

ISA 73595

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UNITED STATES INTERNATIONAL DEVELOPMENT COOPERATION AGENCY  
AGENCY FOR INTERNATIONAL DEVELOPMENT  
Washington, D. C. 20523

BOLIVIA  
PROJECT PAPER  
INTERACTIVE RADIO LEARNING

AID/LAC/P-650

PROJECT NUMBER: 511-0619

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<b>AGENCY FOR INTERNATIONAL DEVELOPMENT</b> <b>PROJECT DATA SHEET</b>		<b>1. TRANSACTION CODE</b> <input checked="" type="checkbox"/> A = Add <input type="checkbox"/> C = Change <input type="checkbox"/> D = Delete	Amendment Number _____	<b>DOCUMENT CODE</b> 3
<b>2. COUNTRY/ENTITY</b> Bolivia		<b>3. PROJECT NUMBER</b> 511-0619		
<b>4. BUREAU/OFFICE</b> Latin America & Caribbean (LAC)		<b>5. PROJECT TITLE (maximum 40 characters)</b> INTERACTIVE RADIO LEARNING		
<b>6. PROJECT ASSISTANCE COMPLETION DATE (PACD)</b> MM DD YY 09 30 96		<b>7. ESTIMATED DATE OF OBLIGATION</b> (Under "B" below, enter 1, 2, 3, or 4) A. Initial FY 91 B. Quarter 4 C. Final FY 96		

8. COSTS (\$000 OR EQUIVALENT \$1 = )						
A. FUNDING SOURCE	FIRST FY 91			LIFE OF PROJECT		
	B. FX	C. L/C	D. Total	E. FX	F. L/C	G. Total
APP Appropriated Total	400	15	415	4,600	400	5,000
(Grant)	( 400 )	( 15 )	( 415 )	( )	( )	( 5,000 )
(Loan)	( )	( )	( )	( )	( )	( )
Out- U.S.	1.					
	2.					
Host Country	--	380	380	--	3,380	3,380
Other Donor(s)	--	--	--	--	--	--
<b>TOTALS</b>	400	395	795	4,600	3,780	8,380

9. SCHEDULE OF AID FUNDING (\$000)									
A. APPROPRIATION	B. PRIMARY PURPOSE CODE	C. PRIMARY TECH. CODE		D. OBLIGATIONS TO DATE		E. AMOUNT APPROVED THIS ACTION		F. LIFE OF PROJECT	
		1. Grant	2. Loan	1. Grant	2. Loan	1. Grant	2. Loan	1. Grant	2. Loan
(1) HE	510	560	-	-	-	415	-	4,000	-
(2) ED	620	620	-	-	-	-	-	1,000	-
(3)									
(4)									
<b>TOTALS</b>						415	-	5,000	-

<b>10. SECONDARY TECHNICAL CODES (maximum 6 codes of 3 positions each)</b> 636						<b>11. SECONDARY PURPOSE CODE</b> 680			
<b>12. SPECIAL CONCERNS CODES (maximum 7 codes of 4 positions each)</b>									
A. Code		BR		BU					
B. Amount									

**13. PROJECT PURPOSE (maximum 480 characters)**

To institutionalize interactive radio technology and health/math curricula in the Bolivian basic education system and to improve the quality of health/math education.

<b>14. SCHEDULED EVALUATIONS</b>						<b>15. SOURCE/ORIGIN OF GOODS AND SERVICES</b>							
Interim		MM	YY	MM	YY	Final		MM	YY	<input checked="" type="checkbox"/> 000 <input type="checkbox"/> 941 <input checked="" type="checkbox"/> Local <input type="checkbox"/> Other (Specify) _____			
				07	93			10	95				

**16. AMENDMENTS/NATURE OF CHANGE PROPOSED (This is page 1 of a \_\_\_\_\_ page PP Amendment)**

The USAID Controller has reviewed the methods of implementation and financing and the financial procedures described herein and hereby indicates concurrence.

*Thomas J. Johnstone, Jr.*  
 Thomas J. Johnstone, Jr.  
 Acting Controller

<b>17. APPROVED BY</b>	Signature <i>Garber A. Davidson</i>	<b>18. DATE DOCUMENT RECEIVED IN AID/W, OR FOR AID/W DOCUMENTS, DATE OF DISTRIBUTION</b> MM DD YY 
	Title Garber A. Davidson Acting Director	
	Date Signed MM DD YY 016 27 91	

## PROJECT AUTHORIZATION

Name of Country/Entity:        Bolivia  
Name of Project:                Interactive Radio Learning  
Number of Project:              511-0619

1. Pursuant to Sections 104 and 105 of the Foreign Assistance Act of 1961, as amended, I hereby authorize the Interactive Radio Learning Project (The Project) for Bolivia (The Cooperating Country) involving planned obligations of not to exceed Five Million United Dollars \$5,000,000 in grant funds over a five year period, subject to the availability of funds, in accordance with the A.I.D. OYB/allotment process, to help in financing foreign exchange and local currency costs for the Project. The planned life of the Project is approximately five years from the date of initial obligation, to September 30, 1996.
  
2. The Project will seek to improve the health status of children in primary school grades 3 through 5, and mathematics skills of children in grades 2 through 5, using interactive radio instruction. Furthermore, the Project intervention will become an institutionalized part of the Ministry of Education and Culture by the end of the Project. The Project will be carried out by a buy-in to the Learning Technologies Project, and by the Ministry of Education and Culture.
  
3. The Project Agreement(s), which may be negotiated and executed by the officer(s) to whom such authority is delegated in accordance with AID Regulations and Delegations of Authority, shall be subject to the following essential terms and covenants and major conditions, together with such other terms and conditions as AID may deem appropriate:

a

**a. Source and Origin of Commodities, Nationality of Services**

Commodities financed by AID under the project shall have their source and origin in the Cooperating Country or in the United States, except as AID may otherwise agree in writing. Except for ocean shipping, the suppliers of commodities or services shall have the Cooperating Country or the United States as their place of nationality, except as AID may otherwise agree in writing. Ocean shipping financed by AID under the Project shall, except as AID may otherwise agree in writing, be financed only on flag vessels of the United States.

**b. Disbursements for Ministry of Education**

Prior to disbursements to or on behalf of the Ministry of Education, and Culture (MEC), the Government of Bolivia (GOB) shall submit annual annual operational plans and budgets satisfactory to AID, and MEC shall demonstrate to the satisfaction of AID that the MEC has financial and administrative systems and capabilities to adequately manage and properly account for the funds disbursed to or on behalf of the MEC.

**4. Authorization of Local Cost Financing**

Based on the financial plan and justification included in the Project Paper, Section III, and the description of Project activities and implementation arrangements in Sections II, IV and V of the Project Paper, local cost financing with appropriated funds is hereby authorized for the Project, as necessary to fulfill program objectives and to best promote the objectives of the Foreign Assistance Program.

A waiver to permit local cost financing for non-exempt goods and services in the aggregate amount of \$200,000 is hereby granted. Other local costs identified as necessary for the Project are hereby determined to be exempt from the waiver requirement, in accordance with Section III.C. of the Project Paper.

  
Garber A. Davidson  
Acting Director  
USAID/Bolivia

Date: 6/27/91

RLA:SCAllen:nec

**Clearances:**

A/HHR:Sanderson SA 6/25/91  
PD&I: MBarash MB 6/28/91  
DP: WTate WT 6/25  
CONT: JRDavison JD 6/28/91  
RCO: CBucher CB 6/28/91  
A/DD: EKadunc EK 6/28/91

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LIST OF ACRONYMS

AID Agency for International Development  
AID/S&T Agency for International Development, Bureau for Science and  
Technology  
AID/W Agency for International Development/Washington  
BS Backstop  
CCN Counterpart Country National  
CNC Confederación Nacional de Campesinos  
COP Chief of Party  
DHS Demographic Health Survey  
EDC Education Development Center, Inc.  
EOP End of Project  
ERBOL Escuelas Radiofónicas de Bolivia  
ESF Economic Support Fund  
FAR Foreign Assistance Regulations  
FIS Fondo de Inversión Social  
FS Foreign Service  
FX Foreign Exchange  
FY Fiscal Year  
FYA Fe y Alegría  
GOB Government of Bolivia  
GTZ German International Development Agency  
HE Health Educator  
HHR Health and Human Resources  
IBRD International Bank for Reconstruction and Development  
ICI Instituto de Cooperación Iberoamericana  
IRI Interactive Radio Instruction  
IRL Interactive Radio Learning  
LAC Latin American Caribbean  
LC Local Currency  
LOP Life of Project

*n*

LT Learning Technologies Project  
MCH Maternal/Child Health  
MEC Ministry of Education and Culture  
MIS Management Information System  
MOH Ministry of Health  
MPH Masters of Public Health  
NGO Non-Governmental Organization  
OPG Operational Program Grant  
ORS Oral Rehydration Salts  
OYB Operating Year Budget  
PDI Project Development and Implementation  
PERAB Programa de Educación por Radio en Bolivia  
PID Project Identification Document  
PIL Project Implementation Letter  
PIO/T Project Implementation Order/Technical  
PM Person Months  
PP Project Paper  
SC Personal Service Contract  
PV Photovoltaic  
RLP/B Radio Learning Project/Bolivia  
SIF Social Investment Fund  
TA Technical Assistance  
UNICEF United Nations International Children's Education Fund  
USAID/B United States Agency for International Development in Bolivia

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## I. RECOMMENDATION AND PROJECT SUMMARY

### A. Summary Recommendation

USAID/Bolivia recommends that the Interactive Radio Learning Project be approved on grant terms at a total five-year funding level of \$5.0 million. The purpose of the project is to build upon the Radio Learning Project (RLP/B) (AID Project No. 511-0597) to improve the quality of education in two basic subject areas, mathematics and health, through institutionalization within the Ministry of Education and Culture (MEC) of locally adapted Interactive Radio Instruction (IRI) curricula. Improved instruction will contribute to the sector goal of developing Bolivia's human resource base through improved educational opportunities and access to primary health care information. The GOB counterpart contribution will amount to \$3.4 million, \$300,000 of which will be drawn from Economic Support Fund (ESF) local currency accounts and \$100,000 from the Social Investment Fund (FIS). The \$2.9 million balance will be in the form of in-kind teacher salary and support provided through the Ministry of Education.

A USDH direct hire BS-50 and a Bolivian PSC secretary will manage the Project for USAID/B, within the Office of Health and Human Resources. Funds are budgeted for audit, evaluation, secretarial support, and project-related logistical support.

### B. Project Summary

The goal of this project is to improve the quality of life for Bolivians through better maternal and child health care information and basic education. The purpose of the project is to institutionalize interactive radio technology and health/math curricula in the Bolivian basic education system to improve the quality of health/math education.

The proposed five-year project will be composed of the following four major components: (1) the institutionalization of interactive radio health and mathematics curricula in the Bolivian basic education system for grades 2 through 5; (2) the development and field testing of a health curriculum for grades 3, 4, and 5; (3) a monitoring, evaluation, and operations research component to track Project implementation and effectiveness; and 4) an extension of IRI curricula to out-of-school children and adults. As outlined in the Implementation Plan, each of these components will include curriculum design, production and evaluation activities spread over the LOP. By working with the MEC to gradually implement the IRI math curriculum in at least 7 of the 9 departments by EOP, the Ministry's capabilities to administer and manage IRI at the national, departmental and local levels will be developed and strengthened. Continuing policy dialogues with the MEC and potential donor agencies will serve to enhance the Ministry's commitment to incorporate IRI math and health curricula in the pending education reform package.

One of the essential elements of instituting IRI is having a trained cadre of supervisors and teachers. Initially, supervisors will be trained in IRI methodology. Working with the NGO subcontractor trainers, they will in turn train school directors, who will be responsible for training additional teachers.

Other activities necessary for implementation of IRI on a national scale include the development of a system for production and distribution of teachers guides, contractual arrangements with radio stations for transmission of the lessons, and a system for distribution and maintenance of the radio receivers. Since consistent power supply for the radios may be a barrier to program implementation in rural areas, the project and MEC should consider investigating alternative, permanent energy sources as described in Annex G: Appropriate Energy Technologies.

An additional aspect of institutionalization will be the development of an infrastructure for the supervision and evaluation of the IRI lessons. Supervisors will receive in-service training in formative evaluation and a system will be developed for feedback. A small-scale management information system will be field tested to assess and demonstrate its potential for data collection by the MEC. The principal target for this component of the project is the MEC staff at local, regional, and national levels. The actual targets of the math lessons are the Bolivian schoolchildren in grades 2 through 5.

While the mathematics curriculum is being implemented on a nationwide basis, the health curriculum for grades 3, 4, and 5 will be developed and field-tested. This activity will be conducted by the contractor and sub-contractor(s), appropriate NGOs. A total of 9 modules will be developed for three grade levels, including the pilot diarrhea module which will be revised for 4th grade. After the modules for each grade level are field-tested and validated, they will be implemented in all the schools receiving math broadcasts at that time. By EOP, all units for all grades will be ready for national distribution.

As the curriculum units are developed, teacher's guides will be prepared. Teacher training specific to IRI health will be planned and conducted with appropriate field testing. Since one of the units will cover basic first-aid, all teachers will be offered additional training in this area and each pilot school provided with a First Aid kit; this training will be done in conjunction with the MOH which has an on-going project providing preventive health training to primary school teachers. In areas where there are no health care workers, motivated teachers will be encouraged to provide first-aid and primary health measures such as oral rehydration salts (ORS). This should be done in collaboration with the current MOH/MEC program for provision of such services in these areas.

In order to extend the benefits of IRI health education to the community level, NGO and MOH health promoters will be invited to listen and participate in the classrooms, and will be given teacher's guides, which they may adapt for use with their adult audiences.

Extensive baseline data collection will be necessary for the preparation and evaluation of the health lessons. Such data will permit customization of the lessons to the needs, knowledge, practices, beliefs, and lifestyles of the Bolivian children and their families. Specific data on health practices of the children at school and at home will facilitate an assessment of the nature and degree of behavioral modifications.

Targets for the health curriculum are Bolivian schoolchildren in grades 3 through 5 with approximate ages ranging from 8 to 12. During the LOP, twenty pilot schools will be selected in the departments of La Paz, Santa Cruz, and Cochabamba; schools in both urban and rural areas should be included. In addition to the direct beneficiaries, parents, siblings, other relatives, friends, and other people who listen to the radio lessons will be included.

The Project expects to have achieved the following outputs by EOP:

Number of participating students	200,000 *
Number of school directors and teachers trained in IRI	5,000
Number MEC supervisors trained	50
Participating out-of-school youth and adults	10,000
Number of lessons plans broadcast and validated	700
Number of Teachers' guides developed	7

\* Of the 200,000 participating students, approximately 90,000 will be girls. This figure is based on the current female participation rate in MEC schools 1988.

## II. PROJECT RATIONALE AND DESCRIPTION

While Bolivia has made significant advances in government and economic stability during the past decade, the socio-economic situation of the majority of the population remains sub-standard, and the provision of social services, particularly in health and basic education, has not improved. The problem of inexperienced administration and management of the public sector is compounded by the extremes in geography, seriously hampering communication and transportation. Lack of a coherent inter-sectorial policy and long-range planning further hinders efficiency in health care and basic education. Large sectors of the population have little or no access to these services, or only have access to services of marginal quality.

### A. Education

Major problems in education include the large number of children not enrolled in school, repetition of grades, a high drop-out rate, and large numbers of over-age students. MEC data show a large disparity between the quality of urban and rural education. In 1980, only 21% of the students initially enrolled in rural schools ever complete the elementary level, and

only 1% continue on to secondary school. In urban areas, the drop-out rate is reported to be less than 20 percent. In spite of a nearly equal distribution of urban and rural population, the GOB's education budget is skewed towards urban and higher education while many rural schools lack the basic necessities of qualified teachers, chalkboards, and desks.

In the urban areas, over-crowding and strikes create problems for both teachers and students. Economic stress appears to be the major factor behind poor parents' decision not to send their children to school while a lack of confidence in the public system motivates more affluent families to send their children to private schools.

The official illiteracy rate for Bolivia as a whole has been estimated to have been 18.3% in 1988, and the breakdown for urban and rural areas was 7.6% and 31.1%, respectively. Literacy has been defined as the ability to sign one's name or having attended school for any length of time. The functional literacy rate, on the other hand, has been estimated as low as 50% for the entire country, while in rural areas, it is much worse. Not only the inefficiency of the public school system, but also the lack of appropriate, appealing teaching methodologies underlie these low levels.

#### B. Health

The infant mortality rate for Bolivia is the highest in Latin America. According to the 1989 National Demographic Survey conducted by DHS, one in ten infants dies before reaching one year of age, and one in seven dies before reaching age five. Children in rural areas run a 50% higher risk of dying before age five than those living in urban areas.

According to the most recent data, the leading cause of death for children under five is diarrhea, accounting for 36% of deaths. Respiratory infections account for over a fourth of the deaths. From the data collected, DHS calculated that only a third of the children between age one and two have been fully vaccinated. The survey also found that barely half of all births were attended by either midwives or trained medical personnel.

Large sectors of the population in both rural and peri-urban areas do not have access to potable water, latrines, or sewage systems. UNICEF estimates that only 23% of the total population has access to any kind of modern medical care.

The DHS study showed that 38% of children under age three showed signs of stunting (low height for age), a sign of chronic undernutrition. Malnutrition in its synergistic relationship with infection compounds morbidity and mortality. Nutritional deficiencies result from a complex of factors, including poverty, lack of access to a variety of food, lack of knowledge, and recurring illness.

While the MOH has engaged in forty years of health education efforts, presumably targeting adults, there has been minimal improvement in mortality and morbidity rates. The overall life expectancy for both men and women hovers around 55 years, with diseases such as Chagas, malaria, yellow fever, and tuberculosis taking their toll on adults as well as children.

### C. Relationship of Education to Health

During the past decade, it has become apparent that a relationship exists between literacy of the mother and infant morbidity and mortality. Two studies conducted recently in Bolivia have shown a very definite relationship.

In the DHS survey and its follow-up, it was found that children born to mothers without any education were three times as likely to die in their first year of life as children born to mothers with at least nine years of education. A positive relationship was also shown to exist between education level of the mother and incidence and mortality of diarrheal diseases, acute respiratory infections, and malnutrition. This relationship was shown to exist in both urban and rural areas.

Women who with at least a 5th grade education are far more likely to use modern health care facilities and family planning services. Women with no education are more likely to have their first child during adolescence, and to have more children than women who have had a minimal amount of schooling.

Unfortunately, in Bolivia as well as in other developing countries, women form the least educated sector of the population. Often parents do not perceive the importance of education for their daughters, or are obliged by economic circumstances to keep them home working and caring for younger siblings. Because attendance of girls who do enroll in school is often erratic due to family needs, they are twice as likely as boys to have to repeat grades. By fourth grade, a disproportionate number of girls have dropped out of school permanently.

### D. The Role of Interactive Radio Instruction

Experience in a number of AID-funded projects around the world has demonstrated the effectiveness of an innovative instructional approach called Interactive Radio Instruction (IRI) to teach, motivate, and enliven classroom environments at a low cost. Extensive field tests in Latin America, Asia, and Africa have shown IRI to be a cost-effective mechanism for improving the quality, efficiency, and accessibility of education systems in developing countries. Also, the radio lessons have helped to bridge the urban/rural learning gap in core subject areas.

Research and development of the IRI methodology for teaching mathematics spans 15 years in such diverse countries as Nicaragua, Thailand, Honduras, Costa Rica, and most recently, Bolivia. In Bolivia, the entire math curriculum for grades 2 through 5 has been adapted, developed, and

pilot-tested during the past five years in cooperation with Fe y Alegria (FyA). Post-test scores have consistently shown nearly a 25% improvement over pre-test scores, and are significantly higher than scores of students being taught by traditional methods. IRI math has essentially been institutionalized in the participating FyA schools, and the MEC is field testing IRI in 161 second grade classrooms in 3 departments.

In 1989, the Bolivian Radio Learning Project (RLP/B) piloted the use of radio for teaching another subject matter, health. A single, 10-lesson unit on the prevention and treatment of diarrhea was developed and field tested in 10 fourth and fifth-grade classrooms in the peri-urban areas of Cochabamba. The results of the post-test showed that IRI methodology was equally as effective in promoting knowledge gains in health as in math. Very limited qualitative data showed that the lessons also brought about a transfer of information to the children's families. Demand for the health lessons among both FyA and public school teachers has been high. This appears to demonstrate a positive linkage between participants exposed to math and health methodology.

Interactive radio education has the potential for providing nation-wide coverage to all schools and to anyone with access to a radio receiver. It has been shown to be effective in improving teachers' knowledge and skills, and in motivating student attendance. At the same time, the lessons are available to those children who are out of school, either temporarily or permanently. IRI could become a powerful tool for reducing adult illiteracy and for providing basic primary health care information.

#### **E. Project Goal and Purpose**

The goal of this project is to improve the quality of life for Bolivians through better maternal and child health care information and basic education. The purpose of the project is to build upon the RLP/B (AID Project No. 511-0597), through institutionalizing interactive radio technology and health/math curricula in the Bolivian basic education system to improve the quality of health/math education.

While the thrust of the Project is toward the public primary schools, providing boys and girls equal access to the program in participating schools, the impact of the program on the out-of school audience may be most beneficial to girls, given the larger number of girls who are not in school. The Project design places a special emphasis on female beneficiaries.

Unlike most traditional health education projects which target women of child-bearing age, radio health will target children in the primary grades 3 through 5, who will become the future parents of Bolivia, many of whom are now serving as caretakers for younger siblings and engaging in household

activities of food preparation and sanitation practices. Children in this age cohort need information on which to base decisions related to their own health and that of their younger siblings. Studies have shown that young children who learn basic health concepts and practices are more likely to implement and maintain these behaviors as adults.

#### **F. Relationship to AID and Other Donor Activities**

Because of the relationship between basic education for females and improved maternal-child health indices, as well as the expected impact of the health education curriculum, it is expected that this program will complement, in the long-term, other USAID/Bolivia programs such as Women's Reproductive Health, Maternal/Child Health (MCH), and AIDS prevention.

While MEC participation in the Radio Learning Project has been limited, the Ministry has become very aware of the advantages of the IRI curriculum, and has requested assistance in nation-wide implementation. The MEC is currently negotiating with the Instituto de Cooperación Iberoamericana (ICI) to build a national educational radio station for the broadcast of the IRI lessons and other educational activities. As of the June, 1991, the outcome of this negotiation is uncertain.

Furthermore, the MEC is in the process of planning and carrying out an educational reform, financed by the World Bank. Position papers are expected to be available in the first quarter of 1992. The commitment to IRI by the MEC and a gradual implementation would help ensure a place for radio instruction in the educational reform package. The MEC will also have the opportunity to develop the skills and decision-making capabilities required for successful nation-wide implementation.

#### **G. Project Description**

The proposed five-year project will be composed of the following four major components: (1) the institutionalization of interactive radio health and mathematics curricula in the Bolivian basic education system for grades 2 through 5; (2) the development and field testing of a health curriculum for grades 3, 4, and 5; (3) a monitoring, evaluation, and operations research component to track Project implementation and effectiveness; and 4) an extension of IRI curricula to out-of-school children and adults. As outlined in the Implementation Plan, each of these components will include curriculum design, production and evaluation activities spread over the LOP.

##### **1. Institutionalization of IRI Mathematics and Health education.**

By working with the MEC to gradually implement the IRI math curriculum in at least 7 of the 9 departments by EOP, the Ministry's capabilities to administer and manage IRI at the national, departmental and local levels will

be developed and strengthened. Continuing policy dialogues with the MEC and potential donor agencies will serve to enhance the Ministry's commitment to incorporate IRI math and health curricula in the pending education reform package.

One of the essential elements of instituting IRI is having a trained cadre of supervisors and teachers. Initially, supervisors will be trained in IRI methodology. Working with the NGO subcontractor trainers, they will in turn train school directors, who will be responsible for training additional teachers. Refresher training and up-dating for teachers may be provided by other means, including use of distance education by two-way radio. Following a needs assessments of the teachers, plans for such training should be made in conjunction with the MEC; training effectiveness should be field tested prior to national implementation. Project personnel should also initiate contact with the IRI's Distance Learning Program(s) currently being implemented for teachers in Tarija.

A careful assessment should be made of the appropriate length of teacher training, and a study of teachers who have participated in IRI under the RLP/B should be considered. This study would provide information relevant to the design and content of the teacher training modules. The one-day sessions developed by the RLP/B should be carefully examined, and consideration should be given to extending the training to two complete days. Also, teachers experienced in the use of the IRI methodology should be selected to participate in the training. Most certainly, teachers new to IRI will be motivated to learn more rapidly and gain a greater understanding of the advantages of IRI when taught by other teachers.

Other activities necessary for implementation of IRI on a national scale include the development of a system for production and distribution of teachers guides, contractual arrangements with radio stations for transmission of the lessons, and a system for distribution and maintenance of the radio receivers. Since consistent power supply for the radios may be a barrier to program implementation in rural areas, the project and MEC should consider investigating alternative, permanent energy sources as described in Annex G: Appropriate Energy Technologies.

An additional aspect of institutionalization will be the development of an infrastructure for the supervision and evaluation of the IRI lessons. Supervisors will receive in-service training in formative evaluation and a system will be developed for feedback. A small-scale management information system will be field tested to assess and demonstrate its potential for data collection by the MEC. The steps toward institutionalization are detailed in Section IV. Implementation Plan.

The principal target for this component of the project is the MEC staff at local, regional, and national levels. The direct beneficiaries of the math lessons are the Bolivian schoolchildren in grades 2 through 5.

## 2. Development and Validation of the IRI Health Curriculum.

While the mathematics curriculum is being implemented on a nationwide basis, the health curriculum for grades 3, 4, and 5 will be developed and field-tested. This activity will be conducted by the contractor and sub-contractor(s), appropriate NGOs. A total of 9 modules will need to be developed for three grade levels, including the pilot diarrhea module which will be revised for 4th grade. After the modules for each grade level are field-tested and validated, they will be implemented in all the schools receiving math broadcasts at that time. By EOP, all units for all grades will be ready for national distribution.

As the curriculum units are developed, teacher's guides will be prepared. Teacher training specific to IRI health will be planned and conducted with appropriate field testing. Since one of the units will cover basic first-aid, all teachers will be offered additional training in this area and each pilot school provided with a First Aid kit; this training will be done in conjunction with the MOH which has an on-going project providing preventive health training to primary school teachers. In areas where there are no health care workers, motivated teachers will be encouraged to provide first-aid and primary health measures such as oral rehydration packets (ORS). This should be done in collaboration with the current MOH/MEC program for provision of such services in these areas.

To extend the effects of IRI health education in the communities, NGO and MOH health promoters will be invited to listen and participate in the classrooms, and will be given teacher's guides, which they may adapt for use with their adult audiences.

Extensive baseline data collection will be necessary for the preparation and evaluation of the health lessons. Such data will permit customization of the lessons to the needs, knowledge, practices, beliefs, and lifestyles of the Bolivian children and their families. Specific data on health practices of the children at school and at home will facilitate an assessment of the nature and degree of behavioral modifications.

Targets for the health curriculum are Bolivian schoolchildren in grades 3 through 5 with approximate ages ranging from 8 to 12. During the LOP, twenty pilot schools will be selected in the departments of La Paz, Santa Cruz, and Cochabamba; schools in both urban and rural areas should be included. In addition to the direct beneficiaries, parents, siblings, other relatives, friends, and other people who listen to the radio lessons will be included.

## 3. Project Monitoring and Evaluation

The implementation of the scheduled project activities will be carefully monitored through quarterly reports by the contractors, site visits,

evaluation results, operations research, and two outside evaluations--mid-term and final. Periodic audits will also be made to track the timeliness of Project expenditures.

The evaluation activities will consist of baseline studies for the development of the health modules, formative and summative evaluations, and operations research to measure possible behavioral outcomes. The methodologies for the baseline and behavioral studies will be primarily qualitative, and the student evaluations will consist of a combination of formal testing and classroom observations to measure learning achievement and identifying pedagogical problems.

#### **4. Extension of Interactive Radio Curricula in Health and Math to Out-of-School Children and Adults**

During the second and third years of the project, a pilot program will be undertaken to reach out-of-school children and youths and interested adults. Such a program will include creating a general awareness in the community of the normal broadcast times, and possibly, broadcasting at another time of day when working people would be able to listen. Social marketing should be contemplated to motivate participation. Study guides could be developed to take the place of the post-transmission activities normally conducted by a teacher. A distribution system for such materials would have to be developed, as well as a means of assessing program impact on this audience.

The results of this pilot program will be shared with the MEC and other donor agencies. Depending on the success, a program of interactive radio education for adults and children not in school might be incorporated in future plans for Bolivian basic education.

### **III. COST ESTIMATE AND FINANCIAL PLAN**

#### **A. Summary Inputs: Level of Effort**

The personnel inputs in terms of long and short term international technical assistance, local staff, and in-kind support from the Ministries of Education and Health is tabulated below. The project will provide for a total of 10,964 PM of CCN (counterpart country national) resources provided in-kind through the Ministries of Education and Health; and 1,223 PM of Technical Assistance through a buy-in to the S&T/ED LearnTech Project. The following chart is illustrative of the level-of-effort required for successful project implementation:

ITEM	TA (1)	KIND	
		MEC	MOH
1) INTERNATIONAL STAFF:	103 PM		
Long-Term TA	71 PM		
Chief of Party (COP) and Health Educator			
Short Term TA	32 PM		
- Economist/Admin, MIS, Evaluator, Community Health, Primary Health Care Spec, Applied Research, Epidemiologist, Studio Engineer, Video, MPH Researcher, Teacher Trainer			
2) LOCAL STAFF:	1,120 PM	10,894 PM	70 PM
Management Team	50 PM	49 PM	
Curriculum Team	169 PM	29 PM	70 PM
- Production Coord, Curriculumists, Epidemiologist			
Radio Team	198 PM	30 PM	
- Radio Director, Engineer Actors			
Evaluation Team	105 PM	35 PM	
- MIS, Tests & Measurements Operations Research			

(1) Detailed breakdown of TA is provided in Implementation Plan, Section IV.

<u>ITEM</u>	<u>TA</u>	<u>IN KIND</u>	
		<u>MEC</u>	<u>MOH</u>
Implementation Team - Formative Evaluators/ School Supervisors/ Teacher Trainers/Data Collectors, Teachers, School Directors	231 PM	10,405 PM	
Administration Team - Administrator, Accountant Administrative Assistant	105 PM	23 PM	
Support Staff - Secretaries, Guards, Messenger, Office & Grounds Maintenance, Materials Dispatcher, Chauffeurs	262 PM	323 PM	
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TOTALS:	1,223 PM	10,894 PM	70 PM

**B. Financial Plan**

The financial plan for this Project is shown below in four tables: (1) Summary of Project Budget, (2) Methods of Implementation and Financing, (3) Disbursement Schedule, and (4) Budget for EDC Buy-in. Additional discussion of each table can be found in Annex F (2).

**SUMMARY PROJECT BUDGET (US\$ 000)**

ACTIVITY	AID		CONTREPART	
	FX	LC	FX	LC
1. Technical Assistance	\$4,200			
2. Audits and Evaluations	100	50		
3. Management and Logistical Support	250			
4. MEC Support		400		
5. GOB Salaries 5				2,860
6. Radios 2				100
7. Textbook Production and Distribution 3				50
8. Building Construction 4				250
9. Building site				120
<b>Total</b>	<b>\$4,550</b>	<b>\$450</b>		<b>\$3,380</b>

- 1 GOB salaries are calculated on the basis of US\$13.02/student/year for LOP for the mathematics component, and the incremental cost of developing the health modules. Section d, below, provides more information.
- 2 FIS support to MEC
- 3 ESF or PL 480 support expected in FY 1992
- 4 ESF or PL 480 support expected in FY 1992. Building construction will not delay the start of the Project, since activities will be initiated from rented facilities.

METHODS OF IMPLEMENTATION AND FINANCING  
(US\$ 000)

Component	Implementation Method	Method of Payment	Est. Amount
Technical Assistance	Buy-in to EDC	AID/W Direct Payment	\$4,200
MEC Support	PII	Periodic Advances	\$400
Audits and Evaluations	PIO/T Local	Direct Payment	\$150
Management and Logistical Support	PIO/T Contracts	Direct Payment	\$250
Total			\$5,000

The above summary is explained in the following narrative:

- a) AID project funds in the amount of \$5 million dollars will be utilized within the framework of a bilateral agreement with the MEC, and applied primarily to the provision of technical assistance through a buy-in to the Learning Technologies Project contract between S&T/ED and the Educational Development Center. Payments to the contractor shall be made in accordance with the reimbursement terms of that contract. MEC payments will be made through periodic advances in accordance with the terms of the bilateral agreement. Pursuant to AID billing requirements, the MEC will develop a billing system in accordance with the terms established in the bilateral agreement and the corresponding instructions received from USAID-Bolivia.
- b) Payments to the contractor shall be made to cover such things as long and short-term TA and support for project activities associated with developing and field testing the health education radio lessons, expanding the outreach of radio mathematics, MEC training, and the internal evaluations associated with the delivery of educational services. Two international long-term TA positions, and two major local service subcontracts will be contracted by EDC to ensure institutional (schools') participation for the developmental phase of the program, and to ensure the availability of professional IRI staff.

