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El Salvador Education Sector Analysis

Executive Summary

September 1, 1977

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and

Status Report

by

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Status of the El Salvador Education Sector Analysis: September 1, 1977

(Executive Summary)

I. Project Purpose and Background

The analysis has two basic objectives: 1) to obtain findings for increasing the efficiency, access and relevance of the education and training sector; 2) to develop the Ministry's capacity for data collection, data processing and analytical interpretation aimed at continuous improvements in the formulation of policy and the allocation of resources.

The final output will be 15 Analytical Working Documents, (AWDs) written in Spanish, mainly by Salvadorans, the last one "Estimates of Resource Availabilities in 1986 and the Year 2002, and Feasible Alternative Combinations of Enrollment Targets, Programs to Increase Efficiency, and Programs to Improve Relevance for the Five Kinds of Education and Training" to be completed by mid-October. The section that follows, based on only six AWDs deals with the maximization of the efficiency of basic education viewed as: 1) maximizing academic performance or learning; 2) minimizing "dropout"; 3) minimizing repetition; and 4) minimizing per student cost, taking into account the interrelations among these four objectives.

II. Policy Implications of the Findings to Date

A. Minimizing the Loss of Enrollment or "Dropout" (Grades 1-6)

Enrollment loss represents from 18%-20% of grades 1-6 enrollment of 593,000 in 1973. This "dropout" was decomposed through analysis into four kinds and, as a result, a radically different view of the causes was obtained. It was concluded that the loss was heavily concentrated in the rural area and was the result, not of insufficient demand (the prevailing view before the analysis) but of insufficient supply.

It is estimated that elimination of the rural school insufficiency, mainly through completion of the incomplete schools (less than six grades) will increase rural sixth grade graduation rate from about 20% to 70%. Reduction of wastage beyond these levels will probably require corrective measures which address other problems identified in the analysis: provision of school lunches; revision of the mathematics curriculum; teacher training in specific problem areas of language and natural science.

The cost of increasing the sixth grade rural graduation rate from 20% to 70% involves only a 15% increase in the total costs

(operating and capital amortization) of basic education. (The additional operating costs represent a 9% increase in the operating costs of all public education and training provided by the Ministry.) Although all the benefits of converting the illiterate rural majority (which is constantly expanding the urban labor force through rural-to-urban migration) into a schooled and literate segment of the population cannot be quantified, the study of a 1975 1% household survey has shown that schooling attainment is very strongly associated with higher family earnings and standard of living, higher individual earnings and productivities, higher income and more employment of females, and lower fertility rates.

B. Reducing Illiteracy

Illiteracy is officially reported as 1 million adults. Under the analysis 1-1/2 million are estimated. The additional 1/2 million represent individuals who have had 1-2 years of schooling and are apparently marked down as literate in the population census. (Changes in census procedures will be recommended.) By eliminating the rural school inefficiency, the growth in illiteracy among younger generations will be stopped. Since the population is growing the problems will become proportionately smaller.

C. Minimizing Repetition (Grades 1-6)

Under the analysis repetition has been estimated as roughly 150,000 -- 26% of the initial matriculation. Prior to the analysis, repetition was recorded as 8%. Quantification of total repetition was made possible by the application of a new model to the population census data on schooling attainments. Three kinds of repeaters were identified: 1) repeaters-failures; 2) repeaters-dropouts; 3) repeaters-passers. The last kind represents about 1/2 the repeaters, and is mainly the consequence of the rural schooling insufficiency. Elimination of the insufficiency will eliminate type-3 and should greatly reduce type-2 which may be largely due to crowding. It seems likely that repetition can be cut to 1/4 its present size by elimination of the insufficiency. It should be noted that 25% or ¢15,000,000 of the recurring basic education expenditure reflects an "additional" repeater expense. If repetition were reduced to 8%, say, the savings, and, therefore, the more easily quantified portion of the "benefit" would be ¢10,385,000.

D. Minimizing Per Student Cost (Grades 1-9)

Two main procedures for reducing per-student cost have been identified: 1) making more efficient use of facilities and teachers by double-shifting them and thereby increasing the number of students going to school half-day; 2) substituting Ministry-owned for rented schools in the urban zone. Concerns are often expressed about the effect of double shifting on "quality". However, the analysis has shown that in both the rural and urban zones half-day students had

less dropout, very probably less repetition, and overall about the same performance on national achievement exams as the whole-day students. Total savings effected by implementing both these procedures have been estimated as ₡13,104,000 ($1 = ₡2.50). This is about 19% of the total 1973 basic education cost.

E. Academic Performance as Measured by the National Achievement Exams

Tests based on the official curriculum were prepared in the Ministry in the four basic education subjects for grades 2, 3, 5, 6, 8, and 9 (24 exams) and given to 55,149 students. A very important general finding is that the children are learning the curriculum. Perhaps equally important, the rural students did somewhat better than the urban students; and with the exception of the highest income group, there appears to be no statistically significant association between income and test scores.

A socio-economic survey of a 2,500 sub-sample of the tested students was carried out. The student was interviewed in the school, the head of household in the home. Findings emerging from the survey have identified four long-run procedures for improving academic performance: 1) daily homework assignments; 2) school lunches; 3) revision of the math curriculum; 4) revision of four areas in Language and Natural Science.

III. GOES and USAID Policy Changes to Date

As a result of the analysis carried out to date the Ministry of Education has radically altered its view concerning the causes of the huge matriculation loss in the rural areas and now views it as mainly a problem of insufficient supply, and not as a problem of demand. It plans to further expand educational services in the rural areas, in part by completing all the incomplete schools, and in the future, by not building schools which have less than six grades -- a major breakthrough in policy that will favor the rural poor majority. USAID/El Salvador has AID/W approval to support this GOES effort, and is negotiating a loan for about $10 million for both school construction and various kinds of technical assistance.

Technical assistance under the loan cannot be fully specified at this time since the pending 2/3 of the documents (and the corresponding findings) are now being completed. However, the main technical assistance component will probably be the utilization of BUCEN personnel to help establish a Ministry-wide information system for better analysis, planning and day-to-day management. Technical assistance may also be requested in some of the problem areas specified in Part II: revision of the math curriculum; teacher training in math; teacher training in the weak areas in language and

natural science. Additional possible technical assistance areas not mentioned previously are consideration of alternate modes or programs for the preparation of teachers, and introduction of new management procedures that focus on cost control.

