

## II - 6 PROGRAM TRANSMISSION PLAN

### 6.1 Basic Policy for Program Transmission Planning

Programs should be able to be transmitted instantaneously not only from Asuncion to the regional stations, but also from the regional stations to Asuncion.

The program transmission plan should be formulated to coordinate with the broadcast network plan described in Chapter 4 of PART II.

### 6.2 Program Transmission Plan to Main Regional Stations

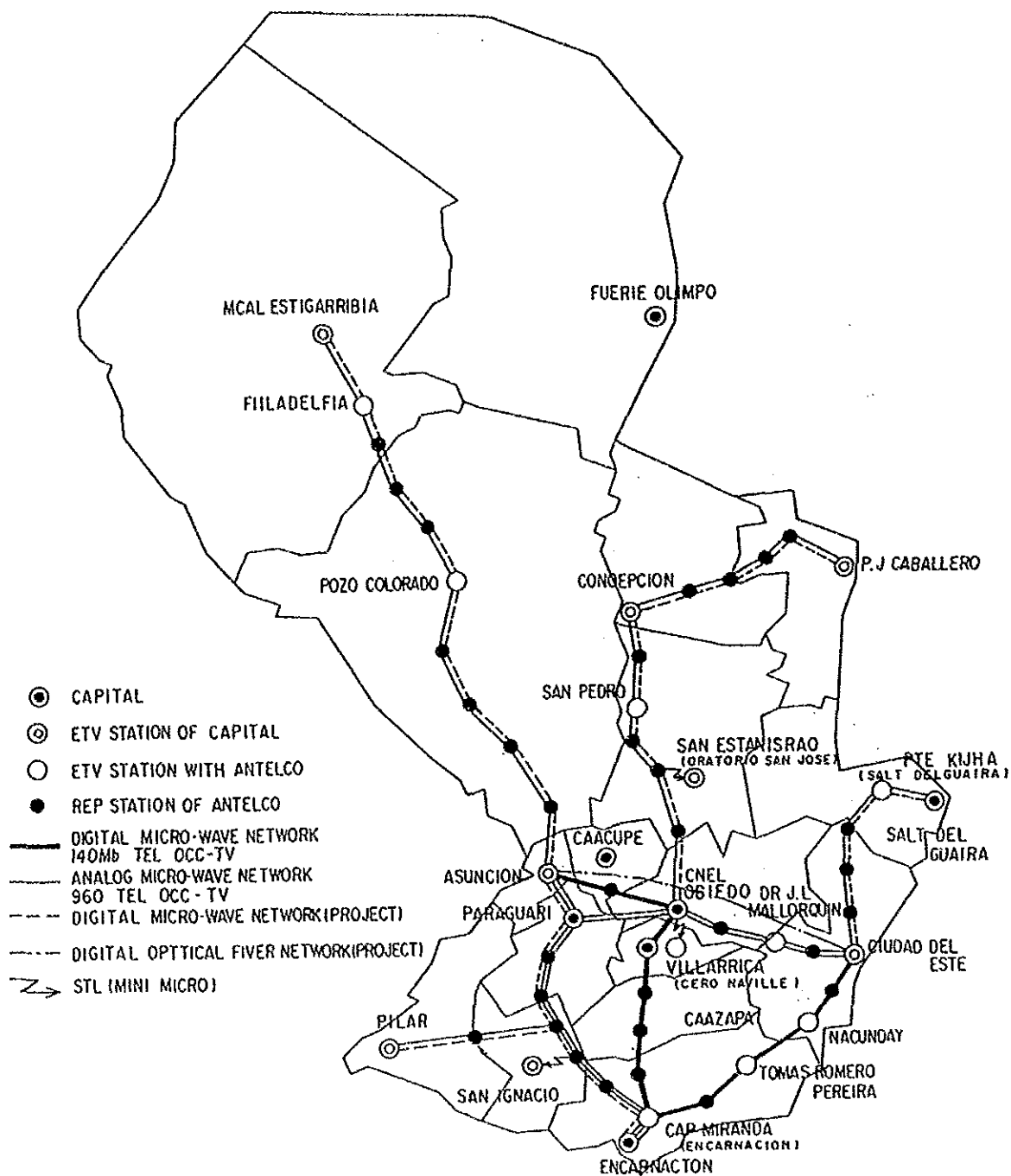
ANTELCO is now carrying out a ten-year plan to modify the nation-wide microwave network. A digital transmission network (140 Mb/sec) has been built from Asuncion to Encarnacion to Ciudad del Este, and will be put into service for telephone as well as for TV use in March 1993. In addition, digitalization of the circuits between Ciudad del Este and Salto del Guaira is scheduled for completion in 1994, while the circuit from Asuncion to Mcal Estegaribia is scheduled to be completed in 1999. Further progress is being made in the digitalization connecting other districts and is expected to be complete in the year 2002.

Furthermore, through the adoption of the world standard for digital coding (34Mb/sec or 45Mb/sec), the two television commercial programs as well as the educational broadcasting program will be able to be multiplex transmitted in one digitalized micro-wave circuit.

Thus, the program transmission to the main regional television stations are planned to use ANTELCO's digital micro-wave networks.

Both the present status of, and the future plan for, this network is shown in the following map.

Figure 6.2.1 Map of Micro-Wave Network for TV



## 7.1 Operation Plan

Based upon the Program Planning described in Chapter 3, a plan to secure staff was compiled to make possible production of broadcast programs. Then, another plan was compiled to operate studios to produce programs for each phase. On-the-job training will be conducted for staff before the Full-scale Phase starts. A plan to increase number of staff will also be implemented, so that all is ready when the Full-scale Phase starts in the sixth year.

### (1) Staff and Their Training

#### 1) First Year (Preparatory Phase)

In the first year, five program directors and a crew of studio production staff will produce 50 programs, taking 20 days to produce each.

The studio production crew will consist of about ten technical members. Under the technical director, there will be cameramen and technicians specializing in video, sound, and lighting

#### 2) Second Year (Experimental Phase)

There will be two studio production crews (20 people in all). It will now take 10 days to produce one program. Programs will be broadcast by CATV in Asunción for experimental utilization.

#### 3) Third to Fifth Year (Introduction Phase)

One crew of ten will be added each year to make them from three to five crews in all. Staff for the main control room and those who operate transmitting facilities will be made available to broadcast using new transmitting devices. (To be increased from 15 in the third year to 26 in the fifth year). Ten beginners will be put to the on-the-job training every year to meet planned increases of staff the next year.

(2) Operational Plan in the Full-scale and the Integrated Phases

1) Studio Operation

When the Full-scale Phase starts, the two studios in the ETV Center will be used fully for seven days a week. This includes their use for "Live Variety Programs" on Saturday and Sunday.

The studios have combined capability of producing up to 1,400 programs a year. But the current programming plan requires production of about 1,000 programs a year. So, five crews of studio staff members (about 50) will work on a two-shift a day basis.

2) Post Production Operation and Staff Needed

The two post production rooms will be operated on a two-shift on weekdays. In all, eight staff members will be needed to make four crews with each having two members.

3) Staff for Two VTR Editing (two rooms) and EFP

One staff member is needed to provide for technical support for a program director to edit programs. In all, from two to four such staff members will be needed.

EFP staff are those needed for on-location activities with VTR. A team of a cameraman and a light man will support a program producer. They will be increased from four to eight eventually.

4) Staff for OB Van

An OB van team consists of seven staff members with the technical director as its leader. When there is no OB work, they will assist in EFP operations.

5) Master Control Room Personnel

One crew of master control room personnel has five members, one technical director, three in charge of VTR for broadcasting and operation of a continuity studio, and one transmitter operator. When the Full-scale Phase starts, crews should work around the clock on a three-shift system.

The work-shift continues all around the year. So, when an employees' leave factor is taken into account (365 divided by 200 work days/year = 1.8), a total of 27 master control staff members will be required. In the master control room, news and information will be broadcast "live" using the continuity studio.

6) Centralized Maintenance Staff

A centralized maintenance and control system will be introduced to carry out maintenance both in the Center and local stations effectively. The centralized system will take care of the nationwide network as a whole.

The centralized maintenance system will have two or three skilled and experienced engineers. Three other engineers will work during the office hours to take care of electricity and air conditioning of offices.

7) Staff at Local Transmitting Stations

The first plan stations will be manned and the second plan stations will be unmanned. The up-to-date solid-state transmitters have high reliability. One person on each shift and a three-shift system a day will suffice. Existing ANTELCO transmitters can be jointly used, and the staff there can also work for these local stations. Therefore, it will be enough if each local station get three or four more staff members on an average for the new operation.

On the stage of Programming I in the Full-scale Phase, nine people will be added at three of the 13 1st plan stations (Ciudad del Este, Encarnación, and Villarrica). On the Full-scale Phase 2, 40 staff members will be added to the remaining nine stations except at the one in Asunción.

## 8) Employment of New Staff and On-the-job Training

Operations of broadcasting stations always need some reserves. It is necessary to recruit new people and have them stand by as reserves and train them on the job.

## 7.2 Maintenance Plan

### (1) Basic Concept about Maintenance Plan

This broadcasting network plan is the first one to be operated in Paraguay. This maintenance plan was compiled with the following two items in mind:

- 1) It should be a maintenance system that can be pragmatic and feasible in Paraguay.
- 2) It should also be a system that can be handled even by new engineering staff at the ETV Center.

### (2) Establishment of Centralized Maintenance and Control System.

Recent broadcasting equipment are highly reliable. This is the basis of our plan for a concentrated maintenance and control system. A Group of people will be assigned to be in charge of such a concentrated maintenance and repair system. Maintenance and repair work itself will be commissioned to outside maintenance companies. Repair of broadcasting units will be commissioned to manufacturers outside Paraguay. The group in charge of centralized maintenance and control system will function as an intermediary between the education broadcasting organization and outside organizations that will provide maintenance and repair services.

### (3) Budget for Maintenance

Since maintenance and repair work is contracted out, it is important to secure more than a certain amount of funds for this purpose every year. In general, 3 % of all the cost needed to buy broadcasting facilities is said to be required for their maintenance and repair. It will, therefore, be necessary for the new broadcasting organization to secure annual budget allocation for maintenance and repair in a form that can be paid in foreign currencies.

**(4) Periodic Maintenance Work**

Studio floors should be checked and maintained at a certain interval of time. Lighting apparatus should be cleaned regularly. It is important to build a system of periodic maintenance and repair.

**(5) Maintenance of VTR Head-chips and VTR Tapes**

These are subject to abrasion. It is essential to always check how long they have been used and how often.

## II-8 ESTIMATES OF PROJECT COSTS

### 8.1 Construction Cost

The total investment cost to finance the construction of facilities envisaged in the Master Plan is estimated at 45.4 million dollars. Of the amount, 33.5 million dollars is to be provided for in foreign currencies and 11.9 million dollars by the Paraguay currency.

The project calls for the following four construction works.

- Work 1 Construction of a television transmitting station in Asuncion, which covers 40% of Paraguayan population, and supplementation of existing studio facilities (US\$4.7 million)
- Work 2 Construction of the ETV Center in Asuncion and construction of stations in three major regional cities, which increases total population coverage to 62 % (US\$19.3 million)
- Work 3 Construction of remaining nine regional transmitters of 13 1st-plan station, which increases total population coverage to 84 % (US\$10.8 million)
- Work 4 Construction of ten 2nd-plan regional stations, which increases total population coverage to 94 %, and construction of studios in major regional stations (US\$10.6 million)

By utilizing ANTELCO's station facilities, nine stations among 13 1st Plan stations, and six stations among 10 2nd Plan stations, reductions of construction cost as well as operating staff number can be possible.

Table 8.1.1 shows the cost of construction works.

Table 8.1.1 Cost of Construction Works

	Unit: US\$ million		
	Foreign	Local	Total
a Construction Work 1	4.0 (85%)	0.7 (15%)	4.7
b Construction Work 2	12.4 (64%)	6.9 (36%)	19.3
c Construction Work 3	8.8 (81%)	2.0 (19%)	10.8
d Construction Work 4	8.3 (78%)	2.3 (27%)	10.6
<b>Total</b>	<b>33.5 (74%)</b>	<b>11.9 (26%)</b>	<b>45.4</b>



## 8.2 Construction Process and Annual Investment Plan

The project shall be implemented stage-by-stage as shown in the Construction Schedule, Figure 8.2.1.

Figure 8.2.1 Construction Schedule

Year	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	
Development Phase	Pre-paratory	Ex-peri-men-tal	Introduction			Full-scale 1			Full-scale 2			Integrated						
Construction Schedule	Construction Works 1		Construction Works 2			Construction Works 3			Construction Works 4									

The annual investment plan of the construction is shown in Table 8.2.1.

