radio that subjects the population to the daily "rhetorical gimmicks" of the ruling class. The scarce resources are deployed along those lines, with priority in funding and facilities diminishing as the program content moves away from the political and affluent newsmaker to others in rural environments. In Amin and Obote II governments, political praise songs (dubbed patriotic music) competed for air time with serious programs like health, agriculture, and education.

Everett Rogers categorizes two forms of development journalism: the critical independent form of development news and the government controlled development news. This distinction is based on Aggarwala's observation that the "journalists job is to critically examine, evaluate, and report the relevance of a developing project to national and local needs, the difference between a planned scheme and its implementation, and the difference between its impact on people as claimed by the government officials and as it actually is" (Everett Rogers, 1978, p. 69).

Government policy to control program content like in the news program, projecting only the official point of view, tends to reap the very opposite. The practice has in the past robbed the national station of audiences to the international radio stations such as the BBC and VOA as more credible sources of news. In the long run, Radio

Uganda's ability to acquire a functional role in shaping public opinion (agenda-setting) around social activities is rendered ineffective.

As Sedney points out about broadcasting in Africa that "programming in general tends to be heavily colored by the concept of national building . . . literacy, civics, public health, agricultural improvement, cultural traditions, political commentary, and social guidance (Sedney, H.W., 1974, p. 12), this often remains in programming schedules in Uganda for a great part of the time. Producers completely handicapped by lack of finance, equipment, transport, and the poor communication infrastructure collect whatever trivial (non-political) material within their proximity and simply fill the air time scheduled for development programs.

Radio Uganda also suffers from an acute shortage of development oriented broadcasters who are creative and flexible enough to make their work continuously relevant and to deal with those often unexpected rural situations. Broadcasters' performance, in most instances, reflect little basic knowledge about the existing social relationships owing to the low level of education of most producers and lack of any sound training after recruitment. "Rural broadcasting needs a new type of professional man, who is beginning to appear in broadcasting and extension services. He must combine technical knowledge of radio with a clear grasp of the rudiments of agriculture and sympathetic approach to the problems of the primary producer" (Opuku, UNESCO, 1964-5, p. 9).

Another problem resulting from poor state of professionalism which has been perpetuated for lack of policy research is the persistence of lack of adequate knowledge about gaps communication can fill in social, political, and economic development. The existing technocratic policy, simply assumes that rural populations are always there only to be informed, educated, or entertained.

The recruitment policy lost direction in recruiting the deserving due to hand picking method by political stalwarts since Amin's rule through Obote II. It is very

costly to maintain such staff recruited on political grounds, who in most instances do not easily respond to any form of training. Professional ethics is sacrificed for crude political methods, with allegiance of such staff accorded more to individuals than their immediate heads or job description.

The remuneration under the civil service, plus the acute shortage of funds and facilities like portable recorders and transport, make broadcasters highly susceptible to corruption and content manipulation by outside interests. "The trend mill of broadcast production by tenured civil servants can have a deadly effect on morale and creativeness. It is all too easy to slip into dull, repetitive routines and to fail to make the extra effort that alert and timely programming always demands" (Sedney, H.W., 1974, p. 350).

The administrative structure to arrest the situation is simply not available and university graduates are technically knocked out of the service by the multitude of anomalies. To reverse this trend, the station will have to re-assess itself to determine whether they have development orientated broadcasters to perform the development communication role.

From the content prism, the political power structure, both by commission and omission, constrains the developmental role of broadcasting in Uganda with more emphasis put on using radio to paint the political image than to tackle the concrete issues as they occur in rural areas. The roots of instability manifested in the unresolved political questions have limited radio's role to that of political manipulator and regime builder. The broadcaster's responsibility as an instrument of the undemocratic government and the failing credibility among the audience surface as key problems to producing programs that are both useful to attain broadcast goals and to attract the people. Radio's role continues to be narrowly and repressively conceived in terms of facilitating the government's image of reality. Program content is technocratically manipulated to suit political ends than to concrete rural development needs.

The democratization of radio is a basic ingredient in the overall democratization process. If radio was involved in the process of policy formulation from grassroot structures like Resistance Committees (RCs), the situation where government would fear criticism on its own station would not arise. A more ruralized radio concept alternative to promote popular participation in the development process would in this context approximate with the decentralization process of the power structure under the popular grassroot Resistance Committees.

Government-dominated programs like news in the case of Radio Uganda do not leave room for criticism that ensures participatory communication, but instead promotes unpopular point of views about such development projects. The process of development news would therefore demand such a democratic context that would bridge the gap between message source and target audiences.

# **Programming Schedule**

The programming schedule of any radio station represents its programming pattern in terms of prioritization of broadcast variables like content categories and language coverage in a multilingual context. The viability of the schedule in addressing these variables, therefore, provides some measure of the programming pattern constraints. Radio Uganda broadcasts in 20 languages, but French and Arabic have been off-air since the collapse of the External Broadcasting Services in 1978.

The Home Service is composed of four channels: Red, national programs, Blue, Midland (Buganda) and Western region programs, Bobi, Northern region; and Buetobo, Eastern region programs. Buetobo, Bobi, and the extended Blue channel (Kabale) to cover the Western region were set up to address the problem of language diversity. This increased capacity has been compromised, however, by technical constraints to link programs to the up-country MW transmitters. As a consequence, Bobi and Butebo channel are off air most of the time, while Blue channel cannot link its programs beyond

Midland (Buganda) to the Western region station at Kabale. The technical constraint diminishes the programming potential in terms of air time to individual languages reduced to the few operating channels and increases congestion of the 18 languages to the two remaining channels. As this technical link constraint intensifies, the intensity of joining channels increases. This is further compounded by the high frequency of joining regional channels to the national (Red) channel for a great part of the broadcast time, for what is conceived as national programs. The resultant broadcast air shrinkage has a decimating effect on the programming strategy of the other channels, with prominence given to the national programs than the diverse rural languages.

