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ABSTRACT

A variety of articles address the use of communications in development, including (1) "Policy Considerations in Global Telecommunications" (Sandra Lauffer); (2) "Sharing Information for Rehabilitation in the Third World" (M. Miles); (3) "Growing More Rice in Sierra Leone: Baseline Survey Guides Media Campaign" (Gary O. Coldevin); (4) "The A.T. (Appropriate Technology) Microfiche Reference Library: Information When You Need It" (Ken Darrow and Michael Saxenian); (5) "Literacy Work in Peru" (Gary Coldevin); and (6) "Microcomputers and Health Improvement in Developing Countries" (Aziz El Kholy and Salah H. Mandil). Barbara Minor reviews five recent documents available through ERIC, and four books on development communications topics are reviewed in "A Communications Checklist." Announcements are included on UNESCO's need for instructional materials on nutrition, a free development communications catalog, a scriptwriting contest, and a 1984 summer seminar on new technologies. In "Radio Coverage Statistics," Wilma Lynn summarizes research findings on the number of broadcasting stations and receivers in less-developed countries around the world. (LMM)

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Policy Considerations in Global Telecommunications

by Sandra Lauffer

Telecommunication and information technologies have been steadily accumulating over recent years an unprecedented—and to some extent unanticipated—political and economic status in countries all over the world. This heightened status is due at least in part to the introduction of new technologies that are changing the contours of the telecommunication and information landscape, blurring distinctions and erasing boundaries that have neatly separated the fields for years.

A major question to be addressed in mapping the future is whether the advanced communication and information technologies can provide the impetus to development that is so desperately needed in so many countries. Can these technologies, if carefully planned and applied, help countries to accelerate the development process to any significant degree? Or will they instead be detrimental to national development when all of the implications are taken into consideration? For example, many of the new technologies require fewer workers than traditional systems, albeit those few must be highly skilled. Will this mean fewer jobs? Will it mean different levels of jobs with vastly different training requirements? Will it mean that the scarce supply of trained manpower can be spread more widely over other sectors, eventually advancing the whole society to another level of development? The answers are not yet clear, but they are being pursued on a number of fronts and need to be taken into account in the planning process as they emerge.

The Changing Technologies

It is generally acknowledged that the most prominent characteristic of the new technologies is digitalization, which essentially provides a single language for handling all information, whether that information be voice, data, or graphics. As a result of digitalization, transmission media are expanding in both capacity and speed; voice, data, telex, and facsimile can all be integrated to travel in a uniform format. Data processing and message carrying are thus increasingly becoming intertwined and even virtually the same process. The computer and telecommunications industries are converging, and the competition within and between these traditional industries is intense and obvious, particularly in the industrialized nations.

Another area where radical change can be anticipated is optical fiber technology, which holds promise to be more competitive with satellites than today's analog cables. Optical fiber cables should prove to be highly economical for certain kinds of transmissions and network configurations; one network is planned for the North American/Western European route before the end of this century. Optical fibers are high-purity glass, each strand thinner than a human hair. Two strands can carry 2,000 telephone calls. Optical fibers also make it possible for telephone cables to carry broadband video signals. Optical fiber technology may be significant for developing countries for several reasons: the fibers can be installed in narrower ducts than

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In this issue . . .

Sharing Information for Rehabilitation in the Third World

by M. Miles

People with disabilities in the rural Third World may be characterized as an economically weak and largely voiceless oppressed minority numbering up to 300 million. Since the early 1970s there have been a few stirrings of interest in their situation, but the difficulties of reaching and programming for this neglected section of the world's population were so great, and the perceived priorities so low, that little work was done. Whatever was done was not replicated or even communicated very widely.

The International Year of the Child (IYC) (1979) and the International Year of Disabled Persons (IYDP) (1981) turned the world's attention to the needs, and soon aid agencies were hunting for suitable projects to fund. The major shortages revealed in the search have been of *practical information* and of *trained experienced personnel.* Some progress has been made in the past five years towards meeting these deficiencies, and it is worthwhile to attempt a sketch of rehabilitation in the Third World from the point of view of information and know-how.

During the past 100 years there has been an exponential increase in the art and science of rehabilitating people with disabilities, in economically developed countries. In the past 15 years this body of knowledge, which had largely been the preserve of medical and educational professionals, has increasingly been made public through the efforts of disabled persons themselves and families with disabled members who wished to engage in home, self-help rehabilitative action. At the same time, and by interaction with this public dissemination of knowledge, there has been a revolution in aims and objectives of rehabilitation and of attitudes towards disabled persons. In the past five years there have been moves to export and adapt this knowledge and experience to the more developed parts

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previous cables; they are immune to most interference; and calls travel further, in contrast to other terrestrial systems, before the signal needs boosting, thus fewer repeaters are required. Because there is yet little experience with fiber optic technology in tropical environments, little is known about the effects of heat, humidity, and other tropical conditions on the technology.