IV. The El Salvador Education Sector Analysis and AID Assistance to Education in Other LDCs

The need for disaggregate analysis has been demonstrated by the Salvadoran results. For basic education (which represents about 1/2 the total education effort) the findings of the first six AWDs identify ways to cut "dropout" by roughly 75%, repetition by another 75%, and total cost by roughly 19%, without prejudice to academic performance. El Salvador's education system is comparatively efficient. This suggests that the potential for human resource and financial savings in other LDCs is greater.

The involvement of host-country personnel, and the development of host-country capacity for data collection, processing and analysis, have not been a purpose of the education sector assessments. The development of this host-country capacity should become a prime purpose of future AID work in this area, whether it is referred to as "assessment" or as "analysis". LDC policy-making needs to be improved. It will not be improved by hurried impressionistic reviews of the sector carried out exclusively by Americans. It can be improved through collaborative analysis and the accompanying internalization of the analytical process.

Failure to satisfy the basic needs of the poor majorities reflects, in large part, the failure to properly analyze their problems. Vested interests opposing reform usually play their part, but these interests are invariably in a stronger position in the absence of any countervailing power, such as the force of sound documented analyses that focus on efficiency and equity issues. Besides, without such analysis AID cannot measure the distance between what <u>could</u> be done and what <u>is</u> done to make the poor majority better off and productive. Without an analysis that leads to the formulation of a reform policy, it is extremely difficult, if not impossible, to determine the extent to which vested interests are blocking reform.

By collaborating with LDCs in multi-year projects that both provide analytical findings of immediate utility for policy and develop host-country capacity for data collection, processing and analysis, AID will be taking a very large step in the direction specified by the Congressional mandate.

The extent to which El Salvador's education sector problems are similar to the sector's problems in other countries can be determined only on a country-by-country basis. Last week, a preliminary review of documents and exchanges with officials in Lima, Peru, by the mission education advisor, two BUCEN officials and myself served to

reveal some important similarities and some differences.

Obviously, the scope of a collaborative analytical project, such as the El Salvador education sector analysis, must be tailored to the LDC's capacity in data collection, processing and analysis. Probably very few LDCs are able at this time to initiate an analysis as broad in scope as the Salvadoran analysis. Few have such manageable geographic and population characteristics. Most have greater deficiencies in data collection, processing and analysis. In some countries many modules or parts of the Salvadoran analysis may be applicable; in other countries perhaps very few of the modules are applicable.

New projects should include activities to arrive at shorter-range analytical outputs (now identifiable as the result of the El Salvador analysis) which would be of immediate utility for host-country and AID programming. Over time the addition of parts or modules can lead to the more accurate total or sectoral estimates of AWD #15. In this document an attempt will be made to specify complementaries and trade-offs among goals and among the five kinds or levels of education and training for the target years of El Salvador's Five-Year Plans, beginning in 1982 and ending in the year 2002. The document is expected to provide useful information for improving policy and the allocation of the sector's resources.

BRobinson/CQ

Status of the El Salvador Education Sector Analysis: September 1, 1977

I. Project Purpose and Background

The El Salvador Education Sector Analysis has two basic objectives:

1) To obtain policy conclusions of immediate utility for increasing the efficiency, access and relevance of the education and training sector;

2) To develop the Ministry's capacity for data collection, data processing and analytical interpretation aimed at continuous improvements in the formulation of policy and the allocation of resources.

The documentation of analytical findings and policy conclusions will consist of 15 Analytical Working Documents (AWDs). These documents are written in Spanish, mainly by Salvadoran analysts, and later translated into English. By September 20, 1977 all the AWDs, except AWDs No. 10 and 15 will have been drafted. The original Spanish versions of these last two AWDs will be completed sometime in October, 1977.

The analysis focuses on the efficiency, access and relevance of: 1) kindergarten; 2) basic education (grades 1-9); 3) High School (grades 10-12); 4) Higher Education; 5) Out-of-School or "Non Formal" education and training. AWD #15 will integrate all of the major policy conclusions. Its title will be "Estimates of Resource Availabilities in 1986 and the Year 2002, and Feasible Alternative Combinations of Enrollment Targets, Programs to Increase Efficiency, and Programs to Improve Relevance for the Five Kinds of Education and Training." It will present different possible trade-offs and complementarities among the three objectives and the five kinds of education and training.

The section that follows, "Some of the Policy Implications of the Findings to Date," is based on only six AWDs. These policy conclusions focus on two intimately related problems: increasing the efficiency of, and increasing the access to, basic education. (Increasing the efficiency of basic education has been defined as: 1) maximizing academic performance or learning; 2) minimizing "drop-out"; 3) minimizing repetition; 4) and minimizing per student cost, taking into account the interrelations among these four objectives.) Section III will also sketch some procedures for improving Ministry analysis, planning and management.

II. Policy Implications of the Findings to Date

A. Minimizing the Loss of Enrollment or "Dropout" (Grades 1-6)

1. What is the Magnitude of the Problem?

Total annual "dropout" or enrollment loss is roughly 18% to 20% of the initial enrollment. For the base year of this analysis this represents between 100,000 to 118,000 of an enrollment of 593,000. Precise measurement of between-grade or interyear "dropout" will be obtained when procedures are introduced to assure correct reporting of repetition. Under this analysis the "dropout" phenomenon has been decomposed into sub-kinds which are represented and estimated in the table below, using the lower total of 18%.

Total "Dropout"	Within Grade Yearly Dropout	Between-Grade Interyear "Dropout"
18%	10%	8%
Permanent "Dropout"	Permanent Yearly Dropout	Permanent Inter-Year "Dropout"
13%	5%	8%
Non-Permanent "Dropout"	Non-Permanent Yearly Dropout	Non-Permanent Inter-Year Dropout
5%	5%	0%

2. Prior to the Analysis, was the Problem Being Properly Conceived, Measured and Analyzed?

No, it was not. Although within-grade or yearly dropout was being properly measured and recorded, between-grade or interyear "dropout" was estimated only occasionally and the estimates were highly inaccurate. No effort had been made to distinguish between permanent "dropout" (the student who drops out and never returns) and non-permanent "dropout" (the student who drops out during the school year and returns as a repeater the next year). The tendency to treat the loss of enrollment or "dropout" as an aggregate and uniform phenomenon (no sub-kinds) helped conceal the various factors involved, disguising an insufficiency problem (shortage of services) as an inefficiency problem (dropout). The low schooling attainment levels in the rural areas were viewed as problems of insufficient demand when they were, in fact, problems of insufficient supply.