Program Schedule Analysis. Programming schedules for Radio Uganda for the year 1977 and 1990 were studied with the objective of determining the magnitude of the language congestion problem on the available channels, prominence of air time per program category, frequency of joining channels, and changes over years in the programming pattern (schedules).

Objectives. The objectives of the schedule content analysis was based on the following subhypotheses:

- 1. The few available channels are highly congested by the many languages which affect program category continuity.
- 2. The frequency of joining channels is high, decimating programming on other designated regional channels.
- 3. There is more "hard news" and "light" than "serious" (agriculture, education, health, and finance and trade) programs.
- 4. There has not been much change in the programming pattern (schedule) between 1977 and 1990.

Method. Programs across the weekly schedule were categorized as follows: "hard news," comprising of news bulletins and current affairs programs; "light

programs," including music, drama, sports, and other entertainment; "serious programs," including educational, agriculture, finance and trade, health, and political mobilization; and "others," comprising of religious content like prayers and commercials.

Content was coded in terms of the number of times each program category occurred on the schedule. Frequency of joining channels was based on total number of times programs and hours joined in an average broadcast day of the week.

Results. The comparative data on the number of programs broadcast on the home service in 1977 showed that the Red channel originated 49.1% of the total broadcast programs followed by Blue with 39.1%, Butebo with 4.9%, and Bobi with 6.9% (see Figure 4).

Most of the news programs in 1977 were broadcast on Red (55.3%) and Blue (40.3%) while Bobi and Butebo only broadcasted 4.4% and 0.0%, respectively (see Table 3). Bobi (97.24 hrs/week) and Butebo (88.00 hrs/week) joined Red (21.34 hrs/week) and Blue channels for mostly news programs in the following languages: English, Luganda, Runyoro, Rutoro, Runyankole, Bukiga, Luo, Kiswahili, and Ateso. This reflects the prominence given to news broadcasting and the languages which to a certain degree reflect the regional diversity at a generalized level.

Table 3. Percentage share of program categories on each broadcast channel for 1977 and 1990.

	Hard	News	Seriou	s Programs	Light	Programs	0	thers
Channels	1977	1990	1977	1990	1977	1990	1977	1990
Red	55.3	62.1	41.5	44.4	44.8	49.6	54.2	49.0
Bobi	4.4	-	3.0		6.6		3.4	-
Blue	40.3	37.9	47.4	55.6	33.6	50.4	40.7	51.0
Butebo	0.0		8.1		15.0	•••	1.7	-

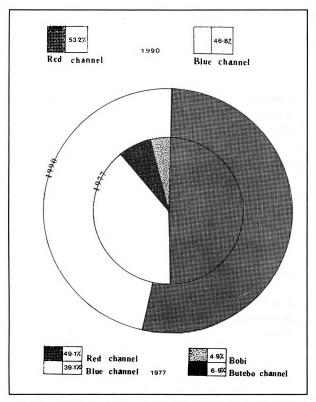


Figure 4. Percentage Share of Program Orientation on the 4 Channels for the Years 1997 and 1990.

The hard news category dominates the four channels. Red channel, which originated the most programs (49.1%), was dominated in 1988 by hard news (45.0%) followed by light programming (32.6%); serious programs, excluding hard news, (14.2%); and others, religious, commercials, etc., (8.2%) (see Table 4). In 1990 hard news again dominated at 47.1% followed by light programming (17.8%), serious programs (21.4%), and others (13.7%). Light programming declined on the Red channel to accommodate more serious programs originated by the Bobi and Butebo channels which were off air in 1990. The Blue channel, which originated 39.1% of broadcast programs in 1977, was almost affected by the same proportion of changes of category distribution as on Red (see Figure 4).

Table 4. Percentage Share of Program Content Categories on the Four Channels for Years 1977 and 1990.

Program	F	Red	F	Bobi	В	lue	Bu	tebo
Content Categories	1977	1990	1977	1990	1977	1990	1977	1990
Hard News	45.0%	47.1%	35.9%	••	41.2%	32.6%	0.0%	-
Light programs	32.6	17.8	48.8		30.7	20.6	78.2	-
Serious Programs	14.2	21.4	10.2	-	20.4	36.6	20.0	
Others	8.2	13.7	5.1		7.7	16.2	1.8	
	100%	100%	100%	-	100%	100%	100%	-

An analysis of the program schedule for the two years indicates that the programmatics of the developmental role of radio have not been grasped and integrated, resulting in structural constraints in the utilization of the broadcast capacities available on the four channels.

Table 5. Number of Light Programs and Others\* in Each Language on Red and Blue Channels in 1990.

Red Channel	Saturday	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Total
English	4	5	2	4	4	3	4	29
Swahili	-	-	-	-	•	1	1	2
Madi	-	-	-	-	•	-	-	-
Lugbara	-	1	-	-	•	-	1	2
Lwo	1	1		1	1	1	1	5
Ateso	1	3	-	1	1	-	1	7
Kakwa	-	-	-	-	1	-	-	1
Karamojong	-	-	-	-	-	-	-	-
Alur	-	-	-	-	-	-	-	-
Blue Channel								
Luganda	-	4	1	4	2	1	4	18
Lugwere	1	-	-	-	-	1	1	3
R/R/R/R	1	4	2	-	1	2	1	12
L/L/L	-	-	-	-	-	-	-	-
Kupsabiny	-	-	-	-	-	-	-	-
Lusoga	-	-	-	-	-	-	1	1
Rwamba	-	-	-	-	1	-	-	1
Luyira/Lukon zo	-	-	-	-	1	-	1	2
Dhapadhora	-	-	-	-	1	-	•	-
TOTAL								84

<sup>\*</sup>Others include commercials and religious content.