- c) International short-term TA consultants with expertise in health and distance education, and evaluations specialists will be contracted by EDC using project funds.
- d) Full coverage of the TA costs of operating and administrating the main Project office in La Paz, inclusive of building a radio production/sound studio, purchasing all equipment and goods necessary for the project will be covered by the grant.
- e) There will be \$150,000 in project funds designated for local audits, mid-term and final evaluations, and financial reviews, to be contracted directly by USAID-Bolivia.

EDC will present vouchers in accordance with the current established practices of the buy-in core contract for corresponding reimbursement. The project's first disbursements will cover start-up and full operations for a period of at least 6 months, in consideration of the intensive front end expenses, contracting and preparation for immediate expansion of the mathematics component, and for the heavy advance work to prepare health pilot lessons in time for the school year beginning in February 1992.

The above notwithstanding, at this time the initial obligation of project funds for FY 91 is planned for only \$415,000. In FY 92 the Mission plans to obligate an additional \$1,250,000, but these funds will probably not be available before April 1992. This delay could place serious constraints on project implementation. However, USAID/B is expecting that AID/W will provide an additional \$400,000 of health funds in FY91.

- f) The \$400,000 of Project funds will cover travel for relevant MEC personnel, all teacher training activities, Departmental office equipment and support, national IRI Advisory Board activities, and MEC central office operating expenses, including radio broadcasts.

Counterpart project funds will support the following MEC activities:

- a) In-kind support in the amount of \$2.9 million for MEC teachers and instructional staff at the local and departmental levels, in connection with the mathematics expansion component and the field testing of the health lessons.
- b) A contribution of approximately \$100,000 from the FIS/World Bank for the purchase of radios to be placed in rural and peri-urban schools. It is acknowledged that schools receiving FIS financing must meet established low income criteria.
- c) \$50,000 for the production of teachers guides in mathematics and health, and \$250,000 for construction of a building for the IRL project or distance learning unit of the Ministry. ESF funds earmarked for FY 1992 will support these activities.

- d) The MEC is contributing a lot, valued at \$120,000, for the construction of a building to house the Central Project offices and production facilities.

DISBURSEMENT SCHEDULE (US\$ 000)

Item	Year 1		Year 2		Year 3		Year 4		Year 5		Total		
	FX	LC	FX	LC	FX	LC	FX	LC	FX	LC	FX	LC	
Technical Assistance	650		1,300		1,300		950				4,200		4,200
Audits & Evaluations					75				75		100	50	150
Management & Logistical Support	15		50		50		65		70		250		250
MEC Support				200		200						400	400
<b>Totals</b>	<b>665</b>	<b>0</b>	<b>1,350</b>	<b>200</b>	<b>1,425</b>	<b>200</b>	<b>1,015</b>	<b>145</b>			<b>4,550</b>	<b>450</b>	<b>5,000</b>

DISBURSEMENT SCHEDULE (HOST COUNTRY)

	Year 1	Year 2	Year 3	Year 4	Year 5	Total
1. ESP or PL 480	0	\$250,000	\$ 50,000	0	0	\$ 300,000
2. FIS	0	0	\$100,000	0	0	\$ 100,000
<b>Total</b>	<b>0</b>	<b>\$250,000</b>	<b>\$150,000</b>	<b>0</b>	<b>0</b>	<b>\$ 400,000</b>

OBLIGATION SCHEDULE

Account	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Health	\$415,000	750	735	1,600,000	0	\$3,500,000
Education	0	500	500	500,000	0	\$1,500,000
<b>Total</b>	<b>\$415,000</b>	<b>\$1,250,000</b>	<b>\$1,235,000</b>	<b>2,100,000</b>	<b>0</b>	<b>\$5,000,000</b>

\* However, we are expecting that AID/W will provide an additional \$400,000 of health funds in FY'81.

C. Local Source Procurement Justification

Local source procurement in Bolivia with appropriated funds will be necessary under the Project in order to successfully implement all four project components. Since the target groups of this Project are rural and peri-urban Bolivians, most mechanisms to reach them will be provided in a Bolivian context which will require Bolivian local currency to implement project activities.

Within the radio mathematics and health components, the Bolivian staff at the technical assistance unit will be paid in local currency. The operating costs of this unit will be a mix of foreign exchange and local currency. Lessons productions and radio broadcasts will require local currency financing.

Therefore, under the Administrator's Buy America Policy ("ABAP"), as last restated in the final implementation guidance cable, 90 State 410442, para 8, a waiver authorizing local cost financing ("LCF") by categories of procurement transactions must be included in project authorization documentation for non-exempt categories of transactions. An analysis of the project budget and justification for the waiver included in the project authorization for such non-exempt categories of procurement transactions follows an explanation of the exemptions.

According to the final implementation guidance cable, 90 State 410442, paras 9-22, the following types of transactions are exempt from the ABAP, and no waiver is required to authorize or finance the following types of local costs:

1. Professional Service Contracts \$250,000 or less in value;
2. Construction Service Contracts \$5,000,000 or less in value;
3. Locally available (local source) U.S. Origin goods up to \$100,000 per transaction;
4. Any transaction below \$5,000 in value;
5. Handbook 13 Grants and Cooperative Agreements, including Grants to capital PIOs: no special waivers are required because the Standard Provisions state source and origin rules;
6. Fixed Amount Reimbursement (FAR) disbursements;
7. Intermediate Credit Institutions (ICIs);
8. Commodities and Services available only locally;

No specific local source procurement waiver is required for the following items available only in the local economy:

- a) Utilities: including fuel for heating and cooking, water disposal and trash collection;
  - b) Communications: telephone, telex, fax, postal and courier services;
  - c) Rental costs for housing and office space;
  - d) Petroleum, oils and lubricants for operating vehicles and equipment;
  - e) Newspapers, periodicals and books published in the cooperating country; and
  - f) Other commodities and services (and related expenses) that, by their nature or as a practical matter, can only be acquired, performed, or incurred in the cooperating country.
9. Participant Training
10. Host country counterpart contribution

IRL Budget Analysis under ABAP

Activity	Type of Transaction	AID Dollar Contribution (\$000)	Total LCF	Exempt	To be Waived
1. Technical Assistance	Contract with U.S. firm	4,200	0	0	0
2. Audits & Evaluations	Prof. Service Contracts	100	50	50	0
3. Management & Logistical Support	Service Contracts Utilities Communications POL	250	0	0	0
4. MEC Support	Salaries Equipment UT/Com/POL	400	400	200	200

Because procurement of non-exempt local services and goods in Bolivia would best promote the objectives of the Foreign Assistance Program, (HB 1B, Section 5D10a (1) (d), a waiver permitting procurement of the services of local staff and equipment source, origin and with nationality in Bolivia is included in the Project Authorization.

The total amount of this waiver is \$200,000, so that no transaction will exceed the \$5 million limit per transaction of the waiver authority delegated to Regional Assistant Administrators under FOA 405. By signing the Facesheet and Project Authorization of this Project, the authorizing official approves this authorization and waiver to permit local cost financing for the categories of transactions described above and determines that the prices of indigenous and locally available imported goods and services are reasonable (HB 1B, Section 18A.1.b. (1)).

#### IV. IMPLEMENTATION PLAN

A detailed project implementation plan is presented as Annex H.

The USAID/B HHR office will assign one USDH officer and one PSC secretary to manage the IRL Project who, together with temporary audit and evaluation personnel, will constitute the Project Management Unit within USAID/B. The Project will be implemented by EDC and will require long and short term specialists, as described in the following scopes of work:

##### SCOPES OF WORK: INTERNATIONAL TECHNICAL ASSISTANCE

#### A. Long Term Technical Assistance

##### 1. Chief of Party - 37 FM

The COP will supervise all technical assistance provided by the Contractor, manage the Contractor's accounts, and act as liaison between the USAID Mission and other official entities, as appropriate. As counterpart to the MEC MC, the COP will provide technical direction in the: a) development and production of the interactive-radio curricula and support materials; b) design and implementation of the research and evaluation plan; c) development of policy alternatives. In addition, the COP will support the MC in establishing a national infrastructure of trained teachers and supervisors in interactive radio. Specifically, the COP will:

- o recruit and manage all TA provided by the Contract, coordinate and supervise the work of all technical teams;
- o coordinate instructional design with the MEC and the MOH;
- o establish an internal system for the design, revision, and production of the interactive radio programs;
- o develop a detailed implementation plan for field testing the radio curricula including transmission, classroom utilization, teacher training, and evaluation;
- o develop long-range plans and procedural models for national implementation of the interactive radio services;

- o coordinate the long-term professional development of Project staff, including international training/exchange trips for key professionals, and in-country training events for core staff, field supervisors, and teachers;
- o participate in internal and external reviews of project activities with management team and USAID;
- o promote institutionalization of the Project by integrating project research into policy dialogue at the highest levels, provide the MEC with the necessary technical and financial analyses needed to determine the feasibility of alternative policy implementation;
- o represent the work of the Project as appropriate, through professional publication and conference presentations in the fields of development communication, health, and education;
- o promote Project activities through consultancies with other countries interested in implementing an interactive radio project;
- o prepare quarterly reports for the Mission on project management and implementation.

## 2. Health Educator - 34 PM

The Health Educator will work under the direct supervision of LearnTech's Chief of Party, and as counterpart to the Project's Chief of Production. The Health Educator will be the principal advisor to the radio-health component of Project and will assist in:

- o designing the implementation plan for radio health;
- o reviewing the official health curriculum for lower primary school and make recommendations for adaptation to the interactive radio methodology;
- o developing the curriculum objectives for the radio lessons taking into account the existence of other programs developed elsewhere and the special bilingual situation in Bolivia.
- o determining the needs for teacher training, giving special attention to enhancing the skills of teachers needed during the postbroadcast period;
- o determining what activities outside the classroom (relevant school health practice/policies; participation by teachers, parents, and other members of the community; potential collaboration with health workers) might be needed to reinforce the content of the health-education curriculum;

- o determining what data need to be collected for curriculum- development work;
- o developing appropriate formative and summative evaluation strategies;
- o developing a monthly report on issues relating to the design and validation of the new health curriculum.

B. Short Term Technical Assistance

1. Economist/Administration Specialist - 5 PM

The Economist/Administration Specialist will work under the direct supervision of LearnTech's Chief of Party, and as counterpart to the Evaluation and Management Teams in the following tasks:

- o develop a set of efficiency indicators to be researched over the life of the project, determine what costs should be monitored so that cost projections can be modified as appropriate;
- o facilitate the execution of research activities relating to the efficiency, cost-effectiveness, and social profitability of the Project;
- o develop a series of policy alternatives related to improved administration and school efficiency for dialogue at the highest levels of the MEC;
- o train the Project staff in advanced data analysis for policy considerations;
- o assess the MEC's capability to manage the project throughout the various stages of implementation, identify constraints to effective implementation, and ways to address these constraints.
- o work with the MEC and the MOH to explore the relevant structures, policies, projects, and personnel of the Ministries to identify an expansion strategy that takes into account the organization and authority of each Ministry at the national, provincial, and local levels;
- o elaborate a strategy for cooperation that would lead to maximum government support for the project during the implementation phase and continued support and funding when AID participation is terminated.

2. Evaluation Specialist - 3 PM

The Evaluation Specialist will work under the direct supervision of LearnTech's Chief of Party, and as counterpart to the Evaluation Team in the following tasks:

- o establish formative and summative evaluation systems for validating the interactive-radio programs;
- o train Project staff in the ongoing use of the evaluation systems;
- o develop testing and data collection instruments, and data analysis techniques for the formative and summative evaluations;
- o establish a systematic way of effectively utilizing formative and summative evaluation results in curriculum development activities.

3. Primary Health-Care Specialist - 3 PM

The Primary Health-Care Specialist will work under the direct supervision of LearnTech's Chief of Party, and as counterpart to the Curriculum Team in the following tasks:

- o identify appropriate topics for inclusion in specific modules;
- o identify complementary materials that would need to be developed, collected, or purchased for specialized modules;
- o specify the level of teacher training necessary for in-school application;
- o describe community-based outreach activities that would lead to increased acceptance of the radio programs;
- o identify research studies that might be conducted relating to the impact and effectiveness of the instructional package;
- o develop a master content plan for selected modules.

4. Interactive-Radio Specialist - 1 PM

The Interactive Radio Specialist will work under the direct supervision of LearnTech's Chief of Party, and as counterpart to the Radio Team and Curriculum Teams in the following tasks:

- o coordinate the establishment of an efficient radio production operation;
- o train the radio team in state-of-the-art production techniques for effective interactive-radio lessons;
- o train the Curriculum Team in the design of interactive-radio scripts;
- o develop and implement a system for archiving all produced material.

5. Studio Designer/Engineer - 2 PM

The Studio Designer/Engineer will work under the direct supervision of LearnTech's Chief of Party, and as counterpart to the Radio Team in the following tasks:

- o design a state-of-the-art studio for construction in the Project Offices;
- o select all equipment to be purchased for the said studio;
- o oversee construction and engineering of the said studio;
- o train the Radio Team in efficient operation of the newly installed equipment;
- o train the Radio Team in maintenance and repair techniques for the studio.

6. Applied Researcher/Community Health Specialist - 5 PM

The Applied Researcher/Community Health Specialist will work under the direct supervision of LearnTech's Chief of Party, and as counterpart to the Evaluation Team in the following tasks:

- o develop a set of indicators to be evaluated and prepare a research and reporting procedure/format appropriate to the component;
- o describe community-based outreach activities that would lead to increased acceptance of the radio programs;
- o explore social soundness concerns taking into consideration the different participants in the project such as students (m-f), teachers, and parents;
- o make recommendations about how radio health can promote the participation of beneficiaries. Indicate what social, gender, cultural, economic, and political factors are expected to facilitate or constrain participation with regard to project activities and objectives. Identify ways in which direct and indirect beneficiary participation can be built into project implementation. Recommend ways for structuring beneficiary incentives to motivate participating children, teachers, community health workers, and parents;
- o describe how local groups, institutions, community leaders, etc. can help to guide implementation of the project;
- o identify socio-cultural issues which may affect the success of the project. This will include an assessment of the suitability of proposed interventions given the administrative, organizational, technological, economic, socio-cultural, administrative, and ideological context of the beneficiary population.

- o identify baseline data to be gathered during initial implementation phases. Recommend ways to develop an ongoing field monitoring and feedback system to identify problems of a socio-cultural nature. Identify a method to evaluate the extent to which the concept and goals of the project have been understood and accepted by those who will participate.

7. Epidemiologist - 1 PM

The Epidemiologist will work under the direct supervision of LearnTech's Chief of Party, and as counterpart to the Evaluation Team in the following tasks:

- o identify baseline data on student health status to be gathered during initial implementation phases;
- o develop a research plan for tracking change in student health status, as might be influenced by the radio programs;
- o identify epidemiological profiles of the target audience to be developed over the LOP;
- o provide scientific background on selected topics relating to the radio health curriculum.

8. Teacher Trainer - 2 PM

The Teacher Trainer will work under the direct supervision of LearnTech's Chief of Party, and as counterpart to the Implementation and Curriculum Teams in the following tasks:

- o develop a comprehensive teacher training program for both presential and distance education applications;
- o identify appropriate support material for effective teacher training;
- o elaborate an ongoing teacher support program based in print and radio;
- o identify an efficient mechanism for coordinating training of Master Teachers with ongoing MEC/UNICEF activities.

9. Video Advisor - 1 PM

The Video Advisor will work under the direct supervision of LearnTech's Chief of Party, and as counterpart to the Radio Team in the following tasks:

- o development of a promotional video in both Spanish and English documenting project activities in health. This activity will include all aspects of script development, storyboard development, production, and postproduction.

10. MIS Specialist - 1 PM

The MIS Specialist will work under the direct supervision of LearnTech's Chief of Party, and as counterpart to the Evaluation Team in the following tasks:

- o design of an appropriate MIS system for all Project needs;
- o selection of appropriate software for Project management, where it exists; and development of appropriate programs for Project management where packaged software is not appropriate;
- o training of all Project staff in use of the MIS system;
- o training of the Evaluation Team in specific advanced applications of Project programs;
- o basic trouble-shooting of the newly installed MIS system.

11. MPH Research Assistant - 9 PM

The Research Assistant will work under the direct supervision of LearnTech's Chief of Party, and as counterpart to the Evaluation Team in specific research activities to be identified over the LOP.

**C. National Coordinating Committee for the Project**

In order to foster mutual reinforcement of efforts and to avoid duplication of activities, the various organizational entities with interest in the Project should establish a National Coordinating Committee. This Committee will not be a governing board but will have an advisory capacity as forum for discussion and coordination of project activities. The members should include representatives from the IRL Project, USAID/B, UNICEF, MEC, MOH, and the rural and urban teachers' unions. Meetings should be held every 1-2 months.

**D. Implementation of Project Activities**

The following tables show specific activities that should be carried out over the five-year course of the Project. The activities have been subdivided into those specific to management, the curriculum team, the radio team, the MIS/Evaluation Team, the Implementation/Training staff, and the Administrative & Support Staff. The levels of effort are shown for the specific personnel

involved, making the following distinctions: the number of person-months (PM) for all personnel contracted under the EDC buy-in budget are shown without parentheses, e.g. 1 PM, MEC counterpart personnel are shown with single parentheses, e.g. (1 PM), and MOH counterpart personnel are shown with double parentheses, e.g. ((1 PM)).

## V. MONITORING, RESEARCH AND EVALUATION PLAN

### A. Overview

The monitoring, research and evaluation component of IRL Project will contain five basic elements: monitoring activities to track Project implementation, baseline studies for the development of the health modules, student evaluations, operations research to measure behavioral outcomes, and two external Project evaluations. The methodologies for the baseline and behavioral studies will be primarily qualitative, using a number of observational and analytical protocols as described below. The student evaluations will consist of a combination of formal testing and classroom observations to measure learning achievement, identify pedagogical problems, and determine the nature and degree of student participation.

The previous project conducted a limited number of baseline studies in Cochabamba and El Alto in La Paz. The former was used in the design of the pilot health module while the latter was intended for the adaptation of the pilot module for use in the Department of La Paz. The baseline studies for the new project will build on these experiences to design additional observational procedures and analytical methodologies to facilitate baseline research in Santa Cruz, Cochabamba, and La Paz where the new health modules will be tested.

The student achievement evaluations in the previous project consisted of formative evaluations to validate the interactive modules and summative tests on control and experimental groups to determine retention of math and health concepts. In the case of radio math, a longitudinal testing design was developed to follow the same students from year to year to determine if achievements continued to increase as a function of IRI. The new project should carefully examine all the testing procedures, including sampling techniques, instrument design, testing implementation, scoring methodologies, and all subsequent statistical analyses.

### B. Monitoring

The Project will be managed by USAID/B's Office of Health and Human Resources (HHR). Included in the budget are funds for a Project Management Unit which includes secretarial services, audits, and two external evaluations, for a total of \$400,000.

Specific monitoring requirements will consist of regular meetings between the USAID/B project manager, the EDC COP, the MEC counterpart, and other relevant personnel, to discuss the implementation schedule, problems, disbursements, and MEC progress toward institutionalization of Project activities. The COP will submit detailed annual work plans, annual reports, and quarterly progress reports to USAID/B. Progress toward Project goals will be measured against the plan of activities as indicated in the Implementation Plan and using the Logical Framework as a reference instrument.

In addition to reports and meetings, the USAID/B Project management staff should make periodic site visits to the central offices to examine the lesson design procedures, observe the production process, and review the evaluation outcomes. Furthermore, site visits should be made to the Departmental offices in Cochabamba and Santa Cruz to discuss progress and problems with the pilot testing of the new health modules. MEC Departmental and local offices involved in the expansion of the math modules should also be visited, and a representative number of schools should be visited to observe the use of the health lessons in the classroom. If at all possible, discussions should be held with teachers and parents to get their views on the strengths and weaknesses of IRI as applied to health, hygiene, and nutrition.

#### C. Baseline Research

The design of the 1989 pilot-health module relied on one specifically contracted study of three Cochabamba neighborhoods and a limited amount of more general information on Quechua culture and social organization. The new Project will use highly specific qualitative methods in the three pilot areas where the health modules will be tested and validated. Local personnel will be trained in data collection, data entry, and a number of analytical procedures. Technical assistance will be required to provide the methodological design and training for project personnel. Baseline studies will also be done in the other regions of Bolivia in preparation for the expanded use of interactive health modules by the MEC. The additional data will be used to adapt the tested and validated modules to ecological, sociocultural, and linguistic differences that may affect the success of radio health in Bolivia.

The baseline research will be coordinated with the subject matter of the health modules as they are developed over three school years from 1992 through 1994. The research will be carried out prior to the design of the health modules to insure the timely availability of verified conclusions and all relevant findings. Therefore, all research and analysis should be conducted from August through January in order to be available for curriculum design to begin in February. An even more ideal plan would be to continuously collect data during the previous school year for the following year's module. A limiting factor would be the availability of trained observers and personnel to analyze large quantities of information.

In general terms, the qualitative data collection will examine knowledge, attitudes and practices of the project beneficiaries as applied to the specific content of the health modules. Relevant data will be gathered for all three grade levels, but specific emphasis must be placed on information relevant to the modules for the up-coming academic year.

The third grade health lessons will consist of four modules covering personal hygiene, dental health, acute respiratory infections (ARI), and immunizations for common childhood diseases. This means that prior to any curriculum design and script writing, detailed information must be available on existing hygienic practices in all three pilot areas, the range of variation within the existing practices, and the sociocultural patterns in terms of what parents tell children they ought to do, versus what they, in fact, actually do. Much of the same applies to dental health. In addition to learning about existing practices, all the local vocabulary and vernacular slang must be collected and carefully recorded in order to design relevant health lessons. In the case of ARI, data must be collected on local perceptions, diagnosis, and treatment, as well as all related linguistic expressions. Here it is very important to distinguish between traditional, allopathic, and syncretic beliefs and practices. Studying local knowledge relating to immunization presents other considerations in light of prevention versus actual illness episodes. A careful study must be made to determine how much people know about immunizations and what their responses have been to illnesses caused by inoculations. Furthermore, the reasons why parents do or do not have their children immunized must be determined. Quite often, very local conceptions have come about from very specific episodes. For example, a recently immunized child may have died, most often from a totally unrelated cause, but the parents have blamed the inoculation, and, as a consequence, an entire community of parents are very reluctant to have their children immunized.

For the fourth grade, the original diarrhea module will be improved, and new modules will be designed on accident prevention/first aid, Chagas disease for the low valleys, and malaria and yellow fever for the Eastern lowlands. An additional module is under consideration for the Highlands, incorporating information, treatment and prevention of all three diseases in an abbreviated form. In order to design these modules, location specific data must be gathered, using the research strategies and building on the experiences from studying upper respiratory infections for the third grade.

The planned content for the fifth grade modules are nutrition, environmental conservation, and self esteem and personal decision-making. Since Bolivia is an extremely diverse country, the research for nutrition and the environment will pose challenges for the research effort. Extra time should be spent in the study areas to assure greater coverage of the expected variations in knowledge and practices. Moreover, larger amounts of detailed data need additional time and effort for analysis and eventual use in lesson design.

D. Student Achievement Evaluation

1. Formative Evaluation

In the process of designing and validating health lessons, the evaluation unit will need to use both classroom observational and ethnographic interview data to assess whether or not the lessons developed meet the learning and teaching needs of the population for whom they are designed. Therefore, students and teachers will be observed in the classroom setting, and teachers and parents will be interviewed as well. The rationale and objectives of the observational research are:

- / to document health lesson use in the classroom,
- / to determine the extent to which teachers use and understand the content of the interactive health lessons,
- / to document how the health concepts are received and understood by the children,
- / to assess whether or not the content presented is relevant to students' lives and sociocultural context,
- / to examine the nature of student/teacher/radio interaction,
- / to identify specific weaknesses in curricular design,
- / to identify possible audio production/reception problems,
- / to determine whether or not teachers are adapting or tailoring pre/post-broadcast activities to students' needs,
- / to examine parent attitudes and acceptance of the health lessons and associated activities, and
- / to provide input for the final program revision to be conducted at the end of each experimental year.

In order to optimize the period in which the classroom observer is collecting data, the following factors should be considered:

- / The fieldworker should have good rapport with the teacher, administrator, and families with whom she/he will be working. The fieldworker should therefore plan to spend extended periods of time at the school in order to gain the trust of the study participants.
- / The fieldworker must be fluent in the languages used in the classroom where she/he will be conducting observations.
- / The fieldworker must be viewed by the study participants as a neutral and objective observer. It is inadvisable, therefore, to have fieldworkers be members of the communities in which they are conducting research.
- / The fieldworker must be trained in participant observation and qualitative interviewing skills.

## 2. Student Achievement Testing

Monthly tests covering student understanding of topics to be taught over the next month and concepts introduced during the past month should be administered to a valid sample of students in all three Departments. The objective of these tests are to validate the content of the master plan and to identify problems where children may not have gained the prerequisite knowledge needed for subsequent radio health lessons.

Summative evaluations should be administered to all students participating in radio health, using carefully designed pre- and post-tests to document student learning achievement. The testing should be carried out using a lapped longitudinal design, tracking students through all three years of interactive radio health participation. Statistical procedures should be used to analyze test scores in relation to location, socioeconomic status, ethnicity, language spoken in the home, parental occupation, etc. to identify levels of differential achievement. Furthermore, consensus analysis would be a useful procedure to identify weaknesses in the testing instrument by pointing to questions that the best students have problems answering "correctly". Project staff should also contract technical assistance in the development of optimal testing instruments, testing procedures, and statistical analyses.

### E. Operations Research

The principal purpose of this activity is to determine whether or not the health concepts learned in school result in positive behavioral changes, if there has been a transfer of knowledge to other household members, and the extent of parental acceptance and support of their children's participation in the radio health curriculum. These data will be used to readjust the health lessons and to develop strategies for improved community outreach to encourage parental participation in school activities. Other research tasks will be to assess the health and nutritional status of selected samples of the target audience in order to design and implement measures to determine possible outcomes resulting from the health interventions.

### F. Evaluation and Research Personnel

The personnel of the Evaluation Unit of the Interactive Radio Learning Project will be responsible for the selection and training of all personnel involved in the research, testing, and evaluation activities described above. Furthermore, technical assistance on specific research design and methodology should be provided to the Evaluation Unit prior to any activities, and at appropriate points throughout the life of the project.

The Central Office Evaluation Unit of the Project should include the following locally hired full-time specialists:

1. A management information system (MIS) specialist who should be knowledgeable in computer hardware and a variety of data-base, spreadsheet, and statistical software; this individual would be responsible for managing all the data and analytical output produced throughout the life of the project.
2. A testing and quantitative measurements expert to design the summative and longitudinal testing instruments; this person would also perform all the analytical procedures and statistical analysis required for the appropriate processing of the test results.
3. A formative evaluation specialist who would be in charge of implementing the classroom observation methodology for the testing of the health lessons. He/she will also train and supervise classroom observers in all three departments where the health pilot will be carried out, as well as being in charge of the data management, data reduction and analyses.
4. A qualitative operations research specialist with training in epidemiology will design and implement the baseline studies in all areas where the health lessons will be broadcast. He/she will also perform the specialized studies to determine the extent of behavioral change in the home and studies to measure nutritional/health impacts of the project interventions.

The evaluation team from the Central Project office will be in charge of training all participation personnel in the Departmental offices of the Project, the MEC, and the MOH. Possibilities of having the Ministries of Education and Health assigning central-level counterparts to the evaluation personnel should also be vigorously explored. This would greatly facilitate and expedite training and supervision of participants on the Departmental and lower levels, as well as providing training for ministry personnel in qualitative and quantitative evaluation and analytical techniques.

The Project personnel in the Central office in La Paz and the Departmental offices in Santa Cruz and Cochabamba should explore the possibility of collaborating with local MEC and MOH staff in the research activities. For instance, MEC supervisors could be trained in classroom observation, and MOH primary health care workers could be trained in interview and observational techniques to document behavior changes, spread-effects, and parental attitudes. Furthermore, community health workers should be approached to help establish community participation in school and other health-care projects relevant to the radio health curriculum, and a number of community health workers could also be trained to observe and document behavioral change and parental participation in project interventions.

All personnel who will be participating in data gathering should receive thorough training in qualitative ethnographic methods. The evaluation personnel from the Central Office in La Paz should receive an extensive month-long course in order for them to carry out all subsequent training of local field personnel. Field observers should be trained by means of 4-5 day workshops, using interactive field-oriented methodologies. The training at all levels should emphasize the major problems field researchers encounter and offer specific techniques for the implementation of effective observational strategies for solving problems in the field. The topics covered in the courses should be the following:

- / Initial immersion and exposure to field work problems;
- / Different techniques for writing effective narratives of field observational data;
- / Techniques for managing one's role in the field setting, including techniques for disclosure, rapport, informed consent, and ethical issues;
- / Techniques for coding and systematically obtaining field notes based on observations, including surveys, different coding schemes, post-coding, and rewriting field notes;
- / Techniques for both formal and informal interviews, including questionnaires, focused interviews, focal group interviews, and informal questioning;
- / Systematic and focused field observation, including different techniques for doing field observations, such as time samples, event samples, key incident samples, and various kinds of qualitative accounts;
- / Techniques for keeping a personal diary and record of the sequence of events and the key events at the field site;
- / Methods for data reduction and analysis of the information collected in the course of the observational research, such as analyzing event across time, and systematically attempting to measure and control for reactivity and observer bias.

Fieldworkers will also have to be trained to follow field protocol forms. These protocols should contain guidelines on the kind of data that should be collected for each of the health modules. For instance, one protocol could be designed for data on parental response to febrile reactions following immunizations of young children, and another could be designed for data on the disposition of household waste. Specific field exercises should

be designed in order provide practice and an opportunity to identify problems that should be overcome. Frequent supervisory and/or retraining visits should be made by the evaluation specialists from the Central Office to ensure that data remains accurate and that there are no major departures from the established standardized procedures.

## **G. Data Collection, Management and Analysis**

### **1. Data Collection in the School Setting**

The duties of the field worker while in the school setting will be a mixture of direct observation of a subset of children and all teachers, generating qualitative notes focused on classroom process and the participation in interactive radio lessons. The field observers should also interview teachers and parents.

Time and event samples of children in the classroom using direct and focused naturalistic observational methods should be employed to document interactive radio use in the classroom. The fieldworker selects a target child at successive predetermined time intervals (5-15 minutes per child per sequence, for instance), focuses on that child and records that child's participation. Using a subsample of 15 children per site, this information could be collected weekly in a variety of different contexts. Although designed to collect data on child participation, these records could also be used to document the teacher's behavior and facility in using the interactive radio lessons.

In addition to the focused event sample style observations, the fieldworkers should also keep a series of notes relevant to the overall functioning of the school and radio lesson use. Some examples of relevant topics include: teacher morale, the role of the parents in the school, school problems with staffing, teacher strikes, problems with buildings and other infrastructure, etc.

The fieldworkers should also collect information by means of a series of questions regarding the attitudes, knowledge, and behaviors of the teachers who are participating in the testing of the radio health modules. These data should be obtained through conversations with and observations of teachers during the exercise of their normal teaching duties. Teachers should also be formally asked to assess the radio lessons and teacher's guides to provide input as to how they would like to see them improved.

### **2. Data Management and Quality Control**

The studies described above will contain a series of data collection points for assembling and monitoring weekly notes, classroom observations, interviews, etc. These should be reviewed by the formative/qualitative evaluation specialist who will give immediate feedback to the fieldworkers.

In addition, monthly debriefing meetings would give the fieldworkers the opportunity to interact with curriculum developers, to obtain further feedback regarding their data, and to support and receive support from fellow fieldworkers. At this time, the fieldworkers should also be asked to write brief summaries of their overall assessments and to describe problems or difficulties they may have experienced. This kind of periodic monitoring of field data is essential for the comparability, reliability, and completeness of the data collection process.

### 3. Data Analysis

As discussed, the fieldnotes should be written-up in observational protocols according to a series of topical headings that provide a set of categories following the detailed structure of the module development. Fieldnotes should be structured and indexed as they are written. The division of fieldnotes into categories or key domains allows frequent review and comparison of fieldnotes by the formative/qualitative evaluation specialist and by the fieldworker. The system of indexing and domain categories should be directly tied to the topics informing the revision and refinement of the interactive radio lessons and teacher's guides.