3. What are the Main Causes of the Problem?

The problem is much better understood when examined in terms of its sub-kinds. Permanent interyear "dropout" is concentrated

almost entirely in the rural zone. In this zone about 20% of the students who enter first grade finish sixth grade (primary education), as compared with about 70% in the urban zone. This lower rural graduation rate has been wrongly viewed as "dropout". It is not caused by a voluntary decision to withdraw by the student or his family. Over 1/3 of the schools are "incomplete" schools (offering fewer than six grades, most of them 3 grades or fewer) and practically all of these are in the rural zone. (Almost two-thirds of the population is in the rural zone where the crude birth rate is almost twice the urban rate.) The estimated square meters of rural school space for grades 1-9 (from the school building survey) in the base year, 1973, could accommodate only an estimated 43% of the corresponding rural school-age population -- the amount, in fact, that enrolled. Urban schools, on the other hand, could handle 125% of the urban school age population; and surprisingly enough, they did, due primarily to rural children who commuted to the urban schools and who constituted about one-fifth of the urban school enrollment. With an overall rural school space shortage, the effort to get everyone into "school", i.e., <u>into the first grade</u>, aggravates the space problem for the upper grades. Space must be rationed among the grades. Second grade space available in rural schools is probably 55% of first grade space, as compared with a probable 71% in the urban schools. The relative shortage of space in rural grade 2 is a major factor accounting for the very high rate of "voluntary" grade 1 repetition (the repeaters-passers to be considered in a subsequent section), and for the large interyear "dropout" between grade 1 and 2 in the rural area.

Could the lesser supply of services in the rural area be a reflection of lesser demand? There is a wealth of evidence that is unfavorable to this hypothesis. All the schools are crowded, but the rural schools are more crowded than the urban. The rural student-teacher ratio in 1976 was about 60:1, as compared to the urban of 42:1. Moreover, 19% of urban school enrollment is composed of rural residents who commute. Nor is there evidence that the rural school students are less capable or interested, since they scored somewhat higher in the national achievement exams. Grade by grade rural students were generally one year older than the urban students. Late entry due to the general space shortage and "voluntary" repetition due to the acute rural post-grade 1 space shortage (and related teacher shortage) accounts largely for this age difference. In the last census year, 1971, 61% of the 12 year old <u>rural</u> residents were in school. Had these children entered school at the prescribed age of seven, and continued up through it without repeating, they would have been in the sixth grade. School attendance of rural residents older than 12 was as follows: 13 yr. olds, 53%; 14 yr. olds 39%; 15 yr. olds, 21%. Had these students entered grade 1 and moved up the grades, without repeating, in 1977 they would have been in grades 7, 8 and 9. Clearly, there is very strong demand for schooling in the rural areas.

So much for between-grade or inter-year dropout. The main causes of within-grade or yearly dropout are probably more varied.

The fairly common explanations that stress socio-economic problems and the alleged irrelevance of the curriculum may have greater applicability to this 10% portion of the total enrollment loss. But even here the shortage of classrooms and teachers is probably very significant. Insufficiencies create various kinds of inefficiencies. Very roughly half of the yearly or within-grade dropout appears to be non-permanent, the students returning the next year as repeaters. Much of this temporary yearly dropout may be due to over-crowding and the presence of over-age students. Moreover, within the rural zone, the incomplete schools have higher rates of yearly or within-grade dropout. Students who can aspire no further than the third grade for example are dropping out and coming back and, thus, taking longer to do so. In fact, in both zones there is a strong correlation between the amount of grades and the rate of upward flow, the flow rate reaching its high point (the lowest relative amount of repetition) in the nine-grade schools.

The analysis has clearly demonstrated that in both zones students respond very strongly to educational opportunities when these are provided. As more grades are offered by the school, late entry decreases, repetition decreases, and annual dropout decreases as well. The waste and inefficiency represented by late entry, repetition, interyear dropout, and a part of annual dropout are the consequences of a general insufficiency of schooling services in the rural area.

4. What are the Solutions?

The solution to all of the between-grade or interyear "dropout" problem (44% of the total "dropout" problem) and to a presently impossible to determine part of the within-grade or yearly dropout problem (56% of the total "dropout" problem) is elimination of the rural school insufficiency, mainly through the "completion" of all the "incomplete" schools by adding grades or through truly effective "nuclearization". (Obviously, this does not include the expansion required to keep up with the population growth -- an independent calculation which will be displayed for a 25-year period in AWD #15.) Elimination of the present rural deficit would be accompanied by an expansion of double-shifting of facilities and teachers in the rural areas where half-day students have a lower yearly or within-grade dropout rate and higher test scores than students who go to school the whole day. The sixth grade graduation rate in the rural schools can be expected to increase from roughly 20% to 70%, with the urban rate increasing somewhat beyond its present level of 70%.

Reduction of the enrollment loss or "dropout" beyond these levels constitutes a more difficult task. The analysis appears to have identified a nutrition problem, and school lunches in selected areas may contribute to reducing this problem. A revision of the mathematics curriculum, some teacher training in mathematics and in three areas identified as weak in two of the other three subjects is also needed.

5. What Would be the "Costs" and "Benefits" of These Solutions?

Estimation of the additional operating or recurrent and capital amortization costs involved in the elimination of the rural school insufficiency -- i.e., provision of the facilities and teachers required for sixth grade education for all rural residents in 1973, the base year -- is surprisingly modest. It would be ₡9,168,000 ($1=₡2.50) additional operating costs and ₡1,678,000 additional amortization cost for a total additional cost of ₡10,846,000. Basic education costs during the base year were ₡63,316,000 for operating and an estimated ₡8,132,000 for the amortization of buildings, equipment and books, a total of ₡71,448,000. The additional cost of ₡10,846,000 therefore represents an increase of 15% in the total costs of basic education (grades 1-9). If the increase in operating costs is compared with the Ministry's total operating expenditures (all levels) in the base year, the cost increase involved in eliminating the rural insufficiency is only 9%.