Table 8.2.1 Annual Investment Plan

Unit: US\$million

	Investment Budget			
	Foreign	Local	Total	
1994	0	0	0	
1995	4.0	0.7	4.7	(Work 1)
1996				
1997	0.4	5.9	6.3	19.3 (Work 2)
1998	12.0	1.0	13.0	
1999				
2000	0.1	1.2	1.3	10.8 (Work 3)
2001	8.7	0.8	9.5	
2002				
2003				
2004	8.3	2.3	10.6	(Work 4)
2005				
2006				
2007				
2008				
	33.5	11.9	45.4	

### 8.3 Annual Operating Cost

According to the Programming Plan (Chapter 3) and Operation and Maintenance Plan (Chapter 7), operating costs for each year are calculated as follows.

#### Yearly Operating Costs

Unit: US\$thousand

	Personnel Costs	Program Production Costs	VTR tapes	Microwave Networks	Electricity	Mainten- ance	Administ- ration	Total
1994	219	20	4	0	0	0	24	268
1995	386	64	13	0	0	0	89	552
1996	726	192	38	0	4	96	148	1,204
1997	1,015	412	51	0	4	96	222	1,801
1998	1,310	605	48	0	4	96	393	2,455
1999	1,586	1,587	60	124	10	381	562	4,309
2000	1,586	1,631	67	124	10	381	571	4,370
2001	1,586	1,631	67	124	10	381	655	4,453
2002	2,049	1,559	51	528	19	561	751	5,578
2003	2,049	1,639	67	528	19	561	761	5,624
2004	2,049	1,639	67	528	19	561	854	5,708
2005	2,168	1,919	119	560	30	750	914	6,460
2006	2,168	1,919	119	560	30	750	914	6,460
2007	2,168	1,919	119	560	30	750	914	6,460
2008	2,168	1,919	119	560	30	750	914	6,460
2009	2,168	1,919	119	560	30	750	914	6,460

#### 8.4 Annual Required Expenditure (Construction Costs + Annual Operating Costs)

Annual required expenditures (Construction Costs + Annual Operating Costs) for the Master Plan Project are shown in Table 8.4.1

Table 8.4.1 Annual required expedition

Unit: Million US\$

Year	Construction Costs	Operating Costs	Total
1994	0	0.3	0.3
1995	4.7	0.6	5.3
1996	0	1.2	1.2
1997	6.3	1.8	8.1
1998	13.0	2.5	15.5
1999	0	4.3	4.3
2000	1.3	4.4	5.7
2001	9.5	4.5	14.0
2002	0	5.5	5.5
2003	0	5.6	5.6
2004	10.6	5.7	16.3
2005	0	6.5	6.5
2006	0	6.5	6.5
2007	0	6.5	6.5
2008	0	6.5	6.5
2009	0	6.5	6.5

## II-9 PROJECT EVALUATION

### 9.1 Basic Principles of Evaluation

#### (1) Socioeconomic Analysis

The objective of the analysis is to estimate the socioeconomic effects of the Project in the Master Plan and to assess the feasibility of the Project from a socioeconomic standpoint.

As the Master Plan is formulated as part of a social development designed to meet the basic learning requirements of the public, it does not intend direct monetary benefits. Evaluation of the Project was made from the socioeconomic viewpoint in regard to the prospective contribution of the Project to the diffusion of basic education among the public. The following two types of effects were evaluated.

- Direct effects : direct effects on recipients of educational broadcasting
- Secondary effects : social effects caused by socioeconomic extension of direct effects

From the implementation of the Project it can be ascertained that various effects have been brought upon the society and economy of Paraguay. However, because the economic benefits of the implementation cannot be assessed in monetary or quantitative terms, the socioeconomic benefits of implementing the Project will be assessed in qualitative terms.

#### (2) Financial Analysis

The financial cost for the investment, the operation and maintenance for the Project are subject to the financial analysis. As the anticipated sources of income for the educational broadcasting network are limited commercials to be inserted among educational and cultural programs for general public, the likely cash flow of the organization responsible for the educational broadcasting and the required scale of government subsidy are estimated. The suitability of providing such a government subsidy is also examined in relation to the trends of government finance.

## **9.2 Socioeconomic Effects of Educational Television Broadcasting**

### **(1) Preconditions of Evaluation**

The effects of educational television broadcasting are not uniform and depend on the program contents and the method of its use. The types of programs, use methods and recipients environment, which are the preconditions of evaluation, are shown in Table 9.2.1

### **(2) Socioeconomic Effects**

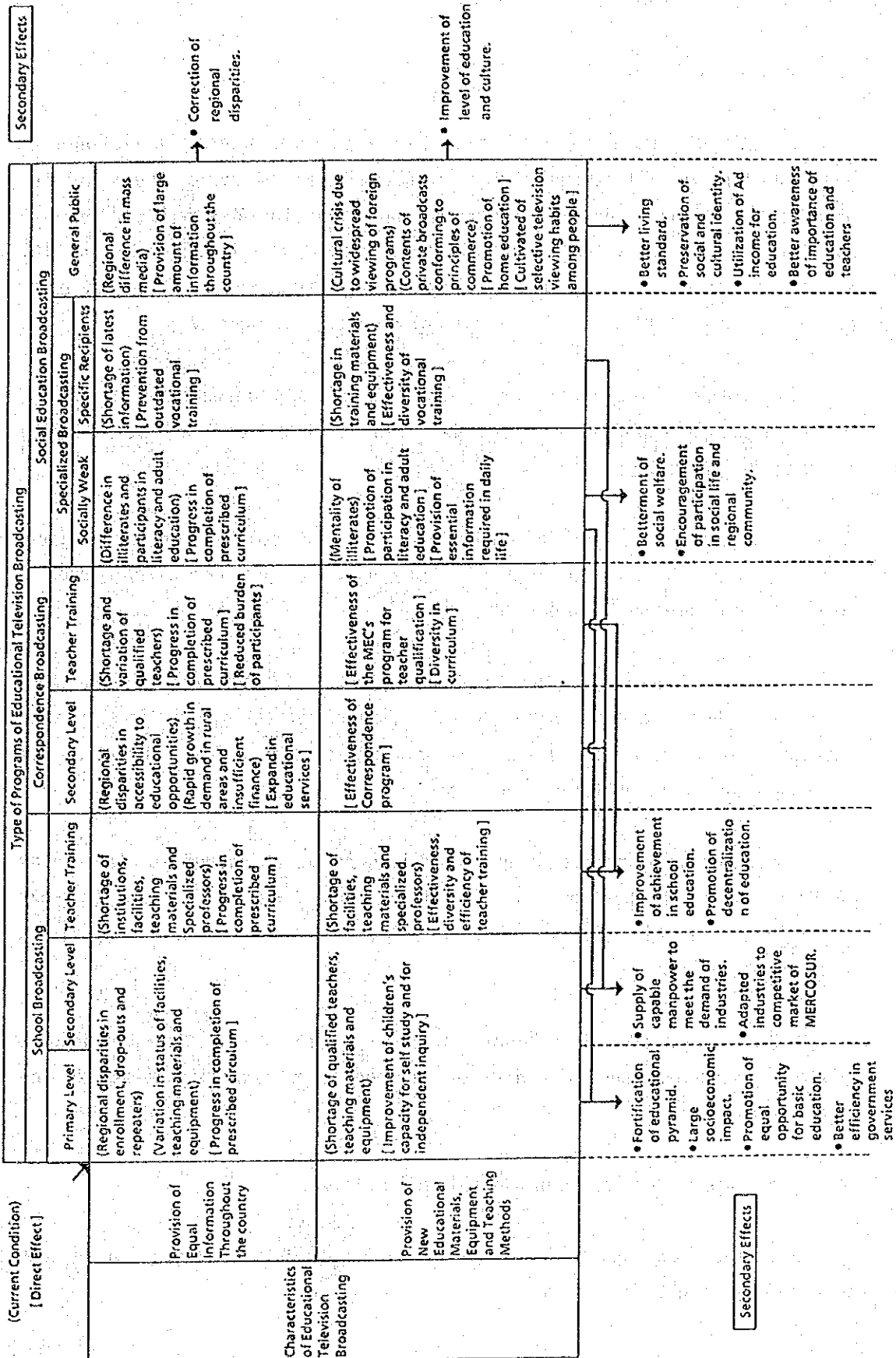
Direct and secondary effects of the Project for each field of education is summarized as Figure 9.2.1.

As shown in the Figure 9.2.2, the Project will cause many positive effect in each field and level of education and will produce effects of essential importance on the society and economy of Paraguay.

Table 9.2.1 Program Contents, Use Method and Recipients Environment of Educational Television Broadcasting by Type of Education

Type of Education	Main Programmes			Use Method (Basic Unit)	Recipient Environment
	Short-Term Targets	Medium-Term Targets	Long-Term Targets		
1. School Education					
1-1 School Broadcasting					
1-1-1 Primary Education	Spanish; arithmetic; science; health and hygiene	as left	as left	school	teacher shortage, gap between educational environment of urban and rural areas
1-1-2 Secondary Education		basic courses (natural science; hygiene; art; social studies; labour)	addition of specialised subjects to basic courses	school	2-shift system; shortage of teachers and teaching materials
1-1-3 Teacher Training	instruction method for each subject; method to efficiently use broadcasting	instruction method for each subject	as left	school	shortage of research and/or private learning time due to 2-shift system; high education cost
1-2 Correspondence Broadcasting					
1-2-1 Secondary Education			Spanish; mathematics; natural science	individual	disadvantageous element due to inadequate school facilities, need to work for the family and poor transport
1-2-2 Teacher Training	instruction method for each subject; method to efficiently use broadcasting	as left	as left	individual	as above
2. Social Education					
2-1 Specialised Broadcasting					
2-1-1 Socially Weak	anti-illiteracy education	addition of basic knowledge required for social and family life	addition of information on social activities and social issues	group/individual	not wealthy (non-possession of TV set)
2-1-2 Specific Recipients			technical and other courses to meet specific demands	individual	insufficient opportunity for education, including a shortage of facilities
2-2 General Education	women; culture; environment; public hygiene; civil life; others	as left	as left	individual/family	

Figure 9.2.2 Socioeconomic Effects of Educational Television Broadcasting



### **9.3 Financial Analysis**

#### **(1) Appraisal Method**

In this financial analysis, scope of the Project can be defined as broadcasting of educational programmes for the objective areas by the broadcasting entity as planned in each component of the Master Plan. The cost for the Project consists of construction cost for establishment of the educational broadcasting network and operation cost of the broadcasting body. Financing cost will also be analyzed in case where loans are necessary.

The educational broadcasting is placed as part of the nation's social policy, the major part of financial source of the broadcasting entity should be funded by The National Treasury.

In this analysis the scale and the period of the subsidy from the National Treasury is clarified taking account of all necessary cost such as construction cost, operation cost and finance cost.

The other financial for the broadcasting body -- in addition to the National Treasury -- is an advertisement income. Advertisement income is estimated putting in order what advertising income ought to be within the limit set corresponding to the public nature of the Project.

Advertisement income is estimated because, even though for the strong public nature of the Project, reduction of the burden on the National Treasury should be considered under the budgetary constraints to secure smooth operation of the broadcasting.

Necessary subsidy is estimated taking account of advertisement income and appropriateness and possibility is assessed from budgetary trends of the relevant sectors.

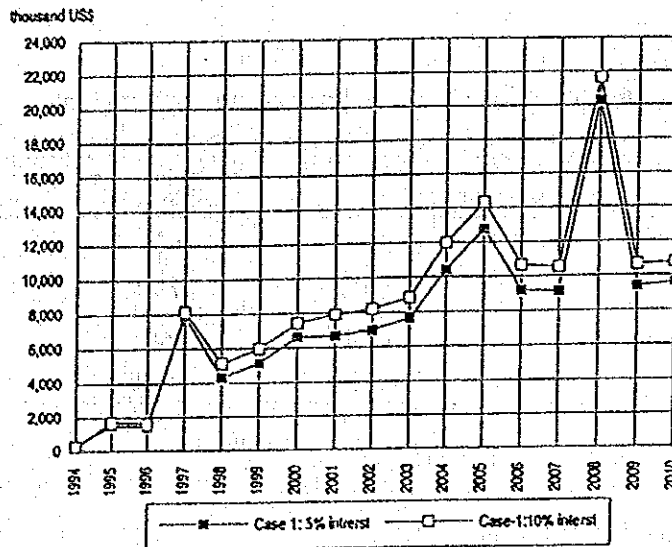
#### **(2) Estimate of Subsidy from the National Treasury**

The scale of subsidy is estimated as Figure 9.3.1 without taking into account any advertising income.



In the estimation, the conditions of long term loans only for foreign currency portion of capital investment are assumed as 25 years' repayment, including 5-year grace-period, and two cases --5% (case 1) and 10% (case 2) percent -- for interest.

Figure 9.3.1 Change in Subsidy from the National Treasury for the Project (Advertisement disregarded)



### (3) Estimated Advertisement Income

Advertisement income (ad income) is estimated based on the current situation of advertising for existing TV stations setting limitation from the public nature of the Project.

Major assumptions for the estimation are as follows.

- a) Ad income is based on the rate of a short spot CM.
- b) Charges for Government's Public Relation (PR) films are regarded here as ad income.
- c) CMs are considered only for general education and culture broadcasting for the general public.
- d) CMs can run for 10% of the program hours.

e) Government's PR charges are estimated on a half of commercial advertisement basis and supposed to be broadcast in public notice hours

f) The unit charge is set lower than the private one.