The field summaries should provide qualitative data on assessing the use, understanding and acceptance of the interactive radio lessons by Bolivian teachers. A further revision and collapse of the domain and index categories should be undertaken at the end of each health module. It is most probable that a set of core concerns relevant to the Project will emerge across most, if not all, test sites, while more unique concerns with site-specific relevance should be examined in conjunction with the relevant fieldworkers.

The Project should also explore the use of software programs for data storage, analysis, and retrieval. A number relational data-base programs could be very useful for the management of the very large amount of data that will be generated by the Project. The software programs will not, however, be able to perform the qualitative analyses, but can be extremely labor-saving once data have been reduced and indexed. Site-specific information on diet and nutritional practices, for instance, could then be instantly retrieved by the health educator and the curriculum developers.

The qualitative data can also be used in a number of other ways, such as to gain a better understanding of attitudes, behaviors, learning achievements across field sites, linguistic groups, occupational groups, recent migrants versus long-time residents, etc. Essentially, the data can also illustrate to the Project what works and what does not and why; be used for the generation of hypotheses for understanding the social, cultural, and economic context of interactive radio education in both urban and rural Bolivia; and as baseline data for long-term studies of a methodology to generate behavioral changes for improved health practices.

#### H. External Project Evaluations

Two Project evaluations will be contracted by USAID/Bolivia. The Mission will review and approve the scopes of work for the evaluations, as well as review and approve the selection process for the AID contracted evaluation team. The first evaluation should be done as close as possible to the mid-point of the activities involving the design and testing of the health modules. If project activities are initiated as scheduled, the mid-term evaluation should be done in the middle of the 1993 school-year--July/August 1993. The final evaluation should be done after the long-term TA has been completed and the MEC has had an opportunity to manage and operate the Project for a full school-year. The most opportune time for the final evaluation would therefore be in October/November of 1995.

The mid-term and final evaluations evaluation should address the following issues and concerns:

- / Comparative examination of differences between project design and actual implementation;
- / Project successes, failures, problems, causes and effects, and consequent recommendations;
- / Lessons learned, to be applied for improved project performance and management;
- / Comparative institutional, contractor, and subcontractor(s) performance evaluation, planned versus actual;
- / Accomplishment of project objectives as stated in the outputs section of the Logical Framework and progress towards the realization of EOPS;
- / Particular attention should be paid to the MEC's institutional capabilities, personnel performance, and management of project activities by staff in Departmental and local offices.

#### VI. CONDITIONS AND COVENANTS

A. USAID plans to execute a Memorandum of Understanding among the Ministries of Planning and Coordination, Health and Education and Culture, and the Contractor EDC during FY 91, which will describe the roles of each in implementing the Project, provide tax exemptions for duty free import of project goods and for expatriate contractor employees, and state that USAID plans to obligate funds for the Ministry of Education component of the Project by bilateral agreement during FY 92.

B. Prior to disbursements to or on behalf of the Ministry of Education, and Culture (MEC), the Government of Bolivia (GOB) shall submit annual operational plans and budgets satisfactory to AID, and MEC shall demonstrate to the satisfaction of AID that the MEC has financial and administrative systems and capabilities to adequately manage and properly account for the funds disbursed to or on behalf of MEC. In addition, MEC will provide AID with annual reports detailing the GOB in-kind contribution to this project during the previous year.

## VII. SUMMARIES OF PROJECT ANALYSES

### A. Technical Analysis

Development of the IRI health curriculum will be the exclusive responsibility of the contractor/subcontractor team. This team already has extensive experience in curriculum development and field-testing, having written the successful radio math curriculum. The team also has experience adapting the IRI methodology to health, having pilot-tested a ten-lesson health module, and has individuals skilled in the technical aspects of radio production.

Based on serious consideration of the health issues facing Bolivian children and their families, topics for the ten health units have been tentatively proposed. These topics agree with MOH health priorities, national data, and information from WHO and UNICEF. The existing MEC curriculum for health in rural schools was also taken into account. Further discussions with MOH personnel will be carried out before topic selection is final. To facilitate these discussions, the MOH may need a clearer understanding of the objectives of the radio health program. Both the MOH and PROCOSI will be consulted to assure consistency in concepts being taught.

The proposed topics for grades 3, 4, and 5 are as follows:

- / Personal Hygiene - 6 lessons
- / Dental Health - 6 lessons
- / Acute Respiratory Infections - 6 lessons
- / Immunizations and Preventible Diseases - 6 lessons
- / Diarrhea Prevention and Treatment - 10 lessons (revised from 1989 pilot project)
- / Accidents and First Aid - 10 lessons
- / Chagas (Valleys and Highlands) - 8 lessons, and Malaria and Yellow Fever (Lowlands) - 8 lessons
- / Nutrition - 15 lessons
- / Environmental Awareness - 8 lessons
- / Self-esteem (includes drugs, alcohol, sex ed.) - 7 lessons

As each lesson is written, a teachers' guide will be developed and field tested along with the lessons. The guide will include instructions for activities the teachers must conduct before, during, and after each lesson.

A separate component of the project is to extend IRI health and math education, on an experimental basis, to interested adults and to children who are not in school. More than one method will be tried during the latter half of the project.

In areas where there are NGO or MOH health promoters, they will be invited to the classroom to participate in the lessons. They will be given a teacher's guide from which they can adapt activities for their adult audiences. In return, they will be asked to make their clientele aware of the times and themes of the radio lessons.

The results of this pilot program will be shared with the ME/ her donor agencies. Depending on the outcome, a program of interactive education for adults and children not in school might be incorporated into future plans for Bolivian basic education.

#### B. Financial Analysis

The total amount of this 5-year project is \$8.4 million, with an AID contribution of \$5 million to be obligated under a bilateral agreement with the MEC. The counterpart contribution by the GOB will be \$3.4 million, \$300,000 of which will come from ESF funds and \$100,000 from the Social Investment Fund (FIS). The balance of \$2.9 million is derived from in-kind, mostly teacher salary inputs from the MEC.

AID funds will primarily finance the cost of the technical assistance: long and short-term technical services, operational activities and training. AID support will also cover equipment purchases, including a radio production studio, sound production equipment, computers, the costs of project evaluations and audits, and AID management and logistical costs. Procurement under the contract will be performed in accordance with AID/FAR procurement guidelines; some equipment will be purchased locally.

GOB counterpart funds derived as in-kind support from the MEC, will provide for teachers and departmental school staff participating and receiving training in the project. ESF and FIS support will cover construction costs for a distance education headquarters for the Project, teachers' guides, and the purchase of radios for participating schools.

Project support and expenditures are summarized in the following budget:

SUMMARY PROJECT BUDGET (US\$ 000)

ACTIVITY	AID		COUNTERPART	
	FX	LC	FX	LC
1. Technical Assistance	\$4,200			
2. Audits and Evaluations	100	50		
3. Management and Logistical Support	250			
4. MEC Support		400		
5. GOB Salaries				2,860
6. Radios				100
7. Textbook Production and Distribution				50
8. Building Construction				250
9. Building site				120
<b>Total</b>	<b>\$4,550</b>	<b>\$450</b>		<b>\$3,380</b>

According to Bolivian law and GOB regulations, the MEC is subject to audits by a GOB agency. The PP team did not examine any financial reports or statements from the MEC in the preparation of this analysis. Thus, that capability cannot be addressed in a direct manner. The Team did, however, hold extensive talks on this subject with MEC officials, who offered strong assurances about developing and adhering to AID payment and vouchering concerns and procedures in connection with the operation of the IRL Project by the host country. As a result, the MEC can, in all probability, acquire the capability to administer grant or contract funds in accordance with AID regulations. The MEC is amenable to establishing appropriate accounting systems to deal with the expressed needs of the Project.

C. Economic Analysis

Results from several underdeveloped countries, as well as the RLP/B currently being implemented in Bolivia, show impressive improvements in math performance tests for those participating in radio-math lessons. Furthermore, the radio-math program is also more cost-effective than the traditional instruction system. It is estimated that while students will improve up to 76% in math performance over the life of the IRL Project, the total cost of reaching the same target group of the radio-math program will be 9% less than for the traditional system.

Similarly, findings of a study based on actual data for Bolivia show that improvement in maternal education has direct and indirect results on the reduction of child mortality and morbidity. The IRL Project will improve educational levels and provide greater coverage to mothers and children which will strengthen the GOB's MCH program and its efforts to alleviate economic hardships resulting from the economic crisis. Improving the health status and educational levels of the target population will improve Bolivia's human resource base and contribute to a higher standard of living.

The benefits of the Project are positive and do not limit themselves to the direct impact on the educational levels of the target population. The Project could establish a model for the design and implementation of other projects related to education and health, and other fields to address the social and technical needs of the Bolivian population. It is anticipated that other donors, such as the IBRD, will continue with the IRL model and will finance its expansion. Moreover, the Project will reduce budget expenditures for the Ministries of Education and Health which, without the Project, would be directed toward support for less effective programs, while the IRL Project would serve to strengthen the GOB's MCH program. It may induce these ministries to re-examine their education campaigns in order to better allocate their limited resources.

#### D. Social Soundness Analysis

The principal beneficiaries of the project are rural and urban children who will be better educated in mathematics to participate in economically productive activities. Furthermore, the basic knowledge of health and nutrition will provide them with the means of coping with disease and other hazards common to the substandard living conditions of the vast majority of low income families. As in the case of most development interventions, others will also be affected. Those who never went to school or dropped out may be motivated to return even though they have long passed the usual age, and many adults may clearly see the advantages of numeracy and health education. The net outcome could be an enhanced social consciousness and increased community involvement leading to demands for more and better government services.

In recent years, a large number of Bolivians have migrated from their traditional homes to cities and other areas in hope of a better life. With so many people on the move, traditional communities have been disrupted in many parts of the Highlands and the Valleys. The areas where the migrants settled have become mixed communities representing distinct cultural traditions, and it is no longer possible to generalize about language, attitudes and behaviors based on what is known about traditional Ayamara and Quechua culture and social organization. In other words, the migrant communities have to be studied on their own terms in order to provide useful baseline data for the Interactive Radio Learning Project.

Anthropological studies done for the RLP/B have concluded that attempts should be made to design programs using Aymara and Quechua cultural traditions of cooperation and community responsibility to address common health problems; the idea would be to inspire direct action by groups of children, and to indirectly motivate their parents to unite in attempts to improve their deplorable living conditions. Andean people have a long tradition of cooperative action, but as migrants in new urban environments, many such behaviors are being lost.

A basic rationale for teaching health practices to primary school children is that 6-10 year-olds take care of their younger siblings. Previous studies have shown that the amount of responsibility that fourth and fifth graders have for their younger siblings was quite varied, but that most parents expected older children to look after their younger brothers and sisters, including preparing and serving food, cleaning-up and helping with their hygiene; some of these activities were done more by girls than boys, but both sexes were expected to help. From these results, it can be concluded that teaching health practices to children will, in all probability, result in more positive attitudes and beneficial practices.

Teachers and parents are generally in favor of the continuation of radio mathematics because it helps children learn much faster, keeps their attention, and makes learning much less of a burden. Furthermore, both parents and teachers feel that health education is necessary and that it should be included in the primary school curriculum. A number of parents have suggested that the programs be repeated at night so that they have the opportunity to learn the same concepts and practices as their children.

#### **E. Institutional and Administrative Analysis**

The IRL Project will be formalized through a bilateral agreement between USAID/B and the Ministry of Education, as the GOB recipient institution. The MEC will receive \$400,000 in grants, and technical assistance will be provided through a buy-in to the Learning Technologies Project; the principal contractor will be the Educational Development Center.

The MEC has explicitly stated its willingness to be part of the Project and is prepared to extend full access to all schools throughout the country. The MEC will also commit full-time staff to the Project and has also agreed to provide resources which include secretarial support, drivers, guards and fuel. The Ministry has also made available a plot of land for the construction of a building to house Project staff, studios, and other facilities and equipment. The Ministry has provided assurances that the appropriate accounting systems will be established for the administration of AID funds.

The MEC project participants will require extensive training and direction on how to develop the appropriate capacities to administer and eventually institutionalize IRL for both mathematics and health. Training will be needed at all levels of the Ministry's educational bureaucracy, ranging from the Central offices in La Paz to Departmental and local personnel who will be involved in training, data collection, and supervision. At present, the MEC does not have sufficient resources and trained personnel to meet project requirements.

F. Initial Environmental Examination

The project consists of activities for which there are no foreseeable direct, significant impacts on the environment. These activities fall under Section 216.2(c)(2); Categorical Exclusions, as types of projects that do not require an initial Environmental Examination or further environmental scrutinizing.  
(See Annex E.)

3533H

AGENCY FOR INTERNATIONAL DEVELOPMENT <b>PROJECT IDENTIFICATION DOCUMENT</b> FACESHEET (PID)				1. TRANSACTION CODE <input type="checkbox"/> A = Add <input type="checkbox"/> C = Change <input type="checkbox"/> D = Delete		Revision No. _____ DOCUMENT CODE 1			
4. BUREAU/OFFICE A. Symbol B. Code LATIN AMERICA & CARIBBEAN <input type="checkbox"/> 05				5. PROJECT NUMBER <input type="checkbox"/> 511-0619					
6. ESTIMATED FY OF AUTHORIZATION/OBLIGATION/COMPLETION A. Initial FY <input type="checkbox"/> 91 B. Final FY <input type="checkbox"/> 95 C. PACD <input type="checkbox"/> 95				5. PROJECT TITLE (maximum 40 characters) <input type="checkbox"/> INTERACTIVE RADIO LEARNING					
7. ESTIMATED COSTS (\$000 OR EQUIVALENT, \$1 = )				FUNDING SOURCE		LIFE OF PROJECT			
				A. AID		3,000			
				B. Other U.S.		1. _____ 2. _____			
				C. Host Country		1,000			
				D. Other Donor(s)		_____			
TOTAL				4,000					
8. PROPOSED BUDGET AID FUNDS (\$000)									
A. APPROPRIATION		B. PRIMARY PURPOSE CODE		C. PRIMARY TECH CODE		D. 1ST FY		E. LIFE OF PROJECT	
(1)	HE	510	500	415		2,000			
(2)	EDUC	620	620			1,000			
(3)									
(4)									
TOTALS				415		3,000			
9. SECONDARY TECHNICAL CODES (maximum 6 codes of 3 positions each) 636						10. SECONDARY PURPOSE CODE 680			
11. SPECIAL CONCERNS CODES (maximum 7 codes of 4 positions each)									
A. Code BR		BU							
B. Amount									
12. PROJECT PURPOSE (maximum 480 characters)									

To improve the quality of basic education in two core subject areas, health and mathematics, through dissemination of locally adapted interactive radio curricula.

13. RESOURCES REQUIRED FOR PROJECT DEVELOPMENT

Staff: 3 experts via IQC to Creative Associates in:

- Health Administration
- Evaluation
- Education Management

Funds

PDS FY 90 (\$32,312)

14. ORIGINATING OFFICE CLEARANCE	Signature _____			15. DATE DOCUMENT RECEIVED IN AID/W. OR FOR AID/W DOCUMENTS. DATE OF DISTRIBUTION MM DD YY			
	Title Edward L. Kadunc Jr Chief, Project Development & Implementation						
16. PROJECT DOCUMENT ACTION TAKEN <input type="checkbox"/> S = Suspended CA = Conditionally Approved <input type="checkbox"/> A = Approved DD = Decision Deferred <input type="checkbox"/> D = Disapproved				17. COMMENTS			
18. ACTION APPROVED BY	Signature _____			19. ACTION REFERENCE		20. ACTION DATE MM DD YY 10/5/91	
	Title Garber A. Davidsen Acting Mission Director						

LOGICAL FRAMEWORK

ANNEX B

Narrative Summary (NS)	Measurable Indicators (MI)	Means of Verification (MOV)	Important Assumptions
<p><b>Goal:</b></p> <p>1. To improve the quality of life for Malians through better maternal and child health and basic education</p>	<p>1.1 Infant/child and maternal mortality/morbidity rates improve</p>	<p>1.1 DHS survey (1998)</p>	<p>(Goal to Supergoal)</p> <p>1.1 Political and economic conditions will not deteriorate</p> <p>1.2 School health education and basic education are related to improved MCR</p>
<p><b>Purpose:</b></p> <p>1. Institutionalize interactive radio technology and math/health curricula in the Malian basic education system to improve the quality of health/math education</p>	<p>1.1 MEC has appropriate trained personnel in place to manage program IRI math/health program</p> <p>1.2 Operational curricula in math and health</p> <p>1.3 IRI infrastructure functioning</p>	<p>1.1 Site visits and examination of staff credentials</p> <p>1.2 Review of curricular design and lesson modules</p> <p>1.3 Review/observation of broadcasts and records</p>	<p>(Purpose to Goal)</p> <p>1.1 Continued enrollment in IRI by the MEC and MPSSP</p> <p>1.2 Sustained political stability</p> <p>1.3 No debilitating long-term strikes</p>
<p><b>Outputs:</b></p> <p>1. Health curriculum developed for grades 3-5</p> <p>2. Health knowledge applied in the home</p> <p>3. Expanded delivery of radio mathematics</p> <p>4. Improved knowledge of math/health concepts</p> <p>5. National infrastructure of trained IRI teachers, directors and supervisors</p>	<p>1.1 Field test curriculum in valid sample of schools</p> <p>2.1 Increased student knowledge of preventive health</p> <p>2.2 Documented behavioral changes</p> <p>3.1 IRI math curriculum implemented in MEC schools in 7 departments</p> <p>4.1 25% increase in test scores</p> <p>5.1 5,000 teachers, directors and supervisors trained</p> <p>5.2 50 MEC supervisors trained</p>	<p>1.1 Records of field tests</p> <p>2.1 Training records</p> <p>2.2 Survey instruments and qualitative studies</p> <p>3.1 Records and site visits</p> <p>3.2 Number of schools using curriculum</p> <p>3.3 Project records</p> <p>4.1 Pre/post tests of students</p> <p>5.1 Project/administrative records</p> <p>5.2 Classroom ethnography</p>	<p>(Output to Purpose)</p> <p>1.1 Educational reform package (1994), financed by IFRD, implemented by MEC</p> <p>2.1 MEC policy permits IRI to fulfill objectives</p> <p>3.1 Availability of trained personnel to assume responsibilities for IRI</p>
<p><b>Activities:</b></p> <p>1.1 Develop/field test IRI health curriculum</p> <p>1.2 Conduct pilot producing 3rd grade health module in indigenous languages)</p> <p>1.3 Develop testing instruments and evaluate IRI health interventions</p> <p>2.1 Train MEC/MPSSP technical staff in evaluation of IRI health education using qualitative methods</p> <p>3.1 Train teachers, directors and supervisors in IRI</p> <p>3.2 Expand/extend broadcast coverage of IRI mathematics</p> <p>4.1 Develop appropriate testing instruments and evaluate learning achievements</p> <p>5.1 Train MEC supervisors</p> <p>5.2 Establish administrative systems</p> <p>5.3 Promote policy/program dialogue with other donors and MPSSP</p>	<p><b>Inputs/Resources:</b></p> <p>Learning Technologies Project: \$1.2 million buy-in</p> <p>USAID Management Unit: \$100,000</p> <p>MEC: \$100,000</p>	<p>1.1 Baseline Studies and operations research</p> <p>1.2 Social and administrative studies</p> <p>1.3 Evaluations</p> <p>2.1 Specialized technical, social and administrative studies and project records</p> <p>3.1 Project records</p> <p>3.2 Project records and site visits</p> <p>4.1 Evaluations</p> <p>5.1 Contractor reports and records</p> <p>5.2 Detailed annual plans and budgets</p> <p>5.3 Contractor reports and records</p>	<p>(Activity to Output)</p> <p>1.1 No major contract delays</p> <p>1.2 Availability of trained local personnel</p> <p>2.1 A.I.D. funds are obligated and disbursed on a timely basis</p> <p>3.1 Resources are provided on a timely basis and in adequate quantity</p> <p>4.1 Acquisition of appropriate technical assistance</p> <p>5.1 Adequate back-stopping from Learning Technologies</p>

NOTE: Once baseline data is established, measurable indicators will be broken out by gender

**5C(2) - ASSISTANCE CHECKLIST**

Listed below are statutory criteria applicable to the assistance resources themselves, rather than to the eligibility of a country to receive assistance. This section is divided into three parts. Part A includes criteria applicable to both Development Assistance and Economic Support Fund resources. Part B includes criteria applicable only to Development Assistance resources. Part C includes criteria applicable only to Economic Support Funds.

Interactive Radio Learning Project.  
No. 511-0619

CROSS REFERENCE: IS COUNTRY CHECKLIST UP TO DATE?

**A. CRITERIA APPLICABLE TO BOTH DEVELOPMENT ASSISTANCE AND ECONOMIC SUPPORT FUNDS**

**1. Host Country Development Efforts** (FAA Sec. 601(a)): Information and conclusions on whether assistance will encourage efforts of the country to: (a) increase the flow of international trade; (b) foster private initiative and competition; (c) encourage development and use of cooperatives, credit unions, and savings and loan associations; (d) discourage monopolistic practices; (e) improve technical efficiency of industry, agriculture, and commerce; and (f) strengthen free labor unions.

The goal of the Project is to improve the quality of life for Bolivians through better maternal and child health and basic education. More specifically, to institutionalize radio technology and math/health curricula in the Bolivia basic education system, using interactive radio instruction to improve the quality of health/math education.

**2. U.S. Private Trade and Investment** (FAA Sec. 601(b)): Information and conclusions on how assistance will encourage U.S. private trade and investment abroad and encourage private U.S. participation in foreign assistance programs (including use of private trade channels and the services of U.S. private enterprise).

A private U.S. firm will provide technical assistance to the Project.

**3. Congressional Notification**

**a. General requirement (FY 1991 Appropriations Act Secs. 523 and 591; FAA Sec. 634A):** If money is to be obligated for an activity not previously justified to Congress, or for an amount in excess of amount previously justified to Congress, has Congress been properly notified (unless the notification requirement has been waived because of substantial risk to human health or welfare)?

A Congressional Notification will be sent to the Congress before obligation.

No funds will be obligated until AID/W advises USAID/B that the CN has expired without objection.

**b. Notice of new account obligation (FY 1991 Appropriations Act Sec. 514):** If funds are being obligated under an appropriation account to which they were not appropriated, has the President consulted with and provided a written justification to the House and Senate Appropriations Committees and has such obligation been subject to regular notification procedures?

N/A.

**c. Cash transfers and nonproject sector assistance (FY 1991 Appropriations Act Sec. 575(b)(3)):** If funds are to be made available in the form of cash transfer or nonproject sector assistance, has the Congressional notice included a detailed description of how the funds will be used, with a discussion of U.S. interests to be served and a description of any economic policy reforms to be promoted?

N/A.

**4. Engineering and Financial Plans (FAA Sec. 611(a)):** Prior to an obligation in excess of \$500,000, will there be: (a) engineering, financial or other plans necessary to carry out the assistance; and (b) a reasonably firm estimate of the cost to the U.S. of the assistance?

(a) Yes.

(b) Yes.

**5. Legislative Action (FAA Sec. 611(a)(2)):** If legislative action is required within recipient country with respect to an obligation in excess of \$500,000, what is the basis for a reasonable expectation that such action

Not required.

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will be completed in time to permit orderly accomplishment of the purpose of the assistance?

6. **Water Resources** (FAA Sec. 611(b); FY 1991 Appropriations Act Sec. 501): If project is for water or water-related land resource construction, have benefits and costs been computed to the extent practicable in accordance with the principles, standards, and procedures established pursuant to the Water Resources Planning Act (42 U.S.C. 1962, et seq.)? (See A.I.D. Handbook 3 for guidelines.)

Yes.

7. **Cash Transfer and Sector Assistance** (FY 1991 Appropriations Act Sec. 575(b)): Will cash transfer or nonproject sector assistance be maintained in a separate account and not commingled with other funds (unless such requirements are waived by Congressional notice for nonproject sector assistance)?

N/A

8. **Capital Assistance** (FAA Sec. 611(e)): If project is capital assistance (e.g., construction), and total U.S. assistance for it will exceed \$1 million, has Mission Director certified and Regional Assistant Administrator taken into consideration the country's capability to maintain and utilize the project effectively?

Yes.

9. **Multiple Country Objectives** (FAA Sec. 601(a)): Information and conclusions on whether projects will encourage efforts of the country to: (a) increase the flow of international trade; (b) foster private initiative and competition; (c) encourage development and use of cooperatives, credit unions, and savings and loan associations; (d) discourage monopolistic practices; (e) improve technical efficiency of industry, agriculture and commerce; and (f) strengthen free labor unions.

The goal of the Project is to improve the quality of life for Bolivians through better maternal and child health and basic education. More specifically, to institutionalize radio technology and math/health curricula in the Bolivia basic education system, using interactive radio instruction to improve the quality of health/math education.

10. **U.S. Private Trade** (FAA Sec. 601(b)): Information and conclusions on how project will encourage U.S. private trade and investment abroad and encourage private U.S. participation in foreign assistance programs (including use of private trade channels and the services of U.S. private enterprise).

A private U.S. firm will provide technical assistance to the Project.

11. **Local Currencies**

a. **Recipient Contributions** (FAA Secs. 612(b), 636(h)): Describe steps taken to assure that, to the maximum extent possible, the country is contributing local currencies to meet the cost of contractual and other services, and foreign currencies owned by the U.S. are utilized in lieu of dollars.

a. The Government of Bolivia provides local currency to all AID-GOB projects in conjunction with the Balance of Payment Program. The U.S. does not use Bolivian currency.

b. **U.S.-Owned Currency** (FAA Sec. 612(d)): Does the U.S. own excess foreign currency of the country and, if so, what arrangements have been made for its release?

b. No.

c. **Separate Account** (FY 1991 Appropriations Act Sec. 575). If assistance is furnished to a foreign government under arrangements which result in the generation of local currencies:

c. N/A.

(1) Has A.I.D. (a) required that local currencies be deposited in a separate account established by the recipient government, (b) entered into an agreement with that government providing the amount of local currencies to be generated and the terms and conditions under which the currencies so deposited may be utilized, and (c) established by agreement the responsibilities of A.I.D. and that government to monitor and account for deposits into and disbursements from the separate account?

(1) Yes, the 1991 ESF agreements and procedures approved by USAID comply with all these requirements.

(2) Will such local currencies, or an equivalent amount of local currencies, be used only to carry out the purposes of the DA or ESF chapters of the FAA (depending on which chapter is the source of the assistance) or for the administrative requirements of the United States Government?

(2) Yes.

(3) Has A.I.D. taken all appropriate steps to ensure that the equivalent of local currencies disbursed from the separate account are used for the agreed purposes?

(3) yes.

(4) If assistance is terminated to a country, will any unencumbered balances of funds remaining in a separate account be disposed of for purposes agreed to by the recipient government and the United States Government?

N/A

## 12. Trade Restrictions

a. **Surplus Commodities (FY 1991 Appropriations Act Sec. 521(a)):** If assistance is for the production of any commodity for export, is the commodity likely to be in surplus on world markets at the time the resulting productive capacity becomes operative, and is such assistance likely to cause substantial injury to U.S. producers of the same, similar or competing commodity?

a. and b. Section 559(a)(3) of the FY 91 Appropriations Act provides a waiver of Sections 521 restrictions for Bolivia, for the purpose of reducing dependence upon the production of crops from which narcotic and psychotropic drugs are derived.

b. **Textiles (Lautenberg Amendment) (FY 1991 Appropriations Act Sec. 521(c)):** Will the assistance (except for programs in Caribbean Basin Initiative countries under U.S. Tariff Schedule "Section 807," which allows reduced tariffs on articles assembled abroad from U.S.-made components) be used directly to procure feasibility studies, prefeasibility studies, or project profiles of potential investment in, or to assist the establishment of facilities specifically designed for, the manufacture for export to the United States or to third country markets in direct competition with U.S. exports, of

textiles, apparel, footwear, handbags, flat goods (such as wallets or coin purses worn on the person), work gloves or leather wearing apparel?

13. **Tropical Forests (FY 1991 Appropriations Act Sec. 533(c)(3)):** Will funds be used for any program, project or activity which would (a) result in any significant loss of tropical forests, or (b) involve industrial timber extraction in primary tropical forest areas?

(a) No.  
(b) No.

14. **PVO Assistance**

a. **Auditing and registration (FY 1991 Appropriations Act Sec. 537):** If assistance is being made available to a PVO, has that organization provided upon timely request any document, file, or record necessary to the auditing requirements of A.I.D., and is the PVO registered with A.I.D.?

N/A.

b. **Funding sources (FY 1991 Appropriations Act, Title II, under heading "Private and Voluntary Organizations"):** If assistance is to be made to a United States PVO (other than a cooperative development organization), does it obtain at least 20 percent of its total annual funding for international activities from sources other than the United States Government?

N/A.

15. **Project Agreement Documentation (State Authorization Sec. 139 (as interpreted by conference report)):** Has confirmation of the date of signing of the project agreement, including the amount involved, been cabled to State L/T and A.I.D. LEG within 60 days of the agreement's entry into force with respect to the United States, and has the full text of the agreement been pouched to those same offices? (See Handbook 3, Appendix 6G for agreements covered by this provision).

Not Necessary as agreement is for less than \$25 million.

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16. **Metric System** (Omnibus Trade and Competitiveness Act of 1988 Sec. 5164, as interpreted by conference report, amending Metric Conversion Act of 1975 Sec. 2, and as implemented through A.I.D. policy): Does the assistance activity use the metric system of measurement in its procurements, grants, and other business-related activities, except to the extent that such use is impractical or is likely to cause significant inefficiencies or loss of markets to United States firms? Are bulk purchases usually to be made in metric, and are components, subassemblies, and semi-fabricated materials to be specified in metric units when economically available and technically adequate? Will A.I.D. specifications use metric units of measure from the earliest programmatic stages, and from the earliest documentation of the assistance processes (for example, project papers) involving quantifiable measurements (length, area, volume, capacity, mass and weight), through the implementation stage?

Yes. The metric system will be used for procurements from non-US sources.

17. **Women in Development** (FY 1991 Appropriations Act, Title II, under heading "Women in Development"): Will assistance be designed so that the percentage of women participants will be demonstrably increased?

Yes.

18. **Regional and Multilateral Assistance** (FAA Sec. 209): Is assistance more efficiently and effectively provided through regional or multilateral organizations? If so, why is assistance not so provided? Information and conclusions on whether assistance will encourage developing countries to cooperate in regional development programs.

No. The project concerns interactive radio learning within Bolivia.

19. **Abortions (FY 1991 Appropriations Act, Title II, under heading "Population, DA," and Sec. 525):**

a. Will assistance be made available to any organization or program which, as determined by the President, supports or participates in the management of a program of coercive abortion or involuntary sterilization? a. No.

b. Will any funds be used to lobby for abortion? b. No.

20. **Cooperatives (FAA Sec. 111):** Will assistance help develop cooperatives, especially by technical assistance, to assist rural and urban poor to help themselves toward a better life? The project will work with the Ministry of Education and local non-governmental organizations to provide interactive radio education.

21. **U.S.-Owned Foreign Currencies**

a. **Use of currencies (FAA Secs. 612(b), 636(h); FY 1991 Appropriations Act Secs. 507, 509):** Describe steps taken to assure that, to the maximum extent possible, foreign currencies owned by the U.S. are utilized in lieu of dollars to meet the cost of contractual and other services. The U.S. does not own any significant amount of Bolivian currency.

b. **Release of currencies (FAA Sec. 612(d)):** Does the U.S. own excess foreign currency of the country and, if so, what arrangements have been made for its release? No.

22. **Procurement**

a. **Small business (FAA Sec. 602(a)):** Are there arrangements to permit U.S. small business to participate equitably in the furnishing of commodities and services financed? Yes.

b. **U.S. procurement (FAA Sec. 604(a)):** Will all procurement be from the U.S. except as otherwise determined by the President or determined under delegation from him? Yes.

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**c. Marine insurance (FAA Sec. 604(d)):** If the cooperating country discriminates against marine insurance companies authorized to do business in the U.S., will commodities be insured in the United States against marine risk with such a company?

Yes.

**d. Non-U.S. agricultural procurement (FAA Sec. 604(e)):** If non-U.S. procurement of agricultural commodity or product thereof is to be financed, is there provision against such procurement when the domestic price of such commodity is less than parity? (Exception where commodity financed could not reasonably be procured in U.S.)

No procurements of agricultural commodities are planned.

**e. Construction or engineering services (FAA Sec. 604(g)):** Will construction or engineering services be procured from firms of advanced developing countries which are otherwise eligible under Code 941 and which have attained a competitive capability in international markets in one of these areas? (Exception for those countries which receive direct economic assistance under the FAA and permit United States firms to compete for construction or engineering services financed from assistance programs of these countries.)