It is obviously impossible to quantify all the "external" or non-education benefits of reducing the loss of enrollment or "dropout" in grades 1 through 6 from 18% of initial enrollment to a level that will lie somewhere between 5% and 10%. The data indicates that the rural sixth grade graduation rate would increase from 20% to 70%, transforming a predominantly illiterate peasantry into a literate one. This would have far-reaching political, social and economic consequences, not only in the rural zones, but in the urban areas as well -- since the urban labor force is continuously fed and increased through migration from rural to urban areas.

The analysis that is focused on the increase of relevance or so-called external efficiency is based on four main data sources which were handed over for editing and analysis to the Harvard University group, headed by Russell Davis. The findings that follow are preliminary or intermediate outputs; they are based on one of the four sources, albeit the major one; and they do not, unfortunately, control for urban and rural residence, though this factor is the one that presents the greatest socio-economic, as well as educational, contrasts. (In the words of the preliminary report: "Since urban/rural differences are so large, future analysis will explore the relationship between educational attainment and employment characteristics after controlling for residence.") The source is a 1% random 1975 sample of households (6,400 of 665,120 dwellings sampled). I will select those preliminary Harvard findings concerning three groups -- the labor force, women, and working dependents -- that seem to shed light on the issue of rural schooling benefits.

Labor Force. Forty percent of the labor force is in agriculture. These people work comparatively long hours, have lower incomes, and almost no "unemployment". Obviously, their productivity

is comparatively low. The strong association between low education levels and socio-economic factors is illustrated below.

	Rural	Urban
Household head with 1 or less years of education	66%	27%
Household head with 9 or more years of education	1%	1 out of 5
Household head earning less than ₡120 per month	4 out of 5	1 out of 4
Household head with score of 3 or less in life style index (tenancy, type of housing, crowding)	4 out of 5	1 out of 4

Women. One of every five households is headed by a female with no spouse present; and one of every three members of the labor force is a woman. Women as a whole get less education and earn less in their jobs. More are self-identified illiterates (40% vs. 35% for the labor force). And less than 1% (as compared with 2% for men) had some university education. Twenty-three percent of male heads of household earned less than ₡80 per month ($32), whereas this was true of as much as 1/2 of the female heads of household.

Women in urban areas come from families with higher income levels, live in better housing, are better educated, are more often employed, and have higher status jobs. These relationships are fairly strong. Weaker trends show that urban women earn more, have fewer children per year of fertility, have higher survival rates among children born, and first gave birth at older ages.

In the case of women heading households, educational attainment is strongly related to earnings: 84% of the women with 2-5 years of education earn less than ₡120 per month, and only 5% of those with 12-14 years of education earn at this low level.

Better educated women are more often employed, have higher status jobs, fewer children per year of fertility and first gave birth at older ages. It is important to note that controlling for age does not significantly affect the relationship between educational attainment and either earnings or fertility.

Working Dependents. Surprisingly, almost 30% of the labor force are working dependents. These appear to be concentrated in the rural areas, working on farms owned or rented or worked by the parents. For this group of people, as for the other two groups, the

urban/rural differences are the starkest. Working dependents who live in urban areas have higher family income, living style, and better educated household heads. They are better educated, employed in higher status jobs, and earn more. They are also more often unemployed.

Although the next step of a more thorough analysis of the relations among educational attainment and income, employment, occupation, standard of living and fertility within the rural area will shed fuller light on the issue, the information provided above supports the view that the extension of schooling opportunities in the rural area will have desirable effects on production, income, standard of living and fertility. Studies in other countries have tended to show that agricultural productivity increases are associated with higher education level attainments when changes in cultural practices are taking place. This is another way of saying that education is a necessary but not sufficient condition of development: the extension of rural educational opportunities should be accompanied by improvements in agricultural sector policies that are based on disaggregate analysis and the consequent identification of physical and human resource constraints.

It is likely that schooling in the rural area would play a particularly dynamic role in El Salvador where we know that rural schooling "works" -- learning in the rural schools, as measured by the achievement exams, having at least the same level of success as in the urban schools. As suggested before, raising the rural educational level attainments should have considerable impact on the urban labor force. The failure to provide the rural people with a basic education is a major social injustice that almost surely is slowing down the development process.

B. Reducing Illiteracy

1. What is the Magnitude of the Problem?

The 1971 population census reported approximately 1 million illiterates 10 years and older. This estimate is questioned in the analysis which arrives at the very rough estimate of 1-1/2 million.

2. Prior to the Analysis, Was the Problem Being Properly Conceived, Measured, and Analyzed?

It was not. Moreover, if we are right concerning the source of measurement errors, the extent of underestimation will get worse over time. Literacy is measured every 10 years in the population census. It appears that the individuals who have never entered school are noted down as illiterates, and those who have had any schooling whatsoever are noted down as literates, including 1/2 million adults in 1971 who had not completed the third grade.

Apparently, individual "literacy" in El Salvador is being equated with schooling -- however slight in duration this schooling may be. The need for clearer definitions, better questionnaire items and item sequences, and the testing of responses through sampling is, we suspect, a world-wide need, since the questionnaire formats in most countries are similar. The literacy statistics published by UNESCO as a result of reports by each nation almost surely represent a great underestimate of the global problem.

3. What Are the Main Causes of the Problem?

The overwhelming majority of the 1 million adults who identified themselves as illiterate are those who stated that they have had no schooling. The additional 1/2 million who we believe are probably illiterate are those who had only 1 or 2 completed grades of school. It seems likely that most of these individuals lapse back into illiteracy due to the lack of reinforcement in reading and writing skills.

4. What are the Solutions?

The encouraging results of the 24 achievement exams constitute powerful evidence that school attendance through the six grades in both urban and rural areas assures the development of basic skills. Providing this opportunity to all children by eliminating the rural school insufficiency would at least prevent an increase in the present amount of adult illiterates.

5. What Would be the "Costs" and "Benefits" of the Solutions?

The costs and some of the probable benefits of preventing an increase in illiteracy have been considered in Part A.5. on the costs and benefits of sharply reducing the rural enrollment loss. Reducing the present amount (not proportion) of illiterates would require effective adult illiteracy programs. Respectable theoretical work (such as Paolo Freire's) as well as empirical evidence, suggest that successful programs for adults must take into account their personal problems, their verbal habits and concepts, their occupations and vocational aspirations, and their world-view when it reflects a culture that is not the culture of the instructors or teachers, and cannot simply be the extension of primary education to adults that is so often mistakenly provided.