Policy Implications

The implications of such changes are extensive for both developed and developing countries. For example, the use of microprocessors as universal components in industrial processes results in increased productivity potential that can affect virtually all areas of economic activity. Microprocessors are programmed to be self-monitoring, self-adjusting, and self-diagnosing, thus they can provide automatic detection of breakdowns and damage. It therefore becomes more feasible, for example, to build mini-factories in rural areas, as they do not require a large corps of highly skilled technicians to operate them.

However, the use of advanced information technologies requires exceptionally good planning; although such technologies generally save capital outlay per unit of output, they generally increase capital outlay per worker employed. International management specialist Juan F. Rada conjectures that, because "the saving of capital is a crucial factor for the Third World, the technology could be used beneficially, *providing that the application complies with a well thought-out plan aimed at fulfilling the needs of the majority of the population*" (emphasis added). Major diseconomies may result, however, if the new information technologies are introduced randomly, with inadequate attention to systematic and coherent national policies.

Technological Dependency

It is important to consider the impact of the new technologies on the gap between the rich and poor countries. While microchips may increase industrial productivity, they also alter production processes and products by shifting mechanical, electromechanical, and electronic control processes into microprocessors. Technology transfer to less advanced countries thus becomes a more complex process; workers cannot understand and deal with microchips at their most fundamental level. Adaptation and maintenance of the microchip may well stay in the domain of the manufacturer. Technological interdependency may be increasing, but control will reside where the functions of the microchip are understood.

Increasingly, advanced communication and information technologies are purchased, rather than transferred; the information processing field abounds with "black boxes" and "turnkey projects," which tend to limit the use of domestically produced equipment and move the purchasing countries away from manufacturing their own components or into manufacturing only supporting components.

The new technologies also hold significant implications for the labor force in all countries. Whereas developing countries may have a relative advantage in production processes because their labor costs are low, that advantage can diminish as industrialized countries become more able to lower their own labor costs by using robots and other advanced production aids. Developing countries thus need to anticipate these and other impacts of microelectronics, possibly focusing their efforts on using advanced information processes to process their raw materials in order to maintain a competitive position in the global marketplace. In terms of educational planning, it is important to begin now to train the labor force that will be charged with implementing the new technologies.

The less developed countries are becoming alert to the dangers of dependency in the software area. Developing countries are relying on industrialized countries to a high degree for data processing, research, and design functions. Not only does this move them away from achieving their own research and development capabilities, it also makes them vulnerable to the risk of losing legitimate access to vital information through the selective release of data. And it is a tremendous drain on hard currency resources.

Imported or National Technology?

Developing countries are faced with a series of complex and often conflicting problems associated with importing new technologies, while at the same time supporting the production of their own technology. Limited economic resources tend to favor imported technology, which has already been tested and which has had its development costs spread over the large existing markets in the industrialized countries.

Harroldo Correa de Mattos of Brazil has outlined the process of developing national technological capacity, which he sees as occurring in four distinct phases. The first is a phase of technological absorption, in which the user is exposed to the equipment, attains a degree of familiarity with its parts and components, and learns to operate and maintain it. In the second phase, the advent of industrialization, the user begins to explore and control the technical characteristics of the equipment. The third phase is the beginning of development, with efforts to nationalize the technology by substituting national components for imported ones. The fourth is the research phase, wherein "the expert begins to develop his scientific skills and creates adequate conditions to achieve the technological independence of his country." The Brazilian strategy for encouraging the development of national industrial development has included giving local manufacturers longer delivery terms, more favorable payment conditions and order guarantees, and limiting the rise of competition through policies such as import restrictions.

Benefits of the New Technologies

The benefits that will accrue from the new technologies are significant. Advanced information technologies pave the way toward improved accuracy, reliability, and timeliness of statistical information, which makes it more valuable for decision making and planning. Such technologies also serve to reduce the time lag between events and their evaluation, increasing the potential for more relevant decisions, policy design, and understanding of real feedback and reward processes. Agricultural marketing is an example of a sectoral application that can benefit substantially from advanced information processing and dissemination capabilities. For example, the installation of a satellite earth station on an Alaskan island enabled the local fish packing plant to get current information on demand and prices in the East Coast seafood market, and thereby to adjust its catch. Advanced technologies may also help to optimize the allocation and use of resources by tracking industrial processes more effectively.

Countries might also consider the positive impact of telecommunication-computer linkages on labor force development and job creation. For example, corporations in the United States are beginning to see the economic advantage of having such functions as word processing and mailing list maintenance performed by workers in countries where labor costs are not as high, capitalizing on the rising quality and decreasing cost of the international telephone system to link them to that distant work force. This has a parallel negative consequence, in that it contributes to unemployment in the United States.

There are also positive cost implications associated with the new digital technologies. Digital systems are estimated to be 20 times more reliable than electromechanical systems; they take less space and less time to install, have lower operating and maintenance costs, and offer a higher quality of service. Further, system expansion to accommodate new customers and services can be modular and thus may not require a redesign of the system.