No.

**f. Cargo preference shipping (FAA Sec. 603):** Is the shipping excluded from compliance with the requirement in section 901(b) of the Merchant Marine Act of 1936, as amended, that at least 50 percent of the gross tonnage of commodities (computed separately for dry bulk carriers, dry cargo liners, and tankers) financed shall be transported on privately owned U.S. flag commercial vessels to the extent such vessels are available at fair and reasonable rates?

No.

**g. Technical assistance (FAA Sec. 621(a)):** If technical assistance is financed, will such assistance be furnished by private enterprise on a contract basis to the fullest extent practicable? Will the

Yes.

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facilities and resources of other Federal agencies be utilized, when they are particularly suitable, not competitive with private enterprise, and made available without undue interference with domestic programs?

**h. U.S. air carriers**

(International Air Transportation Fair Competitive Practices Act, 1974): If air transportation of persons or property is financed on grant basis, will U.S. carriers be used to the extent such service is available? Yes.

**i. Termination for convenience of U.S. Government (FY 1991 Appropriations Act Sec. 504):** If the U.S. Government is a party to a contract for procurement, does the contract contain a provision authorizing termination of such contract for the convenience of the United States? Yes.

**j. Consulting services**

(FY 1991 Appropriations Act Sec. 524): If assistance is for consulting service through procurement contract pursuant to 5 U.S.C. 3109, are contract expenditures a matter of public record and available for public inspection (unless otherwise provided by law or Executive order)? Yes.

**k. Metric conversion**

(Omnibus Trade and Competitiveness Act of 1988, as interpreted by conference report, amending Metric Conversion Act of 1975 Sec. 2, and as implemented through A.I.D. policy): Does the assistance program use the metric system of measurement in its procurements, grants, and other business-related activities, except to the extent that such use is impractical or is likely to cause significant inefficiencies or loss of markets to United States firms? Are bulk purchases usually to be made in metric, and are components, subassemblies, and semi-fabricated materials to be specified in metric units when economically available and technically adequate? Will A.I.D. specifications use metric units of measure from the earliest programmatic stages, and from the earliest Yes.

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documentation of the assistance processes (for example, project papers) involving quantifiable measurements (length, area, volume, capacity, mass and weight), through the implementation stage?

**1. Competitive Selection**

**Procedures (FAA Sec. 601(e)):** Will the assistance utilize competitive selection procedures for the awarding of contracts, except where applicable procurement rules allow otherwise?

Yes.

**23. Construction**

**a. Capital project (FAA Sec. 601(d)):** If capital (e.g., construction) project, will U.S. engineering and professional services be used?

Any construction and engineering services under the project will be carried out by Bolivian firms because of their small value.

**b. Construction contract (FAA Sec. 611(c)):** If contracts for construction are to be financed, will they be let on a competitive basis to maximum extent practicable?

Yes.

**c. Large projects, Congressional approval (FAA Sec. 620(k)):** If for construction of productive enterprise, will aggregate value of assistance to be furnished by the U.S. not exceed \$100 million (except for productive enterprises in Egypt that were described in the Congressional Presentation), or does assistance have the express approval of Congress?

N/A

**24. U.S. Audit Rights (FAA Sec. 301(d)):** If fund is established solely by U.S. contributions and administered by an international organization, does Comptroller General have audit rights?

Yes.

**25. Communist Assistance (FAA Sec. 620(h)).** Do arrangements exist to insure that United States foreign aid is not used in a manner which, contrary to the best interests of the United States, promotes or assists the foreign aid projects or activities of the Communist-bloc countries?

Yes.

**26. Narcotics**

a. **Cash reimbursements (FAA Sec. 483):** Will arrangements preclude use of financing to make reimbursements, in the form of cash payments, to persons whose illicit drug crops are eradicated?

Yes.

b. **Assistance to narcotics traffickers (FAA Sec. 487):** Will arrangements take "all reasonable steps" to preclude use of financing to or through individuals or entities which we know or have reason to believe have either: (1) been convicted of a violation of any law or regulation of the United States or a foreign country relating to narcotics (or other controlled substances); or (2) been an illicit trafficker in, or otherwise involved in the illicit trafficking of, any such controlled substance?

Yes. USAID/Bolivia has developed a certification form for contractors, grantees and borrowers under Sec. 487, by which USAID and the U.S. Embassy can check the appropriate narcotics records to ensure compliance.

27. **Expropriation and Land Reform (FAA Sec. 620(g)):** Will assistance preclude use of financing to compensate owners for expropriated or nationalized property, except to compensate foreign nationals in accordance with a land reform program certified by the President?

Yes.

28. **Police and Prisons (FAA Sec. 660):** Will assistance preclude use of financing to provide training, advice, or any financial support for police, prisons, or other law enforcement forces, except for narcotics programs?

Yes.

29. **CIA Activities (FAA Sec. 662):** Will assistance preclude use of financing for CIA activities?

Yes.

30. **Motor Vehicles (FAA Sec. 636(i)):** Will assistance preclude use of financing for purchase, sale, long-term lease, exchange or guaranty of the sale of motor vehicles manufactured outside U.S., unless a waiver is obtained?

Yes.

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31. **Military Personnel** (FY 1991 Appropriations Act Sec. 503): Will assistance preclude use of financing to pay pensions, annuities, retirement pay, or adjusted service compensation for prior or current military personnel? Yes.

32. **Payment of U.N. Assessments** (FY 1991 Appropriations Act Sec. 505): Will assistance preclude use of financing to pay U.N. assessments, arrearages or dues? Yes.

33. **Multilateral Organization Lending** (FY 1991 Appropriations Act Sec. 506): Will assistance preclude use of financing to carry out provisions of FAA section 209(d) (transfer of FAA funds to multilateral organizations for lending)? Yes.

34. **Export of Nuclear Resources** (FY 1991 Appropriations Act Sec. 510): Will assistance preclude use of financing to finance the export of nuclear equipment, fuel, or technology? Yes.

35. **Repression of Population** (FY 1991 Appropriations Act Sec. 511): Will assistance preclude use of financing for the purpose of aiding the efforts of the government of such country to repress the legitimate rights of the population of such country contrary to the Universal Declaration of Human Rights? Yes.

36. **Publicity or Propoganda** (FY 1991 Appropriations Act Sec. 516): Will assistance be used for publicity or propoganda purposes designed to support or defeat legislation pending before Congress, to influence in any way the outcome of a political election in the United States, or for any publicity or propoganda purposes not authorized by Congress? No.

37. **Marine Insurance** (FY 1991 Appropriations Act Sec. 563): Will any A.I.D. contract and solicitation, and subcontract entered into under such contract, include a clause requiring that U.S. marine insurance companies have a fair opportunity to bid for marine insurance when such insurance is necessary or appropriate?

Yes.

38. **Exchange for Prohibited Act** (FY 1991 Appropriations Act Sec. 569): Will any assistance be provided to any foreign government (including any instrumentality or agency thereof), foreign person, or United States person in exchange for that foreign government or person undertaking any action which is, if carried out by the United States Government, a United States official or employee, expressly prohibited by a provision of United States law?

No.

B. **CRITERIA APPLICABLE TO DEVELOPMENT ASSISTANCE ONLY**

1. **Agricultural Exports (Bumpers Amendment)** (FY 1991 Appropriations Act Sec. 521(b), as interpreted by conference report for original enactment): If assistance is for agricultural development activities (specifically, any testing or breeding feasibility study, variety improvement or introduction, consultancy, publication, conference, or training), are such activities: (1) specifically and principally designed to increase agricultural exports by the host country to a country other than the United States, where the export would lead to direct competition in that third country with exports of a similar commodity grown or produced in the United States, and can the activities reasonably be expected to cause substantial injury to U.S. exporters of a similar agricultural commodity; or (2) in support of research that is intended primarily to benefit U.S. producers?

Section 559(a)(3) of the FY 91 Appropriations Act waives Section 521 for Bolivia.

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2. **Tied Aid Credits** (FY 1991 Appropriations Act, Title II, under heading "Economic Support Fund"): Will DA funds be used for tied aid credits?

No.

3. **Appropriate Technology** (FAA Sec. 107): Is special emphasis placed on use of appropriate technology (defined as relatively smaller, cost-saving, labor-using technologies that are generally most appropriate for the small farms, small businesses, and small incomes of the poor)?

Yes.

4. **Indigenous Needs and Resources** (FAA Sec. 281(b)): Describe extent to which the activity recognizes the particular needs, desires, and capacities of the people of the country; utilizes the country's intellectual resources to encourage institutional development; and supports civic education and training in skills required for effective participation in governmental and political processes essential to self-government.

The project will develop the capacities of local groups and organizations to provide interactive radio education in at least one indigenous language (Aymara, Quechua, or Tupi-Guarani).

5. **Economic Development** (FAA Sec. 101(a)): Does the activity give reasonable promise of contributing to the development of economic resources, or to the increase of productive capacities and self-sustaining economic growth?

Yes.

6. **Special Development Emphases** (FAA Secs. 102(b), 113, 281(a)): Describe extent to which activity will: (a) effectively involve the poor in development by extending access to economy at local level, increasing labor-intensive production and the use of appropriate technology, dispersing investment from cities to small towns and rural areas, and insuring wide participation of the poor in the benefits of development on a sustained basis, using appropriate U.S. institutions; (b) encourage democratic private and local governmental institutions; (c) support the self-help efforts of developing countries; (d) promote the participation of women in the national economies of developing countries

-The target group includes the poor.  
-The project will work with the MOE and local NGOs.  
-50% of the target group are women.  
-The success/failure of the Interactive Radio Project will be shared with other Andean countries.

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and the improvement of women's status; and  
(e) utilize and encourage regional  
cooperation by developing countries.

7. **Recipient Country Contribution**  
(FAA Secs. 110, 124(d)): Will the  
recipient country provide at least 25  
percent of the costs of the program,  
project, or activity with respect to which  
the assistance is to be furnished (or is  
the latter cost-sharing requirement being  
waived for a "relatively least developed"  
country)?

Yes.

8. **Benefit to Poor Majority** (FAA  
Sec. 128(b)): If the activity attempts to  
increase the institutional capabilities of  
private organizations or the government of  
the country, or if it attempts to  
stimulate scientific and technological  
research, has it been designed and will it  
be monitored to ensure that the ultimate  
beneficiaries are the poor majority?

Yes.

9. **Abortions** (FAA Sec. 104(f); FY  
1991 Appropriations Act, Title II, under  
heading "Population, DA," and Sec. 535):

a. Are any of the funds to be  
used for the performance of abortions as a  
method of family planning or to motivate  
or coerce any person to practice  
abortions?

No.

b. Are any of the funds to be  
used to pay for the performance of  
involuntary sterilization as a method of  
family planning or to coerce or provide  
any financial incentive to any person to  
undergo sterilizations?

No.

c. Are any of the funds to be  
made available to any organization or  
program which, as determined by the  
President, supports or participates in the  
management of a program of coercive  
abortion or involuntary sterilization?

No.

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d. Will funds be made available only to voluntary family planning projects which offer, either directly or through referral to, or information about access to, a broad range of family planning methods and services? Yes.

e. In awarding grants for natural family planning, will any applicant be discriminated against because of such applicant's religious or conscientious commitment to offer only natural family planning? No.

f. Are any of the funds to be used to pay for any biomedical research which relates, in whole or in part, to methods of, or the performance of, abortions or involuntary sterilization as a means of family planning? N/A.

g. Are any of the funds to be made available to any organization if the President certifies that the use of these funds by such organization would violate any of the above provisions related to abortions and involuntary sterilization? No.

10. **Contract Awards (FAA Sec. 601(e)):** Will the project utilize competitive selection procedures for the awarding of contracts, except where applicable procurement rules allow otherwise? Yes.

11. **Disadvantaged Enterprises (FY 1991 Appropriations Act Sec. 567):** What portion of the funds will be available only for activities of economically and socially disadvantaged enterprises, historically black colleges and universities, colleges and universities having a student body in which more than 40 percent of the students are Hispanic Americans, and private and voluntary organizations which are controlled by individuals who are black Americans, Hispanic Americans, or Native Americans, or who are economically or socially disadvantaged (including women)? These organizations may bid for contracts or grants directly, or for subcontracts under the project.

12. Biological Diversity (FAA Sec. 119(g): Will the assistance: (a) support training and education efforts which improve the capacity of recipient countries to prevent loss of biological diversity; (b) be provided under a long-term agreement in which the recipient country agrees to protect ecosystems or other wildlife habitats; (c) support efforts to identify and survey ecosystems in recipient countries worthy of protection; or (d) by any direct or indirect means significantly degrade national parks or similar protected areas or introduce exotic plants or animals into such areas?

- (a) Yes.
- (b) Other agreements provide for such protection.
- (c) Other agreements provide for such protection.
- (d) No.

13. Tropical Forests (FAA Sec. 118; FY 1991 Appropriations Act Sec. 533(c)-(e) & (g)):

a. A.I.D. Regulation 16: Does the assistance comply with the environmental procedures set forth in A.I.D. Regulation 16?

Yes.

b. Conservation: Does the assistance place a high priority on conservation and sustainable management of tropical forests? Specifically, does the assistance, to the fullest extent feasible: (1) stress the importance of conserving and sustainably managing forest resources; (2) support activities which offer employment and income alternatives to those who otherwise would cause destruction and loss of forests, and help countries identify and implement alternatives to colonizing forested areas; (3) support training programs, educational efforts, and the establishment or strengthening of institutions to improve forest management; (4) help end destructive slash-and-burn agriculture by supporting stable and productive farming practices; (5) help conserve forests which have not yet been degraded by helping to increase production on lands already cleared or degraded; (6) conserve forested watersheds and rehabilitate those which have been deforested; (7) support training, research, and other actions

Yes.

- 1) Yes.
- 2) Yes.
- 3) Yes.
- 4) Yes.
- 5) Yes.
- 6) Yes.
- 7) Yes.

which lead to sustainable and more environmentally sound practices for timber harvesting, removal, and processing; (8) support research to expand knowledge of tropical forests and identify alternatives which will prevent forest destruction, loss, or degradation; (9) conserve biological diversity in forest areas by supporting efforts to identify, establish, and maintain a representative network of protected tropical forest ecosystems on a worldwide basis, by making the establishment of protected areas a condition of support for activities involving forest clearance or degradation, and by helping to identify tropical forest ecosystems and species in need of protection and establish and maintain appropriate protected areas; (10) seek to increase the awareness of U.S. Government agencies and other donors of the immediate and long-term value of tropical forests; (11) utilize the resources and abilities of all relevant U.S. government agencies; (12) be based upon careful analysis of the alternatives available to achieve the best sustainable use of the land; and (13) take full account of the environmental impacts of the proposed activities on biological diversity?

- 9) Yes.
- 9) Yes.
- 10) Yes.
- 11) Yes.
- 12) Yes.
- 13) Yes.

c. Forest degradation: Will assistance be used for: (1) the procurement or use of logging equipment, unless an environmental assessment indicates that all timber harvesting operations involved will be conducted in an environmentally sound manner and that the proposed activity will produce positive economic benefits and sustainable forest management systems; (2) actions which will significantly degrade national parks or similar protected areas which contain tropical forests, or introduce exotic plants or animals into such areas; (3) activities which would result in the conversion of forest lands to the rearing of livestock; (4) the construction, upgrading, or maintenance of roads (including temporary haul roads for logging or other extractive industries) which pass through relatively undergraded

- 1) No.
- 2) No.
- 3) No.
- 4) No.

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forest lands; (5) the colonization of forest lands; or (6) the construction of dams or other water control structures which flood relatively undergraded forest lands, unless with respect to each such activity an environmental assessment indicates that the activity will contribute significantly and directly to improving the livelihood of the rural poor and will be conducted in an environmentally sound manner which supports sustainable development?

5) No.

6) No.

d. **Sustainable forestry:** If assistance relates to tropical forests, will project assist countries in developing a systematic analysis of the appropriate use of their total tropical forest resources, with the goal of developing a national program for sustainable forestry?

N/A.

e. **Environmental impact statements:** Will funds be made available in accordance with provisions of FAA Section 117(c) and applicable A.I.D. regulations requiring an environmental impact statement for activities significantly affecting the environment?

Yes.

14. **Energy (FY 1991 Appropriations Act Sec. 533(c)):** If assistance relates to energy, will such assistance focus on: (a) end-use energy efficiency, least-cost energy planning, and renewable energy resources, and (b) the key countries where assistance would have the greatest impact on reducing emissions from greenhouse gases?

a) Yes.

b) N/A.

15. **Sub-Saharan Africa Assistance (FY 1991 Appropriations Act Sec. 562, adding a new FAA chapter 10 (FAA Sec. 496)):** If assistance will come from the Sub-Saharan Africa DA account, is it: (a) to be used to help the poor majority in Sub-Saharan Africa through a process of long-term development and economic growth that is equitable, participatory, environmentally sustainable, and self-reliant; (b) to be used to promote sustained economic growth, encourage

N/A.

private sector development, promote individual initiatives, and help to reduce the role of central governments in areas more appropriate for the private sector; (c) to be provided in a manner that takes into account, during the planning process, the local-level perspectives of the rural and urban poor, including women, through close consultation with African, United States and other PVOs that have demonstrated effectiveness in the promotion of local grassroots activities on behalf of long-term development in Sub-Saharan Africa; (d) to be implemented in a manner that requires local people, including women, to be closely consulted and involved, if the assistance has a local focus; (e) being used primarily to promote reform of critical sectoral economic policies, or to support the critical sector priorities of agricultural production and natural resources, health, voluntary family planning services, education, and income generating opportunities; and (f) to be provided in a manner that, if policy reforms are to be effected, contains provisions to protect vulnerable groups and the environment from possible negative consequences of the reforms?

16. Debt-for-Nature Exchange (FAA Sec. 463): If project will finance a debt-for-nature exchange, describe how the exchange will support protection of: (a) N/A. the world's oceans and atmosphere, (b) animal and plant species, and (c) parks and reserves; or describe how the exchange will promote: (d) natural resource management, (e) local conservation programs, (f) conservation training programs, (g) public commitment to conservation, (h) land and ecosystem management, and (i) regenerative approaches in farming, forestry, fishing, and watershed management.

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17. **Deobligation/Reobligation**  
(FY 1991 Appropriations Act Sec. 515): If deob/reob authority is sought to be exercised in the provision of DA assistance, are the funds being obligated for the same general purpose, and for countries within the same region as originally obligated, and have the House and Senate Appropriations Committees been properly notified?

N/A.

18. **Loans**

a. **Repayment capacity** (FAA Sec. 122(b)): Information and conclusion on capacity of the country to repay the loan at a reasonable rate of interest.

N/A.

b. **Long-range plans** (FAA Sec. 122(b)): Does the activity give reasonable promise of assisting long-range plans and programs designed to develop economic resources and increase productive capacities?

N/A.

c. **Interest rate** (FAA Sec. 122(b)): If development loan is repayable in dollars, is interest rate at least 2 percent per annum during a grace period which is not to exceed ten years, and at least 3 percent per annum thereafter?

N/A.

d. **Exports to United States** (FAA Sec. 620(d)): If assistance is for any productive enterprise which will compete with U.S. enterprises, is there an agreement by the recipient country to prevent export to the U.S. of more than 20 percent of the enterprise's annual production during the life of the loan, or has the requirement to enter into such an agreement been waived by the President because of a national security interest?

N/A.

19. **Development Objectives** (FAA Secs. 102(a), 111, 113, 281(a)): Extent to which activity will: (1) effectively involve the poor in development, by expanding access to economy at local level, increasing labor-intensive production and the use of appropriate technology, spreading investment out from

1) The target group is poor school children and their families.

cities to small towns and rural areas, and insuring wide participation of the poor in the benefits of development on a sustained basis, using the appropriate U.S. institutions; (2) help develop cooperatives, especially by technical assistance, to assist rural and urban poor to help themselves toward better life, and otherwise encourage democratic private and local governmental institutions; (3) support the self-help efforts of developing countries; (4) promote the participation of women in the national economies of developing countries and the improvement of women's status; and (5) utilize and encourage regional cooperation by developing countries?

**20. Agriculture, Rural Development and Nutrition, and Agricultural Research (FAA Secs. 103 and 103A):**

**a. Rural poor and small farmers:** If assistance is being made available for agriculture, rural development or nutrition, describe extent to which activity is specifically designed to increase productivity and income of rural poor; or if assistance is being made available for agricultural research, has account been taken of the needs of small farmers, and extensive use of field testing to adapt basic research to local conditions shall be made.

**b. Nutrition:** Describe extent to which assistance is used in coordination with efforts carried out under FAA Section 104 (Population and Health) to help improve nutrition of the people of developing countries through encouragement of increased production of crops with greater nutritional value; improvement of planning, research, and education with respect to nutrition, particularly with reference to improvement and expanded use of indigenously produced foodstuffs; and the undertaking of pilot or demonstration programs explicitly addressing the problem of malnutrition of poor and vulnerable people.

- 2) The project will work with MOF and local NGOs.
- 3) Community participation in terms of self-help projects are included.
- 4) 50% of the target group are women.
- 5) Project successes/failures will be shared with other countries in the region.

a, b, c - See detailed description of project activities in the Project Paper. All these items are addressed.

**c. Food security:** Describe extent to which activity increases national food security by improving food policies and management and by strengthening national food reserves, with particular concern for the needs of the poor, through measures encouraging domestic production, building national food reserves, expanding available storage facilities, reducing post harvest food losses, and improving food distribution.

**21. Population and Health (FAA Secs. 104(b) and (c)):** If assistance is being made available for population or health activities, describe extent to which activity emphasizes low-cost, integrated delivery systems for health, nutrition and family planning for the poorest people, with particular attention to the needs of mothers and young children, using paramedical and auxiliary medical personnel, clinics and health posts, commercial distribution systems, and other modes of community outreach.

N/A.

**22. Education and Human Resources Development (FAA Sec. 105):** If assistance is being made available for education, public administration, or human resource development, describe (a) extent to which activity strengthens nonformal education, makes formal education more relevant, especially for rural families and urban poor, and strengthens management capability of institutions enabling the poor to participate in development; and (b) extent to which assistance provides advanced education and training of people of developing countries in such disciplines as are required for planning and implementation of public and private development activities.

N/A.

**23. Energy, Private Voluntary Organizations, and Selected Development Activities (FAA Sec. 106):** If assistance is being made available for energy, private voluntary organizations, and selected development problems, describe extent to which activity is:

See portions of the Project Paper dealing with the participation

a. concerned with data collection and analysis, the training of skilled personnel, research on and development of suitable energy sources, and pilot projects to test new methods of energy production; and facilitative of research on and development and use of small-scale, decentralized, renewable energy sources for rural areas, emphasizing development of energy resources which are environmentally acceptable and require minimum capital investment;

b. concerned with technical cooperation and development, especially with U.S. private and voluntary, or regional and international development, organizations;

c. research into, and evaluation of, economic development processes and techniques;

d. reconstruction after natural or manmade disaster and programs of disaster preparedness;

e. for special development problems, and to enable proper utilization of infrastructure and related projects funded with earlier U.S. assistance;

f. for urban development, especially small, labor-intensive enterprises, marketing systems for small producers, and financial or other institutions to help urban poor participate in economic and social development.

of Bolivia PVOs (NGOs), whose capacities to deliver interactive radio instruction will be strengthened under the Project.



ANNEX D

MINISTERIO DE EDUCACION Y CULTURA

LA PAZ — BOLIVIA

La Paz, marzo 13 de 1991  
CITE: D.H. OF. 177/91

Señor  
Carl Leonard  
DIRECTOR DE USAID  
Presente. -

Distinguido Señor:

De acuerdo a conversaciones del Asesor del Ministerio de Educación y Cultura, con la Sra. Sigrid Anderson, Subdirectora de la División de Salud y Recursos Humanos, con el propósito de ver la cooperación que su institución podría prestar al Programa de Matemáticas por Radio, me complace comunicarle que Education Development Center, prestará un apoyo al Ministerio de Educación y Cultura para iniciar el plan de matemáticas por radio en las ciudades de Sucre, Tarija y Cochabamba a nivel urbano.

La intención de este plan experimental es generalizarlo a partir del 92, para lo cual solicito a usted considerar este proyecto en el programa de presupuesto que USAID prepare para el mencionado año. Con tal motivo le hacemos llegar oportunamente el proyecto mencionado.

Asimismo, deseo poner en su conocimiento que el Ministerio de Educación y Cultura ya sostuvo conversaciones con el Banco Mundial, con el fin de continuar este proyecto a partir de 1994.

Con este motivo, aprovecho la oportunidad de reiterarle las seguridades de mi más alta y distinguida consideración.

  
Mariano Baptista Guzmán  
MINISTRO DE EDUCACION Y CULTURA

6. INITIAL ENVIRONMENTAL EXAMINATION

Project Location: Bolivia  
Project Title: Interactive Radio Learning  
Project Number: 511-0619  
Funding: \$3 to 5 million  
Life of Project: 5 years (FY-91-95)  
IEE Prepared by : John Wilson, LAC Deputy Chief  
Environmental Officer

I. Project Description:

The purpose of the Interactive Radio Learning project is to improve the quality of basic education in two core subject areas, health and mathematics, through dissemination of locally adapted interactive radio curricula. The project contributes to the overall effort to develop Bolivia's human resource base through improved educational opportunities and expanded access to primary health care education.

The project consists of six basic components: (1) development and dissemination of radio curricula in health education; (2) continuing dissemination of mathematics curricula; (3) development of a teacher-training support model for teacher effectiveness; (4) enhancement of the Ministry of Education and Culture's ability to manage a permanent basic education program, (5) establishment of a network of "Master Teachers" trained in basic health-care to provide school-based support to community members who do not have access to other health-care facilities, and (6) achievement of policy objectives for integration of the radio curricula into the national educational reform package.

II. Discussion:

The project consists of activities for which there are no foreseeable, direct, significant impacts on the environment. These activities fall generally within those classes of actions listed in Section 216.2(c) (2) of A.I.D.'s Environmental Regulations which are not subject to further environmental review, i.e., education, technical assistance and training, and nutrition, health care and family planning services. Therefore, the proposed project is determined to qualify for a Categorical Exclusion.

This Request for a Categorical Exclusion is submitted for review by the LAC Bureau Environmental Officer in accordance with Section 216.2 or 22 CFR 216, Environmental Procedures, Section 216.2 (c) (2) (i).

III. Recommended Threshold Decision:

USAID/Bolivia recommends a Categorical Exclusion for the Radio Education project.

Mission Director's Concurrence:         

Date:         

*Cooper*  
5/7/91

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CLEARANCES:

HHR:PHartenberger Draft  
HHR:SAnderson Draft  
DP:SSmith Draft  
EXO:JLiebner Draft  
RCO:CBucher Draft  
CONT:JRDavison Draft  
ECON:CJoel Draft  
RLA:SAllen Draft  
PD&I:LLodle Dodd

A/DD:PHartenberger Pitt

4/30/91

## ANNEX F

### 1. Technical Analysis

#### a. Interactive Radio Mathematics

Working with Fé y Alegría, the proposed contractor has already prepared and validated the IRI curriculum for grades two through five. Grades two and three were actually adapted from the Nicaraguan model while grades four and five were designed and written specifically for Bolivia. The content at all levels meets or exceeds the curriculum norms for math as established by the Bolivian Ministry of Education and Culture. This complete curriculum is ready for implementation.

The extensive field tests of the math curriculum have included pre and post-testing with control groups. The results consistently show that the participating students' math scores are significantly better than those of children being taught the same math concepts by traditional means.

Working closely with Fé y Alegría, the RLP/B has, in essence, institutionalized the IRI math curriculum in the participating schools of the Fé y Alegría system. An efficient system of monitoring and supervision is in place, contracts for transmission with an adequate number of radio stations have been established, and a distribution system worked out for dissemination of the lessons, the teachers' guides and radio receivers. Teacher training sessions have been developed, tested, and instituted. With this current system, IRI math is now reaching approximately ten percent of Bolivian school children.

During the 1991 school year, a pilot program with the MEC is being conducted to assess the possibility of instituting IRI math in the MEC basic education system. This program is being carried out in three different regions of the country with apparent success, giving the MEC an opportunity to learn what is involved in nationwide implementation. This pilot effort has convinced the MEC of the need to implement IRI radio instruction on a nation-wide basis, using a gradual carefully controlled approach.

One important aspect of MEC institutionalization will be the arrangements for broadcasting the lessons. For the time being, they will have to rely on paid broadcast time on commercial AM and FM stations. One of the major policy decisions for the continuation of IRI math and health after EOP will be the recurrent costs for the financing of these broadcasts.

While the project will initially provide radio receivers, the MEC will have to devise a means of replacement, distribution and maintenance. This will be the second largest expense of institutionalization. With unstable power supply an issue in many areas of the country, the MEC may wish to consider reliable alternative energy sources such as described in Annex G.

In order to work effectively with IRI methodology, teachers will require a basic orientation. This initial training must be structured to be accessible and effective with minimal dilution. In this project, the NGO subcontractor trainers, who devised the successful training for Fé y Alegría personnel, will train the MEC supervisors and then assist them in training school directors. The school directors, in turn, will train their teachers. Supervisors and directors will be responsible for training new teachers in the future and for refresher training. Needs assessments of teachers will be undertaken to determine additional training needs, and appropriate training materials developed and disseminated, possibly by distance learning methods, such as special broadcasts for teachers and the use of two-way radios.

At the onset of implementation, a system for the production and distribution of the teachers' guides and other supporting materials will be put in place. This will be worked out in cooperation with MEC supervisors. The existing difficulties in transportation and communication will have to be overcome.

Some of the effectiveness of the pilot projects in radio math and health was due to the vigilant supervision and monitoring. In the beginning of MEC implementation, supervisors will be hired by the project to work along side of the MEC supervisors. Such on-the-job training will strengthen the MEC supervision capabilities.

Along with supervision, an effective monitoring and evaluation system will be devised. Careful testing and record-keeping are basic elements of the IRI methodology. The MEC is particularly weak in data collection. A small-scale management information system will be developed and pilot-tested to assess its feasibility, and to demonstrate its potential for the Ministry.

The project will encourage on-going policy dialogues between the MEC and other donor agencies. It is important that the MEC have sufficient experience with IRI to promote its inclusion in the 1994 educational reform package being supported by the World Bank and the IDB.

#### **b. Interactive Radio Health**

Development of the IRI health curriculum will be the exclusive responsibility of the contractor/subcontractor team. This team already has extensive experience in curriculum development and field-testing, having written the successful radio math curriculum. They also have some experience with adapting IRI methodology to health having pilot-tested a ten-lesson health module. The team also has individuals skilled in the technical aspects of radio production.

Health practices are intricately tied to culture and environment. This fact is of utmost importance for the development of health education lesson modules for Bolivia, which has such a diversity of cultures, climates, and geographical zones. Behaviors and beliefs are also affected by societal transitions, and many Bolivians, especially the young, are in the process of transition to a lifestyle very different from that of their parents. Such transitions are brought about by the migration from rural to urban areas, or to other geographic regions, and also to the exposure to new ideas and people with different lifestyles and beliefs.

For health education to be effective, particularly for school children, detailed anthropological studies are essential. These studies must be based on present-day reality, and as much on the lifestyle of the children themselves as on that of their families. These studies will provide baseline data on health practices which will be used to evaluate the effectiveness of the IRI health curriculum in bringing about behavioral changes, and will also provide information essential for developing lesson content and scripts.

The suggested theoretical frameworks for lesson development are Fishbein's Theory of Reasoned Action and the Health Belief Model. A full-time health educator with Bolivian experience will provide basic technical assistance, but additional short-term technical support will be necessary to tailor the health concepts to IRI, to train the team in information gathering, scripting, and evaluation, and to develop particular topics.

Lessons will be pilot-tested in 20 schools in three different regions using a pre-test, post-test, control-group design. An improved formative evaluation system will provide rapid feedback for curriculum development and technical production of the lessons. Summative evaluations will determine student achievement levels. Studies will be designed to determine whether relationship exists between knowledge level and adoption of improved health practices.

Based on serious consideration of the health issues facing Bolivian children and their families, topics for the ten health units have been tentatively proposed. These topics agree with MOH health priorities, national data, and information from WHO and UNICEF. The existing MEC curriculum for health in rural schools was also taken into account. Further discussions with MOH personnel will be carried out before topic selection is final. To facilitate these discussions, MOH may need a clearer understanding of the objectives of the radio health program. Both the MOH and PROCOSI will be consulted to assure consistency in concepts being taught.