It is barely possible that some of the findings of the "Audiencia" survey (one of the data sources being used to study relevance)may be useful in designing effective adult literacy programs and in training the teachers. However, proper design of the program and adequate training of the teachers will require thought and planning

that draws on much fuller information than is presently available. In short, an effective adult literacy program will take considerable time to prepare.

Obviously, primary education curriculum and training can be improved; and findings of the analysis of test items, inter alia, can be used for this purpose. The tests show that learning does take place in rural primary schools. Whatever the defects of the curriculum may be, there is good reason to believe that the attested verbal and number skills developed under it contribute to the individual's problem-solving abilities as a worker, family member, and citizen. If schooling opportunities to eliminate the rural deficit and to keep pace with a fast-growing population are not provided, the adult illiteracy problem will grow. By stopping the growth of illiteracy among its younger generations, El Salvador will have taken a very large step in reducing the problem's relative magnitude.

C. Minimizing Repetition (Grades 1-6)

1. What is The Magnitude of The Problem?

The problem is surprisingly large -- an estimated 26% of the initial matriculation (roughly 150,000 repeaters). It is highest in the first grade at an estimated 35% of initial matriculation (the average grade-1 student matriculating 1.6 times) and dropping steadily in each grade to 16% in grade-6.

2. Prior to the Analysis, Was the Problem Being Properly Conceived, Measured and Analyzed?

It was not. In the first place, repetition was underreported by a factor of 3! Reported repetition for the six grades was 8% compared with the real rate of about 26%. Other analysts (for example, Ernesto Schifelbein of Chile) had pointed to underestimated repetition as a serious source of errors for many estimates and consequent obstacle to proper analysis and planning, but they had not, to my knowedge, quantified it adequately, nor broken it down into the kinds that compose it. Under this analysis, Alan Saalfeld of BUCEN designed a model that uses the 1971 population census data to generate estimates of new entrants into each grade for different years. By subtracting new entrants from matriculants we arrived at estimates of repeaters. This is one of the important methodological contributions of the El Salvador analysis.

In the second place, by relating the conception of the four hypothetical types of "dropout" or matriculation loss, illustrated in II.A and the revised estimates of repetition, it became possible to identify the three kinds of repeaters which will be considered below. Previous effort by the Ministry to reduce repetition was hindered by a misconception of the phenomena, as well as by an underestimation of

it. The Ministry previously treated repetition as if there were only one kind.

The three kinds of repeaters are: 1) repeaters-failures; 2) repeaters-dropouts; 3) repeaters-passers. For many years the Ministry has recognized that the rates of repetition were high (though the real rates were, in fact, three times as high as reported) and that these high rates were both costly and causative of other kinds of inefficiencies. Assuming that the repeaters were repeaters-failures, i.e., children obliged to repeat the grade because the teacher had failed them, a system of "oriented promotion" was introduced to, inter alia, unclog the early grades of repeaters. The sector analysis has shown that this policy has not had the desired effect, and that the failure is due to the fact that only about 1/4 of the repeaters are repeaters-failures. Roughly 1/2 of the repeaters are repeaters-passers (students who "pass" but repeat the grade because passage to the next grade is blocked) and 1/4 are repeaters-dropouts (students who are annual dropouts of the previous year (non-permanent annual dropouts) and have returned to the grade). Obviously, the right corrective treatment for the latter two kinds of repeaters differs from the corrective treatment for the former. Since all repetition was being treated as repetition-failure, it is not surprising that the policy failed. In Peru, where two BUCEN officials and I, recently spent a 1-week TDY, "automatic promotion" is apparently failing to reduce repetition rates for very similar reasons. When planning is not informed by the findings of disaggregate analysis, corrective measures tend to be crude and over-simplified and, therefore, ineffective.

4. What are the Solutions?

Just as the solution varies for different kinds of "dropouts", identified by means of disaggregate analysis, so with different kinds of repeaters. The discovery of large amounts of repeaters-passers can be viewed as very good news since problems due to insufficiencies are easier to solve. Elimination of shortages in rural school services should eliminate these repeaters entirely -- not only the large number of repeaters in the terminal grades of the "incomplete" schools (terminal grades 2, 3, 4, and 5) but also the many students who "pass" but cannot move on to the next grade because, within the school, this grade has less space allotted to it than the previous grade.

The amount of reduction of repeaters-dropouts will depend largely on how much annual dropout can be reduced. If reducing crowding reduces this dropout significantly, the repeaters-dropouts will be correspondingly reduced. Finally, reducing repeaters-failures depends on the extent to which the Ministry is successful in persuading the teachers that these should be kept to a minimum -- since repeaters-failures do reflect a teacher decision. In any case, it is most fortunate that the major remedy for most of the matriculation

loss or "dropout" appears to be the major remedy for repetition. As a result of the rural expansion policy a reduction in repetition from its present 26% to 4-8% can be expected, though the reduction may take several years to be fully realized.

5. What Would be the "Costs" and "Benefits" of These Solutions?

The concepts of "costs" and "benefits" have highly limited application in education and have been used here to simplify and abbreviate the exposition. Aside from the special attitudinal and learning difficulties, confronted by repeaters, each repeater can be viewed as a doubling of monetary expenditure. If we multiply the approximate basic education per student cost of ₵100 to roughly 150,000 repeaters we get ₵15,000,000. This is to say that 26% or ₵15,000,000 of the recurring basic education expenditure is "additional" -- a form of waste since it reflects a double expense for the set of students who failed to move on to the next grade. If repetition were reduced to 8%, say, the savings and, therefore, the more easily quantified portion of the "benefit" would be ₵10,384,614. The "costs" were considered in section A.5. on matriculation loss.

D. Minimizing Per Student Cost (Grades 1-9)

1. In What Ways Can Per Student Cost Be Reduced?

Three ways have been identified: 1) decreasing the proportion of whole-day groups of students or "schools" (students attend classes in the morning and afternoon) and increasing the proportion of half-day schools (attend classes only in the morning or only in the afternoon), and making a double use of both facilities and teachers, i.e., using each classroom and teacher for two sets of half-day students or schools; 2) increasing the number of students per teacher; 3) substituting Ministry-owned for rented schools in the urban zone.