Source: Derived by analysis from Radio Uganda proposed 2 Channel program schedule No. 22.

# Language Multiplicity and Joining Channels

Radio Uganda's program schedule, in the situation of language multiplicity (18 broadcast languages, see Table 5), does not seem to highlight consistence of programming strategies. The high frequency of joining channels to the national programs in a few languages further decimates both air time broadcast capacity and the already language-segmented audiences (see Table 6).

Table 6. Number of Hours Joined to Red and Blue Channels in a Weekly Broadcasting Schedule 1977

Channel	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Total
Bobi-Red	13.32	14.22	13.42	14.22	13.42	14.42	13.02	97.24
Butebo-Red	10.07	9.57	10.07	9.57	9.27	9.57	8.42	66.14
Blue-Red	1.52	3.37	3.22	3.37	3.37	3.37	1.52	21.34
Butebo-Blue	3.53	2.23	2.38	3.53	1.08	2.23	3.38	19.56
Total	29.24	30.19	29.49	31.49	27.54	30.39	27.14	207.08

Source: Derived by analysis from weekly program schedule Saturday 24 December to Friday 30 December 1977

Joining the other three channels to the national programs on Red channel in a few major languages, such as English, provides an alternative for reaching the literate public strewn across the vastly multilingual barriers. But, the assumption is that at the time of joining a minority public is greater in importance than the predominantly illiterate majority who would instead feel comfortable with more local programs on their channels unjoined.

Joining channels then has had a disadvantage of compressing radio's ability to cross the vast linguistic barriers and address the development needs manifested in the content categories. As a result of joining channels, 54.2% of the air time broadcast capability is unutilized yet burning the same transmitter power as would be the case at full utility when not joined (see Table 6 and Figure 5).

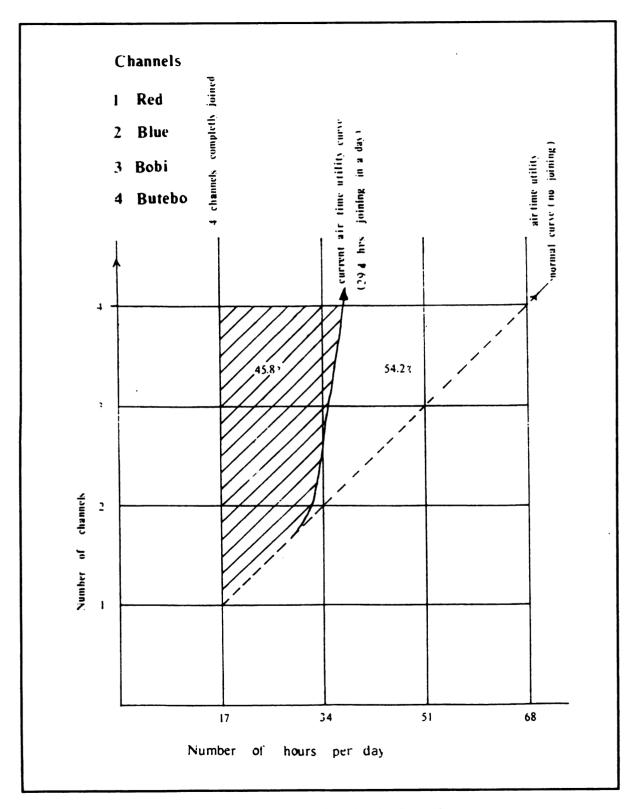


Figure 5. Air Time Shrinkage Due to Joining the 4 Channels.

Furthermore, the underlying temptation to perceive audiences as masses and the desired social action in its aggregate renders radio content too general for the already segmented audiences. While this lack of specificity diminishes content relevancy, the consequent variance of program content categories with concrete rural issues also renders the medium's potential to elicit pro social change responses impotent.

The technical failure of Bobi and Butebo channels intensified the decimating effect of joining channels, compressing the broadcast capacity to deal with content categories and language variables (see Table 6).

The foregoing analysis provides a strong case for more flexibility in responding to the contextual factors for the efficient utilization of broadcast technology. The need to forge a national public and national broadcast language conflicts with the more essential need for radio to attain acceptability among the vastly rural multilingual population. Improving on broadcasts in the various local languages then becomes an imperative. It is unlikely that Uganda will in the near future adopt such a language policy that would provide an alternative to polylingual broadcasting. The congestion of the 18 languages on the existing four centralized channels reflect the wide ranging ethnic pride and status which makes the issue more political than what communication pedagogy can offer.

## **Content Categories**

With all the four channels operational in 1977, light programming ranked second to the hard news category (see Table 3). Butebo (78.2%) and Bobi (48.8%), up-country designated channels, were dominated by light programming in comparison to 20.0% and 10.2%, respectively, of the serious programming category. Also, as already pointed out, scheduled serious programs, due to lack of funds, are instead filled with low-cost light and talk programs. Continuity of themes in the serious programs is further decimated as content is handled on a situational basis, reflecting inconsistency of strategy in the

development component reflected in this category on radio. Pragmatic programming is a function of such a complexity of inferences that have not been integrated into the programming strategy of Radio Uganda.

A common assumption is Radio Uganda's wider audience is due to its unequaled reach compared to both print and television. But the common temptation such an assumption brings to radio broadcasting is to use this banded listenership as a raw measure of the fulfillment of the broadcast objectives. A fact that must be grappled with is to balance between interesting (light programming) and developmental (serious programs) and to improve on radio's interactive potential. The challenge then is for broadcasters to attain a reasonable blend between the two, not to produce a program for its sake, but to exploit all that makes programs interesting to deliver developmental messages.