The proposed topics are as follows:

#### THIRD GRADE

- A. Personal Hygiene - 6 lessons
- B. Dental Health - 6 lessons
- C. Acute Respiratory Infections - 6 lessons
- D. Immunizations and Preventable Diseases - 6 lessons

#### FOURTH GRADE

- A. Diarrhea Prevention and Treatment - 10 lessons (revised from 1989 pilot project)
- B. Accidents and First Aid - 10 lessons
- C. Chagas (Valleys and Highlands) - 8 lessons, and Malaria and Yellow Fever (Lowlands) - 8 lessons

#### FIFTH GRADE

- A. Nutrition - 15 lessons
- B. Environmental Awareness - 8 lessons
- C. Self-esteem (includes drugs, alcohol, sex ed.) - 7 lessons

As in the pilot project, the lessons will target health behaviors over which the children have control for themselves or for younger siblings. The objective is to present them with basic concepts and practices which they may immediately put into practice or teach their families.

Because of regional differences in health problems, sources of accidents, customs, and different food habits, some regionalization of modules will be necessary. With careful planning, the region-specific content can be ordered within the lesson strands to eliminate the need to write and record completely different scripts. Regional differences in terminology can be handled within the lesson, by avoiding use of an excessive number of regional expressions and using differing terms together within the lesson. Much will be learned about this aspect of writing the health lessons during the course of the Project.

Since the pilot lessons are being developed for eventual national dissemination, the baseline data collected for their preparation will have to come from all regions of the country rather than just from the three pilot regions. The script writers and health educator should have active roles in this data collection since first-hand experience will better enable them to formulate lessons and content.

The steps necessary to produce each of the curriculum units are as follows:

1. Identify the major theme and any sub-themes.
2. Study all information available about the theme.
3. Define the goal and operational plan for the unit to include time, audience, division of work, etc.
4. Carry-out baseline data collection and analysis, including pre-test of the children.
5. Define the health knowledge, attitudes, and practices to be incorporated into the lessons based on their appropriateness for the children and relation to achieving unit objectives.
6. Examine the content in relation to the theoretical framework.
7. Determine the strands and arrange content accordingly.
8. Write the behavioral objectives for each lesson or strand.
9. Organize the content into lessons.
10. Write the script, record, and pilot-test with formative evaluation.
11. Conduct post-test of participating children and control group.
12. Revise and re-record lessons as necessary.

As each lesson is written, a teachers' guide will be developed and field tested along with the lesson. The guide will include instructions for activities the teachers must conduct before, during, and after each lesson.

Lessons will be 20 to 25 minutes in length with a 20-minute post-broadcast activity led by the teacher. Lessons in the pilot will be broadcast once a week. The current project will look at the effect of more frequent broadcasts, or a review activity or brief broadcasts during the intervening time between the weekly lessons.

Based on the previous experience, the following time frame is recommended for the development of the units for each grade level. Baseline data collection will take no less than two months before any actual lesson development can be begun. Development of each lesson, including content definition, script-writing, recording, and preparation of teachers' guides will take at least one and a half weeks. Preparation of the following lesson can obviously take

place while the previous lesson is being field-tested. Allowing for interruption of strikes and holidays, it is calculated that the entire process for each grade level will occupy 11 months, leaving the remaining month of the year for finalization of those units. Hence, the four units for third grade can be developed and evaluated during 1992, those for fourth grade during 1993, and fifth grade in 1994. Any limitations or serious interruptions of the process will result in health curriculum of lesser quality.

To examine whether the presence or absence of latrines and water at the school has an impact on the adoption of health practices, the project will design a small study of children in schools with or without access to these services. In policy dialogues with other donor agencies regarding the education reform package, the project will encourage the provision of these services at school, along with garbage disposal and, possibly, school breakfasts. The project will provide data from other studies on the efficacy of such services to school children.

#### c. Extension of IRI Health and Math

A separate component of the project is to extend IRI health and math education, on an experimental basis, to interested adults and to children who are not in school. More than one method will be tried during the latter half of the project.

In areas where there are NGO or MOH health promoters, they will be invited to the classroom to participate in the lessons. They will be given a teacher's guide from which they can adapt activities for their adult audiences. In return, they will be asked to make their clientele aware of the times and themes of the radio lessons.

During the second and third years of the project, a pilot program will be undertaken to reach children and youths not in school and interested adults. Such a program will include creating a general awareness in the community of the normal broadcast times, and possibly, broadcasting at another time of day when working people would be able to listen. Social marketing might be incorporated to motivate participation. Study guides could be developed to take the place of the post-transmission activities normally conducted by a teacher. A distribution system for such materials will have to be developed, as well as a means of assessing program impact on this audience.

The results of this pilot program will be shared with the MEC and other donor agencies. Depending on the success, a program of interactive radio education for adults and children not in school might be incorporated in future plans for Bolivian basic education.

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ANNEX F

2. Financial Analysis

The IRL Project is, in a large sense, an extension of the RLP/B which ends in April, 1992. The Project is targeting the extension of the proven benefits of IRI to an estimated 200,000 primary school students in grades 3-5. The context of the expansion is in two areas --a broader application of the mathematics methodology that is already developed, and designing and field testing new health education modules. The chief goal is improvement of health habits and life quality of approximately 200,000 Bolivian basic education students, and also affecting an out-of-school listening audience of approximately 10,000 people. Through programmed technical assistance and training, the Project will develop an IRI infrastructure in at least seven of the nine Bolivian departments.

These and other project objectives will be pursued through a contractual partnership involving USAID/Bolivia, the Bolivian Ministry of Education and Culture (MEC), and a prime contractor, the Educational Development Center (EDC). The viability of the project will be supported by a grant from USAID-Bolivia to the MEC for a period of 4 years (ending September 30, 1995), and a TA buy-in contract with EDC for a period of 3 years (ending September 30, 1994.)

In the long run, the effectiveness of the project will be demonstrated by the ability of the MEC to continue with IRI once the Project has terminated. This goal is felt to be realistic and financially viable, insofar as the cost efficiency ratios of IRI, and the infrastructural capacity that the project will provide to the MEC will make institutionalization highly probable. Refer to the Economic Analysis of the PP for a review of the overall efficiency of IRI, as reflected in its lower costs and higher achievement or learning ratios of participating vs. non-participating students.

**a. Financial Plan**

**i. Project Budget and Financing Plan**

The total amount of this 5-year project is \$8.4 million, with an AID contribution of \$5 million to be obligated under a bilateral agreement with the MEC. The counterpart contribution by the GOB will be \$3.4 million, \$200,000 of which will come from ESF funds and \$100,000 from the Social Investment Fund (FIS). The balance of \$2.9 million is derived from in-kind, mostly teacher salary inputs from the MEC.

AID funds will primarily finance the cost of the technical assistance: long and short-term technical services, operational activities and training. AID support will also cover equipment purchases, including a radio production studio, sound production equipment, computers, the costs of project evaluations and

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audits, and AID management and logistical costs. Procurement under the contract will be performed in accordance with AID/FAR procurement guidelines; some equipment will be purchased locally.

GOB counterpart funds derived as in-kind support from the MEC, will provide for teachers and departmental school staff participating and receiving training in the project. ESF and FIS support will cover construction costs for a distance education headquarters for the Project, teachers' guides, and the purchase of radios for participating schools.

Project support and expenditures are summarized in the following budget:

SUMMARY PROJECT BUDGET (US\$ 000)

ACTIVITY	AID		COUNTERPART	
	FX	LC	FX	LC
1. Technical Assistance	\$4,200			
2. Audits and Evaluations	100	50		
3. Management and Logistical Support	250			
4. MEC Support		400		
5. GOB Salaries (a)				2,860
6. Radios (b)				100
7. Textbook Production and Distribution (c)				50
8. Building Construction (d)				250
9. Building site				120
<b>Total</b>	<b>\$4,550</b>	<b>\$450</b>		<b>\$3,390</b>

- (a) GOB salaries are calculated on the basis of US\$ 13.02/student/year for LOP for the mathematics component, and the incremental costs of developing the health modules. Section d, below, provides more information.
- (b) FIS support to MEC
- (c) ESF or PL 480 expected in FY 1992
- (d) ESF or PL 480 expected in FY 1992. Building construction will not delay the start of the Project, since activities will be initiated from rented facilities.

ii. Methods of Implementation and Financing

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ii. Methods of Implementation and Financing

The project's elements will be implemented and financed in the following manner:

METHODS OF IMPLEMENTATION AND FINANCING  
(US\$ 000)

Component	Implementation Method	Method of Payment	Est. Amount
Technical Assistance	Buy-in to EDC	AID/W Direct Payment	\$4,200
MEC Support	PIL	Periodic Advances	\$400
Audits and Evaluations	PIO/T Local	Direct Payment	\$150
Management and Logistical Support	PIO/T Contracts	Direct Payment	\$250
<b>Total</b>			<b>\$5,000</b>

The above summary is explained in the following narrative:

- a) AID project funds in the amount of \$5 million dollars will be utilized within the framework of a bilateral agreement with the MEC, and applied primarily to the provision of technical assistance through a buy-in to the Learning Technologies Project contract between S&T/ED and the Educational Development Center. Payments to the contractor shall be made in accordance with the reimbursement terms of that contract. MEC payments will be made through periodic advances in accordance the terms of the bilateral agreement. Pursuant to AID billing requirements, the MEC will develop a billing system in accordance with the terms established in the bilateral agreement and the corresponding instructions received from USAID-Bolivia.
- b) Payments to the contractor shall be made to cover such things as long and short-term TA and support for project activities associated with developing and field testing the health education radio lessons, expanding the outreach of radio mathematics, MEC training, and the internal evaluations associated with the delivery of educational services. Two international long-term TA positions, and two major local service subcontracts will be contracted by EDC to ensure institutional (schools) participation for the developmental phase of the program, and to ensure the availability of professional IRI staff.

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- c) International short-term TA consultants with expertise in health and distance education, and evaluations specialists will be contracted by EDC using project funds.
- d) Full coverage of the TA costs of operating and administrating the main Project office in La Paz, inclusive of building a radio production/sound studio, purchasing all equipment and goods necessary for the project will be covered by the grant.
- e) There will be \$150,000 in project funds designated for local audits, mid-term and final evaluations, and financial reviews, to be contracted directly by USAID-Bolivia.

EDC will present vouchers in accordance with the current established practices of the buy-in core contract for corresponding reimbursement. The project's first disbursement will be an advance to cover start-up and full operations for a period of at least 6 months, in consideration of the intensive front end expenses, contracting and preparation for immediate expansion of the mathematics component, and for the heavy advance work to prepare health pilot lessons in time for the school year beginning in February 1992.

The above notwithstanding, at this time the initial obligation of project funds for FY 91 is planned for only \$415,000. In FY 92 the Mission plans to obligate an additional \$1,250,000, but these funds will probably not be available before April 1992. This delay could place serious constraints on project implementation. USAID/B anticipates receiving an additional \$400,000 in health funds in FY 91.

- f) Project funds will cover travel for relevant MEC personnel, all teacher training activities, Departmental office equipment and support, national IRI Advisory Board activities, and MEC central office operating expenses, including radio broadcasts.

Counterpart project funds will support the following MEC activities:

- a) In-kind support in the amount of \$2.9 million for MEC teachers and instructional staff at the local and departmental levels, in connection with the mathematics expansion component and the field testing of the health lessons.
- b) A contribution of approximately \$100,000 from the FIS/World Bank for the purchase of radios to be placed in rural and peri-urban schools. It is acknowledged that schools receiving FIS financing must meet established low income criteria.

- c) \$50,000 for the production of teacher's guides in mathematics and health, and \$250,000 for construction of a building for the IRL project or distance learning unit of the Ministry. ESF funds earmarked for FY 1992 will support these activities.
- d) The MEC is contributing a lot, valued at \$120,000, for the construction of a building to house the Central Project offices and production facilities.

### iii. Disbursement Schedule

The disbursement schedule for the 5-years of the project is shown in the following chart:

DISBURSEMENT SCHEDULE (US\$ 000)

Item	Year 1		Year 2		Year 3		Year 4		Year 5		Total		Grand Total
	FX	LC	FX	LC	FX	LC	FX	LC	FX	LC	FX	LC	
Technical Assistance	650		1,300		1,300		950				4,200		4,200
Audits & Evaluations					75				75		100	50	150
Management & Logistical Support	15		50		50		65		70		250		250
MEC Support				200		200						400	400
Totals	665	0	1,350	200	1,425	200	1,015		145		4,550	450	5,000

### b. Contracting Procedures - The Buy-in Arrangement

Technical assistance and training for IRI design, evaluation, production and management will be implemented through a buy-in arrangement to the AID S&T/ED funded Learning Technologies for Basic Education (LT) Project. This mechanism provides several advantages for the Project, and include the following:

1. LT is designed to support the development of IRI building on AID's own IRI models. The project has a Mission buy-in feature permitting USAID-Bolivia to add incremental funding to an existing contract to obtain technical services for educational media projects.
2. The LT contractor, EDC, was selected through a full and open competitive procurement. The quality of services available through the LT consortium is very high, representing virtually all the accumulated experience with IRI.
3. EDC is now the TA provider to the RLB/B Project. Besides being the best available source of technical

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resources, skilled professional advisors, and experience in IRI, EDC is a well known leader in development of IRI curricula in the U.S. and abroad.

4. By collaborating with LT, the Project will become part of an international network of educational media projects. LT will promote the interchange of materials, model programs, evaluation findings, and technical advisors to the mutual benefit of all participating countries.

#### **c. Overview of MEC Implementation Capabilities**

The MEC will be the GOB's implementing agency, with EDC as the major contractor. Recapping earlier statements, local TA for program development, evaluation, production, and implementation will be subcontracted locally to the extent that such services are available. Local short-term services and international advisors will also be recruited by EDC to address specific needs.

##### **1. Educational Products**

Using the bilateral agreement as a basis, the project will carry out its operations under the following general plan for the health component: Thirty half-hour lessons will be developed for each of 3rd, 4th and 5th grades, under a modular format of some 10 lessons per module for each grade, with a broadcast of one lesson per week. Modules may include diarrheal disease, respiratory infections, personal hygiene, accident prevention, among many other subjects. Teacher training, baseline studies, and operations research are integral parts of the Project.

An additional overview of other elements in this narrative also highlight features like content identification, behavioral and learning objectives, master planning, MOH content reviews, message design, scripting, teachers' guides, observation sheets, recording, distribution, broadcasting, formative observations, student testing, revisions, final reproduction and final broadcasting. By EOP, health modules for all 3 grades will be operational and ready for broadcasting.

The mathematics expansion component will be shaped in the form of continued transmission of developed and validated programs for grades 2-5. The MEC will extend participation to all schools in the areas currently served by existing radio stations, increasing participation by three-fold to at least 200,000 students by EOP. The infrastructure of FyA (grantee under the former RLP/B) will continue to serve the project during this transitional stage toward MEC control, feasible by 1994. The math component does not require revalidation, but it does call for full scale teacher training and MEC support on the path toward institutionalization. Teachers guides and redubbing of all master tapes for all grades will need to be done to reflect

MEC patronage. It also includes summative evaluation actions, to measure achievement in MEC schools.

Other elements of the project involve the use of alternative technologies, such as the use of 2-way radios on a limited pilot basis to facilitate interaction between health experts and community based teachers, health promoters and interested community members. This intervention may increase the community outreach efficiency of health programming. Where appropriate, solar powered radios or battery regenerators will be tried on a pilot basis.

#### ii. Management/Administration of the TA

The contractor will provide technical administrative services, addressing the following four chief requirements: 1) Permanent long-term advisors; 2) Short-term advisors; 3) local expertise, and 4) home office support services. Besides the provision of TA services to the MEC, the contractor will also coordinate the activities of the TA team to achieve maximum impact at all levels of project implementation. The MEC will provide the general direction and orientation to contractor activities; however the contractor will be ultimately responsible to USAID/Bolivia. On a day-to-day basis, the contractor's Chief of Party (COP) will have the responsibility for the technical direction of the project and coordinate with the MEC through the designated counterpart.

Other responsibilities of the COP will include but not be limited to: 1) managing the contractor's accounts and serving as the legal representative of the contractor, 2) managing global technical assistance and monitoring the technical output of all project teams, 3) preparing work plans in collaboration with the MEC, 4) preparing regular and timely reports and other deliverable reports on the execution of the work plans, as required by USAID-Bolivia, and 5) keeping AID and the MEC informed of significant implementation problems.

The above comments notwithstanding, the contractor will work primarily and diligently to ensure an orderly and expedited transition of all technical and managerial responsibility to the MEC at a date no later than September 30, 1994. It will therefore be the COP's key role to encourage and promote actions by the TA team that lead to building the capacity of the MEC to assume this control.

#### d. Project Investment Returns

The returns on this AID grant investment are expected to be even more impressive than those of its RLP/B precursor. The impact on teachers and students, and out-of-school youth and adults is primarily measurable through its social impact. The quality of mathematics instruction will be significantly

improved, thereby teaching important skills to participating students, enhancing their interest additional schooling. The quality of life for those impacted by the health education interventions will be similarly affected, with the expectation that by improving health habits greater life longevity will be achieved, especially among children and future mothers.

A numerical assessment of project impact points to the following list of outputs against which the investment can be measured:

OUTPUT	ALL YEARS
Students Participating	200,000 *
Directors and School Teachers Trained	5,000
MEC Supervisors Trained	50
Out-of-School Youth and Adults Participating	10,000
Lessons Broadcast and Revised	700
Teachers Guides Printed (1/Grade)	7

**e. MEC Financial and In-Kind Inputs**

Implementation of the above activities calls for extensive inputs from the MEC and MOH. Committing supervisory and teaching personnel, as well as facilities at all levels is crucial, both for start-up operations and through the life of the project. These are in-kind commitments that should flow without significant difficulty from both Ministries, although only the MEC's contribution has been considered in the preparation of this PP since the MEC will be the sole grantee.

In an effort to quantify the extent of in-kind support, extensive use has been made of the data generated by the RLP/B which is discussed to a greater length in the Economic and Social Soundness Analyses. Previous findings indicate that Bolivian schools, operating on the basis of 25 periods per week generate costs of \$2.6 per period per year. Mathematics is normally allocated six periods per week. Figures for the RLP/B math project, based on 5 periods per week at a cost of \$13 per year, plus the incremental costs of the radio instruction and other variable recurrent costs, estimated at \$0.81 per student per year as shown in the following table:

\* Of this number, 90,000 are girls

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**Total Cost of Math Instruction per Student/Year  
(In US\$)**

Instruction System	Fixed Costs	Variable Costs	Total Costs
Traditional System	15.6	-	15.60
Interactive Radio Learning	13.00	0.81	13.81

Using the above figures and the MEC commitment to the project, it is estimated that the in-kind support offered by the MEC during the life of the project will exceed \$2.5 million. This figure represents an assessment of instructional costs, mostly in the form of teachers and supervisory staff salaries. This is very significant contribution under any point of view. Looking beyond the LOP, into the projected institutionalized cycle, and in consideration of a probable service target of 700,000 students by the year 1996, the expected investment in radio education by the MEC in mathematics alone might easily reach \$9.9 million. The table below, taken from the economic analysis, illustrates this point.

**COST EFFECTIVENESS ANALYSIS OF THE RADIO-MATH PROGRAM**

	1992	1993	1994	1995	1996
Students Served (000)	100	350	600	700	700
1. CURRENT COST OF "TRADITIONAL" MATH INSTRUCTION (6 periods/week at \$2.6/period/student/year)	1.56	5.46	9.36	10.92	10.92
2. TOTAL COST OF IRI	1.49	5.00	8.51	9.91	9.91
a. Current costs for 5 periods at \$2.6/period/student/year	1.40	4.91	8.42	9.83	9.83
b. Incremental costs of IRI	0.08	0.08	0.08	0.08	0.08
3. INCREMENTAL COSTS OF IRI OVER "TRADITIONAL" MATH INSTRUCTION (items 2 less 1)	-0.08	-0.46	-0.86	-1.01	-1.01
"Traditional" costs/student (\$)	15.6	15.6	15.6	15.6	15.6
IRI costs/student (\$)	14.9	14.3	14.2	14.2	14.2

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Important evidence for the MEC's commitment to and investment in IRL, is the Ministry's willingness to assign the Project a plot of land in the Miraflores section of La Paz; it will be used to construct a building to serve as the permanent headquarters for IRI and possibly a distance education unit for the Ministry. The estimated value of this contribution, a lot of approximately 1200 square meters, is US\$ 120,000. This contribution has been accounted for in the budget presented earlier.

**f. Financial Audits**

According to Bolivian law and GOB regulations, the MEC is subject to audits by a GOB agency. The PP team did not examine any financial reports or statements from the MEC in the preparation of this analysis. Thus, that capability cannot be addressed in a direct manner. The Team did, however, hold extensive talks on this subject with MEC executives, who offered strong assurances on developing and adhering to AID payment and vouchering concerns and procedures in connection with the operation of the IRL Project by the host country. This point is also addressed in the Institutional and Administrative Analysis.

To summarize the PP team's views, it has been determined that the Ministry can acquire the capability to administer grant or contracts funds in accordance with AID regulations. The MEC is amenable to establishing appropriate accounting systems to deal with the expressed needs of the Project.

**g. Rollover and Start-up Considerations**

As with most projects, the start-up budgetary period for the IRL Project is heavily front-loaded. Hiring, equipment purchases for offices, studio, building lease, and immediate broadcasting requirements have to be met in order to bring about an effective transition from the previous RLP/B Project. In the case of the equipment, it needs to be selected, competitively bid, shipped and imported into Bolivia. It is likely that some items will need to be back-ordered, thereby causing significant delays. Without a minimal amount of operational infrastructure (basic furniture and equipment), the Project risks losing valuable time in transition. This is a most undesirable risk, since the project must be able to begin its educational broadcast activities in time for the school year beginning in February 1992.

It is, therefore, important to allow the contractor the ability to rollover a number of basic items procured with Mission funds under the current RLP/B buy-in. Contractually, this action does not pose a problem. Initially the project was divided into two contractual mechanisms --a grant agreement with the FyA, and a central AID/S&T/ED buy-in. The FyA grant agreement contains a total budget of \$0.8 million, including \$30,000 for procurement. Under its provisions, the goods thereby acquired remain with FyA when the project ends. In turn, the TA contract is a separate instrument with a budget of \$0.9 million. The only mention of this contract in the FyA agreement refers to AID's procuring of international TA through the buy-in to EDC. According to EDC's contract, commodities procured under this instrument are subject to AID disposition. AID should therefore clarify by contract amendment or letter that the following items should remain with EDC under the new project until such time as AID and EDC determine that they should be transferred to Bolivian entities in the best interest of the new project.

Since the IRL Project is a continuation of the former Radio Education Project, and because the contractor (EDC) is expected to remain the same, it is prudent to allow this contractor to roll over certain basic equipment purchased through the original buy-in, and currently in use by the RLP/B. The suggested items are distinct from the commodities to be purchased under the contract. They include:

- 4 Desks and 1 computer table (of 21 purchased)
- 9 Chairs (of 42 purchased)
- 3 Typewriter tables (of 3 purchased)
- 2 Space heaters (of 10 purchased)
- 5 Lamps (of 15 purchased)
- 3 Computers (of 9 purchased)
- 2 Printers w/switch box (of 5 purchased)
- 2 Typewriters (of 3 purchased)
- 1 Voltage regulator w/2 line tamers (of 2 purchased)
- 4 Filing cabinets (filled with T/A documents)
- 2 Bookcases
- 1 Central telephone systems (of 2 purchased)
- 1 Telephone line (dedicated to TA)
- 5 Radio/Cassette players
- 1 Adding machine

In addition, the Mission issued a PIO/C for \$35,000 against the original buy-in to purchase a furniture/appliance/security (household goods) package for EDC's COP. This package should also be rolled-over into the new contract.

**3. ECONOMIC ANALYSIS**  
**INTERACTIVE RADIO LEARNING PROJECT**

To determine the economic benefits of the Interactive Radio Learning Project (IRLP), the following analysis includes: 1) a cost-effectiveness analysis for the Radio-Math program, and 2) an analysis of the available data of the effect of maternal education on child mortality and morbidity rates and possible impact on economic development.

**I. Summary**

Results in several underdeveloped countries, as well as of the pilot program currently being implemented in Bolivia, show the impressive improvements in math performance tests with the radio-math programs.

The following analysis shows that the radio-math program will not only be highly beneficial to the targeted group of some 700,000 students, but that it is more cost-effective than the traditional instruction system. It is estimated that while students will improve up to 76% in math performance tests over the life of the project (five-year period, from 1992 to 1996), the total cost of reaching the same target group of the radio-math program will be 9% less than for the traditional system.

Similarly, findings of a study based on actual data for Bolivia show that improvement in maternal education has direct and indirect results in the reduction of child mortality and morbidity. The IRLP will improve educational levels and provide greater coverage to mothers and children which will strengthen the GOB's mother and child health program and its efforts to alleviate the economic hardships resulting from the economic crisis. Improving the health status and education levels of the target population will improve Bolivia's human resources and contribute to the achievement of a higher standard of living.

**II. Radio Math**

Since 1974, experience in twelve countries in Latin America, Africa, and Asia has demonstrated the cost-effectiveness of interactive radio learning in improving the efficiency, accessibility, and quality of interactive education. Experience has also proven that instructional radio can effectively teach mathematics, science, and language both to children in the formal and non-formal environment, while at the same time, the teachers' own knowledge of basic subject matter is strengthened.

A. Prior Evidence on Effectiveness and Costs

Based on the Radio Mathematics Project carried out in Nicaragua from 1974 to 1979, a carefully controlled study compared first grade achievement gains in radio classrooms and in textbook classrooms with that in control classrooms (having relatively limited access to textbooks and no access to radio programs). The results indicated that students in both radio classes and textbook classes scored significantly higher than the control group on mathematics achievement tests. In fact, students in the radio group outperformed students in the textbook group: control classes scored 44.3% correct, textbook classes 48.7% correct, and radio classes 62.1% correct.<sup>1/</sup>

The Bolivian Radio Education Project (RLP/B) was initiated in April 1987 by adapting, producing and broadcasting the first lessons of the second-grade radio-math curriculum. Over a three-year period, the RLP/B has developed and broadcasted 405 half-hour radio-math lessons which reached approximately 50,000 students at the second, third, and fourth-grade levels. Five of the country's nine departments have participated in this program to date. Table 1 summarizes the growth in geographic, curriculum, and student coverage of RLP/B.

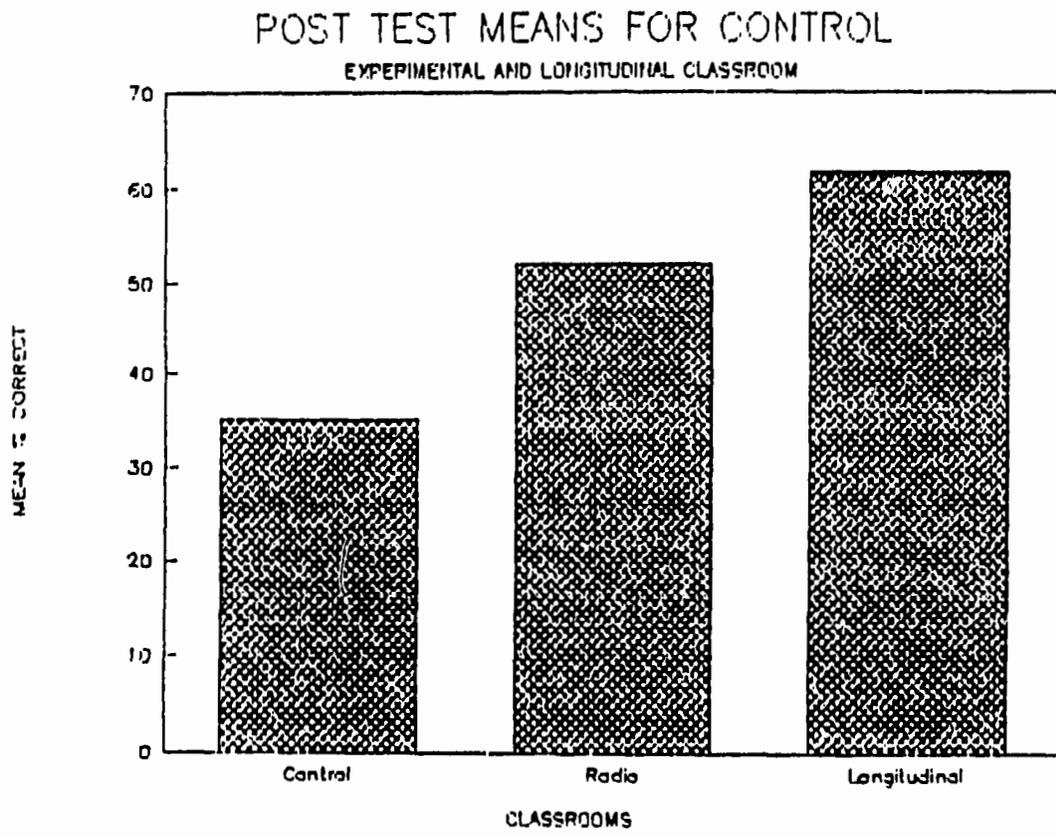
Table 1  
Growth of Radio Mathematics Coverage and Enrollment

<u>Year</u>	<u>No. of Departments</u>	<u>No. of Schools</u>	<u>No. of Students</u>	<u>Grades Covered</u>
1988	3	145	10,284	2
1989	5	182	12,600	2,3
1990	5	367	25,000	2,3,4

The results of the RLP/B in Bolivia have yielded the highest gains of any second-grade interactive-radio curriculum to date (see Figure 1). The distribution of learning gains in Bolivia follows the same patterns developed in other countries using interactive-radio. The highest learning gains are in the suburban and rural areas where traditional teacher-led instruction is the weakest. The lowest mean gains are in the urban areas where better students, better teachers, and better schools are generally found. In Bolivia, the experimental groups in rural schools not only demonstrated strong learning gains, but their post test score (57.3% correct) exceeded the average score for urban students in the control group (55.1% correct).

<sup>1/</sup> Jamison, D.T., Searle, B., Galda, K., and Heyneman, S. (1981). "Improving Elementary Mathematics Education in Nicaragua: An Experimental Study of the Impact of Textbooks and Radio on Achievement", Journal of Educational Psychology, No. 73, 556-567.

Figure 1



B. The Impact of Time and Radio on Learning

Table 2 summarizes the effect of one-year schooling (from mid-second to mid-third grade) on student performance in mathematics in Bolivia. The results are reported in the aggregate, as well as separately for the rural, suburban, and urban samples.

Table 2  
The Effect of One Year of Schooling

	<u>Rural</u>	<u>Suburban</u>	<u>Urban</u>	<u>Total Sample</u>
1. Second Grade Mean (%)	16.5%	17.5%	31.0%	22.5%
2. Increment of 3rd Over 2nd Grade Score	23.5%	31.0%	16.5%	23.5%

The first row shows, for each sample, the average percentage correct for second-graders. Note how much better the performance of urban children was if compared to those in the rural areas; on the other hand, note that the standard performance of urban children over others (row 2) is being eroded as children remain longer in school.

Moreover, in an attempt to measure the cumulative effects of the treatment over time, RLP/B modified the third-grade summative evaluation design to include a tracer study of those children who were originally tested as part of the grade-two experimental cohort, and had gone on to complete their grade radio curriculum. Figure 1 shows that after one year of radio-math instruction (third grade only), the experimental cohort's mastery of basic mathematics was clearly superior to that of the control groups, i.e. some 48% better. Even more impressive, however, is the gain of the longitudinal group who had taken radio math in both second and third grades, strongly suggesting a cumulative impact of the instructional radio curriculum over time, representing a 76% improvement.

C. Assessing Costs

To obtain a reasonable first approximation, the incremental costs of educational systems can be divided into those that are fixed independently of the number of students and those that vary directly with the number of students.

According to reliable data from the Ministry of Education, the annual cost of primary education in Bolivia, per student, is broken down as follows:

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Salary (teacher and administration)	\$35
Non-salary recurrent costs	\$ 9
Capital Costs (annualized)	<u>\$20</u>
Total	\$64

Bolivian schools typically operate on a schedule of 25 periods per week at a cost, given the above data, of \$2.6 per year for one period per week. Traditionally, mathematics instruction is allocated six periods per week at a pro-rated cost of \$15.6 per year. The IRLP will provide mathematics instruction in only 5 periods per week at a cost of \$13 per year, plus the incremental costs of the radio instruction. Note that the transition from traditional to radio based mathematics training frees up one period per week.

Radio receivers constitute the main variable capital cost and, assuming a 5-year lifetime for the receivers, the annualized receiver cost comes to about \$0.11 per student, per year. Variable recurrent costs are estimated to come to \$0.70 per student, per year. Thus, the total variable costs is estimated at about \$0.81 per student.