2. What Effect Would These Cost Reduction Procedures Have On "Quality"?

One of the various encouraging findings of the analysis is that in both the rural and urban zones half-day students had less dropout, very probably less repetition (presently impossible to estimate well on a disaggregate basis because of under-reporting of repetition), and overall about the same performance on national achievement exams as the whole-day students. In the rural area the 3-3-6 school (3 rooms, 3 teachers, 6 grades: for example, grades 1-3 in the morning, and grades 4-6 in the afternoon) which, by specification, lowers per student cost had the highest average scores among the different school types. As will be seen, shifting all or almost all of the whole-day students into half-day status, together

with double use of rooms and teachers, would have the greatest impact in lowering overall per student cost, with the evidence strongly indicating that it would have a beneficial effect on dropout and repetition and, at the very least, a neutral overall effect on academic performance.

Prediction of the effect on dropout, repetition and test scores of increasing student/teacher ratios within specified ranges are more difficult to make. Generally speaking, the evidence suggests that there are no significant differences in test score averages for ratios of up to, say, 40 students per teacher, even in the lower grades, but research employing greater controls and carried out over extended periods would be needed to arrive at truly firm conclusions -- if such conclusions can be reached. In 1973 the rural student/teacher ratio was 49.7:1 and the urban 36:1. The point of decreasing returns (assuming one exists) has not, to my knowledge, been found in any country. Indeed, no one has yet been able to prove that students in "small" classes do better than students in "large" classes (measurements tend to show no significant differences). I suspect that "maximum" class size will tend to be set by other factors, the main one being the beliefs and attitudes of teachers, or, if you will, the maximum number of students they are willing to handle.

Although using state-owned instead of rented buildings should not, as such, affect dropout, repetition or academic performance, in most cases the substitution will probably provide more appropriate quarters.

3. What Would Be The Amount Of Savings Realized Through These Per Student Cost Reductions?

As stated previously, the greatest potential for cutting costs, under the existing system, would involve the shift of students from whole-day to half-day status, together with a double use of building and teachers. This potential saving is being carefully estimated by José Velasco who is now preparing AWD #10 which will summarize and integrate all the findings concerning ways to increase the efficiency of basic education. Consequently, a very approximate estimate will be made here.

The average salary in 1973 for teaching either one whole-day or one half-day school was very roughly ₡300. A half-day school teacher who takes on a second half-day school (or a teacher in a 3-3-6 "school" who perforce teaches one grade in the morning and another in the afternoon) now gets a "supplemental" salary of ₡150. If we assume 35 students per shift then the annual per student salary cost is ₡102.84 for a whole-day student and ₡77.16 for a half-day student. There is, then, a ₡25.68 salary saving for every student that is shifted. In 1973, 58%, or 248,813 of the urban school students, and 89%, or 223,899 or the rural school students were

whole-day. Savings in salary operating costs represented by a complete shift would therefore have been ₡12,396,044. Capital amortization cost savings would have been ₡388,134. These total savings represent 18.9% of the total 1973 cost. Though it would not be possible to make a total shift, the estimate serves to point up the importance of a fully informed and carefully controlled double shifting of buildings and teachers in a country of limited resources and a fast-growing population.

By substituting buildings rented in the urban areas with publicly-owned building (amortization costs of these are taken into account) an estimated yearly savings of about ₡319,933 could have been effected. This is the cost of enrolling an additional 3,053 students.

E. Academic Performance As Measured By The National Achievement Exams

1. What are the More General Findings and Their Policy Implications?

The most general and most important finding to emerge as a result of testing 55,149 students with national achievement exams prepared in the Ministry in the four basic education subjects for grades 2, 3, 5, 6, 8, and 9 (24 exams) is that the kids are learning. The overall percentage of questions answered correctly was 61.6% -- almost 2 out of every 3 questions right on exams based on the official curriculum. This curriculum was reformed in 1970, and since that time criticism of the new curriculum has been bitter and unceasing. The national achievement exam was prepared to analyze the curriculum as well as the students' performance. The results have provided the Ministry with a powerful argument with which to defend the reform.

Another important general finding is that the rural students are learning as much or more as the urban students. The average percentile of the six examined grades was 49.3 for the urban zone and 53.7 for the rural zone. The difference of 4.4 is statistically significant at the 95% confidence level, indicating a better performance in the National Achievement on the part of rural students. These higher scores can be partly attributed to the older ages of rural students, particularly in grades 2 and 3 (where enrollment is heaviest) and to the substantial amount of repeaters-passers in the rural areas (repeaters who have passed a terminal grade 3, say, and repeat it because they have no fourth grade they can enter).

Learning takes place in all the different income groups. Except for the highest income group, there appears to be no statistically significant association between income and test scores.

The disaggregate analysis of repetition, dropout,

student ages, school population, enrollment and classroom space has revealed the fact that the rural enrollment loss is a supply and not a demand problem. The wealth of evidence indicating strong demand for schooling in the rural areas, and the finding that the rural enrollment loss is due to lack of space or services rather than dropout, has served to discredit the reasons more commonly given for opposing the expansion of schools services in the rural areas -- the allegation that students "drop out" because they do not learn, because the curriculum is irrelevant, because the "opportunity costs" of schooling are greater than the "benefits", etc.

2. How Would the Suggested Cost-Cutting Procedures and a Large-Scale Expansion Program Affect Learning?

The previous section, II.D., specified three ways of reducing per student cost: 1) shifting students from whole-day to half-day schools; 2) increasing class size (the number of students per teacher) and 3) substituting state-owned for rented buildings in the urban areas. As was pointed out, the first measure has by far the greatest potential for reducing the unit cost of basic education. The analytical evidence indicates that a large-scale shift to half-day schools will not have an overall favorable nor unfavorable effect on learning; will reduce dropout; and will probably reduce repetition. There are conflicting findings that bear on a postulated relation of class size and test scores, and it is not possible therefore to reach a general conclusion. Finally, state-owned buildings can be expected to provide a more appropriate physical layout for learning and teaching than the rented buildings, the majority of which were not designed for this purpose. At the very least, no negative consequences can be expected from such a shift.