For the radio medium to attain the functional role of supplementing development, content categories must be reflective of the burning needs of the audience contexts. The political image painting role must be balanced with the development needs of the rural people by allowing the broadcaster to explore the professional freedoms to reflect objectively on society. The political factor variable must be reduced to the minimum of its positive ingredient.

Policies must also be devised to allow for the efficient utilization of broadcast capability on the available channels, to address the problem of dealing with content categories and language diversities. The unutilized air time capacity (54.2%, see Figure 5) must be utilized efficiently by allowing the up-country designated channels--Blue, Butebo, and Bobi (and others to be installed in the future like Gilgili)--to originate their own programs in the various local languages in a decentralized context as proposed in this model (Figure 6).

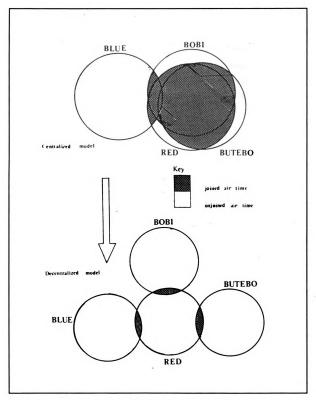


Figure 6. A Decentralized Model for the 4 Channel Network.

### Conclusion

The aim of carrying out program content and schedule analysis is specifically aimed at identifying structural constraints and making suggestions to restructuring, harmonizing, and rationalizing the development program and the use of radio channels.

The development communication approach to media requires a systematic and efficient use of communication resources like radio channels. The programming schedule with the development program must both highlight consistency of interaction between the broadcaster, development agent, and the audience.

To elicit rightly considered action demands prescription of right ideas by the broadcaster. Yet when technocratically done under strict government control, the impracticality of the ideas, plus lack of reinforcement, breeds frustration. Whoever then elects himself as a rightful authority to prescribe the regardedly right ideas must first conform to the democratic process of generating ideas or else credibility is lost on part of the communicator caused by the frustrated actors (audiences).

The democratic ingredient in the design and production of programs is dependent upon a democratic programming concept based on the concrete analysis of the needs and characteristics of the target audience. This democratic process thrives best in a broadcast system which, while maintaining some degree of verticality, promotes the horizontal process of rural radio communication. The decentralization of radio broadcasting (see Figure 6) presents a more flexible environment that makes it possible to attain a participatory communication process. Short of this possibility, the variance between the programming component and the target audience will keep widening.

#### CHAPTER 4

#### **AUDIENCE INTERVENTION CONSTRAINTS**

The most critical point along the message source-audience continuum is the medium intervention process. The preceding chapters (Two and Three) have with empiric data, although vastly descriptive, attempted to reinforce the theoretical framework for the decentralization model of radio communication channels to address the diversified needs in varied social contexts. More evidence on the practical aspects between the technocratic pattern radio has taken in rural areas and the real impressions of the audience's opinions on the programming pattern and content variables becomes even more critical to reinforce the decentralization model. In short, an audience research in a constraint perspective sets out to identify possible evidence about the medium's intervention problems and suggestions to the alternative solutions.

## Surveying the Audience

Ideal communication policy research attempts to combine a number of different research methods (triangulation method). The previous chapters relied mostly on focused synthesis (Chapter Two) and content analysis (Chapter Three) in providing technical analysis of the problems to the organization and development of radio broadcasting in a development perspective.

To underscore the importance of policy research and the various constraints it brings into the limelight, this chapter will rely on data collection by survey method across Ugandans varied audience contexts.

Background. The degree to which radio communication has taken in Uganda's rural context is still a subject of speculation based mostly on mere assumptions about audience characteristics. The crucial question of how radio enters the social communication networks of the rural areas has not been addressed mainly due to lack of policy research in dealing with rural communities. The last and perhaps only audience survey limited to demographic facts is said to have been done in 1963, although there is no record of it at MIB.

While research is acknowledged as important by MIB, it has for decades received lip service. In the circumstances, broadcasters depend mostly on intuition to anticipate audience responses. The gap between broadcasters and audiences has kept widening as the former is not constantly kept abreast of the changing audience needs. Part of the reasons owe to the influence of the political factor on the existing policy flaw already explored in the previous chapters and can be crystallized in Sedney's general observation on broadcasting in Africa, "officials of some governments still tend to regard broadcasting as a one-way medium. They see it as a way of issuing directives, orders, fiats, or edits rather than as a means of establishing dialogue. They see it as a way of imposing conformity rather than a means of developing consensus, as a weapon of propaganda rather than as an avenue of enlightenment. Such officials use the national broadcasting service as a personal megaphone rather than a device for responding to the wants and needs of the receiving ends" (Sedney H. 1974, p. 321).

Survey Objective. To suggest optimum policy mix that will enable Radio Uganda to attain optimal utilization of its broadcast channels.

Focus. Listenership habits and feedback flow constraints all over the country.

Major Hypothesis. Due to the technical constraints, preferential program scheduling, urban nature of program content, and feedback flow constraints; radio's potential to elicit pro social change behavior is greatly constrained.

# Sub-hypotheses.

- 1. Constant technical failures constrain the effective listenership of Radio Uganda.
- 2. Due to preferential program scheduling, less people listen to programs in their individual languages.
- 3. Much of the current program content (urban) is at variance with desired content by rural audiences.
- 4. Due to feedback constraints, radio is likely to elicit less rural program participation.

## Methodology

The survey was carried out between the months of April and May 1990. Due to linguistic barriers, coders with knowledge in local languages from sampled areas were employed to administer the questionnaire under supervision. The survey was self-funded and was, therefore, implemented on the most minimum budget.