Two cases are set taking the coverage and operational capability into consideration. Cases set in this analysis are summarized as Table 9.3.1.

Table 9.3.1 Cases for the Ad Income Estimation

	Interest of Long Term Loan	Unit Ad Charge (% to Commercial Broadcasting St.)		
		Full-Scale I	Full-Scale II	Integrated
Case 1-A	5%	30%	60%	90%
Case 1-B	5%	50%	75%	100%
Case 2-A	10%	30%	60%	90%
Case 2-B	10%	50%	75%	100%

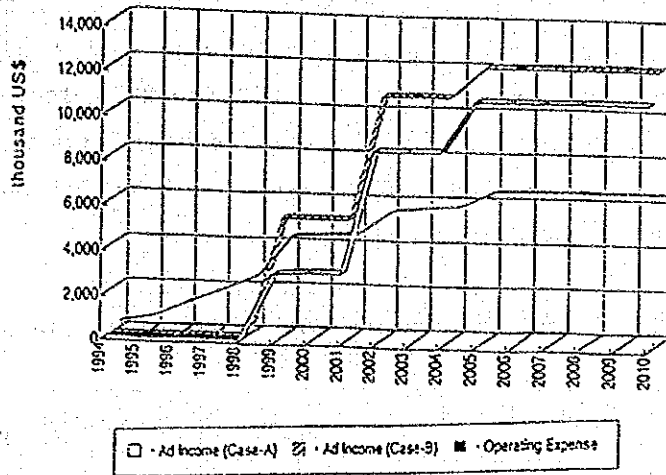
Under the conditions specified above, the advertisement income in each phase is estimated as Table 9.3.2.

Table 9.3.2 Annual Advertisement Income (in thousand US\$)

Case-A			
	Full-Scale 1	Full-Scale 2	Integrated
Commercial Ad	3,014	8,341	10,431
Public Relation	202	405	607
Total	3,217	8,746	11,038
Case-B			
	Full-Scale 1	Full-Scale 2	Integrated
Commercial Ad	5,024	10,427	11,590
Public Relation	337	506	674
Total	5,361	10,933	12,264

Changes in the estimated advertisement income and operation cost are shown in Figure 9.3.2

Figure 9.3.2 Change in Operation Cost and Advertisement Income



The FIRR (OI) (financial internal rate of return on total investment) in each case is shown in Table 9.3.3. These FIRRs show that the project is not financially feasible in the sense of commercial business or certain amount of subsidy will be necessary.

Table 9.3.3 Financial Internal Rate of Return

Financial Internal Rate of Return Total Investment*	
Case 1-A	- 2.45 %
Case 1-B	+ 2.48 %
Case 2-A	- 2.45 %
Case 2-B	+ 2.48 %

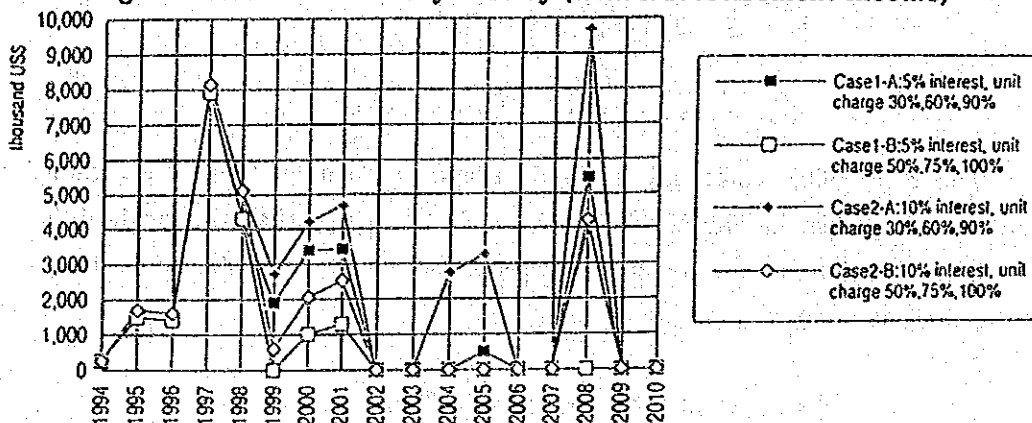
\* Here, to clarify the rentability of the project itself, Financial Internal Rate of Return On total Investment (FIRROI) is calculated. As given in the following formula, FIRROI is not affected by interest of loan.

$$\sum_{t=1}^T \frac{I_t}{(1+r)^t} = \sum_{t=1}^T \frac{B_t - C_t}{(1+r)^t}$$

Here,  $I_t$  : Investment in year  $t$   
 $B_t$  : Advertisement Income in year  $t$   
 $C_t$  : Running Cost in year  $t$   
 $T$  : Period (17 years)  
 $r$  : FIRROI

Based on the condition for long term loan, necessary amount of subsidy from National Treasury is computed. As shown in Figure 9.3.3, subsidy from National Treasury is largely reduce in any case. In most cases, except Case 1-B however, subsidy will be required even after 2002. In 2008, the year for the replacement of electric equipment, US\$10 million to US\$4 million of subsidy is necessary. In Case 1-B, Self-financing operation will be possible, i.e., the broadcasting body will be able to be a public corporation.

Figure 9.3.3 Necessary Subsidy (with Advertisement Income)



(4) Appropriateness and Possibility of the Subsidy from the National Treasury

1) Need and Appropriateness of the Subsidy from the National Treasury

As identified in the analysis, the broadcasting entity, in most cases, will depend on the National Treasury for its investment fund and operating expense even in the Integrated phase.

National Treasury should be appropriated from the viewpoint of the objectives, nature and socioeconomic effects to cover the deficit.

2) Possibility of the Subsidy from the National Treasury

i) Support by the People

Since education especially basic education benefits the entire nation directly, , the people might understand the subsidy from the National Treasury as one of the appropriate uses of national taxes.

ii) Possibility from National Financial Viewpoint

Budgetary trends and contents of relevant sector of the Project, education sector and telecommunication sector, are reviewed below in the budget of the MEC and ANTELCO, the main executing agencies for the sectors.

Change in the total governmental budget is shown in Table 9.3.4. The budget grows much faster than inflation.

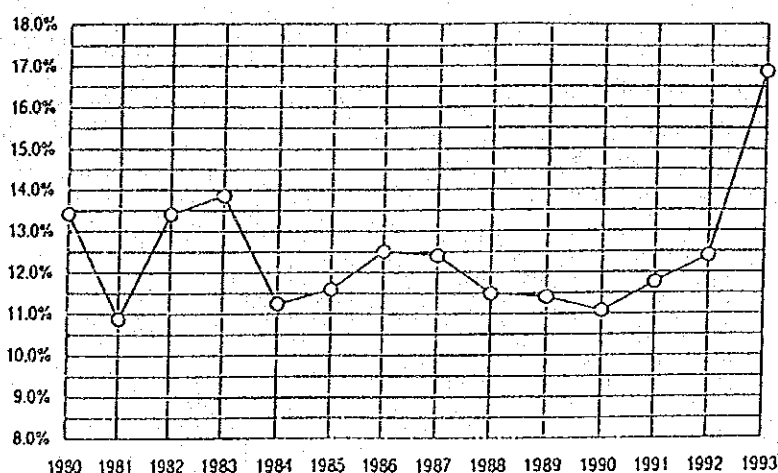
Table 9.3.4 Budget of the Government

	1989	1990	1991	1992
Budget in million Guaraní	456,055	695,702	1,247,249	2,014,958
(Increase to the previous year)	66.7%	52.5%	79.3%	61.6%
Budget in thousand US\$ *	398,301	565,519	939,901	1,334,409
(Increase to the previous year)	35.9%	42.0%	66.2%	42.0%
Share to GDP	9.9%	10.7%	15.1%	20.8%
Increase in Consumer Price	26.0%	38.2%	24.3%	15.1%
Growth in GDP (Real) of Paraguay	5.8%	3.1%	2.5%	1.7%

\* Calculated in the average exchange rate of each year.

In the expanding government budget, the share of MEC to the total budget has increased rapidly, as shown in Figure 9.3.4. The new constitution, effective from 1992, stipulates that more than 20% of the government (excluding donations and loans) should be spent on education.

Figure 9.3.4 Share of MEC's Budget to the Total Government Budget



As shown in Table 9.3.5, although the budget of MEC in 1992 reached US\$ 165 million, 81.5% of the total, US\$ 135million, was personal expenditure and 89.3%, US\$ 148 million, was current expenditure. Capital expenditure shared only 10.7%, as little as US\$ 18 million, and no large change in the proportion took place recently.

Table 9.3.5 Budget of MEC by Purpose (1992)

	Current Expend.		Capital Expend.	Total Budget
	Personnel (%)	Other Expend. (%)	(%)	(%)
	203,657 (81.5%)	19,480 (7.8%)	26,611 (10.7%)	249,748 (100.0%)
(in thousand US\$)	(134,872)	(12,901)	(17,623)	(165,396)

On the other hand, more than half of the budget of ANTELCO was for the capital expenditure in 1992 as show in Table 9.3.6.

Table 9.3.6 Budget and Execution of ANTELCO (1992)

	(Unit: Million Guarani)		
	Budget	Executed	Not Executed
Income	194,160	173,666	20,495
Donation	5,689	0	5,689
Income	16,944	16,944	0
Total Income	216,793	190,610	26,183
(in thousand US\$)	(143,572)	(126,232)	(17,340)
Current Expenditure	102,515	91,859	10,656
Capital Expenditure	114,174	97,281	16,893
Total Expenditure	216,689	189,140	27,550
(in thousand US\$)	(143,503)	(125,258)	(18,245)
Balance	104	1,470	
(in thousand US\$)	(69)	(974)	

Source : ANTELCO

Note : US\$1 = Gs. 1,510

Annual operation cost of the Project will reach to US\$6.5 million in maximum, corresponding to 2.9% of MEC's recurrent budget. Maximum construction cost will take place in 1998 and to be US\$ 13 million, accounting for 18.5% of the total of MEC's budget and ANTELCO's capital expenditure in 1992. Total capital investment for construction and replacement up to 2010 will reach to US\$ 61 million, corresponding a capital investment for 0.9 year of the two organization.

(5) Result of the Analysis

From the above-mentioned conditions, high possibility can be expected for the subsidy from the National Treasury to fulfill the gap between the required cost and ad in come, especially for recurrent expenditure. Further more, it should be reminded that for the personal expenditure of existing staff, such as persons from MEC, will not cause actual increase in the government budget.

As for the investment cost, although the budget for the MEC is growing rapidly, the large scale of capital cost can not be expected from the budget through the MEC, and also the source from MOPC or ANTELCO seems to be difficult.

The government budget for capital investment is usually executed only less than half portion and ANTELCO borrows loans form foreign or international organization in case of large investments.

For capital investment for the Project, a certain measure, such as securing foreign loan with favorable condition, should be taken to reduce intensive burden on the government capital budget.

On reinvestment cost, actual replacements of equipment will not occur simultaneously as set in the estimation. The cost will not take place so intensively as appears in the estimated figures. The scatter will make possible for the estimated the ad income and subsidy to cover the cost for reinvestment.

## II- 10 IMPLEMENTATION PLAN

Figure 10,1 shows the implementation plan for the Master Plan.

For five years before the completion of the new ETV Center at ISE site, all the preparatory activities before the commencement of the full-scale broadcasting service will be carried out at the provisional headquarters to be located at the Department of Tele-education of MEC in Don Bosco, Asuncion.

In Figure 10.1, major activities of the project are arranged year by year for each stage of the development phases.