By and large, beneficial effects on the learning process can be expected from a major expansion program. I do not refer to the opportunity to learn which would be provided to the children who are presently denied that opportunity, but to the effects on the children now enrolled. Eliminating the current crowding in rural and urban classrooms should contribute to an improvement in the teaching/learning process.

3. What Other Measures Might Have a Beneficial Effect on Academic Performance?

The findings that appear below are based on a socio-economic survey of a 2,500 sub-sample of the tested students. The student was interviewed in the school, the head of household in the home.

a. Homework: Both rural and urban students who were assigned homework every day scored significantly better than the others. The usual strictures about the value of practice, and the need for

reinforcement, are supported by this finding. Consequently, the Ministry may decide to encourage the schools to give daily homework assignments.

b. Food: Students were asked what they had for their meals the day before the interview. The listed items were later classified by ODEPOR as Good, Average, or Bad. Of all the students 83% has their meals classified as Bad. These students scored 7.1 percentiles lower than students whose meals were classified as Good. Moreover, 4.4% of the students said they had not eaten before arriving at school the day of the interview. These students scored 5.5 percentiles below the average. Obviously, the relation of nutrition to performance needs to be more carefully studied and more fully explored. And it is also obvious that certain beneficial actions could be taken without further delay. A seminar concerning this issue to be attended by different GOES entities is going to be held next week. The Ministry of Education will be represented by the head of ODEPOR's planning department.

c. Revision of the Mathematics Curriculum: As I pointed out before, the achievement tests were designed to reflect the mathematics, Spanish, social studies and natural science reformed curriculums for grades 2, 3, 5, 6, 8, and 9. It is therefore significant that mathematics had the lowest score of the four subjects in every grade except the third by a margin of about 8%. Overlays of curves of the 24 tests show the math curve further and further below the other subject curves with increasing school grades. Among possible interpretations are: 1) the tests get "harder" as you go up the grades; 2) the teaching gets poorer; 3) the math program is over-ambitious and the gap between requirements and student potential is cumulative and therefore greatest in the upper grades. In support of the third hypothesis, one can point out that the grade-by-grade superiority of rural student performance is greatest in mathematics, and that the overall difference can, in fact, be attributed almost entirely to math. Since rural students are 1-2 years older than urban students in each grade their better performance in math suggests that grade-by-grade the official curriculum may be pitched too high. Some Ministry officials believe that the teaching in this area may also be comparatively weak. In any case, a problem area for curriculum revision and teacher training has been identified. Some specialized technical assistance for revision of math curriculum and instructional procedures would appear advisable. The revision should include a grade-by-grade comparison with other countries of the level of difficulty of the Salvadoran math curriculum.

d. Revision of three areas identified as weak in Spanish and Natural Science: In El Salvador each of the four main subjects is composed of six "areas" which are maintained throughout the nine grades in order to assure continuity and reinforcement. The scoring of "areas" across grades and within subjects for each zone (urban and rural) was carried out for the purpose of identifying the

areas in which the students were comparatively weak, and thus getting a better focus on the changes required in either curriculum, teacher training, or both.

Future work by the Ministry in test construction, application and the analysis of scores will probably be carried out in deeper, more detailed ways. By concentrating testing and analysis on 1 or two grades at a time, the Ministry should be able to arrive at findings of considerable utility.

III. GOES and USAID Policy Changes to Date

As a result of the analysis carried out to date, the Ministry of Education has radically altered its view concerning the causes of the huge wastage or enrollment loss in the rural areas and now views it as mainly a problem of insufficient supply, and not as a problem of demand. It plans to further expand educational services in the rural area, in part by completing all the incomplete schools, and in the future, by not building schools which have less than six grades -- a major breakthrough in policy that will favor the rural poor majority. USAID/El Salvador has AID/W approval to support this GOES effort, and is negotiating a loan for about $10 million for both school construction and various kinds of technical assistance.

We expect the largest technical assistance component to be the utilization of BUCEN personnel in helping establish a Ministry-wide information system for better analysis, planning, and day-to-day management. The reformed information system would assure expeditious and proper editing and storage of the large amounts of data presently being collected by the various operating Ministry departments, and the relatively few additional kinds of data identified as needed, such as the three kinds of repeaters and the four kinds of dropouts. It would also assure immediate access to this data by the operating departments, as well as by ODEPOR.

One of the purposes of the information system will be that of helping remove the barriers between analysis, planning, project preparation, implementation and evaluation. These are five different kinds of activities which need to be closely linked if development problems are to be solved and the corresponding goals achieved. Although systematic analysis is a relatively new feature of public administration, it is a logical precondition of planning, and should be given a much larger role than it has been given. Planning that draws on disaggregate analysis is more efficient and effective. After all, a macroeconomic or sectoral plan is an attempt to solve a set of social problems and to achieve the corresponding goals. The solutions are much more likely to be effective if the problems and their interrelations have been thoroughly analyzed.

The new Ministry information system should also help strengthen the links between implementation and evaluation, on the one hand, and

analysis, planning and project preparation on the other. For example, the analytical findings concerning the greater overall efficiency of the half-day schools will lead to the establishment of procedures for periodic disaggregate measurements of cost. These procedures will be used for implementation purposes by the Division of Basic Education and for evaluative purposes by ODEPOR, the evaluation being used as feed-back for both planning and implementation.

ODEPOR has requested BUCEN assistance for development of the information system, and conversation with the Minister and the operating division heads necessarily involved in such a project is the next step. Technical assistance may also be requested in some of the problem areas specified in Part II: revision of the math curriculum; teacher training in math; teacher training in the weak areas in language and natural science. Additional possible technical assistance areas not mentioned previously are consideration of alternate modes or programs for the preparation of teachers, and introduction of new management procedures that are focused on cost control. However, it should be kept in mind that only about one-third of the AWDs have been published to date, and that the analytical finds of the pending AWDs (to be completed OOA October 15, 1977) are bound to alter the content of the GOES request. For instance, it appears likely that examination of higher education efficiency, access and relevance problems will point to the possibility of introducing changes in the tabulation and processing of data presently collected by the National University which could contribute significantly to improvements in its analysis, planning and management. It should also be kept in mind that a total education policy and resource allocation picture will not be obtained until ODEPOR completes the last document, AWD # 15, sometime next month.