Telecommunications and Development

The growing status of telecommunications internationally is also attributable to a growing recognition of the importance of telecommunications to all aspects of a nation's development -to agriculture, education, transportation, health care, rural/urban migra-

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Growing More Rice in Sierra Leone:
Baseline Survey Guides Media Campaign

by Gary O. Coldevin

Sierra Leone, like the majority of West African nations, is primarily agriculturally oriented. Approximately 75 percent of its 3.9 million people live in the countryside. But while farming accounts for 30 percent of the Gross Domestic Product, most of it is still based on shifting cultivation. Small farms average about three acres per unit, and farmers use traditional implements and slash and burn methods. As a result, the growth of this economic sector has been slow, averaging only about 1.5 percent per annum since independence in 1961. Population increases – currently estimated at 2.6 percent—have been greater, so that by 1974 the demand for food had outstripped national production.

Rice is the staple crop in Sierra Leone and provides for 80 percent of the total food consumption. The current annual rice production is estimated at over 300,000 milled tons. About 380,000 tons are required to adequately feed the nation, leaving a deficit of about 80,000 tons which have to be imported and paid for with foreign exchange. If Sierra Leone were self-sufficient in rice production, the funds now used for importing rice could be used to generate an export market economy.

With this background in view, the government of Sierra Leone has made increased yields, increased acreages, and more productive rice farming key development priorities. About 60 percent of the current rice production is through the so called "upland" farms, but the area for expansion of this ecology is limited. Experts from the United Nations Food and Agriculture Organization (FAO) suggest that to expect even a 10 percent increase over current levels from this source is optimistic. The more immediate solution lies in expanding and improving swamp land rice farming. Current estimates indicate that of the 1.7 million acres of swamp land potentially available for development, only 13 percent are in use. Thus the area available for expansion is considerable. Equally important, the yield from an acre of swamp land is six times that which one could expect from an acre of an upland farm. Ministry of Agriculture officials suggest that up to one third of the nation's total rice requirements could be grown on swamp lands. Their primary problem is one of educating the farming community about this potential resource and providing information and training about appropriate farming methods and high-yield seed varieties. This is an easy task, given the existing communications infrastructure and estimated 95 percent illiteracy rate of the nation's 300,000 small farmers.

While agricultural extension agents are often an effective way to promote agricultural innovations to farmers, they have not been particularly successful in Sierra Leone, because of the low agent-to-farmer ratio. Currently, about one extension agent is available for every 500 farmers, whereas a ratio of 1:250 is recommended. In addition, transportation facilities are lacking and print information is poorly distributed among the agents. Direct action among the farming community has been haphazard as a result.

Radio is receiving increasing attention as support for extension services. There are an estimated 250,000 radios in the country, or one receiver for every 15 people. Radio's potential access to adult farmers is thus reasonably high, and with its ability to slice through problems associated with illiteracy, radio is perceived as the only effective way to reach the rural community on a national level.

"... Radio is perceived as the only effective way to reach the rural community on a national level..."

Radio broadcasting began in the mid-50s when Britain established a radio studio and 10 kw. medium wave transmitter in Freetown, the capital city. This service was limited to the southern portion of the country. With the construction of a 250 kw. short-wave transmitter in 1973, radio coverage was assured on a national level, although recurring problems with fuel supplies to operate the facility have precluded a reliable transmission schedule.

Agricultural Radio

Regular agricultural broadcasting began in 1976 with the creation of the Publicity Unit of the Ministry of Agriculture. Its initial objectives were to explain the aims of government policy to farmers and to provide basic information on farming methods. More recently, in 1982, it was renamed the Agriculture Communication Unit and given a revised mandate: to support extension services and key agricultural development sectors.

The basic radio production format consists of four 15-minute programs per week. Broadcast under the banner of "Farming Magazine" at 7:30 pm from Tuesday through Friday, each of the four main language groups in the country occupies a particular evening. Interviews and other material such as market reports are interspersed with popular music and assembled for transmission simultaneously on the medium- and short-wave services. A "one message per interview" format is common. Topics are regionally based and planned around seasonal activities and current information needs.

The Unit also produces posters, pamphlets, and slide-cassette programs, which prior to the current campaign were mainly used at agriculture fairs.

FAO Assistance

When the Communication Unit was created, it was severely hampered by its lack of trained production staff, audiovisual equipment, and raw film stock. Transportation facilities were virtually nonexistent. On the positive side, the Ministry provided for additional staff to establish communication sections in the seven administrative regions of the country. Their role would be to produce audio segments for radio broadcasts and to organize extension communication support services such as cassette listening groups and slide-tape presentations.

The FAO was approached in this context for technical and training assistance. Production equipment and supplies were purchased to strengthen the audio and photographic sections, and a Land Rover was supplied for the Unit's exclusive use. External consultants were brought in to conduct six-week workshops in rural radio and slide-tape production.

The FAO's third innovation was to recruit a media evaluation consultant to assist the Unit in determining baseline levels of farmers' knowledge and practice of, and attitudes toward, key agriculture development priorities. The Unit would subsequently produce materials for a multi-media campaign based upon the recommendations of the survey. The campaign would last between two and three months, after which another survey would be taken to assess its impact.