- a) Plans and targets for each development phase
- b) Broadcast programs
- c) Number of programs produced
- d) Number of producers and technical staff
- e) TV Program production facilities
- f) TV Transmitting facilities
- g) Facilities construction work
- h) Coverage area
- i) Project Cost
  - Construction costs
  - Annual operating expenses
  - Advertising Revenue
  - Balance
- j) Organization





Figure 10.1 IMPLEMENTATION PLAN

Years		1 (1994)	2 (1995)	3 (1996)	4 (1997)	5 (1998)	6 (1999)	7 (2000)	8 (2001)	9 (2002)	10 (2003)	11 (2004)	12 (2005)	13 (2006)	14 (2007)	15 (2008)		
Development Phases		Preparatory Phase	Experimental Phase	Introduction Phase			Full-scal Phae-1			Full-scal Phae-2			Integrated Phase					
Site of ETV HQ		Tentative ETV Center at MEC (Don Bosco)					New ETV Center at ISE Site											
P L A N  C O N T E N T S	Plans Targets	Various Councils Committees	VCR CATV of Test	Explemental Broadcast			Short-term Plan											
	Broadcast Programs	Prod. of Experiment Prog. Training staff Research Develop of Utilization	Prod. of Experiment Prog. Training staff Research Develop of Utilization	1. Obtaining evaluation from rural and urbarn areas 2. Promotion of model school education 3. Public program from Government 4. Programs for General 5. Raising capability of staff 6. Advance Production for Full scale phase			Primary school 1000programs Pre-primary school 200programs Teachers' 200programs Literacy 200programs "Wide" 365programs Public Notice 3time/day General Prog.	Mid-term Plan			Long-term Plan							
	No. of Programs	50	160	480	640	800	1000											
	No. of Producers	8	11	15	26	32	50			55			60					
	No. of Technical Staff	10	22	45	63	80	93			130			140					
F A C I L.	TV Studios	MEC Studio			Operation in the ETV Center													
	TV Transmitters	IPT Studio			major equip. TV studio 2 rooms Post prod. 2 rooms M.C.R. TV OB van													
C O N S T R U C T I O N W O R K	Contents of Construction Works	TV Transmitter Studio Equip.	3 Regional Station Asuncion Transmitter, ETV Center at ISE			Ciudad del Este Encarnacion Billarrica			9 1st Plan Stations			9 2nd Plan Stations			10 2nd Plan Stations		10 2nd Plan Stations	
	Coverage Area	Asuncion CATV	40%			62%			84%			94%						
	Construction Cost	Work 1 4.7	Work 2 6.3 13.0			Work 3 1.3 9.5			Work 4 10.6			Renewal of Equip. 4.0						
P R O J E C T  C O S T S	annual operating expenses	0.3	0.6	1.2	1.8	2.5	4.3	4.4	4.5	5.5	5.6	5.7	6.5	6.5	6.5	6.5		
	Advertising Revenue	--	--	--	--	--	3.2	3.2	3.2	8.7	8.7	8.7	11.0	11.0	11.0	11.0		
	Balance	Δ0.3	Δ5.3	Δ1.2	Δ8.1	Δ15.5	Δ1.1	Δ2.5	Δ10.8	3.2	3.1	Δ7.6	0.5	4.5	4.5	4.5		
	Organization	Joint op. body			Independent decentralized government entity (ex. Asuncion University)									Public Corporation				

**PART III FEASIBILITY OF PRIORITY PROJECT**

### III- 1 THE PRIORITY PROJECT

#### 1.1 Objective and Methodology of Feasibility Study

The objective of the feasibility study is to verify the technical, socioeconomic and financial appropriateness of the Priority Project which is comprised of the following programs:

- a) School Broadcasting for Primary Education
- b) Educational Broadcasting for Teacher Training
- c) Social Broadcasting for the Socially Weak/Disadvantaged
- d) Educational and Cultural Broadcasting for the General Public

The positions of the above-stated programs within the Master Plan are as illustrated in Figure 1.1.1.

Figure 1.1.1 Priority Project and the Master Plan

		Stage of School Education			Specified Public		General Public
		Primary	Secondary	Teacher Training	Socially Weak	Specific Users	
School Education Broadcasting	School Education	a)		b)			
	Correspondence Courses			b)			
Social Education Broadcasting					c)		d)

- Priority Programs of Master Plan
- Other Programs of Master Plan

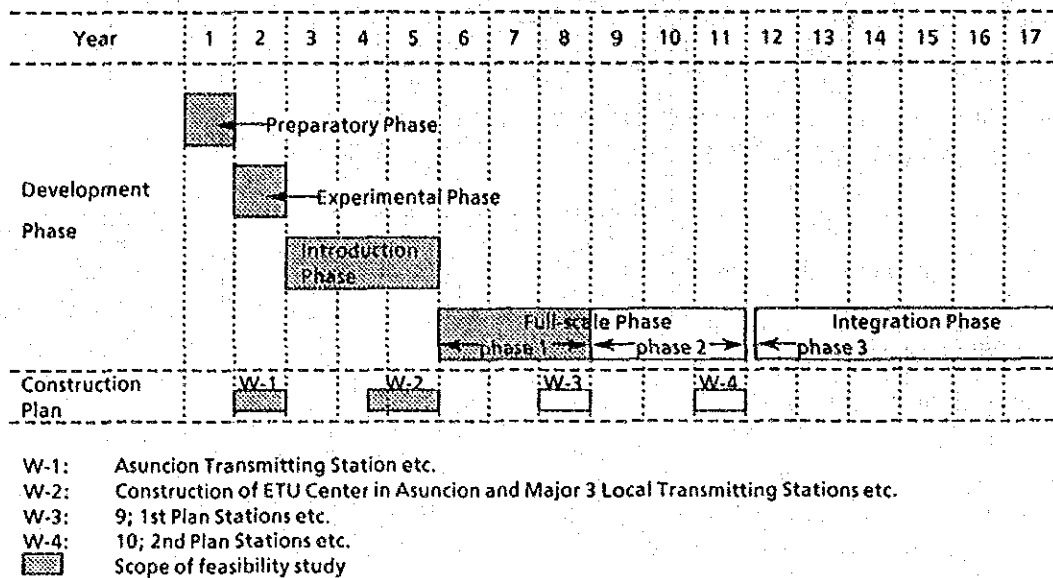
The present Priority Project is an independent project and is the first step towards the full achievement of the ultimate goals of the Master Plan. Consequently, the feasibility study was conducted to clarify the planning contents of the Priority Project proposed by the Master Plan and included supplementary surveys and studies designed to enable more detailed analysis.

### 1.2 Scope of the Priority Project

It is particularly important to note the need for gradual development, i.e. the adoption of a preparatory phase, an experimental phase and an introduction phase prior to full-scale broadcasting. Gradual development is essential for steady successful implementation of the Master Plan with maximum benefits and for the promotion of utilization of educational television broadcasting as advocated by the development plan in the Master Plan.

Consequently, this report proposes that the project period of the feasibility study shall include the full-scale phase (phase 1) as well as preparatory phases such as the preparatory, experimental and introduction phases, as shown in Figure 1.2.1. This report therefore provides a detailed description of not only the planning contents for full-scale phase 1, but also for the programming of the introduction phases.

Figure 1.2.1 Scope of the Priority Project



## III-2 PROGRAM DEVELOPMENT

### 2.1 Preparatory Phase (First Year)

First year shall be the preparatory phase, during which basic preparations necessary for the running of a broadcasting station will be made. The preparations are to create the various councils and committees mentioned in Part II Chapter 2. According to issues followed by discussions of the above councils or committees, the following examination will be conducted.

#### (1) Primary School curriculum and programming

How educational broadcasting can be incorporated into the existing primary school system; which part of the curriculum could be taught by broadcast, and what kind of programs should be produced.

#### (2) Production of Experimental Programs: 1st-3rd Grade Communication

- |                    |   |
|--------------------|---|
| a) Name of program | Communication, etc  |
| b) Target          | 1st to 3rd grade pupils at primary schools  |
| c) Duration        | 20 minutes  |
| d) Format          | Direct teaching, with one teacher and 1-2 guests  |
| e) Place           | Studio (i.e. completed in studio)   |
| f) Evaluation      | Have the programs viewed in classrooms by VCR and CATV, and obtain evaluations                  |
| g) Feedback        | Evaluation will be reflected in the next production   |
| h) Problems        | Treatment of dual language (Spanish and Guarani) Production of supplementary teaching materials |

**(3) Training of Production personnel**

The educational programs will be 20-30 minutes in duration, and a large number of programs will have to be produced and packaged before full-scale regular transmission. Because of budget restrictions, efficiency will be an imperative in program production. That means, if producing a 20-minute program in the studio, it is not only desirable but also essential to complete the recording in 20 minutes, i.e. without stopping the VTR. This will require intensive training of production staff, and if it is accustomed to, it is not so difficult.

**(4) Research and Development on effective utilization of educational programs at schools**

Sufficient number of television receivers could not be distributed to every school in the initial stages of the project. Therefore, efficient use has to be made of just one or two receivers which will be installed at optimal places in schools, and used jointly by pupils of different grades.

**2.2 Experimental Phase (2nd Year)**

The experimental phase will allow producers to improve their basic production skills acquired during the preparatory phase. Furthermore, programs will be broadcast experimentally on CATV in Asunción, in order to verify its effectiveness in the classroom and its acceptance by the general public. In this year, more production staff will be recruited and trained during this phase.

**(1) Producing Experimental Programs**

Science and mathematics programs for grades 4-6, as well as teacher-training programs aimed at enhancing the quality of teachers will be produced.

**(2) CATV Broadcasts coinciding with classroom teaching hours**

Once a sufficient number of programs have been accumulated, these will be broadcast on CATV, so that they could be evaluated by designated model-schools.

(3) Obtaining co-operation from teachers

One of the key objectives of the experimental phase is to obtain co-operation and understanding of teachers in adopting educational TV programs in their teaching. In collaboration with ISE and regional education centers, programs which demonstrate exemplary teaching by ISE teachers will be produced, and recorded on VCR or broadcast via CATV. Such model programs are expected to contribute to wider acceptance of broadcast teaching.

(4) Evaluation by model schools

A system of evaluation will be standardized across different model schools. This could be tested and improved over time.

**2.3 Introduction Phase (3rd, 4th and 5th Years)**

In the introduction phase, programs will be transmitted by on-air broadcasts. The number of model schools will be increased, and it would be possible to obtain evaluation of programs not only from urban areas but also from rural areas. There will also be an increase in the number of general public viewers. This phase is crucial in establishing the groundworks of the project, facilitating the eventual introduction of educational and cultural programs, and live "Wide" socio economical programs on every night.

(1) Obtaining evaluation from urban and rural areas where educational opportunities are relatively scarce.

Promotion of equality in educational opportunities is one of the major objectives of the project. To achieve this, one must first find out what differences there are between urban and rural areas, for example differences in language and lifestyles as affecting educational opportunities. It is equally important to find out whether a same program would be appropriate in every region, and to set certain educational levels.



(2) Fostering model schools, promoting broadcast teaching

More schools will be able to take advantage as programs are broadcast on-air. However, schools may at first be hesitant to adopt new teaching methods. Model schools will be selected, whose experiences and observations will be conveyed to other schools, thus bringing about diffusion of broadcast programs.

(3) Producing government publicity programs

Government publicity forms an important part of people's daily lives. For example, programs on AIDS and drugs prevention campaign, alcoholism prevention, and child-care made by the Ministry of Health and Social Welfare; programs of parasite prevention made by the Ministry of Agriculture and Livestock; programs on crime prevention made by the police; programs on literacy made by the Ministry of Education have been produced, and have proven extremely effective in informing the public. More programs along these lines will be produced.

(4) Producing Educational Programs for the General Public

Live programs will be broadcast three times a day, which will include news, government publicity, human interest stories, and educational information. This phase will give the opportunity for training staff for live presentation and also technical skills for live transmission.

(5) Advance-production of programs in 4th and 5th Year

Once full-scale broadcasting is under operation, about 1,000 programs will have to be made for primary school broadcasting alone. Adding another 200 children's programs, 200 teacher-training programs and 200 literacy education programs, about 1,600 programs will be required annually. Under the current plan, the annual capacity is 800. This means that some of the programs will have to be produced two years in advance.

Table 2.3.1 Program Production by Year

	3rd Year	4th Year	5th Year
<b>Program Production</b>			
Lecture program	480 programs	640 programs	800 programs
Live "Wide" program		156	365
Public notice		(1 program/day)	(2 programs/day)
		365	730
<b>Production Cost (per program)</b>			
Lecture program	400 US\$	400 US\$	400 US\$
Live "Wide" program		2,000	2,000
Public notice		400	400
<b>Number of PDs Required</b>			40
Lecture program	15	26	(20)
Live "Wide" program	(15)	(16)	(12)
General program		(10)	(8)
<b>Production Span</b>			
Lecture program	5 days	5 days	5 days
Live "Wide" program		7 days	7 days
<b>Production Crew</b>	3 crews (30 persons)	4 crews (40 persons)	5 crews (50 persons)
<b>Remarks</b>	From this year, a daily 2-shift production system shall be introduced in weekdays.	Number of PDs includes 10 to produce the live "wide" programs, public notices. There will be 156 live programs which are 3 days a week for test broadcasts. From this year, work shall be started to produce programs for Saturday and Sunday evenings for live "Wide" programs.	Number of PDs includes 12 to produce live "wide" programs and public notices and news, and 8 to be trained to produce general programs on Saturdays and Sundays in the full-scale broadcasting phase. There will be 365 live programs. From this year, two production shifts shall be started on every weekday. Program production will continue even the summer vacation as well.

## 2.4 Full-Scale Phase 1 (6th, 7th and 8th Years)

The number of programs to be produced during these three years are as follows.