The total annual cost of serving "n" students per year is shown below:

Table 3  
Total Cost of Math Instruction  
per Student/Year  
(In \$)

<u>Instruction System</u>	<u>Fixed Costs</u> (F)	<u>Variable Costs</u> (V)x(n)	<u>Total Costs</u> (TC)
Traditional System	15.6	-	15.60
Interactive Radio Learning	13.02/	0.81	13.81

D. Cost Analysis of the REP

Table 4 shows a cost-effectiveness analysis for the life of project (1992-1996). The RLP/B's cost structure reflects, principally,

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2/ In the previous RLP/B project, the main fixed cost, which was the capital cost, was for lesson preparation. These costs were over \$1.1 million for the preparation of 540 lessons, resulting in a cost of about \$2,100 per one 30-minute lesson. Assuming a 15-year lifetime for the lessons and start-up activity and annualized at a 12% interest rate, costs for these items would be \$144,000 per year.

Table 4

COST EFFECTIVENESS ANALYSIS OF THE RADIO-MATH PROGRAM					
	1992	1993	1994	1995	1996
Students Served (thousands)	100	350	500	700	700
	(In Mill of \$)				
1. CURRENT COST OF "TRADITIONAL" MATH INSTRUCTION (6 Periods/Week at \$2.6 per Period/Student/Year)	1.56	5.46	9.36	10.92	10.92
2. TOTAL COST OF INTERACTIVE RADIO	1.49	5.00	8.51	9.91	9.91
a. Current Costs for 5 Periods/Week at \$2.6 per Period/Student/Year	1.40	4.91	8.42	9.87	9.87
b. Incremental Costs of IEP	0.08	0.08	0.08	0.08	0.08
3. INCREMENTAL COSTS OF IRLP OVER "TRADITIONAL" MATH INSTRUCTION (Items 2-1)	-0.08	-0.46	-0.86	-1.01	-1.01
"Traditional" Costs per Student (\$)	15.6	15.6	15.6	15.6	15.6
IRLP Costs per Student (\$)	14.9	14.3	14.2	14.2	14.2

incremental costs to those of the ongoing system of primary education. However, since the RLP/B takes place within the regular classrooms, and requires the availability of the regular teachers, the total cost of RLP/B must also include those costs.

The expected number of students served by the program will gradually increase from 100,000 to 700,000 by 1995 and 1996. Line item 1 shows the current costs of the "traditional" math instruction system which takes 6 periods a week and at an annual cost per student of \$15.6 (see section above). Given the fact that 100,000 students will be served the first year (1992), the annual cost of the "traditional" math instruction system would be \$1.56 million.

Line item 2 includes:

(a) the current costs for only 5 periods a week (one period less than the "traditional" system of instruction); that is \$14 per student, per annum. Reaching 100,000 students during the first year (1992), these costs would total about \$1.4 million for the first year (similar calculation is done for the following years) and,

(b) the annual incremental cost of IRLP (\$0.81 per year/student) as shown in Table 3.

Line item 3 shows that the IRLP will be more cost-effective than the "traditional" instruction system beginning the first year (1992). For 100,000 students, the radio-math program will spend about \$80,000 less during the first year, \$460,000 less during the second year, and so on. Over the life of the project, the IRLP will not only expand its broadcasting educational services, but will do so at about \$3.4 million less than the "traditional" way.

#### E. Conclusions

This section has made reference to the significant gains in student performance as a result of the radio-math instruction system, as well as to its cost-effectiveness.

Most previous assessments of the cost-effectiveness of interventions to improve quality of education in developing countries focused on the ratio of incremental effectiveness to incremental cost, and referred to this ratio as the "efficiency" ratio, where incremental effectiveness is measured in units of "effect" size and incremental cost in terms of dollars per student per year.<sup>3/</sup> Providing textbooks, according to the finding of Lockhead and Hanushek, results typically in

<sup>3/</sup> Lockhead, M.E., and Hanushek, E. (1988), "Improving Educational Efficiency in Developing Countries: What do we Know?", World Bank Reprint No. 435.

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an efficiency ratio of about 0.2. Most other interventions reviewed were less cost-effective, except for interaction radio, which had a ratio in the range of 0.3 to 1.3.

As shown earlier, the improvement in student performance in Bolivia as a result of the radio-math program, has resulted in a gain of 76% in relation to control programs (having relatively limited access to textbooks and no access to radio programs), which characterizes the Bolivian primary education system (see section I.B.). Given an incremental cost of 0.81 (see Section I.C.), we obtain an efficiency ratio of 0.94 units of (incremental) effect per dollar, per student, per year. This estimate, in the range of available alternatives and experience, is extremely attractive despite the relatively high cost environment that the Bolivian terrain imposes.

The arguments showing the efficiency for switching to IRLP are, therefore, very strong and sound. In addition, the cost (over 5 years) of making the transition nationwide was estimated to be about \$400,000. The fact that the total estimated cost of the IRLP would be about 9% less than the costs incurred by the traditional instruction system and the results that are reflected in an improvement of about 76% in the students' performance, make the IRLP an undoubtedly attractive option.

In sum, the principal advantages of the IRLP are:

1. A more cost-effective instruction system,
2. Greater effectiveness in the improvement of the students' performance in basic mathematics, and
3. Greater accessibility to primary education through relatively low investment.

### III. Radio Health

This component supports the current GOB social "safety net" program which has been on going since the implementation of the socio-economic measures of Decree 22407, promulgated in January, 1990. It contributes to the achievement of GOB and MOH health care objectives stated in the national plan for improved health care and maternal/child survival rates.

The project will strengthen the physical and educational development of children which, in turn, will contribute over the long-run to improved health status of children and young adults. In particular, the project will address the health care needs of low income, urban and rural populations, with emphasis placed on reducing the infant mortality and morbidity rates. As in the radio-math project component, radio health will also provide wide coverage to approximately 700,000 people.

Studies using data from the World Fertility Survey have shown that, on average, each one-year increment in maternal education corresponds to a reduction of 7% to 9% in mortality for children under 5 years of age.<sup>4/</sup>

This section will be based on findings of a recent study made for the Bolivian case.<sup>5/</sup> This study pursues several related lines of inquiry, each line building on inference drawn from the previous one. First, "does formal education increase a mother's propensity to use modern child health services?" The study uses multivariate methods to isolate the effect of maternal education.

Table 5 summarizes the odds of survival of all births in the last 5 years (from the date of the study) from mothers with basic and no education for the rural and urban areas.

Table 5  
Odds of All Live Births in Last 5 Years  
(Mothers with No Education: Index of 1.00)

<u>Education of Mother</u>	<u>Rural</u>	<u>Urban</u>
Basic (1-5 yr)	1.81	4.24

The table shows that, in the rural area, the chances of survival of all children born from mothers with basic education 81% higher than from mothers with no education. In the urban area, the probability of survival of all children born from mother with basic education is more than four times greater than from mothers with no education.

Similarly, the study concludes that in the rural area, for example, children born from women with no education are about 2.9 times more likely to be stunted (a child with a height-for-age index is two or more standard deviations below the median).

<sup>4/</sup> Cleland, J. and Van Ginneken, J.K. (1988), "Maternal Education and Child Survival in Developing Countries: The Search for Pathways of Influence, Social Science and Medicine, No. 27, 1357-1368.

<sup>5/</sup> Bicego, George T., and Boerma J. Ties, Maternal Education, Use of Health Services, and Child Survival: An Analysis of Data from the Bolivia DHS Survey, Institute for Resource Development, Inc., Dec. 1990.

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The findings of the study indicate that in the rural areas of Bolivia, children of more educated mothers are at a decided advantage in terms of survival prospects and in terms of linear growth (height-for-age), but are no less frequently ill than children of less educated mothers. The education advantage is particularly important during the neonatal (under one month) period, but it extends through the postneonatal period as well.

The results of the urban population are somewhat different. Maternal education has a much weaker influence on child survival during the first two years than was observed in the rural setting. Differences in disease prevalence related to educational level were shown to be roughly of the same magnitude as education-related differences in postneonatal survival.

Nevertheless, the IRLP is a cost-effective alternative to reach a broad population segment of mothers in rural as well as urban areas, which otherwise would have no access to basic education. Given the financial situation of the Ministry of Health and/or Ministry of Education, it would be almost impossible to invest in additional infrastructure and/or supporting recurrent costs to expand coverage by about seven times, which is the proposed target over 1992-1996. Moreover, it is most likely that Bolivia does not have trained people available to reach larger populations.

Finally, increasing mothers' educational level improves the possibilities of children not only for surviving in the difficult environment of an underdeveloped country, but being able to increase their nutritional levels, obtain more education and be better fit to work more productively. Clearly, these positive externalities would improve the country's human resource base and contribute to long-term economic growth and social progress.

The benefits of the IRLP are certainly positive and do not limit themselves to the direct impact on the educational level of the target population. The IRLP could establish a model for the design and execution of other projects related to education and health, and other fields, to address the social and technical needs of the Bolivian population. It is anticipated that other donors, such as the IBRD, will continue with the IRLP model and will finance its expansion. Moreover, the project will reduce budget expenditures for the Ministries of Education and Health which, without the IRLP, would be directed toward support for an ineffective program; while the IRLP would serve to strengthen effectively the GOB's mother and child health program. It might induce these ministries to re-examine their education campaign in order to better allocate their resources and achieve optimal impact on improving the level of education and health status of project beneficiaries.

#### 4. Social Soundness Analysis

##### a. Introduction

This is an examination and analysis of the proposed interventions of the Interactive Radio Learning Project in terms of appropriateness and possible benefits for the intended beneficiaries. The data presented are based on a review of the relevant literature, especially the Mid-Term Evaluation of the Radio Learning Project/Bolivia.

The Interactive Radio Learning Project components examined by this SSA are the expansion of radio mathematics for grades 2-5 to cover 7 out of 9 Departments, and the design and pilot-testing of interactive radio health education for grades 3-5 in Santa Cruz, Cochabamba and La Paz.

Each of the project components are examined in terms of feasibility which is, in effect, looking at the distribution, organization, activities, and motivation of the beneficiary population. The individual interventions are viewed in terms of past experience and whether or not the new approaches and expanded coverage will generate increased participation. Possible obstacles and problems relating to implementation are discussed, and the crucial role of the urban and rural teachers and his/her interaction with parents has been given particular attention.

The principal beneficiaries of the project are rural and urban children who will be better educated in mathematics to participate in economically productive activities. Furthermore, the basic knowledge of health and nutrition will provide them with the means of coping with disease and other hazards common to the substandard living conditions of the vast majority of low income families. As in the case of most development interventions, others will also be affected. Those who never went to school or dropped out may be motivated to return even though they have long passed the usual age, and many adults may clearly see the advantages of numeracy and health education. The net outcome could be an enhanced social consciousness and increased community involvement leading to demands for more and better government services.

In terms of social consequences and benefit incidence, a specific concern has been the participation of and effects of the project interventions on females, especially young girls who will soon be mothers. Women have characteristically been the most marginalized from education and, as a result, have had the fewest opportunities to benefit from better employment and increased involvement in community affairs. Historically, Bolivian women have been kept within the domestic sphere, but current economic and social conditions are, by necessity, demanding their increased participation in income-generating activities.

**b. Relevant Considerations**

**i. Socioeconomic Conditions and Health in Bolivia<sup>1</sup>**

Health and nutrition indicators for Bolivia are among the lowest for Latin America. A large percentage of the population does not have sufficient income to purchase the basic food basket to meet minimal nutritional requirements. The lack of basic sanitation, potable water, sewer systems, and appropriate education contributes significantly to the poor nutritional and health status of the Bolivian population.

The main health problems are high mortality and morbidity rates in children under five years of age. Diarrhea accounts for 35.7% of the deaths, followed by respiratory diseases accounting for another 28.3%; the combined total is 64% of all deaths in the under five cohort. Other major problems include chronic malnutrition as indicated by and high rates of stunting (38% of children measured were short for their age) and acute malnutrition as indicated by low weight for age (19% of children weighed in the 12 to 23 month cohort). Both stunting and low weight for age result from the combined effects of early weaning, insufficient protein in the diet, and high rates of diarrheal disease. The infant mortality rate in 1989 was estimated to be 102/1000 live births, also one of the highest in Latin America.

The health problems in Bolivia are further compounded by the large inequalities in income distribution and the resultant low standards of living for large sectors of the population, especially when marginal urban neighborhoods and rural areas are taken into consideration. Using infant mortality as an indicator, the rate for urban areas in general is 82/1000, but rises to 120 for the rural population. A disaggregation of the urban statistics to break out the rates for marginal neighborhoods would most probably turn out to be equal to the rural mortality rates.

Bolivia is a highly diverse country both economically and socially, and differences in infant mortality rates are reliable indicators of socioeconomic differences. In 1986, the infant mortality rate for the Highlands was 110, the Valleys it was 109, and in the Eastern Lowlands it was 80. Furthermore, recent decreases in the mortality rates (1976-1988) have varied by Department. In Chuquisaca, Santa Cruz, Potosi, and La Paz the rates have decreased by 30 to 50%, while in Pando, Cochabamba, Oruro, Tarija, and the Beni, the decrease was between 20 and 29%.

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<sup>1</sup> The information presented in this section has been excerpted from: Políticas de Población: Instrumento para el Desarrollo. Unidad de Políticas de Población, Dirección de Planeamiento, Subsecretaría General de Planeamiento y Coordinación, Ministerio de Planeamiento Y Coordinación, La Paz, 1991.

Because of low agricultural incomes from traditional crops and massive unemployment in the mining industry, Bolivia has in the last 5-10 years been experiencing massive internal migration, principally from rural to urban areas. A significant portion of migrants have travelled from rural areas of Potosí, Oruro, and Chuquisaca to the urban centers of Santa Cruz, Cochabamba, and Tarija in search of employment and a better life. The 1988 Population and Household Survey showed that the Departments of Cochabamba, Santa Cruz, Tarija, La Paz, and Pando experienced significant population growth between 1983 and 1988. There is every reason to believe that this migration continues unabated. The following table shows the growth of the urban population since 1900:

Urban Population Growth in Bolivia: 1900-1988

CENSUS	Total Population	Urban Population	Percent Urban
1900	1,633,606	292,564	18.0
1950	2,674,165	739,460	27.7
1976	4,613,486	1,925,840	41.7
1988	6,405,095	3,286,343	51.3

Source: Ministerio de Planeamiento y Coordinación, 1991

Projections made by the United Nations estimate that by the year 2000 the urban population of Latin America will be close to 80%. From the trends shown above, Bolivia will not be quite as dramatic. Estimates for Bolivia are that in ten years the population will increase by 1,862,000; of this increase 1,560,000 will be urban and 302,000 will be rural, or 58.6% urban. The significance of urbanization and population growth for the IRL Project is the large increase in the school-age cohort which will be more than half urban and living under substandard conditions.

The complexity of internal migration is further confounded by unknown levels in intradepartmental population movements, especially in Cochabamba, La Paz, and Santa Cruz. For example in the city of Santa Cruz, data from the 1988 Survey of Migration, Employment and Households showed that 255,406 individuals over ten years of age had migrated to the city from other areas of the same Department; this represented 44.8% of the population. Comparable rates have been estimated for the cities of Cochabamba and El Alto de la Paz; 81% of the residents of El Alto have moved from other parts of the Department of La Paz.

The data on recent migration patterns in Bolivia are incomplete and most probably underestimate the number of people who have decided to make a living elsewhere. With so many people on the move, traditional communities have been disrupted in many parts of the Highlands and the Valle's. The areas where the

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migrants settled have become mixed communities representing distinct cultural traditions, and it is no longer possible to generalize about traditions, language, attitudes and behaviors based on what is known about traditional Ayamara and Quechua culture and social organization. In other words, the migrant communities have to be studied on their own terms in order to provide useful baseline data for the Interactive Radio Learning Project.

Clearly, the marginal urban neighborhoods where the vast majority of migrants live are the areas of highest under and unemployment, with the worst living and sanitary conditions, and experiencing the high infant mortality rates and the great incidence of diarrheal and other infectious diseases. In addition, the remaining rural population continue to suffer from the continued economic decline, live in poor housing, lack adequate nutrition, and suffer from high rates of infectious disease. These are clearly the people who, within the limits of their socioeconomic circumstances, could benefit the most from health education.

**ii. The Primary School Population: Current Size, Distribution and Projected Growth**

In order to determine the coverage and eventual impact of a health/education project, attempts must be made to determine the size of the primary school cohort at the beginning of the project interventions and at EOP in 1994. In overall terms, the 6-19 year-old cohort, encompassing primary and secondary education, was 1,200,000 students for the MOH system. According to UNICLF, half are outside the system, making the total 2,400,000.

For 1990, UNICEF estimated that 800,000 children were enrolled in grades 1-5, both rural and urban. Furthermore, this total is divided into 300,000 in rural and 500,000 in urban schools. The estimated growth in primary school enrollments are as follows:<sup>2</sup>

1991	787,300
1992	798,400
1993	810,100
1994	822,800
1995	835,600
1996	848,300
1997	861,100
1998	874,100
1999	887,400
2000	900,900

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<sup>2</sup> These projections have been made by the Unidad de Políticas de Población, Ministerio de Planeamiento y Coordinación.

An estimated disaggregation by grade and urban versus rural, shown below, provides a basis for quantifying the coverage of the IRI Project.

Projected Enrollments: 1991-1995

Grade and location	1991	1992	1993	1994	1995
Grade 2	237.9	241.8	245.2	250.3	254.7
Urban	141.9	145.2	148.8	152.3	156.0
Rural	96.0	96.6	97.4	98.0	98.7
Grade 3	212.7	217.5	221.3	225.5	229.3
Urban	133.9	138.6	141.9	145.4	148.8
Rural	78.8	78.9	79.4	80.1	80.5
Grade 4	181.5	183.9	188.5	191.8	196.5
Urban	126.7	129.1	133.6	136.8	140.2
Rural	54.8	54.8	54.9	55.0	55.3
Grade 5	162.9	164.2	165.6	170.0	173.1
Urban	119.0	120.3	121.7	126.0	129.0
Rural	43.9	43.9	43.9	44.0	44.1
Total	795.0	807.4	820.6	837.6	853.6
Urban	521.5	533.2	546.0	560.5	574.0
Rural	273.5	274.2	275.6	277.1	278.6

Source: Ministry of Education and Culture, 1990

If the IRL Project reaches its goal of having 200,000 students participate in radio math by the end of the 1994 academic year, then 23.9% of the grade 2-5 target primary school population would be participating. Of course, these figures are estimates, and Project student coverage should be calculated using yearly enrollment figures as they become available. The MEC was unable to provide enrollment estimates based on sex; in 1985, female primary school enrollment was reported to be 47% of the total. The percentage of urban students in 1991 is estimated to be 65.6; by 1995, the urban cohort is estimated to be 67.2%. Since the last full-scale census was done in 1976 and only surveys with limited samples have been done in the interim, the figures cited above should only be considered as orders of magnitude. More accurate statistics will have to wait for the completion of the 1992 nation-wide census.

iii. Interactive Radio Health Pilot Project

In July of 1988, the RLP/B submitted a proposal to USAID/Bolivia to include a pilot in health education for the fourth grade in a limited number of FyA schools. A series of logical and timely arguments were made in the context of

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Bolivia's high infant mortality rate, especially among peri-urban and rural residents, and the prevailing high morbidity rates not only for pre-schoolers under the age of five, but also those currently in school. The basic rationale was to use interactive radio to teach children in the upper primary grades the basic principles of disease prevention, hygiene and nutrition.

Because of the high prevalence of diarrheal disease, and malnutrition within the context of sub-standard living conditions, the RLP/B designed 10-12 lesson health module emphasizing the dangers of dehydration, the use of oral rehydration therapy, and proper nutrition targeted for children aged 8-13. A basic assumption was that children in this age group often take care of younger siblings while parents are away for varying periods of time and who within relatively few years will themselves be parents of infants at risk. Furthermore, the module would also be available to children not attending school as well as interested adults.

The health module was tested using 25 minute weekly broadcasts followed by 15-20 minutes of activities directed by the teacher. A detailed teachers' guide was also developed giving details on possible follow-up activities, class projects, and activities to be carried out in the home and community. The basic strategy to insure motivation and to facilitate participation was to design the lessons to teach activities that are within the realm of the possible and very doable for school children and other participants. In other words, the children were asked to do small projects, using inexpensive locally available resources, such as reducing bacteria content in water by sunning and improving personal hygiene; they were not, however, expected to alter their parents' behavior, something over which they have little or no control.

The health pilot used the personnel and facilities of the RLP/B, and schools that had been participating in radio math. The same experienced evaluation staff made the formative observations to improve the test-lessons designed by curriculum specialists; technical assistance was provided by the EDC resident adviser and a health educator with international experience. Participating teachers received one-day courses on the use of the health programs with particular attention to post-broadcast activities. Teachers were also interviewed before, during and after the programs to record attitudes for the purpose of facilitating program revisions and the development of future modules.

FyA recommended that the RLP/B use schools in the Cochabamba area as the pilot-test schools and for the summative evaluation of the health module. Five schools were selected reflecting distinct environmental, economic, and cultural characteristics to include the following: rural/agrarian, urban wage-laborers, recent highland immigrants, migrant laborers, and white-collar workers; economic status ranged from relative economic well-being to abject poverty. A fourth and fifth grade class was chosen

from each school with a total of 453 students. A pre-test of health knowledge was administered and some basic socio-demographic data were collected, including age, sex, language spoken at home, position in family, and the amount of responsibility for younger siblings.<sup>3</sup> The module was developed and field-tested between January and June, 1989.

The summative evaluation of the Health Pilot was conducted in five schools in the Cochabamba area using approximately 50% fourth grade students, and 50% fifth grade students. The average test scores for both fourth and fifth grade student increased by approximately 20%. A more practical examination testing student ability to apply what they had learned gave the following results: 23 of 27 students were able to prepare an oral rehydration solution correctly. Both teachers and parents expressed generally favorable attitudes toward the health module.

The summative evaluation showed that students learned about diarrheal disease, but an important question was to what extent did this new knowledge contribute to any changes in health and/or sanitation practices in the home? No data exist as to the real behavioral outcomes. Getting reliable data on household behavior has been a problem for the majority of health education interventions world-wide. For evaluation purposes, most studies have relied on self-estimates or recall rather than direct observation, and when observational data have been used for comparison, the results indicate lower rates of compliance than had been expected from inferential analyses (Touchette 1990).

Another question is whether or not students who have been exposed to IRI in math have higher test scores than those who have not. Clearly, the design of the pilot module did not include the collection of data to address this question. In the new project, however, the selection of schools to participate in the testing of the new modules should be evenly divided between those who have had radio math experience and those who have not.

A study by the Unidad Sanitaria in Cochabamba (October 1990) was designed to measure the effects of the radio health module on the parents of the participating students at the Escuela Obispo Anaya. The idea was to get a measure of how much knowledge has been brought home by children and remembered by parents. As mentioned above, this study does not in any way measure behavioral outcomes, but it is the only and most recent data available from a sample of 51 out of 205 participating families. The most notable results include the following:

- A little over two-thirds of the respondents said that their children talked about their health education classes at home.

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<sup>3</sup> McNulty, Judiann, "Final Report: Interactive Health Pilot Project." Education Development Center: RLP/B, 1990.

- Almost three-quarters of the parents remember hearing their children sing the health module songs at home, and 43% of the parents learned some of the songs.
- Nearly two-thirds claim to have learned some of the signs and symptoms of dehydration; two times as many mothers learned about dehydration than fathers.
- Some 63% of the parents said they know how to make "suero casero," and one-fifth of those who knew claimed to have actually prepared and administered "suero casero" to a child with diarrhea.
- Four-fifths of the parents, mostly mothers, learned basic concepts of hygiene from their children.
- Virtually all of the parents interviewed expressed a desire to attend radio health classes at the school.

This study clearly demonstrated that parents at one school in Cochabamba are interested in health education and are aware of what their children are learning.

#### c. Sociocultural Feasibility

##### i. The 1989 Radio Health Pilot

###### Anthropological Baseline Studies:

Two anthropologists were contracted by the RLP/B to provide a sociocultural context and behavioral data for the design of the pilot health module. Inge Harman<sup>4</sup> performed a study of fifty families in the target area covered by three of the five participating schools, and Joseph Bastien<sup>5</sup> was asked to provide a relevant summary of his own work that could be used in the design of the radio health programs. The intent was to identify specific social and cultural characteristics of the target population that should be taken into consideration for the design and content of the module. As such, the two studies served very distinct functions: Bastien's gave a general overview of more "traditional" Aymara and Quechua societies based on many years of experience while Harman's more specific operations research examined a sample of families who would be exposed to the radio health intervention.

In very general terms, Bastien suggested the module emphasize that any delay in treating diarrhea could result in death, and that ORT should be used to prevent death; but the module should not in any way indicate that ORT cures diarrhea but instead treats the life-threatening consequences of dehydration.

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<sup>4</sup> "A Profile of Bolivian Health and Hygiene: Concepts and Practices in Three Marginal Cochabamba Neighborhoods." Education Development Center: RLP/B, March 1989.

<sup>5</sup> "Report on Diarrhea and Health Education." Education Development Center: RLP/B, February 1989.

Another important point was that Quechua adults accept very little information from school children because:

- Adults frequently perceive schooling as a means of suppression, deculturation, and introducing unwarranted and unsuccessful innovations;
- Quechuas posit knowledge within elders of the community; and
- Quechua epistemology is very data centered in that they want to see results and consider the sources. An example would be that telling a story of how someone was saved by use of ORT is much more convincing than making the point that diarrhea kills by dehydration

Furthermore, for Aymara and Quechua, teachers have very poor reputations because they don't speak the language, are patronizing, and are often absent from the community when they should be in school. Most teachers are isolated from residents in the communities where they work, but some have become accepted by being involved in community activities, staying over weekends, and making friends. When teachers have become part of the community, they have demonstrated abilities to be effective innovators in areas such as hygiene practices and the introduction of sports; some have been asked to resolve conflicts, settle feuds, and help deal with bureaucracies.

In general, the Quechua language is primarily oral, and many have resisted becoming literate, an indication that radio is, perhaps, one of the best media to introduce new knowledge. Bastien suggests that radio programming in early morning and late evening hours are good ways to reach these communities. Health modules should be very specific beginning with concrete experiences from village life, i.e, children dying, signs and symptoms of dehydration, visiting healers, and elders. Traditional healers, elders, and parents should be involved by having them talk about diarrhea; this brings the community into the process. But expectations should not be raised by telling people to wash frequently and use ORT where neither water nor sugar is available.

Bastien indicated that generic health modules can be designed, but they have to be adapted to regional differences which means detailed data has to be available. As to the best methodology for the module, he suggested using couples having dialogues, enactment of illness, treatment role-playing, group problem solving, animated cartoons, plays, singing of songs, word games, memorization, and repetition. Module themes should include the point that diarrhea is deadly and should be treated with ORT; children should be taught to mix and administer home-made ORS, *suero casero*, and great emphasis should be placed on "correct" mixing of the solutions. He warned that themes on getting rid of the causes are problematic because people are being told to raise their standard of living which is something they have to endure because of exploitation. Obviously, he meant these are not realistic objectives for interactive radio. He

went on to warn against attacking or downgrading native diarrheal disease etiologies, but he recommended that the lessons concentrate on the fact diarrhea is deadly and should be treated with ORT. Numerous native treatment regimes should also be left alone since many include a rehydration component, i.e, rice-water and a wide variety of herbal teas.

Furthermore, Bastien went on to say that etiology and native treatments are hard to change and most often do not need to be changed; Andeans, and Latin American indigenous peoples, accept both modern and traditional medical practices by forming parallel systems thus eliminating the need to remove one to instill the other.

Harman's yielded specific information relevant to the design of the health module and also supported most of the points made by Bastien. She pointed out that the majority of the residents in her sample were recent migrants from the highlands and were living in areas where clean water was in short supply and when available, very expensive; sanitary garbage and waste disposal was virtually non-existent. The author's view of the target population is best summarized by the following:

When water supplies are inadequate and contaminated, when uncollected garbage and human waste routinely pollute the environment in which people live and work, and when incomes are such that financial resources are extremely limited, modern health standards of cleanliness and hygiene are virtually unattainable for most families. In this context, the problem which faces health educators is not so much, or certainly not solely, one of disseminating information about correct health habits and personal hygiene practices. The problem is clearly the much larger one of poverty.

Her most important departure from Bastien's recommendations was the suggestion that the RLP/B broaden the scope of topics for the health module because a narrow focus on individual health habits would have little impact on the general health of children in the target area, especially on the incidence of diarrheal disease. She felt that students would benefit from learning to become active citizens by participating in the cooperative efforts of neighborhood and community organizations.

Radio programs could be used to teach small-scale but plausible activities to effect change in neighborhood health conditions. More specifically, "games and projects can be included in the programs which encourage children to devise solutions to imaginary problem situations and later to real (though small-scale) problems in their own environment."

Attempts should be made to design programs using Aymara and Quechua cultural traditions of cooperation and community responsibility to address common health problems; the idea would be to inspire direct action by groups of children, and to

indirectly motivate their parents to unite in attempts to improve their deplorable living conditions. Andean people have a long tradition of cooperative action, but as migrants in new urban environments, many such behaviors are being lost.

Another important finding was that poor urban residents often do not accept Western ideas about disease etiology, especially regarding the causes of infant diarrhea; but at the same time, many respondents also felt that dirt and uncleanness were contributing factors. These findings correlate with those of Bastien in that naturalistic and empirical people have, over time, made accurate observations of cause and effect when it comes to diarrheal and a host of other diseases.

Additional sources of information used by Harman were the numerous mothers' clubs in the Cochabamba and other areas. Again, people show a strong sense of tradition while at the same time incorporating the logic from their own observations and "credible" outside sources of information. As a result of these findings, Harman recommended against trying to replace eclectic perceptions about etiology, but instead to emphasize the effectiveness of Western medicine in the treatment of potentially deadly conditions such as dehydration from diarrhea. People accept Western treatments because they have observed their effectiveness, but at the same time they can maintain traditional ideas about why someone gets sick.

Part of the rationale for the pilot-health module, teaching children how to make and administer oral rehydration salts (ORS), was that many take care of younger siblings when parents are away from home. Harman's study addressed this issue. Of the fifty households surveyed, 23% indicated that fourth and fifth grade children are expected to take care of both house and younger siblings on a daily basis. More commonly, however, 59% of the respondents said there was usually an adult in the household to oversee fourth and fifth graders and their younger siblings; 17% said they leave children home alone while going to market 1-2 times per week, and 37% said they leave fourth and fifth graders at home with younger siblings occasionally and then for just short periods of time. The study also found that fourth and fifth graders are rarely left in charge of nursing infants who usually go with the mother to market or to work; sometimes the infants are left with an adult sibling or a grandparent. These data would seem to indicate that when fourth and fifth graders are required to take care of siblings, these are at least two years of age.

It is important to note, however, that as part of the pre- and post-test process for the health pilot project, students<sup>6</sup> in the five participating schools were asked whether or not they had

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<sup>6</sup> The pre-test was given to 438 fourth and fifth graders and the post-test to 410; the numbers in each grade were approximately equal.

any responsibilities in taking care of younger siblings: three-quarters reported some responsibility; 26% said child-care took up most of their non-school time, and 21% had no younger siblings.

Harman concluded that the amount of responsibility that fourth and fifth graders have for their younger siblings was quite varied, but that most parents expected older children to look after their younger brothers and sisters, including preparing and serving food, cleaning-up and to help with their hygiene; some of these activities were done more by girls than boys, but both sexes were expected to help. Half the parents interviewed said that fourth and fifth graders could take care of younger siblings when they were ill and could give them medicines. This responsibility was most frequently accorded girls but not to the exclusion of boys. But 45 out of 52 parents stated that medical care for their sick children was exclusively their responsibility. The most common household activities for fourth and fifth graders, exclusive of child care are:

- fetching water
- sweeping
- feeding household animals
- washing dishes
- cooking or helping to cook

One must keep in mind that a study of 52 households in three highly varied urban neighborhoods can by no means be construed as a representative sample of marginal urban neighborhoods in Cochabamba. Therefore, the percentages presented by Harman should not be viewed as having any statistical validity indicating real behavior of the target population. Rather, the data should be seen as broad indicators of kinds of behaviors that most probably exists and that can be useful in the design of an appropriate interactive radio health module.

#### **Interactive Radio: The Reactions of Teachers and Parents:**

The first part of this section addresses the reactions of teachers trained to use IRI in terms of adequacy and effectiveness of training; the second is a summary comments made by teachers regarding classroom problems, and parental involvement; and there is an examination of the social and economic conditions in which most of the families of Bolivian school children live, including the families whose children have participated in radio math and health. An understanding of such conditions provides a more realistic context for the interpretation and understanding of how parents feel about radio math and radio health, and how much parental support exists for these interventions.