The Baseline Survey

The FAO evaluation consultant arrived in Sierra Leone to begin the six-week mission in December 1983. Initial discussions with the Communication Unit centered on the topic or topics to be included in the baseline survey and information campaign. Two important decisions were made: 1) The survey should be centered on *one* priority area of development, and 2) the information campaign should spearhead a drive which could be reinforced primarily by extension workers, but would also include regional agricultural officers and a variety of organizations with central theme projects (U.N. Agencies, the Peace Corps, Integrated Agricultural Development Projects, the Seed Multiplication Project, etc.). Following the rationale outlined earlier, planners made expanding and improving swamp rice production a major development priority, and that activity therefore became the immediate focus of the inquiry.

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(**Swamp Rice** continued from page 3)

The basic parameter for selecting the sample was that respondents should be heads of household and either involved in, or having high potential access to, swamp rice farming. We then set about a stratified sampling which would yield subjects in three stages of swamp farm development: 1) *Fully Developed* (good irrigation structures, drainage, and water control), 2) *Partial* to *Semi-Developed* (ranging from cleared areas for planting to some irrigation structures and drainage), and 3) *Undeveloped* or *Traditional* (no irrigation structures, no drainage, seeding mainly by broadcasting, or scattering seed about). We also included a group of uniquely upland farmers in the Traditional group, farmers who had ready access to undeveloped swamps should they choose to farm them. The main focus of the information campaign would be directed toward the Semi-Developed and Undeveloped categories with the Fully Developed stratum serving as a criterion or reference group.

The initial target sample was set at a minimum of 25 subjects--chosen at random—in each stratum for each of four districts (minimum of 75 for each district, 300 overall) to represent a good cross-section of the country at various levels of swamp development. Final sampling tallies were 121 subjects (34 percent) in each of the Fully Developed and Undeveloped categories and 114 (32 percent) in the Semi-Developed group. Fifty-two uniquely upland farmers were included in the Undeveloped category. In addition, we included a control group having no access to swamp farming to test the knowledge and attitude portions of the questionnaire.

The survey instrument consisted of six sections: *identification* (name, district, village, location of house or farm); *basic demographic data* (age, sex, religion, marital status, education, literacy levels; type, size, and tenancy of farm); *practices, information levels* and *perceived information needs; attitude postures;* and *information sources.*

In deciding how to structure the practices and information levels sections, we compiled a listing of the key stages of swamp farming and ordered it into what we termed "indicators of swamp rice development." Seven indicators were included: Land Preparation, Seed Selection, Nursery Management, Transplanting, Fertilizer Application, Weed Control, and Harvesting. With the indicators in place, the first portion of the questionnaire section relevant to each asked the respondent to describe his or her current or projected practice. In this manner a score indicating the level of recommended practices could be compiled for each individual, with a maximum score of ten possible.

Next came information questions about the particular indicator which tapped respondents' knowledge levels of recommended techniques and practices advocated by the Ministry of Agriculture. These questions were generally open-ended but precoded to incorporate the range of correct answers possible. A total score of 83 was possible.

After completing the practice and information level questions, each subject was asked to enumerate his or her perceived information needs about each of the indicators. The rationale employed here was to place the individual in a state of analyzing his or her current practice, then to allow an expression of knowledge of "correct" techniques for each indicator *before* being asked about specific information needs. Further, by blocking practices, knowledge levels, and information needs separately for each indicator, the respondent was able to focus clearly on each issue at hand, which would not have been the case if all practice questions had been asked together, followed by all information level questions, and finally all information needs.

Attitude postures were assessed through a ten-item attitude scale created from the available literature and surveys on positive and negative features of swamp rice farming. A Likert-type rating scale followed each statement, but rather than using the standard five point scale, we opted for a three point response format, namely, Disagree—Undecided—Agree, since we wanted an instrument which would be simple to understand and administer, two important points to consider when dealing with a "hard to get at" and busy group of farmers. A maximum score of 30 was assigned for these scales (one for Disagree to three for Agree for positive direction statements).

The final section of the instrument assessed media exposure levels, kinds of information available, levels of contact with extension agents, preferred media and interpersonal sources, and perceived utility of all available sources of agricultural information.

Radio Producers Conduct Interviews

The instrument was pretested with ten farmers at various levels of swamp development near Freetown. In the actual field administration, all interviews were conducted by seven radio producers who had attended the FAO rural radio production workshop and who were soon to be posted to their respective regional headquarters. This process yielded several positive benefits: 1) It sharpened interviewing skills with regard to asking focused questions and probing for additional information, techniques which the producers could transfer to the preparation of radio programs, 2) it provided an excellent opportunity to meet their potential "Farming Magazine" audience and to assess felt information needs first hand, and 3) producers became familiar with the agricultural community in the districts where they were to be employed.

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Results

As expected, the majority of the sample was in the 40 plus bracket in terms of age (74 percent) but deviated considerably from national norms in terms of educational background, with 31 percent having attended a formal educational program. As a result, literacy levels were high, with 26 percent being able to read and write English, the official national language. Interestingly, the bulk of literate and educated respondents were owners or renters of Fully Developed swamp farms.