IV. The El Salvador Education Sector Analysis and AID Assistance to Education in Other LDCs

A. The Need for Disaggregate Analysis

The need for disaggregate analysis has been demonstrated by the El Salvador education sector analysis. The education and training systems of most LDCs are characterized by great wastes of resources. Past efforts to identify ways to sharply reduce the misallocation and poor use of resources do not appear to have been very successful. Will the El Salvador analysis constitute an exception? For basic education (which represents about 1/2 the total education effort) the findings and conclusion of the first five AWDs identify what appear to be fairly reliable ways to cut "dropout" by roughly 75%, repetition by another 75%, and total cost by roughly 19% (the cost "saving" by reducing repetition not included), without prejudice to academic performance.

Many observers believe that El Salvador's education system is comparatively efficient. This suggests that the potential for human

resource and financial savings in other LDCs is greater. Admittedly, the superior performance of ODEPOR (demonstrated by its successful execution of the sector analysis) will be lacking in most LDCs, and the analyses they can carry out will therefore have to be smaller in scope.

B. The Need to Make the Analysis Collaborative and Thus Internalize the Analytical Process

Two outside evaluations of various education "sector assessments" in Latin America have come to the conclusion that these have been largely impressionistic and of little value for AID programming. To the best of my knowledge, these "assessments" were based on already available data, largely aggregate in nature, and were carried out almost exclusively by USG personnel or Americans under contract. Consequently, even if the assessments had arrived at sound policy conclusions, there would have been comparatively little reason to expect the LDCs to follow them in the allocation of their own resources.

Leaving the issue of foreign assistance agency paternalism aside, it seems obvious that in the absence of host-country participation, without the learning achieved by officials through increased familiarity with the ideas and methodologies applied in the analysis, it would be foolish to expect a change in the outlook of these officials and a subsequent alteration in host-country policy and in the use of host-country resources. Learning is an essential element in the development process. This is a principle that applies to all sectors. Nevertheless, one is especially surprised to see the principle brushed aside in a sector called education.

The involvement of host-country personnel, and the development of host-country capacity for data collection, processing and analysis, have not been a purpose of the education sector assessments. The development of this host-country capacity should become a prime purpose of future AID work in this area, whether it is referred to as "assessment" or as "analysis". LDC policy-making needs to be improved. It will not be improved by hurried impressionistic reviews of the sector carried out exclusively by Americans. It can be improved through collaborative analysis and the accompanying internalization of the analytical process.

Failure to satisfy the basic needs of the poor majorities reflects, in large part, the failure to properly analyze their problems. Vested interests opposing reform usually play their part, but these interests are invariably in a stronger position in the absence of any countervailing power, such as the force of sound documented analyses that focus on efficiency and equity issues. Besides, without such analysis AID cannot measure the distance between what could be done and what is done to make the poor majority better

off and productive. Without an analysis that leads to the formulation of a reform policy, it is extremely difficult, if not impossible, to determine the extent to which vested interests are blocking reform.

By collaborating with LDCs in multi-year projects that both provide analytical findings of immediate utility for policy and develop host-country capacity for data collection, processing and analysis, AID will be taking a very large step in the direction specified by the Congressional mandate.

C. Other LDCs: The Possible Similarity of the Problems, and the Possible Applicability of the Methodology

In other LDCs, are problems of insufficiency being taken for problems of inefficiency? Are, for instance, students who enter the first grade but do not get very far being automatically labelled as "desertors" or "dropouts"? Are other countries overlooking the three kinds of repetition and the four kinds of "dropout" -- the treatment of each requiring its own kinds of corrective measures? Are repetition and illiteracy being underestimated? In other LDCs has the viewpoint that a universal primary education is not financially feasible been mistakenly and prematurely adopted?

The right answers to these questions can only be given on a country-by-country basis and after review of the relevant facts. Last week, a preliminary review of documents and exchanges with officials in Lima, Peru, by the mission education advisor, two BUCEN officials and myself served to reveal some important similarities and some differences. Repetition is clearly under-reported. The Peruvians are collecting a huge amount of data which they are not processing expeditiously. This data would appear to have great potential for fruitful analysis. It would appear that there is considerable room for improving disaggregate measures of internal and external efficiency (relevance). As in the case of El Salvador, development of a general methodology which clearly distinguishes between basic and intermediate problems may contribute significantly to analytical order and coherence. Parts of the Salvadoran analytical methodology would therefore seem to have application.

Many of the differences are related to characteristics of the Peruvian education reform which has an unusually solid conceptual basis. For instance, decentralization is a basic objective. Interestingly enough, establishing a successful decentralization process will require fuller information and understanding at the national level. To properly allocate national funds among zones or provinces, the Ministry will need regionally disaggregate measurements of the supply of school spaces and teachers, school-age population and demand for schooling, local finances, repetition and "dropout". Arriving at estimates of resource allocations for an optimum sectoral policy may involve more time in Peru due to the size of the country

and the complexity of some of the problems. As a result of the El Salvador analysis, past mistakes and experimentation can be avoided, and procedures carried out more rapidly. Nevertheless, analysis and planning will have long-term beneficial effects only if it is done by the Peruvians, with AID playing a collaborative role.

D. The Issue of LDC Capacity and the Appropriate Scope of the LDC-AID Analytical Project

Since the kind of analytical project I have described is collaborative (an example of the North-South dialogue) and involves the participation of the host-country in every phase, it must be tailored to the LDC's capacity in data collection, processing and analysis. Probably very few LDCs are able at this time to initiate an analysis as broad in scope as the Salvadoran analysis. Few have such manageable geographic and population characteristics. Most have greater deficiencies in data collection, processing and analysis. In some countries many modules or parts of the Salvadoran analysis may be applicable; in other countries perhaps very few of the modules are applicable.

New projects should include activities to arrive at shorter-range analytical outputs (now identifiable as the result of the El Salvador analysis) which would be of immediate utility for host-country and AID programming. Over time the addition of parts or modules can lead to the more accurate total or sectoral estimates of AWD #15. In this document an attempt will be made to specify complementarities and trade-offs among goals and among the five kinds or levels of education and training for the target years of El Salvador's Five-Year Plans, beginning in 1982 and ending in the year 2002. The document is expected to provide useful information for improving policy and the allocation of the sector's resources.

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