Table 2.4.1 Program Production by Year

	6th Year	7th Year	8th Year
<b>Program Production</b>			
Lecture program	600 programs	600 programs	
Live "Wide" program	365 (3 programs/day)	365 (3 program/day)	
Public notice	1,095	1,095	
<b>Production Cost (per program)</b>			
Lecture program	400 US\$	400 US\$	
Live "Wide" program	2,000	2,000	
Public notice	400	400	
<b>Number of PDs Required</b>	50	50	The same as in the 7th year
Lecture program	(24)	(24)	
Live "Wide" program	(17)	(17)	
General program	(9)	(4)	
Post-production (PP)		(5)	
<b>Production Span</b>			
Lecture program	5 days	5 days	
Live "Wide" program	7 days	7 days	
<b>Production Crew</b>	5 crews (50 persons)	5 crews (50 persons)	
<b>Production Studio</b>	New ETV Center 2 studios + PP room	New ETV Center 2 studios + PP room	
<b>Remarks</b>	Personnel required for the operation of PP room and TV OB van (20)	Personnel required for the operation of PP room and TV OB van (20)	

### III-3 FACILITIES ARRANGEMENT PLAN

#### 3.1 Asuncion Transmitter Station and ETV Center

##### (1) Transmitting Facilities Plan

###### 1) Transmitter Building (in the ISE campus)

The TV transmitter in Asuncion is installed in the second year at ISE Campus where ETV Center Studio Building will be jointly constructed 2~3 years later. There are called ETV Center as a whole.

###### 2) Antenna Tower

The Antenna tower of a guy-wired type with triangular trusses shall be constructed which can be obtained in Paraguay at less cost than self-supported antenna towers. Due to the use of low USA channels of VHF band, the side of the triangular trusses shall be 1.8 meters wide.

###### 3) TV Transmitter Equipment and Transmission Antenna

Transmitter output is 10 KW (ch 6), the antenna type is a 2D (2 Dipole) antenna with 3 faces 6 stages and 1 face 2 stages. Maximum ERP (effective radiation power) is 90 KW (maximum antenna gain 9.5 dB). With this transmission scale, Asuncion as well as Central, Paraguari, La Cordillera, and a part of Presidente Hayes Department can be served.

###### 4) Electric Power Facilities

A 23 KV line is extended from the entrance of the ISE premises. A 400 KVA high tension transformer shall be installed for common use of transmitting station and the ETV center.

5) Emergency Generator

A 200 KVA emergency generator equipment shall be installed in the transmitting station for the case of power failure.

(2) Studio Facilities Plan

1) Tentative ETV center (Introduction Phase)

(a) Studio and Master Control Room

The current studio equipment is rather superannuated due to the 10 years of MEC operation since its initial installation and also the number of production equipment is scarce. Therefore, the equipment will be renovated in the second year.

(b) Master Control Equipment

Before the ETV Center is completed, programs will be broadcast from the provisional ETV center at MEC in Don Bosco, equipped with a set of M.C.R equipment installed in a room next to the sub-control room of the studio.

(c) VCR Dubbing and Audition Equipment

In order to examine experimental educational programs in actual school classes, especially in remote areas, equipment to dub produced packaged VTR tapes to VCR (Consumer type VHS) tapes shall be provided. A number of monitoring A/V equipment (VCR and TV monitor; 21 inch) shall also be provided.

2) ETV Center (Full Scale Phase)

A full scaled ETV center's studio equipment shall be installed in the 5th year at the ISE site.

### **3.2 Ciudad del Este Station**

#### **Transmitting Facilities Plan**

**1) The transmitter station site**

The site will be shared with the existing ANTELCO premises on 220m in altitude in the city of Ciudad del Este.

**2) Station building**

A new transmitter building shall be built in the ANTELCO premises.

**3) Antenna tower**

The existing antenna tower (a self-supporting tower with legs 8.2 meters apart, 92 meters tall) of ANTELCO will be shared with ANTELCO.

**4) TV transmitter and antennas**

A UHF 10KW (CH 18+) output was selected for the transmitter which is attached with 3 stage 4D transmitting antenna with a maximum ERP of 90 KW. The feeder uses 77D. Since Ciudad del Este is on the border with Argentina and Brazil, in order to avoid interference with the neighboring countries a maximum radiation power to both countries should be reduced by 5dB.

**5) Electric power facilities**

A 100 KVA high tension transformer for the TV station should be installed at the side of the existing high tension transformer for the ANTELCO use.

### **3.3 Encarnacion Station**

#### **Transmitting Facilities Plan**

##### **1) Transmitter station site**

As the altitude of the ANTELCO Encarnacion station is as low as 110m due to near location to the river, it would not be possible to serve a wide area. Therefore, it was decided to jointly use the ANTELCO relay station (altitude 276m) in the city of Cap. Miranda, a high altitude inland site, as the transmitter station.

##### **2) Station building**

The transmitter station building will be constructed under a new antenna tower on the premises of ANTELCO.

##### **3) Antenna tower**

Since the existing antenna tower (113m high) have no margin of strength, a tower should be newly constructed at a height of 116m and a side width of 1.2m of triangular truss type with guy-wire.

##### **4) TV transmitter and antenna**

A UHF 10 KW (CH18-) television transmitter with 3 face 3 stage of 4D and 1 face 1 stage of 4D antenna should be installed.

##### **5) Electric power facilities**

Since high tension reception (approximately 13 KV) electric power with single-phase line are currently used for the ANTELCO relay station, it should be improved in consideration of power capacity and voltage variation.

### 3.4 Villarrica Station

#### Transmitting Facilities Plan

##### 1) Transmitter station site

A site at an altitude of 291m on Mount Cerro Naville about 850 meters from a high way was selected. From this point, it will be able to reach the heavily populated central part of the eastern region of Paraguay, including such cities as Caaguazu, Caazapa, Dr. Juan M. Frutos, and J.E. Estigarribia.

##### 2) Station building and Antenna tower

A new station building with an area of 128m<sup>2</sup> shall be constructed underneath a new antenna tower. In order to use Channel 2, Villarrica station shall be equipped with a broadcasting antenna with the base of 4.2 × 22.9m attached to the tower, of 1.8m side length of triangular truss type with guy-wire.

##### 3) TV Transmitter and antenna

The transmitter shall have an output power of 10 KW (ch 2), with maximum antenna gain of 7.8 dB, and ERP of 60 KW.

##### 4) Electric power facilities

A 100 KVA high tension transformer should be installed on the top of the mountain, and an high tension line of approximately 850m length should be laid from the 24 KV main line along side of the high way to the top of the mountain. An AVR 100kVA shall also be installed.



### 3.5 Program Transmission Plan

#### (1) Asuncion

##### 1) Third (Introduction Phase) to Fifth year

- a) Relay of programs between the tentative ETV center at MEC (Don Bosco) and ISE transmitter station.

Because the two sites are not located in line of sight.

The three (3) mini-micro links shall be installed.

1st link. MEC to SNT (ch-9) station by FPU.

2nd link. SNT to ANTELCO Central II by STL utilizing existing parabolic antenna of SNT, which is now being used for SNT between ANTELCO Central II.

3rd link. ANTELCO Central II to Transmitter at ISE by newly installed STL (mini Micro) which can be continuously used in Full scale phase for the purpose of receiving international programs.

##### 2) Full Scale Phase (6th year on ward)

STLs will be installed for the following purposes.

- Transmission to regional stations
- Transmission of out-going international line
- Receiving of either international or domestic in coming signals

In ANTELCO Central II, the following equipment shall be installed:

- One set of STL transmitter.
- Two sets of STL receivers.
- One parabolic antenna mounted on the existing self-standing tower.

(2) Program Transmission between Asuncion, Encarnacion, Ciudad del Este, and Villarrica

At present (April 1993), the digital circuit (140 Mb/s) is being used by a private production company in 140 Mb/s coded signal, but ANTELCO has an intention to adopt the world standard codec (34 Mb/s or 45 Mb/s) regulated by CCITT. By adoption of this codec signal, it is possible to transmit the new educational programs by using this 140 Mb/s digital circuit with the spare circuit, commonly used with other commercial TV station's signals and telephone signals in a form of multiple coded digital signals.

The Villarrica station is scheduled to be constructed at Cerro Naville, so the programs shall be transmitted from the nearest ANTELCO's Cnel. Oviedo station by a STL (Mini-Micro).

### 3.6 List of Major Equipment

The major equipment to be installed in each stage of Work are as follows;

For Work 1 (2nd Year)

- |  |        |                     |
|--|--------|---------------------|
| (1) Television Transmitter                               | 1 set  | 10 KW, CH-6, at ISE |
| (2) Transmitting Antenna/Tower                           | 1 set  | 160 m, Guy-wired    |
| (3) TV Studio Equipment for existing MEC and IPT Studios |        |                     |
| 1) Color Television Cameras                              | 5 sets | MEC x 3, IPT x 2    |
| (3 CCD Type)   |        |                     |
| 2) Video Tape Recorders                                  | 4 sets | MEC x 2, IPT x 2    |
| (1/2" Component Type)                                    |        |                     |
| 3) Studio Lighting System                                | 1 set  |                     |
| 4) Video Editing System                                  | 2 sets | MEC x 1, IPT x 1    |
| 5) EFP Cameras/VTR                                       | 2 sets |                     |
| 6) VCR Tape Dubbing System                               | 1 set  |                     |

- |                              |        |
|------------------------------|--------|
| 7) Audition Equipment        | 5 sets |
| 8) Master Control Facilities | 1 set  |
| 9) Radio Transmission System | 2 sets |

For Work 2 (4th-5th Years)

(1) ETV Center Facilities

- |                                   |        |
|-----------------------------------|--------|
| 1) TV Studio Equipment            | 2 sets |
| 2) Sound Studio Equipment         | 1 set  |
| 3) Post-production Room Equipment | 2 sets |
| 4) Master Control Facilities      | 1 set  |
| 5) TV OB Van                      | 1 set  |

(2) Ciudad del Este Station (to be co-sited at ANTELCO premises)

- |                           |       |            |
|---------------------------|-------|------------|
| 1) Television Transmitter | 1 set | 10 KW, UHF |
| 2) Transmitting Antenna   | 1 set |            |

(3) Encarnacion Station (to be co-sited at Cap. Miranda ANTELCO premises)

- |                               |       |                  |
|-------------------------------|-------|------------------|
| 1) Television Transmitter     | 1 set | 10 KW, UHF       |
| 2) Transmitting Antenna/Tower | 1 set | 116 m, Guy-wired |

(4) Villarrica Station (at new site with building to be constructed)

- |                               |       |                  |
|-------------------------------|-------|------------------|
| 1) Television Transmitter     | 1 set | 10 KW, VHF       |
| 2) Transmitting Antenna/Tower | 1 set | 150 m, Guy-wired |

(5) Program Transmission Facilities

- |                                |  |
|--------------------------------|--|
| 1) From MEC to ISE Transmitter |  |
|--------------------------------|--|

Field Pick-up Units            2 sets

2) From New ETV Center to ANTELCO Central II

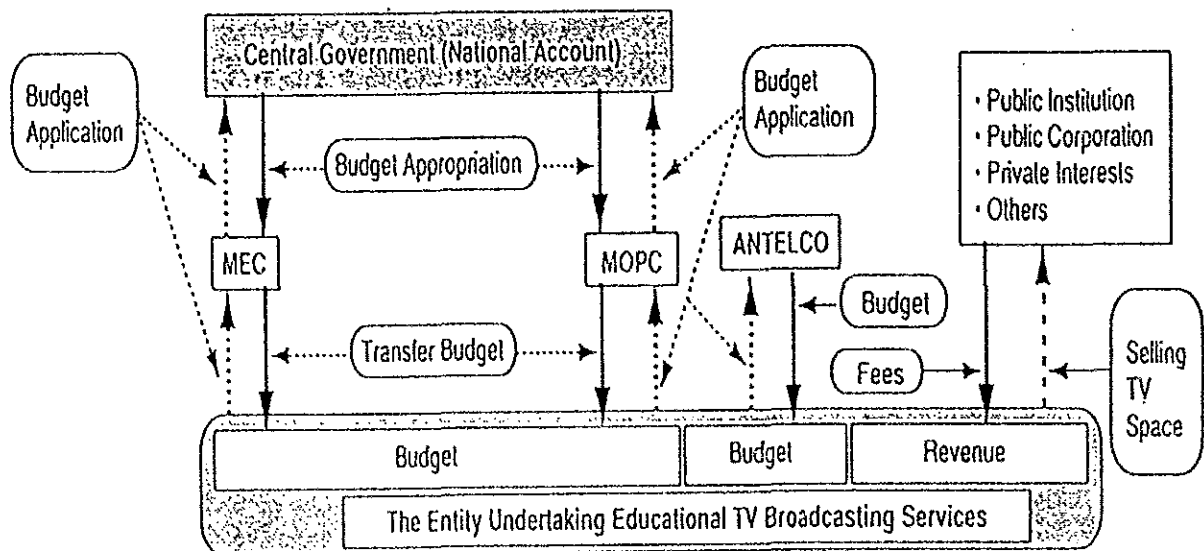
Field Pick-up Units            2 sets

### III-4 MANAGEMENT AND ORGANIZATION PLANS

#### 4.1 Management Plan

A major financial source of an independent decentralized government entity is transfer budget through relevant ministries, whose financial basis is a national account, however, a collection of additional income available from financial sources other than a national account and its management are legally allowed. The organization of the entity is planned to be constituted with the MEC, as a core, which is exclusively responsible for the public education affairs, the MOPC which is exclusively responsible for the development of infrastructures related to the telecommunication, and the ANTELCO which is a public corporation responsible for frequency management and broadcasting technology. It is planned also that each organization forming the entity will provide budget of the entity respectively in accordance with the relative part of the activity. As for the provision of manpower, the organization forming the entity will provide appropriate personnel from their existing human resources as much as possible so as to minimize an additional expenditure on the national account for the operation of the entity.