Only 24 percent of the total sample had a working radio in their houses (another 9 percent had radios which were not working because of the lack of, or high cost of, batteries). An additional 55 percent, however, said they listened at neighbors' homes to bring the current active radio audience to 79 percent. Ninety-seven percent of these indicated mostly evening listening, with "Farming Magazine" occupying almost 90 percent of program preferences. Many, and especially those in the north, indicated "occasional" listening only, a result of the sporadic service available on short-wave. One can assume that the frequency of listening would rise in direct proportion to the frequency of broadcasting given this overwhelming preference for agricultural programs.

The extension agent ranked as the most preferred interpersonal source of information (79 percent) and radio as the most preferred media source (76 percent). When asked to name the most useful of all available sources of information, the rankings were, in order, extension worker (61 percent), neighbors (47 percent), and radio (45 percent). The data thus support the dominance of interpersonal sources in general among the rural population. Radio is surprisingly strong in this context, however, and presumably its ranking would be improved further with a more reliable national service.

A predictable pattern was revealed among the mean scores generated for practices of recommended swamp rice farming techniques with the Fully Developed farmers scoring 8.45, Semi-Developed 6.76, and Undeveloped 2.61. An identical trend was noted in knowledge levels although the averages across all three groups and most indicators were low (24.4, 19.4, 11.6 respectively out of a possible score of 83). Notably weak areas were knowledge and practice of adoption of new seed varieties, transplanting seedlings, and the use of fertilizers. Attitude scores, on the other hand, were surprisingly uniform across all three groups, and with the exception of three areas (belief that swamp farming causes health problems, interferes with traditional ceremonial rites during the dry season and that fully developed swamp farms can be cared for by women and chil-

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On File at ERIC

Documents recently entered in the ERIC (Educational Resources Information Center) files include instructions for making and using low-cost instructional materials, a report on cooperation among regional communication training institutions, a paper on the development of information manpower, a checklist of items required for planning a national communication system, and a guide to preparing a computer search for the ERIC database. All five are available on microfiche and four in paper copy from the ERIC Document Reproduction Service (EDRS), P.O. Box 190, Arlington, Virginia 22210, U.S.A. Be sure to include the ED number and payment in U.S. funds for the price listed plus shipping. One is also available from the publisher.

● *Low-Cost Educational Materials: How to Make, How to Use, How to Adapt. Inventory. Volume II.* 1982. 123 pp. (ED 237 059)

This guide provides instructions for making and using 52 low cost indigenous teaching materials and devices developed during a second series of national workshops held in Bangladesh, Indonesia, the Republic of Korea, Papau New Guinea, Sri Lanka, Thailand, and the Socialist Republic of Viet Nam in 1979 and 1980, and also during the second Sub-Regional Workshop on Educational Technology held in Dacca in 1980. Each description lists the subject area, objectives, materials needed, and source. Instructions tell both how to make the item and how to use it, and describe possible modifications where applicable. The items described include hand-made maps; models and displays; educational toys and games; and science apparatus, including a thermoscope, simple electroscope, simple microscope, osmoscope, plastic beaker, bamboo thermoflask, common pump, spring pendulum, and balances. Instructions are generously illustrated with line drawings. This guide from Unesco's Asian Centre for Educational Innovation for Development in Bangkok is available from EDRS in microfiche for 97¢ or in paper copy for $9.15. Volume I of this publication (ED 205 166), which was published in 1980, contains instructions for 85 products. It is available from EDRS in microfiche only for 97¢.

● *Meeting of Experts on Co-operation among Regional Communication Training Institutions. Final Report, Paris, France, April 19-22, 1983.* 1983. 19pp. (ED 237 067)

Cooperation among institutions, ways of facilitating exchanges of specialists and experience, and the joint development of learning resources were examined in a meeting of leaders from 31 regional training institutions in all world regions. Part of Unesco's long-term concern with the training of media professionals, the meeting opened with a presentation by Antonio Pasquali, Deputy Assistant Director-General for the Communication Sector, who discussed Unesco's professional training programs. Reports presented by participants in plenary sessions focused on specific regional training problems and needs, with emphasis on the trainer and training methods, curricula, training materials, new techniques, and the need for greater regional and interregional cooperation. Participants then separated into two working groups to formulate recommendations concerning cooperation with international and regional communication training organizations, staff development, curricula, textbooks and training materials, specialist needs, women in the media, research and evaluation, and clearinghouses and miscellaneous needs. The 36 consolidated recommendations that resulted were adopted by the participants at the final plenary session. An annex lists participants, observers, organizations of the United Nations System, and the Unesco Secretariat. This Unesco report is available from EDRS in microfiche only for 97¢.