Sample. The "effective" sample size (n=150) composed of a variation of ages (over 18 years), sex, and occupation was randomly drawn from villages in five different regions of Uganda: Western (Kabale district: Butobere and Katuba), Eastern (Tororo district: Luyehe in Bunyore), Northern (Nebbi district: Nebbi, Erusi, Kuchiny), Buganda (Mukono district: Nakisuna), and Central (Kampala district: capital city center and suburbs).

A non response expectation sample (n=160) was taken. The non-response rate on a majority of questions registered a high of three respondents in an individual region, with such an occurrence often limited to one or two of the five regions.

Survey Instruments. The questionnaire measured both demographic (sociological) and psychographic (psychological) phenomenon regarding media use; the major focus was,

however, on the latter. The instrument design was aimed at determining the significance of differences within and correlation between the independent and dependent variables. The independent variables were: technical constraints, preferential program scheduling, content categories variance, and feedback constraints. The dependent variables were: radio signal reception and quality, satisfaction with number of programs across individual languages, congruence of radio content and desired content, and frequency of program participation plus reasons for non participation.

## Results and Analysis

Technical Constraints. The technical constraint variable was measured at two levels: technical quality of programs and the frequency of technical failures registered by the respondents. Respondents who said technical failures were frequent were 94.7%, while 87.9% described the technical quality of Radio Uganda as poor.

Listening to foreign radio stations plus "reasons" for the practice were used as proxy variables to determine the impact of the technical constraint variable on listenership behavior and radio medium use. The difference between those who listened to foreign radio stations (75.8%) and those who did not (24.0%) was significant at the level of percentage frequency distribution. Reasons for listening to foreign radio stations varied from hard news (77.5%), light programs (16.7%), and others banded reasons (5.8%). The proxy variables thus expressed the significant radio use potential.

The high magnitude of the technical constraint is expressed in the significant correlation [r=0.6], see Appendix 1(a)] between the frequency of technical failure and technical quality variable as expressed by the respondents, while the significant but weak correlation [r=0.2], see Appendix 1(b)] between the frequent technical failures and listening to foreign stations shows that there are other influential variables that the technical constraint in explaining the frequency of listening to foreign stations.

The implications of these results conform to the hypothesis that due to technical constraints, the desired reception and thus effective reception is not attained.

**Program Scheduling Constraints.** A two-point scale was used to determine the satisfaction of respondents with the "time programs" in "their language" come to them. The difference between those who expressed satisfaction (44.4%) and dissatisfaction (53.1%) was not very significant. The importance of this variable, however, derives from the mere occurrence of this significant dissatisfied group (53.1%) of respondents. Variance within each of the two groups on the scale was significant; those who expressed satisfaction (yes), y=36.6 (SD=6), and dissatisfaction (no), y=34 (SD=5.8).

Dissatisfied respondents indicated time preferences for programs in their languages: AM (14.9%), PM (56.4%), and AM and PM (28.7%). More respondents desired daily (72.7%) than weekly (14.9%) and biweekly (12.4%) scheduling of programs in their local languages. This contrasts greatly with the current preferential, uneven content category and language scheduling with a few languages given prominence in the afternoon and evening.

Respondents were in an open-ended question asked to give reasons for the desired frequency of program scheduling. The three categories of expressed reasons as proxy variables indicate the inherent effectiveness (evidence) of the expressed responses in the dissatisfaction variable. Serious programs (including hard news) registered 66.7%; light programs (music, art, and leisure), 18%; and others, 15.3% of the total respondents.

The desired time preference and scheduling frequency variables are also implicitly expressed in the program time satisfaction variable scale. Policy adjustment to eliminate variations within the group of respondents expressing satisfaction and attain a significant satisfaction rating against dissatisfaction across all the regions presents itself as the inevitable policy task to attain a more even program category and language scheduling. This policy adjustment would in the long run eliminate the dissatisfaction gap and

consequently increase the satisfaction gap (Figure 7). For example, Alur programs (Northern/Nebbi) are scheduled in the morning while the surveyed preference time is significantly in the afternoon onwards. Western programs (Kabale--R/R/R) are scheduled in the most preferred time, explaining the significant satisfaction percentage distribution from this region. The majority of respondents (rural farmers) are only at home in the afternoon onwards and urban workers in the evening; thus, the expressed strong preference for this time (Figure 7).

Much of this analysis of the preferential program scheduling across languages through the proxy variable reasons for the desired change in scheduling indicates the respondents strong desire for serious content (66.7%). We need to look at other variables to determine whether this expressed desire (reasons) is ever matched by Radio Uganda.

Content Category Constraints. Data on this variable to an extent reinforces the findings in the content analysis (Chapter Three) of the development program and programming schedule. The composition of content categories across current schedules appears to be at variance with that desired (reasons) by the respondents.

A situational question was used to measure respondents impressions of content priority on a three-point scale: rural development issues, urban political issues, and both. Rural development issues registered a significant majority (74%), urban and political issues a mere 6%, and the both group registered 20%.

Desired feedback by the respondents was categorized at two levels: serious development issues (agriculture, health, education, trade, etc.) and non-development issues (mostly entertainment). The difference between the two was significant: 93% and 7%, respectively.