Figure 4.1.1 Financial Flow



As for the incorporation of school education system using educational television broadcasting into a conventional education system, planned councils and committees will work intensively to establish such system through experimentation, analysis and evaluation. The Master plan is planned to implement the Project phase-by-phase basis including a preparation of proper education system. During the preparatory phase at the beginning of the implementation of the Priority Project, a simulation of school education is planned to be conducted repeatedly attaching importance to the formulation of teaching method so as to institutionalize a public education system utilizing educational TV broadcasting program as quick as possible. During the period of preparatory and experimental phases, VCRs and CATV network are planned to be utilized effectively to establish the above mentioned system through experimentation and evaluation as well as to increase technical performance for the program production.

Preparatory and Experimental phases are deemed as a period for technical adaptation and a group of core member related to program production from program planning and production point of view is planned to be formed to be ready to conduct training of necessary personnel on OJT for subsequent introduction and full-scale operation phase.

As for financial management of the entity, it is planned to be financed out of the national Treasury through transfer budget of the MEC and the MOPC; and the budget of the ANTELCO during the course of preparatory, experimental and introduction phase. The efforts to institutionalize educational TV program into a conventional public education system is to be concentrated during preparatory and experimental phases. During this period, operating expenditure of the entity is to be kept as minimum as possible.

It is planned to broadcast commercial advertisement on the programs on week ends for the general public and when a technical skills for program production is increased to meet with the production of program for the general public. However, production of such programs will become available after the completion of educational programs required to be broadcasted for week days. Although the time frame available for taking commercial advertisement will be still limited at the beginning of full-scale operation phase, it will be expanded in the future. It is foreseen that the amount of income generated from commercial advertisement on increased allocation of time space for commercial

advertisement and appropriate rate of charge for commercial advertisement will trade off the amount of total expenditure in about 20 years as indicated in Chapter 9 of Part II.

#### **4.2 Organization Plan**

The organization of the entity undertakes an operation and a management of the educational TV broadcasting services is planned to be of a public corporation in the Master Plan study. However, the income planned to be generated from public and commercial advertisement will not meet with the estimated expenditure of the entity within a time frame set out for the feasibility study of the Priority Project. It is, therefore, recommendable that the type of organization to be employed for the entity planned herein is to be started from an independent decentralized government entity which is to be financed out of the National Treasury substantially although the management of the entity is autonomously conducted under a certain legal status (See Figure 4.2.1 & 4.2.2).

Figure 4.2.1 Organization Chart at Full-Scale Phase

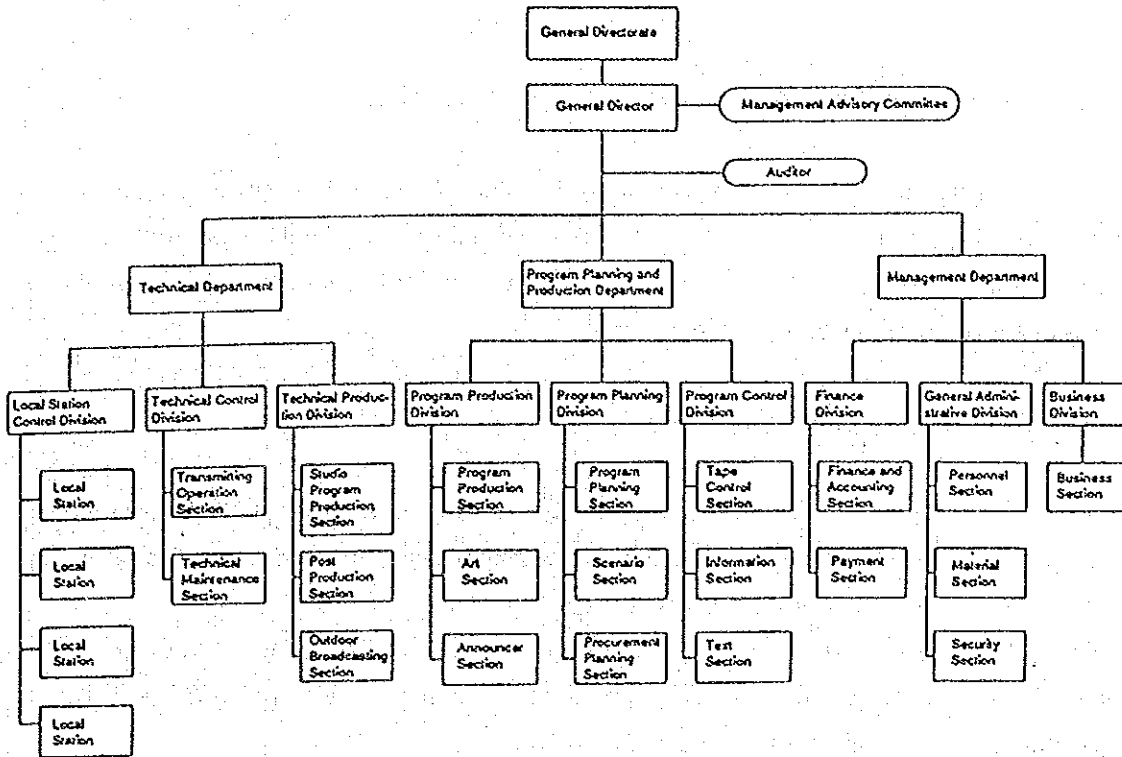
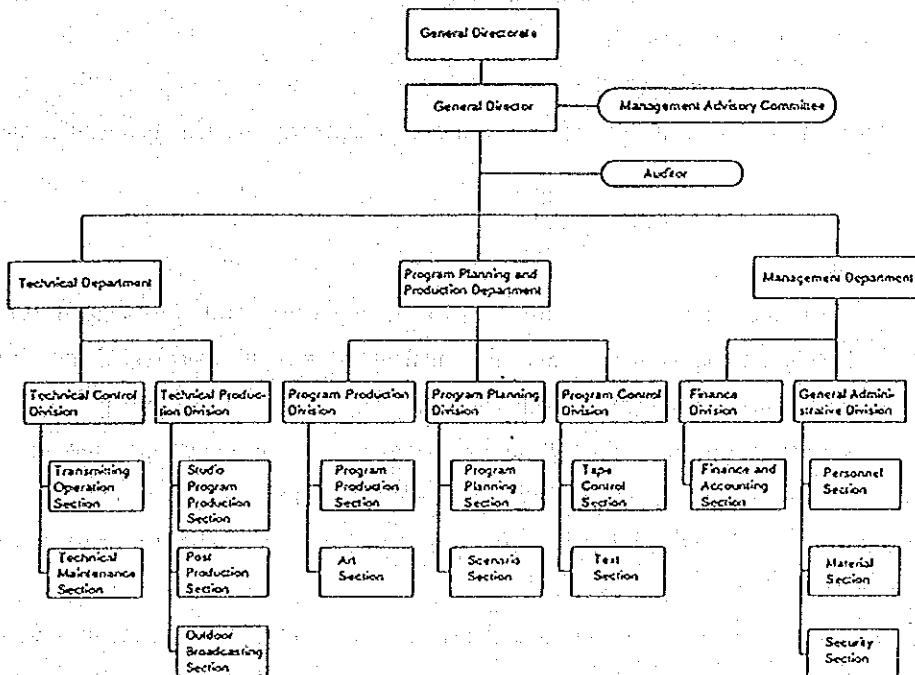


Figure 4.2.2 Organization Chart at Pre-Phases





## III- 5 OPERATION AND MAINTENANCE PLANS

### 5.1 Operation Plan for Production and Transmission

The period between 1st year and 8th year (end of Full-scale phase 1) will be a critical one for consolidating the foundation of the entire project and for dictating its future success. Therefore, of utmost importance is to devise a realistic operational plan for each year.

#### (1) Preparatory phase (1st year)

The eight technical staff currently employed at the MEC Teleducation Department (in 1993) will be required to work full-day instead of half-day during this phase, and to promote their program production capability.

These technicians will also help the producers in monitoring programs at model schools. Training, both in and out of the country, will be provided for 8 producers, 10 technicians, and 3 art designers.

#### (2) Experimental phase (2nd year)

Programs produced during the previous year will be distributed via CATV in Asuncion to model schools.

At this stage, there will be 2 crew (20 persons), who will also participate in the installation of transmission facilities, thereby gaining on-the-job-training.

#### (3) Introduction phase (3rd year)

As the transmission facilities will be in use from this year, additional staff will be recruited to specialize in transmission. As to the production, since each producer will have already been working for two years, and thus become familiar with the production. The producers will be required to reduce their production span from 10 to 5 days. The production quota in this year is 480 programs which will require two working shifts a day. The technical staff will be increased to 3 crew (30 persons).

These personnel will co-operate with producers in VTR location (EFP), VTR editing, broadcasting from the master control room of the tentative ETV Center in Don Bosco, and placement of personnel in charge of operating transmitter

station at ISE.

Broadcast technicians will receive training not only on transmission but on reception as well, so that they could advise regional stations on how to receive good quality pictures.

(4) Introduction phase (4th year)

Advance production of programs for full-scale broadcasting will begin in this year. The production quota will be increased to 640 regular programs a year, calling for two working shifts a day, seven days a week including Saturday and Sunday. 156 live broadcast programs will be produced a year and broadcast experimentally three times a week.

There will be four technical crew (40 persons) employed by this time.

(5) Introduction phase (5th year)

This is the final year before the commencement of full-scale broadcasting. Live programs will be broadcast every evening. Technical staff will be increased to five crew (50 persons), and on-line operation shifts will be in place, uninterrupted by summer vacations, weekends or holidays. The number of regular programs to be produced will be 800 a year, and live programs 356 a year.

20 additional technicians will be employed to install and operate studio equipment at the new ETV Center.

(6) Full-scale phase 1 (6th year)

Full-scale broadcasting will be inaugurated from the new ETV Center. TV OB vans will be introduced to broadcast live on-location programs such as sports on Saturdays and Sundays. The number of operational staff will have been stabilized by this stage, although a few more personnel may be added in order to improve the quality of programs.

(7) Full-scale phase 1 (7th year)

Advance production of programs according to the programming plan for the stage of Full-scale phase 2 will begin from this year.

(8) Full-scale phase 1 (8th year)

This is the final year of the Priority Project. The operation system for both production and transmission will have been firmly established.

**5.2 Maintenance**

(1) Latest broadcasting electronic equipment are extremely stable and reliable, thanks to the adoption of ICs. However, if a failure does occur, it is usually far beyond the capacity of user-technicians to repair it. Therefore, it is essential to make arrangements whereby repairs are sent either directly to manufacturers, or to external specialists.

(2) Technicians who will be operating on-line transmission equipment in the master control room will need to be trained to deal with emergencies on the spot.

Frequently, emergency accidents arise from transmission by VTR and VTR tapes. It will be necessary to keep track of VTR head tip abrasion by making records of how many hours the head tips have been used and how many times the tapes have been used. (The life of a head tip is normally 700 - 800 hours, and tapes can be used repeatedly for a maximum of 100 times). It will also be necessary to control the room humidity to less than 60%, as humidity significantly affects the life of head tips.

(3) It will be necessary to keep closely in touch with foreign manufacturers and consultants, taking account of the fact that Paraguay is located far from most such service agents.

(4) A regular maintenance plan will be devised and executed.

(5) A certain amount of foreign currency will be secured for repairs and maintenance.

(6) To ensure ease of maintenance, a same type of equipment by a same manufacturer will be installed as far as possible.

(7) VTR raw tapes will be provided regularly.

### III - 6 IMPLEMENTATION PLAN OF PRIORITY PROJECT

#### 6.1 Target Date: End of Year 2001

#### 6.2 Project Outline and Implementation Schedule

- (1) In the 2nd year (1995), a transmitter station will be constructed on the premises of ISE in Asuncion. In the meantime, the existing studios at MEC and former IPT 3F will be provided with necessary supplement equipment.
- (2) The period of five years before the commencement of Full-scale broadcasting (Phase 1) will be assigned for preparatory, experimental and introduction phases. At first, various councils and committees shall be set up, and during this preparation period the staff will be recruited and trained. Programs for Full-scale phase 1 will be produced in advance during the Introduction phase (4th and 5th year), enabling smooth transition to Full-scale broadcasting.
- (3) During the introduction phase (4th and 5th year, 1997-1998), the new ETV Center (Educational TV Broadcasting Center) will be constructed on the ISE site. Regional transmission stations will also be constructed in three major regional cities (Ciudad del Este, Encarnacion, Villarica).  
In the meantime, it is necessary to get an agreement on the equitable usage of UHF Lower Band Channels (14ch ~ 20ch) with the neighboring countries.
- (4) Full-scale broadcasting (Phase 1) will be operated at the ETV Center. By this stage, production and transmission arrangements will have been consolidated firmly.
- (5) Broadcasts will cover 40% of the entire population after the construction work 1 during the 2nd year, and increased to 62% by the work 2 scheduled to be implemented during 4th to 5th year.