● Farid, Mona. *The Development of Information Manpower Resources.* 1982. 16pp. (ED 235 833)

This paper examines the training and education of information manpower in the formal educational institutions of Latin America, Africa, and the Middle East. The nature of the information, social, and economic infrastructures in developing countries is also examined. It is suggested that potential information users must be made aware of its importance and how to access it; simply making information available does not constitute in itself a necessary and sufficient condition for its use and the proper utilization of technology. Shortcomings in educational programs for information manpower are identified as the organizational structure of library and information science schools; the well-defined lines between disciplines; the shortage of qualified faculty; methods of teaching; the lack of proficiency in the western European languages in which much of the literature is written; and the absence of a systems approach methodology. Eight recommendations are presented for improving the educational level of information specialists in order to convey the maximum social benefits to developing countries. A 25-item bibliography is included. This 16-page paper is available from EDRS in microfiche for 97¢ or in paper copy for $2.15.

● Rahim, Syed A. *Data-Base for Communication Planning. The Basic and Statistical Data Required for the Elaboration of a Plan for a National Communication System.* 1978. 28pp. (ED 235 816)

Based in part on a list developed by Unesco for use in Afghanistan, this guide presents a comprehensive checklist of items of statistical and descriptive data required for planning a national communication system. It is noted that such a system provides the vital information component for the mobilization and utilization of matter and energy in the process of development, and that the system includes postal services; telecommunications; radio; television; satellite services; computer telecommunications links and online databases; libraries and documentation centers; the press; books and other publications; records, cassettes, and videotapes; films and movies; other audiovisuals; popular culture events; organized interpersonal communication; meteorological communication; commercial and trade communication; advertising; and administrative and security communication services. The checklist of information items required is divided into six areas; societal values, goals, objectives, and institutions; societal context: international context; communication institutional structure; communication technology, resources, and services; and communications future. A statement on the relevance of each of these planning aspects and a discussion of appropriate sources of the required information are provided. Also provided is introductory material on the general planning framework and the social, economic, technological, and international considerations related to national communication planning. This 28-page guide from the East-West Center, University of Hawaii, is available from EDRS in microfiche for 97¢ or in paper copy for $3.90.

● Laubacher, Marilyn R. *How to Prepare for a Computer Search of ERIC: A Non-Technical Approach. Revised and Updated.* 1983. 56pp. (ED 237 100)

Designed for educators requesting information from ERIC and for the search intermediary who channels their requests to a search service, this updated guide explains in non-technical language the steps involved in preparing a computer search for the ERIC database. Topics covered include choice of a database and how to determine whether a manual or computer search is appropriate; the definition of the topic to be searched; ways in which ERIC materials may be searched, including author, title, descriptors and/or identifiers (subject index terms), and free text; using the *Thesaurus of ERIC Descriptors;* how descriptors and identifiers are assigned and the aspects of the documents that are indexed, such as population described, format and type of document (research report, position paper, teaching guide), and educational level. Five appendices include lists of the ERIC clearinghouses with contact information, databases of interest to educators, publication types and codes, and educational level descriptors.

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(**Rehabilitation** continued from page 1)
of the Third World. The "last frontier" remaining to be crossed in the next 20 years is the dissemination of appropriate knowledge, rehabilitation skill and experience to the rural and less developed areas of the Third World.

Such dissemination as has already taken place has provoked some anguished reaction from rehabilitation professionals who see their trade secrets being hawked in the market place, and who fear a dilution and oversimplification of their skills. For better or worse the cats are out of the bag, and the task now is to raise the level and quality of both information and skills. There is no possibility of returning to the dark ages of "guild mysteries."

Typically, rehabilitation facilities in the Third World have started in big cities either with expatriate staff or with nationals who have trained in the West. Orientation has initially been towards a high-tech, institutional approach, providing a high level of rehabilitative service to a small number of clients at considerable expense. The trend is now to try to redistribute rehabilitation resources much more widely by training nationals in their own country, by including rehabilitation skills in the professional training of medical, paramedical, and educational personnel, and by giving knowledge and skills directly to disabled persons and their immediate relatives.

Available Resources

Among the classic "How to do it" manuals are Huckstep's *Poliomyelitis: A Guide for Developing Countries*[1] and Pitcher's *How to Raise a Blind Child*[2], both written on the basis of long experience in Africa and Asia. Less widely accessible to the anglophone world has been the valuable work of the Frères Jaccard[3] in Cameroon in appropriately low-tech, low cost prosthetics and orthotics. The rehabilitation experience developed by Mexican villagers in Project PROJIMO, in which the majority of rehabilitation workers and technicians have themselves been disabled, is potentially of very great importance. If crippled, uneducated, and apparently "useless" villagers can learn in the space of a few months enough to provide the rehabilitation service described by David Werner[4], then a major solution has been found to the problem of personnel resources. There remains the problem of *distributing* the information and developing the appropriate attitudes and confidence.

In the field of mental retardation and developmental delay, several schemes have been developed for use in the West and then adapted in less developed countries. The Portage Project[5], a home-based rehabilitation system developed for rural areas of Wisconsin, USA, has been used in Spanish in mountain villages of Peru and a number of other places. Adapting the Portage Project for use in the West Indies, as much as possible of the material was represented pictorially in order to overcome the literacy barrier.[6] The HANDS approach to mental retardation in Nepal also concentrated on mobilizing persons with little or no education.[7]

The quantity and complexity of information on child development and programming necessary to overcome learning difficulties should not be underestimated. This mistake was made in one of the more widely disseminated manuals, still in experimental draft, *Training the Disabled in the Community*[8]. Material from the Hester Adrian Centre's *Parent Involvement Project*,[9] which is being field tested in several Asian countries, and the programs associated with Chapel Hill's "Learning Assessment Profile" (LAP)[10] used for several years in rural towns of Egypt, together with Portage Project material, go a long way towards filling the gap.