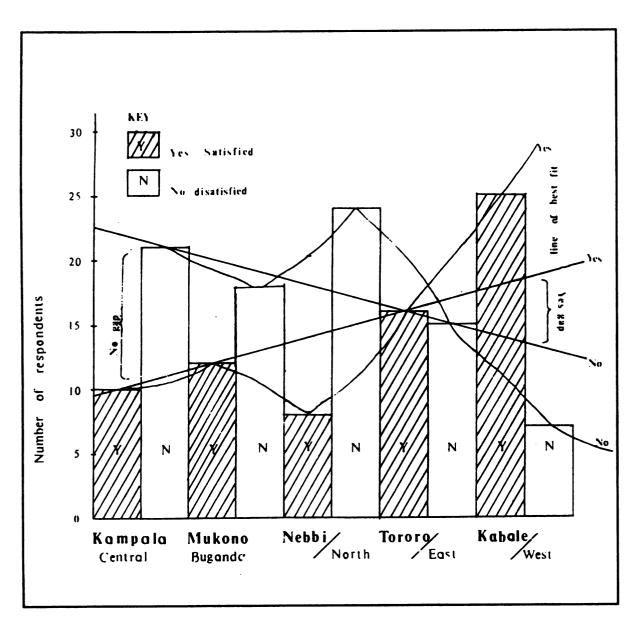


Figure 7. Satisfaction With Time of Program Scheduling by Region (1990).

To further isolate the urban nature of the significant political content variable as in the hard news category (see Chapter Three), the level of information received on local political organization (Resistance Committees, RCs) was measured on a three-pointed scale: a lot (5%), little (30%), and not at all (65%). These findings further reinforce the argument that radio media is basically a one-way medium in its current use, purveying only political interests of the core power structure.

The relationship between the respondents' impressions of content priority, rural development issue (74%), and desired feedback content, serious development issues (95%), was significant though weak [r=0.21, see Appendix 1(c)]. While the correlation between the desire for development-oriented feedback and the complete (not at all) lack of radio information on RCs was significantly moderate [r=0.48, see Appendix 1(d)]. An increase in the number of respondents along the development-oriented feedback content category negatively correlates with the respondents increase in the expressed "complete" lack of radio information on local political organization (RCs) variable. The weak correlation coefficient presupposes the existence of other influencing variables than that expressed in this study.

One clear inference arises from the analysis of the constraint parameters expressed in the preferential content category which is at variance with the respondent's expressed impression about the expected radio medium use. This medium use "expectation" is further reinforced by the significantly high possession of radio sets in the sampled households (72%).

Feedback Constraints. Respondents who have ever participated in a radio program (15%) contrasted highly against those who have never (85%). Reasons for non participation were categorized: first, lack of means to participate (not approached, radio station very far) 88% and, second, other reasons than lack of means to participate 12%.

Correlation between frequency of participation (never participated) and reasons for non participation (lack of means to participate) was significant and strong [r=0.87, see Appendix 1(e)]. To determine the effectiveness of the significance of the expressed non participation frequency (i.e. whether it expresses real desire to participate), correlation was performed with desired development-oriented feedback content category. The relation was significant but moderate [r=0.5, see Appendix 1(f)].

## General Opinions and Suggestions

Respondents were, outside the structured questionnaire, also given a chance to give their views as regards problems associated with radio services in their areas. Those from Nebbi responded most with general opinions and suggestions. Their major complaint was the poor radio signal quality and constant blackout and requested the restoration of Gilgili MW Station which at the time of the survey was being revived. Others requested for reassumption of satellite radio services and introduction of FM transmitters which were abandoned with the fall of Idi Amin from power (see Chapter Two).

Complaints were also raised about the little air time allocated to programs in Alur (local area) language requesting for the introduction of news in Alur to be scheduled immediately after Luo language news bulletin, claiming that not all the majority of Alur understand Luo language. Luo is taken as a northern regional language by Radio Uganda. The implicitly ethnic identity forces on the national radio program scheduling cannot be overlooked in this expressed request.

A significant number also complained about the poor program production, especially the skewed content often dominated by foreign and capital city issues while ignoring local issues like RCs affairs.

Kabale respondents requested for Radio Uganda to open up an office in the area to handle their responses and channel their views to the Broadcasting House. While

Mukono respondents complained about leaving them out in the cold with regard to program content participation.

## Conclusions

Findings of this survey are expressed in the leit-motif of the four sub-hypotheses. Constant technical failures constrain the effective listenership of the radio medium. The potentially "effective" listenership expressed along the content categories and language diversity variables are in turn constrained by the preferential (skewed) program scheduling across these same variables which to date is significantly at variance with needs of rural audiences. The audience, owing to feedback constraints, are in this variant context reduced to dotted, cheerless spectators.

#### CHAPTER 5

#### CONCLUSION

Putting into perspective the problems to development broadcasting is a complex undertaking given the intricate texture of the causal variables on one hand and the multifaceted nature of the development process on the other. This thesis as a technical analysis has examined the factors underlying the problems to development radio broadcasting in Uganda.

Owing to its centralized nature, Radio Uganda's broadcast structure and pattern is inherently constrained in attaining optimum medium utilization, especially in the rural contexts. The survey of the audiences listenership habits and feedback flow constraints reinforces the findings in both the focussed synthesis (Chapter Two) and contents analysis (Chapter Three). Audiences are highly dissatisfied with both the technical quality and content categories. Coupled with feedback flow constraints, radio's potential to facilitate rural change is greatly constrained.

The political factor surfaces as a major constraint in the development and organization of radio broadcasting in Uganda. Secondary constraints such as lack of finance, the bureaucratic decision making, poor state of professionalism, and failure to integrate rural populations in the design of content categories have served to widen the gap between the broadcasting institution, its envisaged audiences, and development objectives. Broadcasting has been technocratically conceived basically from the political perspective manifested in the high publicity element of the content categories.

This scenario and its negative implications can best be summarized in Amjad's observations:

"People in power want radio to prevent the breakdown of their communication in terms of public service. Such a society compels radio to indulge in over publicity of their rulers and succeeds in only distancing them from the people. They have little understanding that broadcasts can be productive to limit. Perhaps that is why one experienced media man was heard to say that it is the policy makers who should be given training on the effects of mass communication to enable society to avoid cognitive dissonance. When the source of news does not enjoy credibility, how can the message be sold?" (Amjad Hossein, 1989, p. 4).