(6) Figure 6.1 shows the Construction work with the Implementation Schedule.

Figure 6.1 Implementation Schedule

	1994	1995	1996	1997	1998	1999
<u>Work I</u>						
Preparation of the budget	=====					
Designin		=====				
Const.TX Build'g		=====				
TX installation			=====			
Studio Equip.			=====			
STL			=====			
<u>Work II</u>						
<u>ETV Center</u>						
Designing			=====			
Building Const				=====		
Studio Equip. installation					=====	
<u>Ciudad Este</u>						
Designing				=====		
Build'g Const				=====		
Tower & Ant.				=====		
TX Inst.					=====	
<u>En carnacion</u>						
Designing				=====		
Buld'g Const				=====		
Tower & Ant.				=====		
TX Inst.					=====	
<u>Villarvica</u>						
Designing				=====		
Build'g Const				=====		
Tower & Ant.				=====		
TX Inst.					=====	
<u>ANTELCO</u>						
Network & STL					=====	

### **6.3 Priority Project Implementation Body**

A Joint corporation of MEC and ANTELCO.

### **6.4 Management Body**

A joint corporation of MEC and ANTELCO, with the legal status of an independent non-central government organization, eligible for substantial national funding. (e.g. National Asuncion University)

### **6.5 Costs of the Project**

#### **(1) Construction costs**

The cost is estimated in a fixed price at 1993 based on the following conditions.

- Currency exchange rates of this estimation ;  
1 US \$ = 120 yen = 1,700 Guraneis (Gs)
- Import tax of 10% of foreign portion is added to local portion.
- Engineering fees are 8% for civil work cost and 6% for broadcast equipment and electric equipment.
- Physical contingency of 10% is included in the building and tower construction costs.
- Price contingency is estimated 15% for local portion and 5% for foreign currency portion. Out of local portion, a part of cost for materials to be imported is extracted and treated as foreign portion in price contingency.

The estimated construction cost on the basis of above conditions, the costs of Work 1 and Work 2 necessary for the Priority project are shown in Table 6.1.

Table 6.1 Construction Cost of the Priority Project

Unit : million Gs  
: million US\$

	Work 1	Work 2	Total
Local Portion	1,348.1 MGs (0.793M\$)	13,083.2 MGs (6.667+1.029M\$)	14,431.3 MGs (8.489M\$)
Foreign Portion	6,585.8 MGs (3.874M\$)	20,253.8 MGs (0.421+11.493M\$)	26,839.6 MGs (15.788M\$)
Total	7,933.9 MGs (4.667M\$)	12,049.6MGs + 21,287.4MGs (7.088+12.522M\$)	41,270.9 MGs (24.277M\$)

(2) Investment Schedule

Table 6.2 shows Annual Investment Schedule of the Work 1 and Work 2 in detail.

Table 6.2 Annual Investment Schedule

Site	Year	1994		1995		1996		1997		1998		1999		2000		2001	
		Local	Foreign	Local	Foreign	Local	Foreign	Local	Foreign	Local	Foreign	Local	Foreign	Local	Foreign	Local	Foreign
W O R K I	Transmitter (Asuncion)																
	Building for TX			92													
	Tower			267													
	Ant. Feeder,Inst.				208												
	Power Supply				83												
	Transmitter (V10Kw)				500												
	Mini.Micro (SYL)×3				667												
	Production Equipment				1,917												
	VCR & Moni, etc.				67												
	IMPORT TAX			371													
	Engineering Fee				239												
Physical Confingency			36	21													
Price Contingency			27	172													
	(4,667)			(793)	(3,874)												
E T V C e n t e r	Building							4,167									
	Engive Generator										542						
	Air-conditions,etc.							408									
	Studio Facility										6,250						
	TV OB van										750						
	(12,117)							(4,575)			(7,542)						
C i u d a d e l E s t e	Building							50									
	Tower							8									
	Ant. Feeder,Inst.										208						
	Power Supply										83						
	Transmitter (U10Kw)										583						
	(932)							(58)			(874)						
E n c a r n a c i o n	Building							33									
	Tower							200									
	Ant. Feeder,Inst.										208						
	Power Supply										83						
	Transmitter (U10Kw)										583						
	(1,167)							(233)			(874)						
V i l l a r t i c a	Building							200									
	Tower							292									
	Ant. Feeder,Inst.										167						
	Power Supply							8			83						
	Transmitter (U10Kw)										500						
	Mini Micro (STL)										250						
	(1,500)							(500)			(1,000)						
I m p o r t T a x E n g i n e e r i n g F e e P h y s i c a l C o n f i n g e n c y P r i c e C o n t i n g e n c y	Import Tax							363		1,029							
	Engineering Fee								421		636						
	Physical							495			58						
	Confingency										515						
	(3,995)							(1,301)	(421)	(1,029)	(1,203)						
TOTAL	(24,277)			793	3,874			6,667	421	1,029	11,493						



### III-7. PROJECT EVALUATION

#### 7.1 Economic Viability of the Priority Project

##### (1) Target of the Analysis

The target of the analysis is set on school education broadcasting for primary schools, which is the major part of priority program.

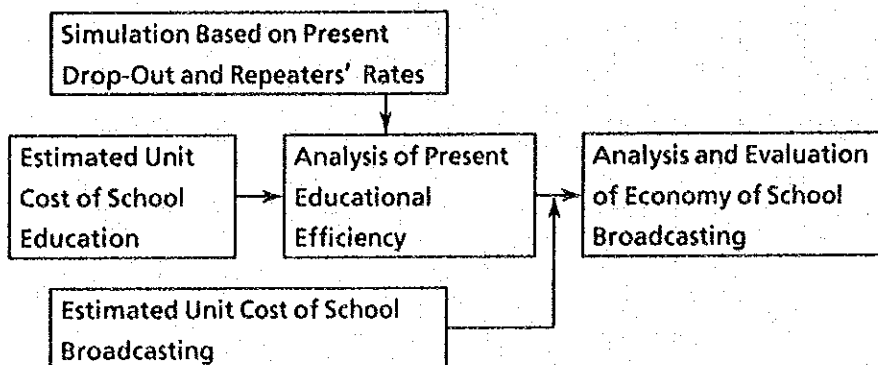
##### (2) Objective and Method of the Analysis

The objective of the analysis is to figure out the monetary portion of school education broadcasting as a method of raising up the efficiency in primary school education.

The analysis is an examination of cost and contribution of school education broadcasting as utilized in the improvement of school education.

The analysis flow is shown in Figure 7.1.1.

Figure 7.1.1 Analysis Flow



(3) Estimate of Present Educational Cost

Estimated cost of present cost of primary school education is \$215 / pupil year.

(4) Current Efficiency

Table 7.1.1 shows the promotion, repetition and drop-out ratios for primary and secondary education estimated by the UNESCO office.

Table 7.1.1 Current Educational Indicators at the Primary Level

	Promotion Ratio	Repetition Ratio	Drop-out Ratio
1st Grade	69.7%	26.4%	3.9%
2nd Grade	70.6%	22.5%	6.9%
3rd Grade	69.4%	23.3%	7.3%
4th Grade	65.2%	22.9%	11.9%
5th Grade	54.5%	26.9%	18.6%
6th Grade		40.5%	14.9%

The results of the simulation using the figures given in Table 7.1.1 indicate that educational resources equivalent to 6,448 pupils year, i.e. the amount of educational resources required to educate 6,448 pupils for one year, are required to produce 827 successful primary school leavers. The current input of educational resources to produce one successful primary school leaver is 7.80 pupils-year which is 1.80 pupil-year above the ideal situation in which everyone completed primary school in 6 years. The educational cost to cover 7.80 pupils-year is \$1,677 (\$215/year×7.80 years). (Figure 7.1.2)

The additional cost of education to cover the extra learning is calculated below.

$$\$215/\text{year} \times (7.80 \text{ years} - 6 \text{ years}) = \$387/\text{successful school leaver}$$

**(5) Estimate of School Broadcasting Cost**

The educational cost for primary school broadcasting is calculated as follows.

- i) The program production cost for school broadcasting were calculated independently. Other costs were proportionally determined based on the ratio of school broadcasting hours in the total number of broadcasting hours.
- ii) The following is presumed to calculate the cost per pupil per year.
  - a. The number of the pupils was determined based on data provided by UNESCO.
  - b. The number of covered pupil is calculated by multiplying total number of pupils and the coverage rate of population.
  - c. The basis for calculation is provision of 1.5 TV sets at each school costing 1,000 US dollars for 10 years use, including the cost of installation and maintenance (3% annually).
  - d. The number of pupil in a school in the future will be the same as present.

The cost of school broadcasting is estimated as \$5.5 / pupil-year in 1999.

**(6) Analysis Results**

An addition of a new measure to the educational system with the purpose of making all pupils complete primary education in the standard 6 years has the following economic significance. Any excess over \$387 under some measures are uneconomical. The figure of \$387 indicates the maximum level of investment permissible.

Based on the following equation, the annual cost of improvement must be lower than \$64.5/pupil year.

$$(\text{Annual Cost of Improvement/Pupil}) \times 6 \text{ years} \leq \$387$$

As the annual school broadcasting cost is \$5.5/pupil, it satisfies the above condition. However, correlation between the input and effect (degree of target attainment) is unclear. To clarify the situation, the longest period permissible with additional investment of \$5.5/pupil year is calculated as follows.

$$(215 + 5.5) (6 + a) \leq 1,677$$

$$a \leq 1.61$$

The investment of \$5.5/pupil-year may not make all pupils complete primary education in 6 years, but should improve 2.5% ( $(7.80 - 7.61) / 7.61 = 2.5\%$  Figure 7.1.3)

An efficiency level of 7.61 pupil-year can be achieved by lowering the repetition ratio by 4 points for all grade or by lowering the drop-out ratio by a mere 0.35 points.

Data on quantitative analysis of effect comparison among educational media or method are quite limited and cannot be easily generalized because the effect of educational media is different depending upon each tradition and social environment. Moreover, quality of arrangement, such as quality of program or enthusiasm of teachers who utilize each media will give large impact on the effect.

Some data shows that 10 minutes session of computer assisted instruction in every day added 12% of annual achievement of conventional education in arithmetic or 23% in reading capability to pupils in primary schools in the United State in late 1970s.

With educational television broadcasting 2.5% of improvement can be achieved where teaching materials and equipment is not sufficient, learning hours are not enough, if well-prepared programs broadcast and systematic assist for utilization by teacher who might not have required professional skills.

Even though this analysis, having many preconditions and Assumptions, might not draw a definitive conclusion, the introduction of school broadcasting at primary level education could be regard as valid from economic viewpoint.

Figure 7.1.2 Current Additional Cost for a Graduates in Primary School

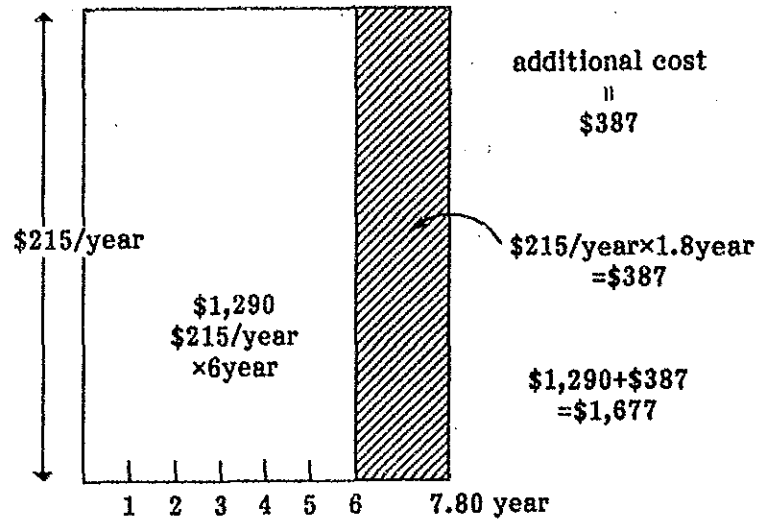
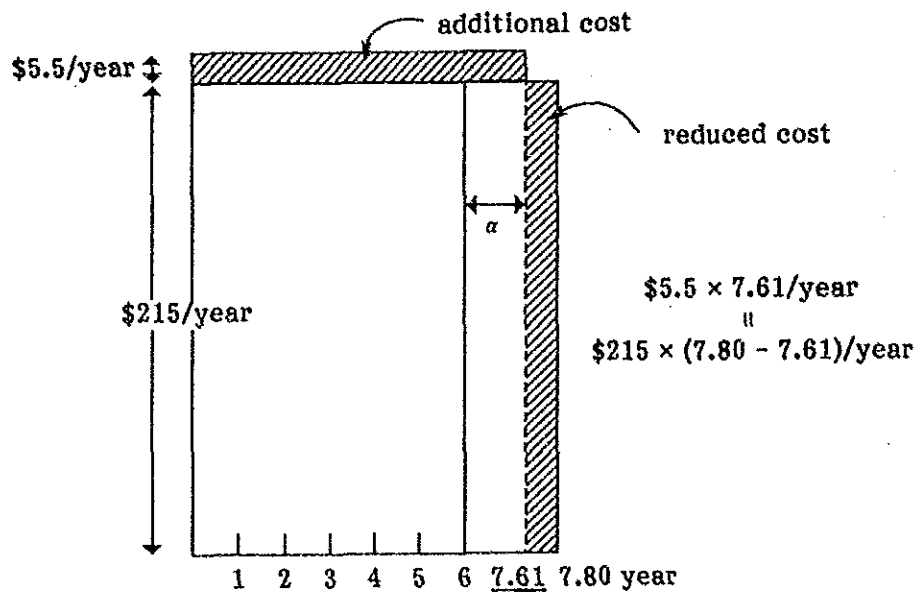


Figure 7.1.3 Permissible Longest Year with School Broadcasting



## **7.2 Financial Analysis**

### **(1) Introduction**

The Propriety Project is selected as the first step to implement the Master Plan. Priority Project cannot be financially assessed apart from the whole of the Master Plan.