### **Teacher Responses:**

Much of the data we collected on teacher training comes from discussions with FyA staff in Santa Cruz who have been involved with the RLP/B since the pilot-effort in 1987. The training modules we reviewed have been designed to be given over six hours on a single day or 3 hours a day for two days.

The teacher training courses are designed to be given over six hours in a single day, and each begins with an introduction to the objectives and structure of IRI for mathematics. Then the concept of segments and distributed learning used in the design of each lesson is explained, followed by what the teacher should be doing before, during and after the transmission. Next, a model class is held using a taped lesson complete with a live audience of children to demonstrate exactly how the methodology functions. Afterward, the process of formative and summative evaluation procedures are explained. A discussion of the formative methodology provides a basis for comments and clarification of doubts and misconceptions concerning the radio lessons. This is followed by an analysis of the most frequent errors made by children participating in IRI, a ten minute discussion of how to work with parents, and finally the mini-course is concluded with discussions of the teacher guides, schedules, and use of the radios.

Departmental RLP/B staff reported that during the early stages of the project, a significant number of teachers did not want to use radio math; in the second year there was more interest; and in the third year there was even more. During a 1990 training course for 117 teachers held in Santa Cruz, three rejected the use of radio math, and some 30% initially thought that IRI was too simple but agreed to use the programs, nevertheless. Local staff claimed that at the end of the school year there are usually considerably fewer skeptics than right after the conclusion of the training courses. In other words, many teachers improve their view of IRI in process of classroom use.

A 1990 study of 45 teachers in Santa Cruz done by the RLP/B Evaluation Division provides some insight into how teachers feel about IRI. The general consensus was that the radio math methodology was something new and relatively simple and easy to use. Almost two-thirds agreed with the lesson content, and 20% were more or less in agreement; virtually all saw radio math as something positive and good. When asked what would happen to their students if radio math was to be terminated, there was virtually an even distribution between those who said that they could continue with conventional math with no problems, they would have problems, their education would be negatively affected, and that there would be no effect. Thirty-three of the teachers said parents feel that radio math helps their children, and a little over half noted that parents now think that children like math. A majority of the teachers felt that IRI in math helps their students, makes them like math more, and serves as an incentive for learning math. With only two exceptions, the

teachers were evenly divided on the feeling that radio math should continue as is or should continue with some modifications.

The teachers interviewed for the 1990 Mid-term Evaluation of the RLP/B reinforced many of the sentiments found by the study described above. In addition, many of the eighteen teachers interviewed in Tarija said that even slow students respond well to radio math, it teaches them to listen as well as respond, some Spanish language topics could be included in the math lessons, and the second and third grade lessons are the best while fourth grade needs some modification. Some problems mentioned included too much repetition—repetition may be necessary in rural areas but not in urban Tarija, many exercises are too simple—lessons should be more complex and varied, some of the post-transmission activities don't work very well—the ideas are too abstract and need to include situations from real life, and often there is no time after the radio lesson to do anything. Most of the teachers said that it is very hard to make contact with parents; usually both work and some are often away from home.

Concerning the pilot health module which was tested in Tarija, the following comments were made by teachers who had participated:

- Children learn more with practical exercises than theory;
- There are words in the lessons that many of the children do not understand;
- Hygiene should be given before discussing illness;
- We liked the lessons very much, but not enough time is the biggest problem;
- Lessons should include information on selecting foods because many children cook;
- There is an urgent need to include sex education because many girls have children at a very young age;
- Sex education is needed because large families live in a very small space, children see everything and need to be taught what it all means;
- There should be a module about immunizations because children need to learn about adverse reactions;
- The health modules were interesting but only adequate for fourth graders and too simple for the fifth grade;
- Talks should be given to parents, so they are aware of what children learn in school to prevent conflicting information;
- There should be lessons on contagious diseases: chagas, sarna, and TBC;
- Lessons on hygiene, garbage disposal, and environmental sanitation are very important;

The thrust of the comments was to include more topics and specific information in the health lessons; there was much less skepticism of the kind expressed for math. All the teachers interviewed voiced strong approval of the health module, albeit

with some reservations and a wealth of suggestions for what to do in the future.

#### **Parental Responses:**

The worsening economic situation in Bolivia has had significant effects on family composition, stability, and behavioral patterns.<sup>7</sup> Extensive internal migration and relocation has also occurred. Very little data exist on the extent to which families have been affected by these forces, but interviews carried out during the Mid-term Evaluation produced subjective accounts provided by FyA personnel with years of cumulative experience in many regions of Bolivia.

Internal migration of unknown proportion has taken place over the past five years or more. In all probability, the majority has been rural Quechua and Aymara who have left highland communities, especially in mining areas of Potosi and Oruro, to seek a better life in larger cities such as La Paz, Cochabamba, Santa Cruz, and Tarija. The number of jobs available, however, has been very limited and because the economic situation is, in fact, steadily deteriorating, the result has been a drastic rise in poverty. In order to cope, families are increasingly turning to informal sector activities such as street vending, smuggling, prostitution, begging, etc. The struggle to make ends meet involves all able bodied family members which means adults are often away from home for extended periods of time. For example, contraband activities in Tarija necessitate frequent trips to the border with Argentina, and parents often leave older children at home to take care of younger siblings; nursing infants, however, travel with their mothers. Another effect has been that children leave school whenever potential income opportunities occur: for boys—shoe shining, petty crime, fare collector on buses, etc. and for girls—domestic work, prostitution, etc.

Personnel at FyA in Santa Cruz provided additional insight into the plight of many families. Numerous children in school have nothing, not even pencil and paper. Many have to share pencils during classroom exercises: one will read a question while the other writes and vice versa. Most of the poor children are from families who have migrated from Potosi and Oruro, and there is increasing homelessness; many families with children sleep in the street, something which did not exist three years ago. Malnutrition is increasing all over the department, and it was claimed that 83% of the school-age population suffer from some degree of malnutrition. One reason for the increased poverty in and around Santa Cruz has been the crack-down on the coca industry, resulting in a drastic decrease in employment

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<sup>7</sup> A more formal economic analysis can be found in the World Bank's Bolivia Poverty Report which points to the lack of recent and reliable statistics describing the magnitude and extent of the current situation.

opportunities, and people are now poorer than they were before the coca boom.

In order for children to have any hope for the future, they have to have access to schools that can provide a minimal amount of quality education. In a society that is increasingly urban, virtually all legitimate employment and informal sector activities require literacy and an ability to work with numbers. In other words, children who are illiterate and who have no math skills are at the greatest disadvantage in the Bolivian economic environment, and assuming that economic conditions will gradually improve during the present decade, these children must have the opportunity to attend school.

Discussions with parents indicate that most see value in education but are often disappointed by how little their children are learning. A common scenario described by FyA Staff in Santa Cruz was typically the following: 50 students enroll in a primary class at the beginning of the school year, only 25 are left in October, and 19 of those will have fallen behind in their classwork and are at risk of having to repeat a grade.

In the context of the conditions described above, meetings were held with groups of parents in Cochabamba, and the opinions given below were collected at an evening meeting, held in October of 1990, of over 100 parents at the Escuela Jesús María operated by FyA. The parents were asked to write down advantages and disadvantages of radio math; 23 parents responded. Also included are opinions voiced by some of the parents during and immediately after the meeting.

#### **Advantages**

- parents also learn math from the radio
- math is easier to learn through songs and stories
- radio learning adds to knowledge of reality
- useful to learn multiplication
- develops child's ability to pay attention
- develops sense of hearing
- creates orderly habits
- makes math more interesting
- if child is sick and cannot go to school, can listen to the radio at home
- music motivates an unmotivated/sad child
- helps develop better liking for math
- more profound reasoning

#### **Disadvantages**

- none
- useless, because children will use calculators
- teachers cannot teach properly
- children do not learn how to subtract
- does not develop audiovisual perception
- lessons lack continuity when children have doubts, they are too timid to ask
- should have a visual component
- does not include problems related to household
- needs more reinforcement when child has an attention lapse, cannot follow rest of lesson

- radio math should be used for all primary grades
- a good new learning method
- can combine learning and play
- children like the songs and sing them at home
- creates orderly habits
- orients children toward computation, the future of mankind
- gives child ability to learn without the teacher
- slow children need "calmer" explanations
- too much complicated homework
- speech too fast and slow children fall behind
- songs are not useful
- radio and teachers do not complement each other
- no feedback on children's progress
- exercises are redundant
- songs interfere with learning
- children not responsible for listening to lessons

Furthermore, virtually all the parents felt that health education was necessary and that it should be included in the primary school curriculum. Several parents suggested that the programs be repeated at night so that they would know what their children are learning. Others suggested that the lessons should include first aid procedures and how to properly use medications, and that the knowledge is useful by reducing the need to go see a doctor which saves the family some money.

#### **ii. The Interactive Radio Learning Project: The Proposed Health Modules**

The topics for the ten health modules have been described in the Technical Analysis. The most important consideration is whether or not the content and presentation of the lessons are appropriate in terms of the local dialectical variations, local practices, and environmental vicissitudes. The key to designing appropriate modules is carefully designed and executed baseline research on specific health practices, especially in terms of what children know and how they actually behave.

Moreover, it is important for the curriculum designers to become very familiar with children's life styles, including games children play, songs, and stories. Another important area to be researched is to determine what responsibilities children have in the home, how these responsibilities vary by age and sex, and how children's daily activities are segmented according to time. This latter point is very important because any new behaviors that the health lessons encourage must fit with all the other activities and responsibilities children are expected to comply with. In other words, new behaviors must not conflict with other chores and duties.

### iii. Radio Health and Bilingual Education

UNICEF's development portfolio in education is primarily oriented toward bilingual education and rural one-room multigrade schools. The bilingual education project, using the materials developed by the German International Development Agency (GTZ) in Puno, Peru, is currently in the process of pilot-testing curricula for use with Quechua, Aymara, and Tupi-Guaraní. Activities have commenced in 12-13 experimental school districts in Huarisata starting with the first grade, and at the end of five years all five primary grades will be covered. Studies are also being done on the feasibility of intercultural education with the participation of the Confederación Nacional de Campesinos (CNC) and the Confederación de Maestros Rurales (CMR). The one-room school project is slated to cover 2,000 schools in four departments; the curriculum will include natural and social sciences, Spanish-as-a-second-language, and math. The Social Integration Fund (FIS) is funding both projects.

One of the major objectives for both bilingual education and the one-room schools is teacher training leading to a substantial and enduring change in attitudes and improved teaching. UNICEF is counting on the experimental school districts acting as multipliers to motivate teachers in other areas to participate in training programs and to use the new curricula. UNICEF feels that interactive radio can be adapted for use in rural areas. Radio math would be particularly useful because so many children have problems learning basic principles, and it should be possible to join IRI with one-room multigrade concept. The problem, of course, would be what to do with the rest of the class when one level is doing radio math, but the radio lessons could be done in one corner of the room while the other students were working independently using the newly designed learning guides. Another possibility would be to design the math lessons for use by multiple grade levels.

UNICEF also feels there is a potential role for radio health as well. Most rural communities in Bolivia have a village health worker (VHW) who could work with the schools and participate in the health programs. According to UNICEF, the health modules should not be designed for specific grade levels but for the entire school; the VHW could help residents take advantage of new knowledge. Furthermore, VHW would be a potential resource for developing a methodology to measure the behavioral impact of the health messages at the household level. The VHW could be trained to make in situ observations of how, for example, diarrheal episodes are treated.

UNICEF's bilingual basic education curriculum is currently being tested and developed in Santa Cruz for Tupi-Guaraní, in Cochabamba for Quechua, and in La Paz for Aymara. The most progress has been made with Tupi-Guaraní in the Province of Cordillera where the local population has been actively supporting the project through their own NGO, Teko-Guaraní.

Very little data exists on the actual demand for bilingual education, but a recent study<sup>5</sup> of why so many children drop out of school concluded that the inability to understand Spanish is a major factor. Furthermore, the anthropological baseline studies, cited above, revealed that marginal urban neighborhoods consisting of migrants from the Highlands contain large numbers of Quechua and Aymara speakers. For many children, the indigenous language is used exclusively in the home, and when these children attend school, they have severe problems following what the teachers is saying.

As a result of the progress made by the Intercultural and Bilingual Education Project being implemented by UNICEF in rural areas of Santa Cruz, Cochabamba, and La Paz, the Interactive Radio Learning Project should establish a link with the UNICEF Project staff with the intention of adapting selected health and math modules to one or more indigenous languages. Because of the active participation of indigenous leaders, Tupi-Guaraní should be considered as the first language to be used for lesson adaptation. If this pilot experience is successful, expansion to Quechua and Aymara should be considered.

#### **iv. Radio Health and Female Students**

There is overwhelming recognition that more females never enroll in school, drop out sooner, and have the highest repetition rates; these same trends are many times worse for rural indigenous girls. Under the current social and economic prevailing in Bolivia, there is no simple solution to this problem.

Both the math and health modules should contain topics and examples especially designed for females with the intention of encouraging them to remain in school. For example, lessons could be designed to reinforce the need for literacy and basic math for market activities and the budgeting of limited incomes to maximize purchasing power. In addition, lessons should show that for women who are entering market activities, involving purchase and resale, can be done much more efficiently and generate better profits for those who are literate and can perform basic mathematical calculations.

The health modules are especially important for females who care for younger siblings and who, in so many cases, will be mothers in the very near future. The modules on hygiene, immunization, diarrheal disease, and acute respiratory infection may be their only opportunity to learn about common childhood diseases and their prevention. Relatively simple interventions

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<sup>5</sup> La Deserción Escolar del Ciclo Básico en Bolivia:  
Estudio Realizado en Cinco Departamentos Durante 1978.  
Area del Sistema Escolar (ASE), CEBIAE, La Paz, Bolivia,  
1989.

such as ORT and timely immunizations can prevent the most deaths in children under five, and it is of utmost importance that young girls not only learn the importance of these interventions, but that they also know what to do.

It would be advantageous for the Project to have one staff member in charge of all aspects of female involvement and to monitor female achievement relative to males. As is very well known, it is a simple matter to make stipulations in the planning stages of a project, but during the long process of implementation, gender-related activities frequently fall by the wayside. A specific staff responsibility would alert the Project directors to potential problems and would be able to suggest alternative and/or corrective actions.

#### **d. Project Spread Effects**

Educational projects do not have the same tangible and immediately quantifiable output as in the case of increased agricultural production due to a new soil management technology. Instead, the number of individuals from particular communities and urban neighborhoods with new knowledge and abilities have increased. Once an investment has been made in education, the beneficiaries must use their learned skills or else they quickly forget how to do simple math and all the health-related knowledge and preventive procedures. But a certain number of children and their families will become actively involved improving their living conditions, health, and nutrition. These families will in all probability affect others who will also want to participate, as was documented by case histories collected during the Mid-Term Evaluation of the RLP/B.

Because of the increased scale and diversity of the health modules, many more children will be exposed to IRI in health, and many more adults will also listen to the broadcast lessons, creating an impact well beyond the number of children participating in the classroom. If the schools are able to implement projects involving community members, the spread effect promised to be even greater. Quite possibly, word of successful projects in one community or neighborhood will spread to others.

There is also a considerable potential for a spread-effect among teachers. Accounts from Santa Cruz have told of untrained teachers asking to receive training in the use of radio math and an unknown number of teachers using IRI without any training or teacher's guides. These limited data indicate that, over time, increasing numbers of teachers will want to participate in IRI, and the Project should make every effort to communicate accounts of positive teacher experiences to other teachers; problems should also be addressed. A newsletter and/or a special radio program for teachers should be tried.

#### e. Social Consequences and Benefit Incidence

As the health modules are developed and the math modules implemented by the MEC over the life of the project, real and measurable gains will be made in student knowledge and test achievement. The social consequences and the incidence of benefits will be more difficult to determine.

One possible benefit of IRI could be more student and parent involvement in school activities which may result in a decrease in school desertion rates, especially for females, providing the lesson contents are relevant. Quite possibly school enrollments could increase as knowledge of the Project and its components become more widely known.

In terms of the health status of the Bolivian population and assuming that the health lessons are used nation-wide, an eventual impact should be measurable in terms of decreased mortality and morbidity rates in children under five years of age. Improved nutritional status may also be noted as measured by a decrease in stunting and low birth-weight babies, which should, in turn, improve the cognitive abilities of school children, resulting in better academic performance.

Assuming that the 1990s will bring economic growth to Bolivia, better educated children will be able to benefit from their parents' investment in education. The cumulative effects would be improved incomes and living standards for both urban and rural residents which, in turn, would encourage more families to send their children to school and insist they remain in school longer.

## **5. Institutional and Administrative Analysis**

The implementation of the IRL Project will unfold in the context of a bilateral agreement between A.I.D. and the MEC of the Government of Bolivia (GOB). The MEC will be the chief recipient of an A.I.D. grant and technical assistance (TA) support, the latter being governed, in turn, by a Learning Technologies buy-in contract between A.I.D. and the Educational Development Center, Inc. (EDC). EDC will provide technical assistance in the form of Bolivian and international specialists and will procure goods that are necessary to the implementation of the Project.

With a subcontract staff of approximately 15 radio education specialists, EDC has been providing technical assistance for the RLP/B, which successfully tested mathematics learning hypotheses through the use of IRI in a Bolivian setting. The outcome of the RLP/B, implemented through a cooperative agreement with Fé y Alegría, a Bolivian NGO, has directly led to the present effort to expand the impact of radio mathematics and to design and test a health pilot with the ultimate goal of improving the quality of life for Bolivians. With this capability, EDC will assist the grantee in its effort to institutionalize IRL.

The administrative analysis described here is focused chiefly on the capabilities of the new member of in the Project, the MEC. The PP team points out that the MOH (Ministerio de Previsión Social y Salud Pública --MPSSP) also should play a significant and influential part in the Project. However, its capability is not included in this institutional and administrative analysis, since the MOH will not receive funds but will commit personnel with expertise in health education and epidemiology.

For the preparation of this analysis, the PP Team met with directors of the organizations described. The Team also examined relevant documentation, evaluations of past projects, and various reports produced by USAID-Bolivia and the RLP/B.

### **a. The Ministry of Education**

#### **i. General Overview**

Without going into a detailed description of the MEC, the Project Paper Team sought to examine, in general terms, the infrastructure deemed applicable and relevant to the Project. The Team focused its analysis on the administrative infrastructure that the project will most likely impact.

This MEC is a highly centralized body, made up of two educational sectors, one urban and one rural, for which it develops all manner of educational policies and of governance.

Policy implementation in turn takes place at the regional and local levels.<sup>1</sup>

Rural education takes place under a district supervisory system made up of zones and local divisions. The local division contains one nucleus or central school with five grade levels, in addition to 5 to 15 satellite schools which may offer five grade levels but usually offers only three levels.

Urban education unfolds within districts that are divided into urban as well as local supervisory areas. The local levels are governed by directors of an area and the various educational units that make it up. The composition of an area may include pre-primary units, grades 1 through 3, grades 4 through 5, 6 through 6, and so forth.

Within this organizational system there are nine national directorates, corresponding to each political Department, each with up to four technical departments charged with formulating educational plans and programs. This arrangement is supposed to allow inclusion of the corresponding geographical area's interests and needs within those plans and programs.

It is important also to note the existence of a National Directorate for Community Education within the national educational system. This directorate includes a Health Education, a part of the regular educational program for primary grades, and middle-level grades 1-3. The importance of this observation relates to one of the central interests of the project, a radio based health pilot. The presence of a health education unit within the MEC offers an organizational instrument which could prove very useful to the project.

#### ii. Policy Considerations

In the interest of identifying institutional climates that can favor the pilot phase of this project, it is wise to underscore the heavy structural reforms being undertaken or planned by the MEC. Besides current steps toward securing international multilateral support for these reforms, there are programs under way and others in planning that lend strong credence to the seriousness of the efforts. Public and private meetings with the Minister of Education and top aides in the course of preparing this PP have reinforced this view.

Distance education appears to be a major element within the expected educational reforms. Interactive radio instruction (IRI) is an integral part of MEC policy options and official considerations. The evidence amassed by the RLP/B and ERBOL (Bolivian Radiophonic Schools), plus the forecasted successes of

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<sup>1</sup>This summary of the MOE is largely attributable to the report by F. Heredia and J. Helwig.

the radio-based teacher training project funded by the Instituto de Cooperación Iberoamericano (ICI) signal much more than a cursory commitment by the GOB to radio education. There is every reason and evidence to believe that the A.I.D. investment in this project will leverage major support from the IBRD for the highly desirable and badly needed educational reform in Bolivia.

A review of the MEC strategy for the years 1989-2000<sup>2</sup> presents written evidence buttressing the foregoing points of view. The same strategy also reinforces an important element of the Project, the inclusion of the design of at least one indigenous language health module. These and other strong indicators observed by the PP Team favor the view that the policy climate currently prevailing within the MEC (and likely to remain in a succeeding administration) will remain sympathetic and amenable to goals and activities contemplated under the IRL Project. USAID-Bolivia should feel strongly encouraged by the strength of this evidence.

### iii. MEC Staffing Commitment

In the process of examining the prospects for institutionalization of IRL Project activities, the main evidence sought by the team was regarding the ability of the MEC to initiate counterpart staffing and how quickly that staffing would be on board. Again, the team was offered strong evidence of readiness to implement this obligation. The MEC has a roster of initial candidates for the counterpart Project management position. These candidates are especially favorable from the key perspective that they have previously established linkages with FyA and the RLP/B. The candidates have acknowledged technical competence and good managerial skills. Moreover, they are held in high esteem by the current RLP/B contractor and subcontractors.

In the course of interviews with MEC representatives, the PP Team also identified a commitment to provide various levels of support staff. The nature of such staff ranges from the provision of secretarial support to clerical, drivers, messengers, and guards, etc.

There is, however, another level of strong MEC commitment to ensure the success of the project. This is the commitment of Departmental MEC staff--directors and supervisors. The tendency to focus on the immediate needs of the TA unit, can easily result in a neglect to account for the enormous and critical role that the Departmental personnel will play in Project implementation. USAID-Bolivia should remain conscious of this important contribution, as well as that of the teachers themselves; all

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<sup>2</sup> Estrategia de Desarrollo Económico y Social, 1989-2000, Ministerio de Educación y Cultura, La Paz, Bolivia, 1988.

will play important roles in the implementation of the project, and are currently on the MEC payroll. This contribution has been taken into consideration in the Project budget, as an in-kind host-country contribution.

The MEC offered support search for possible ministerial units that would be assigned executive oversight of the Project. Furthermore, the MEC was well prepared and disposed to fully cooperate in the identification of the best internal, administrative structure where IRL Project activities would be institutionalized. Apart from initial identification, the Team felt that these possibilities should best be examined in the course of the Project. Since this is a pilot relationship between USAID-Bolivia and the MEC, it is best advised that both parties get to know each other better through the implementation of project activities and through discussions with the TA team.

#### **iv. Financial Management Systems**

The PP Team did not perform a detailed examination of MEC accounting systems or the corresponding capacity to respond to A.I.D. financial management requirements and procedures relative to the funds going directly to this Ministry. This issue was, however, directly addressed in discussions with high-level MEC officials, who gave strong indications of willingness to adapt their accounting and disbursement procedures to conform with Project requirements.

Organizations such as UNICEF have on-going projects with the MEC and has prevailed upon the Ministry to establish separate accounting systems for the management of project funds. Under this format, discrete disbursements take place and are accounted for prior to disbursements for subsequent activities.

The idea of a separate or special bank account for the Project is acceptable to the MEC. Also acceptable is the suggestion of special instructions on its maintenance and the handling and accounting for funds deposited in the account which will be for the exclusive use of the Project. Given the above acquiescence to what were seen as reasonable requirements, the PP Team suggests that these reasonable and relevant requirements be shared in a timely manner with the MEC, so that the latter may address specific details at a mutually convenient time frame prior to the negotiation of the bilateral agreement.

During the first year of the Project, the contractor should conduct an in-depth assessment of the MEC's capacity to assume full operational and financial control of the Project. The focus of this TA initiative, relative to this assessment, will be on building the MEC capacity to assume the desired controls through appropriate training or other actions.

#### **v. In-Kind Support**

In a conclusive positive signal for the project and its institutionalization, the MEC has verbally agreed to provide a 1,200 square meter plot of land for the construction of an IRL or distance education facility. The PP team was taken by the Minister himself to inspect the available lot, located in the Miraflores section of La Paz; the MEC is the legal owner of the property.

The lot is located at the end of a cul-de-sac bordering on a cliff, and appears well suited for the construction of a multipurpose building to house the Project. The new building could also be built large enough to house other radio-based educational activities, significantly enhancing the future stability and role of interactive radio learning in Bolivia.

#### **vi. Conclusions**

On the basis of the Team's observations of the capacity of the MEC to adequately host the IRL project, it can be concluded that the grantee will require extensive training and direction on how to develop this capacity. The training and direction is required throughout the subdivisions of the Ministry which will be involved in Project activities. At present, the resources of the MEC are not sufficient to meet the project requirements. It is, after all, the intent of the Project to address these deficiencies, but there should be no doubt about the interest and commitment of this MEC to engage in Project activities to improve health and mathematics education to enhance the quality of life of Bolivian students and their families.

#### **b. The Educational Development Center (EDC)**

EDC will be the principal contractor to provide TA to the MEC through a Mission buy-in to the centrally funded Learning Technologies Project. The basic TA function to be performed by EDC is prescribed in the existing buy-in contract, the vehicle through which the RLP/B has been implemented over the past 4 years. Thus the capability of the EDC is already a matter of record with USAID-Bolivia and A.I.D.

The TA responsibilities of EDC will begin on or about September 1, 1991, and will extend through September 30, 1994. During this period the contractor is expected to provide a level of effort equivalent to approximately 103 person-months of short and long-term international TA and approximately 1100 person-months of local technical services. The performance of the latter will be implemented chiefly through subcontract arrangements with Bolivian NGO's, as indicated in the introduction to this administrative analysis.

Pending approval by their board of directors, FyA will continue providing access to its schools for the purpose of continuing the mathematics program, and, additionally, FyA will in most like provide a group of schools for field testing of the new health curriculum. The Programa de Educación por Radio en Bolivia (PERAB), a local NGO formed by experienced professionals working for RLP/B, will be subcontracted by EDC to provide technical personnel to carry out the Project activities.

EDC, besides being the overall facilitator, will also fulfill quality assurance and project monitoring responsibilities and duties. To ensure the success of this endeavor, EDC will assist in the formation and administration of a Project Advisory Committee with representatives from the major educational institutions in Bolivia. Potential participants should include multilateral and bilateral donors (UNICEF, ICI, IBRD, IDB, etc.), educational NGO's (such as ERBOL), teachers unions, the Ministry of Health, and other organizations, as deemed appropriate. This body could function in an interactive capacity with germane sectors of the national and international communities, in a manner seldom seen in other A.I.D. distance learning projects. One easily accessible link could be with the radiophonic education association of Latin America, ALER (Asociación Latinoamericana de Educación Radiofónica), thereby a larger international context to the USAID-Bolivia effort.

Details of the technical implementation of the project are described in the appropriate sections of this Project Paper. It is, however, important to highlight that EDC, as the prime provider of TA, will also insure that all subcontractors comply fully with all A.I.D. financial and administrative requirements. EDC will be the ultimate guarantor of this compliance. Following the signing of the buy-in contract between USAID/Bolivia and EDC, the subcontracts with PERAB, FyA, and any other possible subcontractors will be made a matter of record.

Appropriate Energy Technologies

Renewable energy technologies have advanced from both economic and technological perspectives in recent years. Technologies to convert sunlight, wind, and biomass to electricity can now be purchased at prices competitive with conventional counterparts for many productive applications. Under certain conditions, they enjoy great advantages over extension of distribution lines and portable batteries. When electrical loads are relatively small, or when demands occur far from present infrastructure, these technologies present the most reliable and economical source of energy.

Photovoltaic (PV) energy systems convert sunlight directly to energy. In past years, these systems were extremely expensive, but improvements in technology and increases in production have combined to dramatically reduce the cost. Panels sell for prices between \$4.50 and \$5.00 per peak watt, with expected lifetimes of 25 years or longer.

Combined with rechargeable battery packs, PV panels can be used in a variety of low demand, high valued end uses. For example, they are used in many locations in the developing world to provide power for vaccine refrigeration systems. In remote areas where the price of conventional alternatives is prohibitive, or where maintenance is questionable, these systems also enjoy distinct advantages over conventional systems. Reliability is generally better, and although first-time cost for renewable systems is generally higher, life cycle costs are lower.

For electronic applications, PV systems provide great advantages over any other alternative. Dry cell batteries are perhaps the most expensive form of energy on a cost per unit of energy basis, and from a quality control stand-point, are often very problematic. In remote areas, constant supply can also be a problem. PV systems provide direct current to the battery storage unit in a very efficient and uncomplicated system comprised of a battery, charge controller, and PV panel. This system is essentially trouble-free, except for the occasional replacement of the rechargeable battery as needed.

These systems can be used to provide lighting, power for radios, audio-visual equipment, power for pumping water, and other services essential for classroom instruction. Typical systems in use in several countries in Latin America, Africa, and Asia average \$450 in initial cost. Due to their modular nature, these systems can be expanded incrementally as needed, with costs increasing more or less linearly with load.

More information on these systems can be obtained from the National Rural Electric Cooperative Association, Oak Ridge National Laboratory, and Sandia National Laboratory, all of whom provide services to AID. In addition, the AID Office of Energy has published several reports, both technical and non-technical, regarding the relative comparisons of renewable technologies with conventional power alternatives. These reports are available upon request.