Severe hearing impairment, speech impediments, cerebral palsy, and multiple handicaps are among the more difficult types of disability to approach for general advice broadly disseminated. The rehabilitation of the pre linguistically deaf child should commence by the age of 12 months, whereas in the rural Third World this disability does not generally attract attention until much later. In the absence of hearing aid technology and servicing arrangements, it is an extremely difficult task to teach the severely deaf child. Pamphlets produced by the All India Institute of Speech and Hearing, together with their "hearing camps" in rural areas, are among the few forays into this field in rural Asia.[11] The adaptation of normal home activities for stimulation of the cerebral palsied child, so that mothers can maximize the positive stimulation of their child in everyday life, has been investigated and taught by Sophie Levitt, the pediatric physiotherapist. Some of this experience has been incorporated into the CHILD-to-Child pamphlets.[12]

"It seems that human society is seriously impaired and in need of rehabilitation..."

More general approaches to the social barriers which create handicaps out of disabilities, and the design deficiencies which turn impairments into disabilities, have been slow to follow the "nuts and bolts" rehabilitation manuals. Advice on integrated education of the blind for Africa and Asia has been produced by the Commonwealth Society for the Blind[13], and Nigeria as early as 1978 produced *Integrating Marginally Handicapped Children into the Regular Classroom: A Sourcebook for Teachers*. The UN published in 1983 *Designing with Care*,[14] a guide to the adaptation of the built environment for disabled persons, which specifically concentrated on the needs of developing countries both at urban and rural levels. The International League of Societies for Persons with Mental Handicap issued in 1978 a guide to the implementation of the rights of mentally retarded persons, entitled *Step by Step*.[15]

It is, however, becoming apparent that design problems, legal obstacles, and social barriers are merely the visible tenth of an iceberg of negative attitudes, feelings, and stigmatizing beliefs within the community at large.[16] Unless this submerged reservoir of ill will and bad faith is tackled, the guides and manuals will achieve relief merely on the surface, and will leave the *person* without rehabilitation. It seems that human society is seriously impaired and in need of rehabilitation as much as are disabled individuals.

Extremely little has been done or even attempted as yet in the Third World towards large-scale intervention for positive attitudinal change. Practically no controlled studies have been made of the socioeconomic, cultural, and religious roots of prejudice against disabled persons, even in more developed countries. Consequently the public information effort during the IYDP tended to lack target and impact.[17] Some of the western advice manuals such as *Training the Disabled in the Community* even tend to reinforce the image of the disabled person as a helpless object to be trained, rather than an agent in his or her own life.

Disabled persons themselves in rural areas of the Third World remain practically untouched by the spread of information sketched above. There is no reliable mechanism for distribution of printed material into the hands of disabled persons and their families, the great majority of whom in any case do not yet read. A similar problem has of course faced every effort of public health education and primary health care. A number of methods such as village theater, group discussions, role play, and puppet shows have been used. Many of these are described in *Helping Health Workers Learn*.[18]

Recourse had been had to broadcasting programs of advice and information. Radio is a potential channel for the dissemination of rehabilitation information, though the task is daunting. Rehabilitation skills tend to be more complicated than primary health care, and the results tend to be much slower than in curative medicine. Is it possible, or prudent, to attempt to address at random the problems of unknown thousands of families with blind, deaf, mentally retarded or physically handicapped members, none of whom would in practice provide any feedback on success, failure, or disastrous effect of the advice given? There is a picture even more daunting to settle the question: the present condition of disabled persons in rural areas, many of whom live a pitiful and subhuman existence for lack of practical information which could change their lives.

The format chosen for the rehabilitation information broadcasts is a series of 12

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minute dialogues between doctor/counsellor and disabled person/relative/local leader. Building on six years experience in the North West Frontier Province of Pakistan, developing both institutional and community-based rehabilitation facilities and counselling families with disabled members from all over the Province (population 18 million) and from Afghan villages, the broadcasts aim to achieve a level appropriate to the constraints on resources in the village situation, while appealing to the common sense and practical wisdom of the audience.

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M. Miles is Administrator of the Mental Health Centre Peshawar, Pakistan; Project Consultant for the FAMH/UNICEF Community Rehabilitation Development Project; and a member of the Public Information Committee on the International League of Societies for Persons with Mental Handicap.

A future issue of DCR *will publish some of the actual radio scripts broadcast to inform rural community about various kinds of tment and rehabilitation.* ■

Radio Coverage Statistics

by Wilma Lynn

Recently, the Clearinghouse conducted research for AID on the number of broadcasting stations and receivers in less-developed countries around the world. The research surveyed 135 countries in Asia, Africa, and Europe as well as North and South America. We thought some of the research findings would be of interest to *DCR* readers.