This thesis reinforces, with both qualitative and empirical data, the decentralization theoretical framework and model as an alternative to restructuring, harmonizing, and rationalizing of Radio Uganda's communication channels to provide an environment where policy makers, development agents, program producers, and the audience can interact more conveniently. In this framework, the broadcast authorities would be more able to predict conditions whereby radio broadcasting may best facilitate the development process. It offers more opportunities to increase content categories and language variable shares where more broadcast hours are left to the regional channels. More important, fewer hours of joining channels reduces the link costs and ensures broadcast continuity (see Figure 6).

These findings have both political and statistical significance. The political significance of the findings is the greater democratic decentralization framework through which the radio medium can be exploited optimally to benefit both the political system and the population. The decentralization model presents numerous opportunities to enhance local political organization through grassroot institutions like RCs and enables radio to play a larger role of in policy formulation than the presently limited one-way policy implementation flow envisaged by the government.

The development and organization of radio broadcasting in the Uganda context will thus greatly depend on how the government handles the political question. The 1981-86 revolution provides a clear example that genuine power rests among the

consensus of the people. Rural peasants defeated a neo-colonial army, demystifying the power of the gun that ravaged the lives of simple citizens for over a decade.

This transformation process for democracy, however, presents even more challenges of fundamental changes to demystify the colonial and neo-colonial legacy of radio being a preserve of the political powers that may be. Until then, radio will continue to sound strange and meaningless to the rural populations who produce more than 80% of the GNP and remain entrenched in poverty, disease, and ignorance.

#### CHAPTER 6

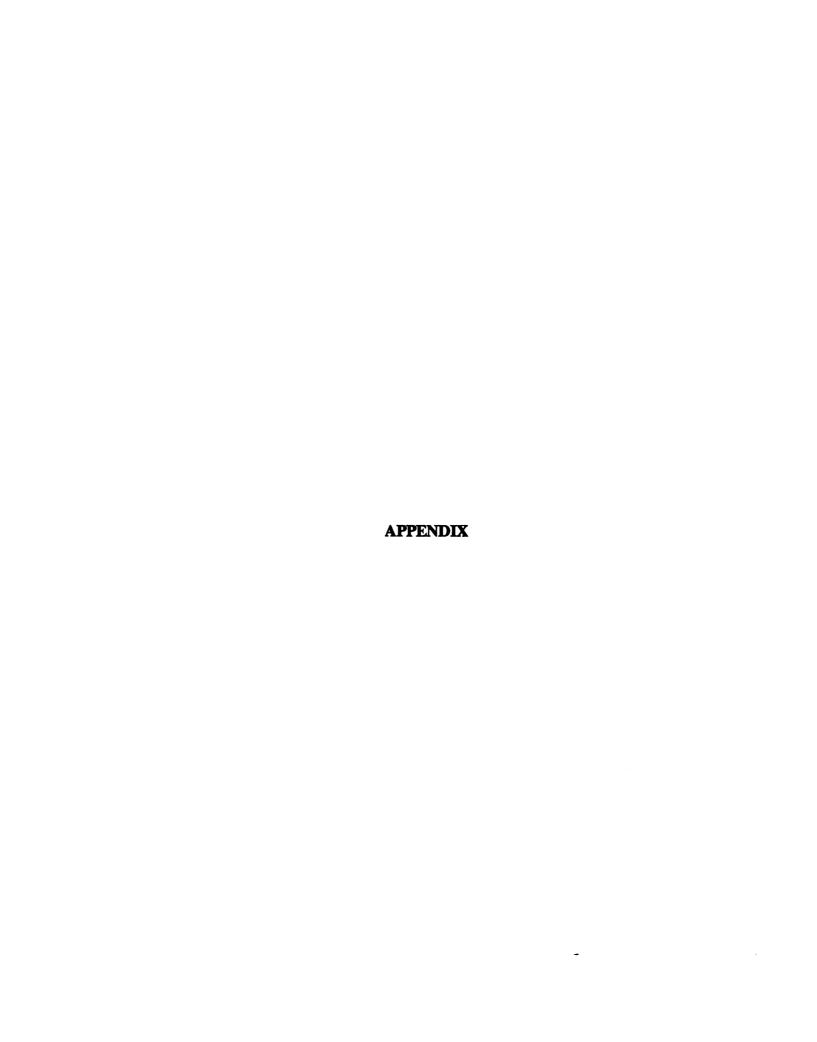
### RECOMMENDATIONS

The desire to undertake this study was based on the strong hope that decision makers would use these findings to guide them in reaching long lasting solutions to the state of broadcasting in Uganda. The re-organization and development of the radio medium is fundamental to the overall national development effort.

The need for more pragmatic and action-oriented recommendations for alleviating the problems to development broadcasting become a policy imperative. A policy framework must, however, be first put in place to guide the development of a more efficient program strategy to reduce the current variance between the programming pattern and the multilingual audience needs.

The varied and strong ethnic pride element manifested in the current languagestrained programming pattern is, owing to nationality political pressure groups, likely to persist. In this context, any restructuring of the broadcasting sector sensitive to these contextual variables would find such policies for attaining optimum utilization of the radio medium in the decentralization broadcast model. Other alternatives like privatization and parastatal options would find room along this model in the long run.

Lastly, this study has emphasized the scope rather than the depth aspect of the constraints to development radio broadcasting. I suggest that each of the causative variables be studied in depth, plus the implementation parameters of addressing these constraints in a decentralization framework (using other comparative research techniques where possible).