IMPLEMENTATION PLAN

PERIOD	MANAGEMENT	CURRICULUM TEAM	RADIO TEAM	MIS/EVALUATION TEAM	IMPLEMENTATION / TRAINING	ADMINISTRATIVE & SUPPORT STAFF
9/91-10/91	NEGOTIATE BUY-IN SUBCONTRACT NEGOTIATION IDENTIFY OFFICE LARGE PROCUREMENTS OFFICE PREP & MOVE RECRUIT HEALTH EDUCATOR IDENTIFY & RECRUIT PERSONNEL DEV DETAILED WORKPLAN - YR1		BEGIN STUDIO CONSTRUCTION			
PERSONNEL	COP - 2PM ECON/ADM SPECIALIST (TA) - 1PM  MOE MANAGER - (2PM)		STUDIO DESIGNER (TA) - 1PM			BILINGUAL AA - 2PM  MESSENGER - (2PM) GUARDS - (2PM)
11/91-12/91	OFFICE STARTUP BEGIN TO STAFF-UP DEVELOP STAFF TRAINING PLANS SUPERVISE WORK OF ALL TEAMS DEV ADM/MGMT STRATEGY- YR 1 FINALIZE PROCUREMENTS IDENTIFY FIELD SITES & SUPERVISORS IDENTIFY LOCAL & INT'L ADVISORY COMMITTEES	REVISE DIARRHEA MODULE (4:1) REVISE MATH TEACHER'S GUIDES GRADES 2-5 BEGIN REVIEW OF EXISTING MOE & HH CURRICULUM/ MATERIALS/STUDIES RELATING TO GRADE 4 MODULES	COMPLETE STUDIO CONSTRUC.	SET-UP COMPUTER/MIS SYSTEM DESIGN BASELINE RESEARCH BEGIN BASELINE STUDY		

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PERIOD	MANAGEMENT	CURRICULUM TEAM	RADIO TEAM	MIS/EVALUATION TEAM	IMPLEMENTATION / TRAINING	ADMINISTRATIVE & SUPPORT STAFF
PERSONNEL	<p>COP - 2PM</p> <p>MOE MANAGER - (2PM)</p>	<p>HE - 2PM</p> <p>CURRIC DEVELOPER - 2PM</p>	<p>STUDIO DESIGNER (TA) - 1PM</p>	<p>MIS TRAINER (TA) - 1PM</p> <p>APPLIED SOC SCI (TA) - 1PM</p> <p>EPIDEMIOLOGIST (TA) - 1PM</p> <p>MIS SPECIALIST - 2PM</p> <p>TESTS &amp; MEASUREMENT SPEC- 2PM</p> <p>MIS TRAINEE - (2PM)</p> <p>EPIDEMIOLOGIST/OR - ((2PM))</p>	<p>BILINGUAL AA - 2PM</p> <p>ACCOUNTANT - 2PM</p> <p>SECRETARY - 2PM</p> <p>SECRETARIES - (4PM)</p> <p>CHAUFFEUR/MECHANIC - (2PM)</p> <p>MESSENGER - (2PM)</p> <p>GUARDS - (4PM)</p> <p>OFF/GROUNDS MAINT - (2PM)</p>	
1/92-2/92	<p>SUPERVISE WORK OF ALL TEAMS COMPLETE STAFFING-UP WK W/TEAMS TO DEV TECHNICAL STRATEGIES START-UP OF FIELD OFFICES</p> <p>ESTABLISH WORKPLANS FOR FIELD OFFICES TRAIN FIELD SUPERVISORS PRINT TEACHER'S GUIDES, MATH GRADES 2-5 MEETINGS OF LOCAL &amp; INT'L ADVISORY COMMITTEES</p>	<p>TRAINING IN CONTENT DEVELOP.</p> <p>TRAINING IN IRI SCRIPTWRITING DEV MASTER PLAN, 4TH GRADE HEALTH MODULE 2 (4:2) SCRIPT LESSONS 1-3 (4:2)</p> <p>CONTINUE REVIEW OF MOH &amp; MOH CURRICULUM/MATERIALS/STUDIES RELATING TO GRADE 4 MODULES</p>	<p>RECORD LESSONS 1-3 (4:2)HLTH REVISE, EDIT, &amp; COPY LESSONS 1-30, GRADES 2-5 MATH</p> <p>TESTING INSTRUMENTS</p>	<p>CONTINUE BASELINE RESEARCH DESIGN TESTING STRATEGY FOR 4TH GRADE HLTH &amp; REVISED 5TH GRADE MATH PROGRAMS DEVELOP &amp; PRETEST SUMMATIVE</p> <p>FOR GRADE 5 MATH &amp; HLTH MOD 4:1 ELABORATE DATA COLLECTION STRATEGY FOR IMPLEMENTATION BY SUPERVISORS DEVELOP FORMATIVE TESTING INSTRUMENTS FOR MODULE 4:1</p>	<p>BEGIN TRAINING OF PARTICIPATING MATH (GRADES 2-5) AND HEALTH (GRADE 4) TEACHERS &amp; SCHOOL DIRECTORS</p> <p>PILOT FIELD OFFICES (LPB, SRZ, &amp; CBB OPERATTIONAL) TRAIN FIELD SUPERVISORS TRAIN FIELD OBSERVERS IN FORMATIVE EVALUATION &amp; DATA COLLECTION</p>	

PERIOD	MANAGEMENT	CURRICULUM TEAM	RADIO TEAM	MIS/EVALUATION TEAM	IMPLEMENTATION / TRAINING	ADMINISTRATIVE & SUPPORT STAFF
1/92-2/92 (Cont'd)	FINALIZE CONTRACTS FOR RADIO BROADCAST - MATH & HEALTH DEVELOP TEACHER TRAINING PLAN DEVELOP A COST AND EFFICIENCIES ORIENTED RESEARCH PLAN FOR IMPLEMENTATION DURING YEAR 1					
PERSONNEL	COP - 2PM ECON/ADM SPEC (TA)-1PM TECH COORD - 2PM FYA COORD - 1PM  MOH MANAGER - (2PM)	HE - 2 PM IRI SPECIALIST (TA) - 1PM CHIEF, PRODUCTION - 2PM CURRICULISTAS - 6 PM	RADIO TECHNICIANS- 4PM RADIO ACTORS - 8PM	EVAL SPEC/TRAINER (TA) - 1PM RESEARCH ASST (TA) 1PM MIS SPECIALIST -2PM TEST & MEASUREMENT SPEC - 2PM  MIS TRAINEE - (2PM)  EPIDEMIOLOGIST/OR - ((2PM))	TEACHER TRAINER (TA) -1PM CHIEF, IMPLEMEN - 2PM PILOT SITE COORDS 6PM PILOT SITE SUPS FYA - 6PM  PILOT SITE SUPS MOE - (6PM) OTHER SITE SUPS MOE - (8PM)	BILINGUAL AA - 2PM CHIEF, ADMIN - 2PM ACCOUNTANT - 2PM SECRETARY  SECRETARIES - (4PM) CHAUFFEUR/MECHANIC - (2PM) MESSENGER - (2PM) GUARDS - (4PM) OFF/GROUNDS MAINT - (2PM) MILS DISPATCHER - (2PM) PILOT CHAUFFEUR - (4PM) PILOT SECRETARY - (4PM)

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PERIOD	MANAGEMENT	CURRICULUM TEAM	RADIO TEAM	MIS/EVALUATION TEAM	IMPLEMENTATION /TRAINING	ADMINISTRATIVE & SUPPORT STAFF
3/92-4/92	SUPERVISE WORK OF ALL TEAMS AND FIELD PERSONNEL START-UP FIELD OPERATIONS DEVELOP A STRATEGY FOR MOE EVALUATION OF FIELD MGMT ACTIVITIES ADVISE MOE ON IMPROVED FIELD MANAGEMENT LOCAL ADVISORY COMMITTEE MTGS	SCRIPT LESSONS 4-9 (4:2) PRETEST LESSONS 1-9 (4:2) CONTINUE REVIEW OF MOE & MOH CURRICULUM/MATERIALS /STUDIES RELATING TO GRADE 4 MODULES	RECORD LESSONS 4-9 (4:2) HLTH REVISE, EDIT, & COPY LESSONS 31-60, GRADES 2-5 MATH	CONTINUE BASELINE RESEARCH ADMINISTER 5TH GRADE MATH & 4TH GRADE HLTH PRETESTS CODE, INPUT, & CLEAN TEST DATA BEGIN DEVELOPMENT OF FORMATIVE OBSERVATION & TESTING INSTRUMENTS FOR MODULE 4:2 CODE, INPUT, & CLEAN PRELIMIN BASELINE DATA ADMINISTER FORMATIVE TEST 1 MODULE (4:1)	COMPLETE TRAINING OF PARTICIPATING MATH (GRADES 2-5) AND HEALTH (GRADE 4) TEACHERS & SCHOOL DIRECTORS, DISTRIBUTE TEACHERS GUIDES & RADIOS BROADCAST LESSONS 1-30 MATH, GRADES 2-5 BROADCAST LESSONS 1-4 HEALTH, MODULE (4:1) DAILY FORMATIVE OBSERVATION, MATH & HEALTH	
PERSONNEL	COO - 2PM TECH COORD - 2PM FYA COORD - 1PM  MOE MANAGER - (2PM)	HE - 2PM CHIEF, PRODUCTION - 2PM CURRICULISTAS - 6PM	RADIO TECHNICIANS - 4PM RADIO ACTORS - 8PM	RESEARCH ASSI. (TA) - 2PM MIS SPECIALIST - 2PM TEST & MEASUREMENT SPEC - 2PM  MIS TRAINEE - (2PM)  EPIDEMIOLOGIST/OR	CHIEF, IMPLEMEN-2PM PILOT SITE COORDS - 6PM PILOT SITE SUPS FYA - 6PM  PILOT SITE SUPS MOE - (6PM) OTHER SITE SUPS MOE - (8PM)	BILINGUAL AA-2PM CHIEF, ADMILN-2PM ACCOUNTANT - 2PM SECRETARY  SECRETARIES -(4PM) CHAUFFEUR/MECHANIC - ((2PM)) MESSENGER - (2PM) GUARDS - (4PM)

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PERIOD	MANAGEMENT	CURRICULUM TEAM	RADIO TEAM	MIS/EVALUATION TEAM	IMPLEMENTATION /TRAINING	ADMINISTRATIVE & SUPPORT STAFF
			OFF/GROUND MAINT -			(2PM) MILS DISPATCHER - (2PM) FIELD CHAUFFEUR - (4PM) FIELD SECRETARY - (4PM)
5/92-6/92	CONTINUED SUPERVISION OF ALL TECHNICAL TEAMS	SCRIPT & PROJECT LESSONS 10, MODULE (4:2)	RECORD LESSONS 10 (4:2) HLTH RECORD LESSONS 1-2 (4:3) HLTH	CONTINUE BASELINE RESEARCH COMPLETE DEV OF FORM EVALUATION	BROADCAST LESSONS 31-65 MATH, GRADES 2-5	
	CONTINUED SUPERVISION OF FIELD ACTIVITIES & MGMT CONTINUED TO MDE ON PROJECT MANAGEMENT & FIELD OPERATIONS LOCAL ADVISORY COMMITTEE MTGS MID-YEAR REVIEW OF ALL TECH AND MANAGEMENT ACTIVITIES REVISION OF ORIGINAL WORKPLAN IF NECESSARY BEGIN DEVELOPMENT OF MDE INSTITUTIONALIZATION PLAN	DEVELOP MASTER PLAN, MODULE (4:3) SCRIPT & PRETEST LESSONS 1-2, MODULE (4:3) CONTINUE REVIEW OF MDE & MOH CURRICULUM/MATERIALS/STUDIES RELATING TO GRADE 4 MODULES	REVISE, EDIT, & COPY LESSONS 61-90, GRADES 2-5 MATH	INSTRUMENTS, MODULE 4:2 ADMIN FORMATIVE TEST 2 (4:1) ADMINISTER SUMMATIVE POSTTEST, MODULE 4:1 DEV, PRETEST & ADMINISTER SUMMATIVE PRETEST, MODULE 4:2 CODE, INPUT, & CLEAN PRELIMIN TESTING & BASELINE DATA	BROADCAST LESSONS 5-10 HEALTH, MODULE (4:1) BROADCAST LESSONS 1-3 HEALTH, MODULE (4:2) DAILY FORMATIVE OBSERVATION, MATH & HEALTH TEACHER RECYCLE - HEALTH	
PERSONNEL	COO - 2PM TECH COORD - 2PM FYA COORD - 1PM	HE - 2PM CHIEF, PRODUCTION - 2PM CURRICULISTAS - 6PM	RADIO TECHNICIANS - 4PM RADIO ACTORS - 8 PM	MIS SPECIALIST - 2PM TESTS & MEASUREMENT SPEC - 2PM  MIS TRAINEE - (2PM)	CHIEF, IMPLEN - 2PM PILOT SITE COORDS - 6PM PILOT SITE SUPS FYA - 6PM	BILINGUAL AA - 2PM CHIEF, ADMIN - 2PM ACCOUNTANT - 2PM SECRETARY

PERIOD	MANAGEMENT	CURRICULUM TEAM	RADIO TEAM	MIS/EVALUATION TEAM	IMPLEMENTATION / TRAINING	ADMINISTRATIVE & SUPPORT STAFF
	MDE Manager - (2PM)			EPIDEMIOLOGIST/OR - ((2PM))	PILOT SITE SUPS MDE - (6PM)	OTHER SITE SUPS MDE - (8PM)
						SECRETARIES - (4PM) CHAUFFEUR/MECHANIC - (2PM) MESSENGER - (2PM) GUARDS - (4PM) OFF/GROUNDS MAINT - (2PM) MILS DISPATCHER - (2PM) FIELD CHAUFFEUR - (4PM) FIELD SECRETARY - (4PM)
7/92-8/92	CONTINUED SUPERVISION OF ALL TECHNICAL TERMS CONTINUED SUPERVISION OF FIELD ACTIVITIES & MGMT CONTINUED TA TO MDE ON PROJECT MANAGEMENT & FIELD OPERATIONS LOCAL ADVISORY COMMITTEE MTGS CONTINUE DEVELOPMENT OF MDE INSTITUTIONALIZATION PLAN	SCRIPT & PRETEST LESSONS 3-8 MODULE (4:3) REVISE MODULE 4:1 BASED UPON FORMATIVE AND SUMMATIVE EVAL CONTINUE REVIEW OF MDE & MOH CURRICULUM/MATERIALS/STUDIES RELATING TO GRADE 4 MODULES	RECORD LESSONS 3-8 (4:3) HLTH REVISE, EDIT, & COPY LESSONS 91-120, GRADES 2-5 MATH	CONTINUE BASELINE RESEARCH BEGIN DEV OF FORM EVAL INSTRUMENTS, MODULE 4:3 ADMIN FORM TEST 1 & 2 (4:2) ADMINISTER SUMMATIVE POSTTEST, MODULE 4:2 DEV & PRETEST SUMMATIVE EVAL INSTRUMENTS, MODULE 4:3 ADMINISTER SUMMATIVE PRETEST MODULE 4:3	BROADCAST LESSONS 66-100 MATH, GRADES 2-5 BROADCAST LESSONS 4-10 HEALTH, MODULE (4:2) BROADCAST LESSONS 1 HLTH (4:3) DAILY FORMATIVE OBSERVATION, MATH & HEALTH	

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PERIOD	MANAGEMENT	CURRICULUM TEAM	RADIO TEAM	MIS/EVALUATION TEAM	IMPLEMENTATION / TRAINING	ADMINISTRATIVE & SUPPORT STAFF
				CODE, INPUT, & CLEAN TESTING & BASELINE DATA		
PERSONNEL	COP - 2PM  TECH COORD - 2PM  MOE MANAGER - (2PM)	HE - 2PM  CHIEF, PRODUCTION - 2PM	RADIO TECHNICIANS - 4PM  RADIO ACTORS - 8PM SPEC - 2PM	MIS SPECIALIST - 2PM  TESTS & MEASUREMENT SPEC-2PM  MIS TRAINEE - (2PM) EPIDEMIOLOGIST/OR - ((2PM)	CHIEF, IMPLEMEN - 2PM PILOT SITE COORDS - 6PM PILOT SITE SUPS MOE - (6PM) OTHER SITE SUPS MOE - (8PM)  PILOT SITE SUPS MOE - (6PM) OTHER SITE SUPS MOE - (8PM)	BILINGUAL AA - 2PM CHIEF, ADMIN - 2PM ACCOUNTANT - 2PM SECRETARY  SECRETARIES -(4PM) CHAUFFEUR/MECHANIC - (2PM) MESSENGER - (2PM) GUARDS - (4PM) OFF/GROUNDS MAINT - (2PM) CHAUFFEUR/MECHANIC - (2PM) MESSENGER - (2PM) GUARDS - (4PM) OFF/GROUNDS MAINT - (2PM) MILS DISPATCHER (2PM) FIELD CHAUFFEUR - (4PM) FIELD SECRETARY (4PM)

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PERIOD	MANAGEMENT	CURRICULUM TEAM	RADIO TEAM	MIS/EVALUATION TEAM	IMPLEMENTATION / TRAINING	ADMINISTRATIVE & SUPPORT STAFF
9/92-10/92	CONTINUED SUPERVISION OF ALL TECHNICAL TEAMS CONTINUED SUPERVISION OF FIELD ACTIVITIES & MGMT CONTINUED TA TO MDE ON PROJECT MANAGEMENT & FIELD OPERATIONS LOCAL ADVISORY COMMITTEE MTCS	SCRIPT & PRETEST LESSONS 9-10 MODULE (4:3) REVISE MODULE 4:2 BASED UPON FORMATIVE AND SUMMATIVE EVAL CONTINUE REVIEW OF MDE VISED HEALTH CURRICULUM/MATERIALS/ STUDIES RELATING TO GRADE 4 MODULES BEGIN PLANNING FOR GRADE 5 HEALTH CURRICULUM	RECORD LESS 9-10 HLTH (4:3) HLTH (4:3) REVISE, EDIT, & COPY LESSONS 121-135 GRADES 2-5 MATH REVISE, EDIT, & COPY MODULES 4:1	CONTINUE BASELINE RESEARCH COMPLETE DEV OF FORM EVAL INSTRUMENTS, MODULE 4:3 ADMIN FORM TESTS 1 & 2 (4:3) ADMIN SUMMATIVE EVAL (4:3) CODE, INPUT, & CLEAN PRELIMIN TESTING & BASELINE DATA ADMIN SUMMATIVE POSTTEST MATH GRADE 5	BROADCAST LESSONS 101-135 MATH, GRADES 2-5 BROADCAST LESSONS 2-10 HEALTH MODULE (4:3) DAILY FORMATIVE OBSERVATION, MATH & HEALTH TEACHER RECYCLE	
PERSONNEL	ODP - 2PM TECH COORD - 2PM FYA COORD - 1PM  MDE MANAGER - (2PM)	HE - 2PM CHIEF, PRODUCTION - 2PM CURRICULISTAS - 6PM	RADIO TECHNICIANS - 4PM RADIO ACTORS - 8PM	MIS SPECIALIST -2PM TESTS & MEASUREMENT SPEC- 2PM  MIS TRAINEE - (2PM)  EPIDEMIOLOGIST/OR - (2PM)	CHIEF, IMPLEMEN - 2PM PILOT SITE COORDS - 6PM PILOT SITE SUPS FYA - 6PM  PILOT SITE SUPS MDC - (6PM) OTHER SITE SUPS MDE - (8PM)	BILINGUAL AA - 2PM CHIEF, AMIN - 2PM ACCOUNTANT - 2PM SECRETARY - 4PM EDC  SECRETARIES - (4PM) CHAUFFEUR/MECHANIC - (2PM) MESSENGER - (2PM) GUARDS - (4PM) OFF/GROUNDS MAINT - (2PM) MIS DISPATCHER (2PM) FIELD CHAUFFEUR - (4PM) FIELD SECRETARY (4PM)

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PERIOD	MANAGEMENT	CURRICULUM TEAM	RADIO TEAM	MIS/EVALUATION TEAM	IMPLEMENTATION / TRAINING	ADMINISTRATIVE & SUPPORT STAFF
11/92-12/92	<p>CONTINUED SUPERVISION OF ALL TECHNICAL TEAMS CONTINUED SUPERVISION OF FIELD ACTIVITIES &amp; MGMT CONTINUED TA TO MOE ON PROJECT MANAGEMENT &amp; FIELD OPERATIONS LOCAL ADVISORY COMMITTEE MICS REVIEW YEAR 1 PROGRESS ALL TECHNICAL &amp; MGMT ASPECTS DEVELOP WORK PLAN FOR YEAR 2 WORK WITH TECHNICAL TEAMS TO DEVELOP YEAR 2 STRATEGIES DEVELOP 1993 TEACHER &amp; SUPERVISOR TRAINING PLAN DEVELOP 1993 EXPANSION PLAN</p>	<p>REVISE MODS 4:2, 4:3 USING FORMATIVE AND SUMM EVAL BEGIN PLANNING FOR GRADE 5 HEALTH CURRICULUM, 1993 CONTINUE REVIEW OF MOE &amp; MCH CURRICULUM/MATERIALS/STUDIES RELATING TO GRADE 5 MODULES FINALIZE REVISED GRADE 4 TEACHER'S GUIDE FOR PRINTING DEVELOP PLAN FOR ADAPTATION OF DIARRHEA MODULE TO THE BILINGUAL/MULTI-GRADE SETTING (TO BE IMPLEMENTED IN A SMALL SAMPLE OF SCHOOLS DURING 1993)</p>	<p>REVISE, EDIT, &amp; COPY REVISED HEALTH MODULES 4:2, 4:3 DEVELOP 1993 WORKPLAN COMPLETE MAINTENANCE, STUDIO</p>	<p>CONTINUE BASELINE RESEARCH COMPLETE ANALYSIS OF GRADE 5 MATH &amp; GRADE 4 HLTH COMPLETE EFFICIENCIES/COST STUDY - GRADE 4 HEALTH DEVELOP 1993 2 WORKPLAN</p>	<p>FINAL TABULATION STATISTICS DEVELOP 1993 WORKPLAN DEVELOP 1993 TRAINING PLAN FOR TEACHERS, SCHOOL DIRECTORS</p>	

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PERIOD	MANAGEMENT	CURRICULUM TEAM	RADIO TEAM	MIS/EVALUATION TEAM	IMPLEMENTATION /TRAINING	ADMINISTRATIVE & SUPPORT STAFF
PERSONNEL	COP - 2PM TECH COORD - 2PM FYA COORD - 1PM  MOE AGER - (2PM)	HE - 2PM CHIEF, PRODUCTION - 2PM CURRICULISTAS - 6PM	RADIO TECHNICIANS - 4PM RADIO ACTORS - 8PM	MIS SPECIALIST -2PM TESTS & MEASUREMENT SPEC- 2PM  MIS TRAINEE - (2PM)  EPIDEMIOLOGIST/OR - (2PM)	CHIEF, IMPLEMEN - 2PM PILOT SITE COORDS - 6PM PILOT SITE SUPS FYA - 6PM  PILOT SITE SUPS MOE - (6PM) OTHER SITE SUPS (MOE)	BILINGUAL AA - 2PM CHIEF, AMIN - 2PM ACCOUNTANT - 2PM SECRETARY - 4PM EIC  SECRETARIES - (4PM) CHAUFFEUR/MECHANIC - (2PM) MESSENGER - (2PM) GUARDS - (4PM) OFF/GROUNDS MAINT - (2PM) MILS DISPATCHER (2PM) FIELD CHAUFFEUR - (4PM) FIELD SECRETARY (4PM)

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PERIOD	MANAGEMENT	CURRICULUM TEAM	RADIO TEAM	MIS/EVALUATION TEAM	IMPLEMENTATION /TRAINING	ADMINISTRATIVE & SUPPORT STAFF
1/93-12/93	<p>CONTINUED SUPERVISION OF ALL TECHNICAL TEAMS CONTINUED SUPERVISION OF FIELD ACTIVITIES &amp; MGMT CONTINUED TA TO MDE ON PROJECT MANAGEMENT &amp; FIELD OPERATIONS LOCAL ADVISORY COMMITTEE MTGS REVIEW YEAR 2 PROGRESS -ALL TECHNICAL &amp; MGMT ASPECTS DEVELOP WORK PLAN FOR YEAR 3 WORK WITH TECHNICAL TEAMS TO DEVELOP YEAR 3 STRATEGIES DEVELOP 1994 TEACHER &amp; SUPERVISOR TRAINING PLAN DEVELOP 1994 EXPANSION PLAN MEETING OF INTL ADVISORY COMMITTEE DEVELOP &amp; IMPLEMENT COMMUNITY OUTREACH STRATEGY FOR 1994 CONTINUE POLICY DIALOGUE W/MDE DEVELOP STRATEGY FOR PROJECT/STUDIO TO BECOME SOMEWHAT SELF-FINANCING.</p>	<p>DEVELOP MASTER PLAN &amp; MODULES FOR GRADE 5 HEALTH BEGIN PLANNING FOR GRADE 3 HEALTH CURRICULUM, 1994 CONTINUE REVIEW OF MDE &amp; MOH CURRICULUM/MATERIALS/ STUDIES RELATING TO GRADE 5 &amp; GRADE 3 MODULES REVISE GRADE 5 MODS &amp; GUIDES USING EVALUATION RESULTS ADAPT MODULE 4:1 TO BILINGUAL AUDIENCE &amp; PILOT TEST DEVELOP PLAN FOR COMMUNITY PILOT IN 1994 DEVELOP 1994 GLOBAL WORK-PLAN</p>	<p>RECORD, EDIT, &amp; COPY GRADE 5 HEALTH MODULES DEVELOP 1994 WORKPLAN COMPLETE MAINTENANCE, STUDIO</p>	<p>CONTINUE BASELINE RESEARCH DEV, PRETEST, &amp; ADMINISTER FORMATIVE &amp; SUMMATIVE TESTS GRADE 5 HEALTH CONTINUE COLLECTION OF PROGRAM STATISTICS COMPLETE ANALYSIS OF GRADE 6 HEALTH EVAL RESULTS COMPLETE EFFICIENCIES/COST STUDY GRADE 6 HEALTH DEVELOP 1994 WORKPLAN SUMMATIVE &amp; FORMATIVE EVAL OF BILINGUAL PILOT</p>	<p>FINAL TABULATION OF STUDENT STATISTICS- GRADE 6 IMPLEMENT EXPANDED TEACHER TRAINING- MATH &amp; HEALTH IMPLEMENT TEACHER TRAINING FOR PILOT BILINGUAL MODULE DEVELOP 1994 WORK-PLAN DEVELOP 1994 TRAINING PLAN FOR TEACHERS, SCHOOL DIRECTORS CONTINUED FORMATIVE OBSERVATIONS - GRADE 6 HLTH DEVELOP 1994 OUTREACH COMMUNITY OUTREACH PLAN FOR COMMUNITY-BASED PROGRAMMING CONTINUED TCHR SUPERVISION &amp; SUPPORT</p>	

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PERIOD	MANAGEMENT	CURRICULUM TEAM	RADIO TEAM	MIS/EVALUATION TEAM	IMPLEMENTATION / TRAINING	ADMINISTRATIVE & SUPPORT STAFF
PERSONNEL	COP -12PM TECH COORD - 12PM FYA COORD - 12PM  MOE MANAGER - (12PM)	HE-12PM CHIEF, PRODUCTION - 12PM CURRICULISTAS - 36PM	RADIO TECHNICIANS - 24PM RADIO ACTORS - 48 PM	MIS SPECIALIST -12PM TESTS & MEASUREMENT SPEC-12PM  MIS TRAINEE -(12PM) EPIDEMIOLOGIST/OR - ((12PM))	CHIEF, IMPLM-12PM PILOT SITE COORDS -36PM PILOT SITE SUPS FYA - 36PM  PILOT SITE SUPS MOE -(64 PM) OTHER SITE SUPS MOE -(84PM)	BILINGUAL AA-12PM CHIEF, ADMIN - 12PM ACCOUNTANT -12PM  SECRETARY-24PM SECRETARIES -(24PM) CHOFFEAUR/MECHANIC - (12PM) MESSENGER -(12PM) GUARDS - (24PM) OFF/GROUNDS MAINT -(12PM) MILS DISPATCHER - (12PM) FIELD CHOFFEAUR - (24PM) FIELD SECRETARY - (24PM)

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PERIOD	MANAGEMENT	CURRICULUM TEAM	RADIO TEAM	MIS/EVALUATION TEAM	IMPLEMENTATION /TRAINING	ADMINISTRATIVE & SUPPORT STAFF
1/94-12/94	<p>CONTINUED SUPERVISION OF ALL TECHNICAL TEAMS</p> <p>CONTINUED SUPERVISION OF FIELD ACTIVITIES &amp; MGMT</p> <p>CONTINUED TA TO MOE ON PROJECT MANAGEMENT &amp; FIELD OPERATIONS</p> <p>LOCAL ADVISORY COMMITTEE MTGS</p> <p>REVIEW YEAR 3 PROGRESS -ALL TECHNICAL &amp; MGMT ASPECTS</p> <p>DEVELOP WORK PLAN FOR YEAR 4</p> <p>WORK WITH TECHNICAL TEAMS TO DEVELOP YEAR 4 STRATEGIES</p> <p>DEVELOP 1996 TEACHER &amp; SUPERVISOR TRAINING PLAN</p> <p>DEVELOP 1995 EXPANSION PLAN</p> <p>MEETING OF INTL ADVISORY COMMITTEE</p> <p>DEVELOP &amp; IMPLEMENT COMMUNITY OUTREACH STRATEGY FOR 1996</p> <p>CONTINUE POLICY DIALOGUE W/MOE</p>	<p>DEVELOP MASTER PLAN &amp; MODULES FOR GRADE 3 HEALTH</p> <p>CONTINUE REVIEW OF MOE &amp; MCH CURRICULUM/MATERIALS /STUDIES RELATING TO GRADE 3 MODULES</p> <p>REVISE GRADE 3 MODS &amp; GUIDES USING EVALUATION RESULTS</p> <p>DEVELOP UNITS FOR COMMUNITY BASED HEALTH EDUCATION</p> <p>DEVELOP 1995 GLOBAL WORKPLAN</p>	<p>RECORD, EDIT, &amp; COPY GRADE 3 HEALTH MODULES</p> <p>DEVELOP 1995 WORKPLAN</p> <p>COMPLETE MAINTENANCE, STUDIO</p>	<p>CONTINUE BASELINE RESEARCH</p> <p>DEV, PRETEST, &amp; ADMINISTER FORMATIVE &amp; SUMMATIVE TESTS</p> <p>GRADE 3 HEALTH</p> <p>CONTINUE COLLECTION OF PROGRAM STATISTICS</p> <p>COMPLETE ANALYSIS OF GRADE 3 HEALTH EVAL RESULTS</p> <p>COMPLETE EFFICIENCIES/ COST STUDY-GRADE 3 HEALTH</p> <p>DEVELOP 1995 WORKPLAN</p> <p>SUMMATIVE &amp; FORMATIVE EVAL OF COMMUNITY PILOT</p>	<p>FINAL TABULATION OF STUDENT STATISTICS -- GRADE 3</p> <p>IMPLEMENT EXPANDED TEACHER TRAINING -- MATH &amp; HEALTH</p> <p>IMPLEMENT TEACHER TRAINING FOR PILOT</p> <p>BILINGUAL MODULE</p> <p>DEVELOP 1995 WORKPLAN</p> <p>DEVELOP 1995 TRAINING PLAN FOR TEACHERS, SCHOOL DIRECTORS</p> <p>CONTINUED FORMATIVE OBSERVATIONS-GRADE 3 HLTH</p> <p>DEVELOP 1995 OUTREACH PLAN FOR COMMUNITY-BASED PROGRAMMING</p> <p>CONTINUED TOUR SUPERVISION &amp; SUPPORT</p>	

12/7-

PERIOD	MANAGEMENT	CURRICULUM TEAM	RADIO TEAM	MIS/EVALUATION TEAM	IMPLEMENTATION /TRAINING	ADMINISTRATIVE & SUPPORT STAFF
PERSONNEL	COP- 9PM TECH COORD - 9PM FYA COORD - 9PM  MOE MANAGER -(12PM)	HE - 9PM CHIEF, PRODUCTION - 9PM CURRICULISTAS - 18PM  CURRICULISTA -(12PM)	RADIO TECHNICIANS - 18PM RADIO ACTORS - 36 PM  RADIO TECHNICIAN - (3PM) RADIO ACTORS - (6PM)	MIS SPECIALIST - 9PM TESTS & MEASUREMENT SPEC - 9PM MIS TRAINEE -(12PM)  EPIDEMIOLOGIST/OR - ((12PM))	CHIEF, IMPLEMEN - 9PM PILOT SITE COORDS- -27 PM PILOT SITE SUPS FXA -27PM  PILOT SITE SUPS MOE - (54PM) OTHER SITE SUPS MOE - (24PM)	BILINGUAL AA - 9PM CHIEF, ADMIN - 9PM ACCOUNTANT - 9PM SECRETARY - 18PM  SECRETARIES - (24PM) CHOFFEAUR/MECHANIC - (12PM) MESSENGER -(12PM) GUARDS -(24PM)
1/95-9/95	CONTINUED SUPERVISION OF ALL TECHNICAL TEAMS CONTINUED SUPERVISION OF FIELD ACTIVITIES & MGMT CONTINUED TA TO MOE ON PROJECT MANAGEMENT & FIELD OPERATIONS LOCAL ADVISORY COMMITTEE MTGS REVIEW YEAR 4 PROGRESS- ALL TECHNICAL & MGMT ASPECTS IMPLEMENT YEAR 4 STRATEGY FINALIZE INTEGRATION OF RADIO EDUCATION INTO NATL CURRIC DEVELOP 1996 TEACHER & SUPERVISOR TRAINING PLAN	REVISE UNITS FOR COMMUNITY BASED HEALTH EDUCATION DEVELOP 1996 WORKPLAN	EDIT, RERECORD/ & COPY GRADE 3 REVISED MODULES EDIT, RERECORD, & COPY COMMUNITY PROGRAMS MOE PROJECT PROMO SPOTS	CONTINUE BASELINE RESEARCH CONTINUE COLLECTION OF PROGRAM STATISTICS GRADE 3 HEALTH DEVELOP 1996 WORKPLAN COMPLETE ANALYSIS OF COMMUNITY PILOT COMPLETE RECURRENT COSTS STUDY OF RADIO HEALTH DEVELOP 1996 WORKPLAN	FINAL TABULATION OF STUDENT STATISTICS - ALL GRADES IMPLEMENT EXPANDED TEACHER TRAINING - MATH & HEALTH DEVELOP 1996 WORKPLAN DEVELOP 1996 TRAINING PLAN FOR TEACHERS, SCHOOL DIRECTORS CONTINUED TCHR SUPERVISION & SUPPORT CONTINUED COMMUNITY OUTREACH DEVELOP WORKPLAN FOR 1996	

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PERIOD	MANAGEMENT	CURRICULUM TEAM	RADIO TEAM	MIS/EVALUATION TEAM	IMPLEMENTATION /TRAINING	ADMINISTRATIVE & SUPPORT STAFF
	DEVELOP 1996 EXPANSION PLAN DEVELOP & IMPLENENT COMMUNITY OUTREACH STRATEGY FOR 1996					
PERSONNEL	MDE MANAGER -(9PM)	CURRICULISTA -(9PM)	RADIO TECHNICIAN - (2PM) RADIO ACTORS -(6PM)	MIS TRAINEE -(9PM) EPIDEMIOLOGIST/OR - -((9PM))	PILOT SITE SUPS MDE -(41PM) OTHER SITE SUPS MEC -(90PM)	SECRETARIES -(18PM) CHOFFEAUR/MECHANIC -(9PM) MESSENGER - (9PM) GUARDS - (18PM) OFF/GROUNDS MAINT -(9PM) MILS DISPATCHER - (9PM) FIELD CHOFFEAUR - (18PM) FIELD SECRETARY - (18PM)