Target period of this analysis is the period of execution of the Priority project, from preparatory phase to full-scale phase 1. The analytical flow of the analysis is as follows.

- To arrange the financial plan for the broadcasting entity.
- To clarify the financial condition based on the estimated advertisement income and cost for construction, operation and financing.
- To estimate the amount of the subsidy (transfer budget) from National Treasury.

### **(2) Revenue and Cost**

#### **1) Budget of the Government (Transfer Budget)**

The transfer budget is a part of the government budget applied and appropriated through the MEC and the MOPC to the broadcasting entity. The budget is allocated in single fiscal year of the Government.

#### **2) Advertisement Income**

Revenue from advertisement is estimated in the financial analysis of the Master Plan under the condition set on broadcasting hours and unit charge of advertisement broadcasting. The amount of advertisement income estimated for Full-scale Phase 1 in the Master Plan is applied in this analysis.

### 3) Total Investment Cost

Conditions and the result of estimation of investment cost are described in Chapter 6 of Part III.

### 4) Conditions of Financing for Investment

For the analysis, foreign currency portion of construction cost, 65% of the total investment, is assumed to be financed with long term loan. For local currency portion, 35% the total, the government budget (transfer budget) is supposed to be appropriated through the MOPC and the MEC.

Loan conditions for the long term loans are supposed as 25 years' repayment, including 5-year grace-period and equal repayment for the principal. As for interest rate, two cases, Case 1; 5 percent and Case 2; 10 percent, are applied in the analysis.

## (3) Implement Entity and Its Financial Plan

### 1) Implementing Entity

Implementing body is to be a national broadcasting entity established with fund from the Government and operated as an independent decentralized entity with subsidy from the Government.

The entity is independent in operation. Financial characteristic of the entity is, unlike directorates or departments of ministries, to have its own revenue. Budget appropriation for the entity is conducted after estimation of its revenue and operation expense and calculation of the gap between revenue and expense. Transfer budget is appropriated to fill the gap.

## 2) Financial Plan and Development Phase

### a) Preparatory Phase

In this phase, the preparation for the establishment of the broadcasting body is to be carried out mainly by the MEC. For this period, financial source is the budget of the MEC.

### b) Experimental and Introduction Phase

After legal arrangement, established broadcasting entity will depend its financial source upon transfer budget of the Government thorough the MEC and the MOPC. Investment from ANTELECO is another possible source of finance.

### c) Full-Scale Phase

Revenue from advertisement broadcasting will be one of the financial sources from this phase. Since advertisement income will not grow enough to meet all operating expense and financing cost for long term loan, deficits in balance will be filled by budget transfer through the above two ministries or investment by ANTELECO.

## (4) Financial Analysis

### 1) Financial Projections

Based on the above conditions and the financial plan, financial projections are made on profit/loss and source/application of the fund for the entity in the following cases.

Table 7.2.1 Cases Set for the Analysis

	Interest of Long Term Loan	Annual Advertisement Income (thousand US\$)
Case 1-A	5%	3,217
Case 1-B	5%	5,361
Case 2-A	10%	3,217
Case 2-B	10%	5,361



## 2) Analysis of Financial Indicators

Estimated financial indicators calculated with the result of financial projection are summarized in Table 7.2.2.

Table 7.2.2 Financial Indicators of Broadcasting Entity

	Operating Ratio* (%)	Maximum Net Loss		Maximum Subsidy Necessary		Average Subsidy**
		Year	Amount**	Year	Amount**	
Case 1-A	195%	2001	- 5,079	1997	8,683	2,796
Case 1-B	117%	2001	- 5,079	1997	8,683	1,992
Case 2-A	195%	2001	- 5,896	1997	8,897	3,262
Case 2-B	117%	2001	- 5,896	1997	8,897	2,458

\* Operating Ratio = Operating Expense / Operating Income in 2001

\*\* Unit: thousand US \$

Operating ratio, the ratio of operating income to operating expense that includes depreciation, in 2001 shows impossibility of self-financing operation in Full-scale phase 1.

In the analysis period, maximum net loss (after interest payment for foreign loan) occurs in 2001 in all cases and the amount will reach to US\$5.1 million in Case 1-A and Case 1-B, cases with 5% interest for long term loan, and US\$5.9 million in Cases 2-A and 2-B, cases with 10% interest.

Transfer budget from the Government will be maximized in 1997 in all cases, and will amount to US\$8.7 million (5.2% of the budget of the MEC, 1992) in Case 1-A and 1-B, to US\$8.9 (5.4% of the same) million in Case 2-A and 2-B. The year of 1997 will correspond to the commencement of construction of ETV Center in Asuncion and three main local transmitting stations.

Average annual subsidy during the period will be smallest in Case 1-B, US\$2.0 million, and be largest in Case 2-A, US\$3.3 million. A comparison among the cases shows that difference of 5% in interest of long term loan will cause US\$0.5 difference in average annual subsidy and the difference in revenue from advertising will be resulted in the difference of US\$0.8 million.

The main factor of fluctuation in subsidy or transfer budget is the capital cost variation. Government fund for the construction, financing local portion of construction cost, during the period is US\$8.5 million and US\$6.7 million is to be financed in 1997. The amount in 1997 corresponds to 39% of the budget for capital expenditure of the MEC in 1992 or to 12% of the capital expenditure of ANTELCO in 1992.

(5) Result of the Analysis

As shown in the financial analysis of the Master Plan, rapid growth in the government budget and sharp increase in the budget of the MEC is a preferable factor for subsidizing the recurrent expenditure or balancing the cash flow. By applying existing human resource and by utilizing the existing facilities and equipment of the MEC and the ANTELCO will reduce the burden on the Government.

For financing for construction cost, as mentioned in the financial analysis of the Master Plan, financial assistances by foreign countries or international organization with favorable conditions will be necessary.

As pointed out in the above, maximum amount of annually required fund of the Government only for domestic currency portion will reach to 40% of the capital budget of the MEC in 1992. In addition to the fund raising from wide sources such as transfer budget of the MEC and the MOPC and investment of the ANTELCO, it is necessary for the implementation of the Priority Project to secure financial assistances by foreign countries or international organization with favorable condition which also cover domestic currency portion.

**PART IV CONCLUSION AND RECOMMENDATION**

## IV-4 CONCLUSION AND RECOMMENDATION

### Conclusion

(1) The Priority Project of creating an educational television broadcasting network is designed to meet the basic human needs forming the basis of the educational system composed of primary education and education for the socially-disadvantaged. For Paraguay, a country not endowed with significant natural resources, the education or the development of her human resources, although it will take time, is the only way to be able to stand on an equal footing with other nations in the future. The Priority Project presented here is designed to achieve such human resources development effectively and efficiently and has high socio-economic significance. Therefore, the Priority Project should definitely be implemented.

(2) As the Master Plan will target education, the principal operational source of budget should come from National Treasury. However, in order to reduce the burden shared by the Government, taking commercials to the broadcasting without obstructing educational service should be given consideration. It is forecast that in the later part of the Master Plan period, revenue from such commercials will be able to almost cover the operational expenses.

(3) A large initial investment will be required to implement the Master Plan to create an educational television broadcast network. However, in light of the current development budget of the Government and the expansion of the ANTELCO's investment, it will be difficult to obtain such a large amount for capital investment.

### Methods of Execution

(1) The Priority Project will serve as the foundation of the operation. In the initial period, advertising income will be limited, and although the subsidies for the operation cost can be expected, it will be imperative to find financial resources that does not rely upon such subsidies to fund for the construction costs, so as not to over-borden the National Treasury at a time.

(2) It will generally take from three to four years to introduce educational television broadcasts into the present educational system. Especially in the case of Paraguay, as this will be the first educational television, the development of the plan will have to be executed gradually in progressive stages.

(3) The actual operation should be executed through a joint venture between the MEC, which will be responsible for the planning and production of the educational programs, and the ANTELCO, which will transmit and broadcast the programs. By transferring as many personnel as possible to the operation, the required increase in the governmental budget can be minimized.

## **Recommendations**

### **(1) Establishment of an Effective System of Utilizing Educational Television Broadcasting**

In order to accomplish in full the objectives of the educational television broadcasting, an effective system should be established between the three parties for smooth coordination and close cooperation. The three parties concerned are the educational television station, schools and pupils, and the government agencies including MEC, which offer administrative supports to the project.

### **(2) Continuous Effort to Improve Conventional Education System**

The objective of educational television is not to replace the current school activities with the television, but to complement and improve them. It is not sufficient to simply introduce educational television broadcasting, but constant efforts should be made to improve the existing education system itself.

### **(3) Early Implementation of Priority Project**

The Priority Project is most essential in establishing the educational television broadcasting service in Paraguay. In particular, the implementation of Work 1 to construct transmitting facilities in Asuncion has an important meaning in securing the TV channel, which the Paraguayan Government has retained for years for educational television in the capital city. With the Asuncion station put into service, some 40% of the entire population of the country will be able to receive education through the television service. Consequently, Work 1 of the Priority Project should be taken up for implimentation at an earliest possible date.

### **(4) Promotion of Television Receivers and VCRs to Schools**

Policies should be established and implemented by the administrative agencies to promote the diffusion and use of television receivers and VCRs in schools.

(5) Use of foreign assistance to reduce finance cost burden

Taking the size of the Paraguayan government's developmental budget into account, it will be difficult to finance all the necessary investments of the project domestically, and acquisition of foreign assistance will be necessary. Particularly, the implementation of the Priority Project should be financed by grants or very soft loans, so as to ease the repayment burden as much as possible.

(6) Provision of National Subsidies

As has been seen from the financial analysis, this project lacks profitability, and for the smooth and successful operation of the educational television, subsidies from the government is a prerequisite. In the initial stage of full-scale operation, commercial revenues are not expected to cover the entire operational expenditure, therefore, subsidies in the region of three to four million dollars a year at most may be needed.

(7) Preparation for Full-scale Broadcasting

Through the five-year preparation period of the preparatory, experimental and introduction phases, some fifty program producers and eighty technical staff for production/transmission should be recruited and trained. Also, over one and half thousands programs must be produced in advance for stock. The following measures should be taken to achieve the objectives as planned;

- Instruction by experts

Experts, who are experienced with systematized educational broadcasting, will be invited from overseas organizations, to give guidance on program selection, efficient program production methodology and evaluation methodology.

- Training at Home and Overseas

In addition to the guidance and instruction given by the overseas experts, key personnel should have training at home and overseas. A system of recruitment and training should be so organized that those key personnel are the core of the manpower and they will subsequently train the newly recruits through the OJT method..

- Efficient Program Production System

For the start of full-scale broadcasting service, a sufficient number of educational television programs should be produced in advance. The establishment of an efficient program production system is prerequisite for the full-scale phase. Most of the educational television programs have some simple standardized formats, and a program production system to produce as many programs as possible in one day studio production should be organized and established

- Early Establishment of an Integrated Organization

The organization for the educational television service is inaugurated with the personnel seconded from MEC and ANTELCO. A very close cooperation is required among them for efficient business operation. A unified and integrated system for organizational operation should be established as early as possible.

(8) Coordination with Neighboring Countries for Allocation of UHF lower Channels

In the planning of the educational television network, the lower channels of the UHF television band are proposed to be allocated where the VHF channels cannot be used by the interference from other television stations. At present a reservation is agreed on between the neighboring countries for the use of the channels, but coordination should be made with the neighboring countries to secure the use of the channels for the educational television service.

(9) Maintenance System for Equipment/Facilities

Current broadcasting equipment are highly reliable with the use of semiconductor devices, however, they cannot be repaired easily by user technicians once they break down. Often the equipment must be sent back to manufacturers or maintenance specialists for repair. Arrangements should be made with the manufacturers and external organizations for fast repair and maintenance. A centralized maintenance unit should be formed with a small number of engineering staff to process these repair procedures, and a certain maintenance budget should be set aside to deal with equipment failure quickly.



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