# **APPENDIX**

1(a)

	Х	Y	$(X-\overline{X})$	$(Y-\overline{Y})$	$(x-\overline{x})^2$	$(Y-\overline{Y})^2$	$(X-\overline{X})(Y-\overline{Y})$
Tororo	23	26	-4.6	-2.8	21.16	7.84	12.88
Mukono	30	29	2.4	0.2	5.76	0.04	0.48
Kampala	23	29	-4.6	0.2	21.16	0.04	-0.92
Kabale	30	31	2.4	2.2	5.76	4.84	5.28
Nebbi	32	29	4.4	0.2	19.36	0.04	0.88
					73.2	12.8	18.6

$$\overline{X} = 27.6$$
  $\overline{Y} = 28.8$ 

$$r = \frac{\sum (X - \overline{X})(Y - \overline{Y})}{\sqrt{\sum (X - \overline{X})^2 \sum (Y - \overline{Y})^2}} = \frac{18.6}{\sqrt{73.2 \times 12.8}} = 0.6$$

1(b)

	Х	Y	(X- <del>X</del> )	$(Y-\overline{Y})$	$(x-\overline{x})^2$	$(Y-\overline{Y})^2$	$(X-\overline{X})(Y-\overline{Y})$
Tororo	23	25	-4.6	1.8	21.16	3.24	- 8.28
Mukono	30	15	2.4	-8.2	5.76	67.24	-22.14
Kampala	23	20	-4.6	-3.2	21.16	10.24	14.72
Kabale	30	27	2.4	3.8	5.76	14.44	9.12
Nebbi	32	29	4.4	5.8	19.36	33.64	25.52
					73.2	128.8	18.94

$$\overline{X} = 27.6$$
  $\overline{Z} = 23.2$ 

$$r = \frac{\sum (X - \overline{X})(Z - \overline{Z})}{\sqrt{\sum (X - \overline{X})^2 \sum (Z - \overline{Z})^2}} = \frac{18.94}{\sqrt{128.8 \times 73.2}} = 0.2$$

1(c)

	X	Y	$(X-\overline{X})$	$(Y-\overline{Y})$	$(x-\overline{x})^2$	$(Y-\overline{Y})^2$	$(X-\overline{X})(Y-\overline{Y})$
Tororo	21	27	-2	-2.8	4	7.84	5.6
Mukono	30	20	7	0.2	49	0.04	1.4
Kampala	20	31	-3	1.2	9	1.44	-3.6
Kabale	16	30	-7	0.2	49	0.04	-1.4
Nebbi	28	31	5	1.2	25	1.44	6.0
·		····	V		136	10.8	8.0

 $\overline{X} = 23$   $\overline{Y} = 29.8$ 

$$r = \frac{\sum (X - \bar{X})(Y - \bar{Y})}{\sqrt{\sum (X - \bar{X})^2 \sum (Y - \bar{Y})^2}} = \frac{8.0}{\sqrt{136 \times 10.8}} = 0.21$$

1(d)

	Х	Y	$(X-\overline{X})$	$(Y-\overline{Y})$	$(x-\overline{x})^2$	$(Y-\overline{Y})^2$	$(X-\overline{X})(Y-\overline{Y})$
Tororo	21	27	6.6	-2	4	43.56	-13.2
Mukono	30	12	-8.4	7	49	70.56	-58.8
Kampala	20	14	-6.4	-3	9	49.96	19.2
Kabale	16	26	5.6	-7	49	31.36	-39.2
Nebbi	28	23	2.6	5	25	6.76	13.0
					136	202.2	-79

$$\overline{X} = 23$$
  $\overline{Z} = 24.4$ 

$$r = \frac{\sum (X - \bar{X})(Z - \bar{Z})}{\sqrt{\sum (X - \bar{X})^2 \sum (Z - \bar{Z})^2}} = \frac{79}{\sqrt{202.2 \times 136}} = -0.48$$

1(e)

	X	Y	$(X-\overline{X})$	$(Y-\overline{Y})$	$(X-\overline{X})^2$	$(Y-\overline{Y})^2$	$(X-\overline{X})(Y-\overline{Y})$
Tororo	24	22	-3.4	-2	11.56	4	6.8
Mukono	31	31	3.6	7	12.96	49	25.2
Kampala	25	19	-2.4	-5	5.76	25	12.0
Kabale	28	23	0.6	-1	0.36	1	- 0.6
Nebbi	29	25	1.6	1	2.56	1	1.6
					33.2	80	45

 $\overline{Y} = 27.4$   $\overline{Z} = 24$ 

$$r = \frac{\sum (Y - \overline{Y})(Z - \overline{Z})}{\sqrt{\sum (Y - \overline{Y})^2} \sum (Z - \overline{Z})^2} = \frac{45}{\sqrt{33.2 \times 80}} = 0.87$$

1(f)

	X	Y	$(X-\overline{X})$	$(Y-\overline{Y})$	$(x-\overline{x})^2$	$(Y-\overline{Y})^2$	$(X-\overline{X})(Y-\overline{Y})$
Tororo	27	24	-2.8	-3.4	7.84	11.56	9.56
Mukono	30	31	0.2	3.6	0.04	12.96	0.72
Kampala	31	25	1.2	-2.4	1.44	5.76	-2.88
Kabale	30	28	0.2	0.6	0.04	0.36	0.12
Nebbi	31	29	1.2	1.6	1.44	2.56	1.92
					10.8	33.2	9.4

 $X = 29.8 \quad \overline{Y} = 27.4$ 

$$r = \frac{\sum (X - \overline{X})(Y - \overline{Y})}{\sqrt{\sum (X - \overline{X})^2 \sum (Y - \overline{Y})^2}} = \frac{9.4}{\sqrt{33.2 \times 10.8}} = 0.5$$



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