Less-Developed Countries

Region	Population	# of Radio Stations	# of TV Stations	# of Radio Receivers	# of TV Receivers
Asia	2,626,313,000	1,364	50	119,014,000	40,858,857
Africa	483,360,000	251	188	29,695,000	7,166,169
Oceania	5,157,000	24	8	969,000	208,700
N & S America	386,573,000	3,935	65	89,522,000	36,415,500
TOTAL	3,501,403,000	5,574	311	239,200,000	84,649,226

Population statistics were obtained from the *World Factbook*, 1983, published by the Central Intelligence Agency and are accurate to July 1983. Data on radio and television stations was obtained from a variety of sources including the *World Factbook*, the *World Radio and TV Handbook* and the *World Radio and T.V. Facts and Figures*, and cover the period between 1979 and 1981.

One glaring problem that became evident from our research is the fact that reliable statistics on the status of broadcast infrastructure in less-developed countries is sorely lacking. Too often, in the case of statistics on radio and television receivers, this information can only be obtained by checking government data on the number of licenses issued yearly for radio and television sets in a given country. In a number of countries, and particularly in those where the broadcast system is government owned, no broadcast surveys have been conducted. In countries where broadcast stations are privately owned and operated by commercial institutions, up-to-date audience surveys which serve as commercial guides to audience listening and viewing patterns are regularly commissioned, thus providing a reliable guide to broadcast services and distribution. However, the reality is that the ratio of government to privately owned broadcast stations in the less-developed countries is almost 2 to 1.

Indeed, our experience points to a serious need for research on a worldwide basis that would provide accurate and reliable information on broadcast demographics as well as listening and viewing patterns. In the face of the growing involvement of the broadcast media in Third World development programs, information on listening and viewing patterns would be particularly helpful to development professionals and program planners. ■

Wilma Lynn is an international communications consultant currently based in Washington, D.C.

Unesco Needs Materials

The worldwide search is still on for outstanding classroom materials for teaching *nutrition* in primary and secondary schools in developing countries.

Types of materials needed: curricula, lesson plans, student workbooks, classroom exercises, descriptions of learning activities and experiences with the CHILD-to-Child approach, teacher- or student-made materials such as posters, flipcharts, stories, plays, flash cards, puppets, coloring books, recipes, nutrition readers, and other creative and innovative ideas and methods.

Unesco plans to use the materials to prepare two publications: an international catalogue of nutrition classroom education materials from countries around the world, and a Unesco *Nutrition Education Sourcebook* for teachers of nutrition education in primary and secondary schools in developing countries.

Please send materials as soon as possible to Dr. Susan Van der Vynckt, Education/STE, Unesco, 7 place de Fontenoy, 75700 Paris, France. ■

A Communicator's Checklist

1 *Distance Education: Evaluating New Approaches in Education for Developing Countries*, by Emile McAnany, João Batista Oliveira, François Orivel, and John Stone. *Evaluation in Education*, (Oxford, England, Pergamon Press, 1983, Vol. 6, No. 3.)

McAnany, Oliveira, Orivel, and Stone are an international group of educators and economists well qualified to examine the experience with non-traditional approaches to education. Their monograph, *Distance Education: Evaluating New Approaches in Education for Developing Countries*, provides a useful survey of a dozen distance education programs, and a much broader discussion of evaluation evidence, issues, and problems.

McAnany *et al.* define distance education as "(1) a teaching and learning organization (2) in which students of a variety of ages and backgrounds (3) study either in groups and/or individually at home with (4) centrally produced self-instructional materials distributed through a variety of media (5) with regular communication and feedback between students and teachers." This looks like quite a comprehensive definition until one realizes that it (apparently deliberately) excludes instructional programs in school classrooms. The consequence of this is that the paper does not discuss several interesting and well-documented projects that use radio or TV to deliver instructional programs to schools. However, the remaining field is still quite wide.

The paper is very long and very meaty and providing a detailed critique here is clearly impossible. Rather, I will mention and briefly comment on the authors' policy and planning conclusions. These fall into two categories: those referring to distance education itself and those concerned with evaluation issues.

The authors conclude, on the basis of the case studies they present and other literature, that the feasibility and usefulness of distance education systems is no longer in doubt. There now exist many systems that provide learning and credentialing opportunities to students inadequately served by traditional systems. They review the distinction between fixed and variable costs and draw the usual conclusion that large audiences make for low unit costs. However, they go on to point out that even so, the fixed costs of technologies can make a large difference in final costs, which usually makes radio the medium of choice.

The review of effectiveness and costs will be familiar to those in the communication field. The new, and thus more interesting part of the analysis from my point of view, is this examination of organization and management issues. The authors note that the central message from the studies reviewed is the need for a better understanding of the relationship between the organizational format and structure and the nature of the tasks to be performed by distance education projects. They note that organizational problems are particularly acute because of the many different professional specialties required to design, produce, and distribute effective instructional software. While acknowledging that there is relatively little literature on these aspects of distance education, the paper makes its own important contribution to our understanding of them.

With regard to future evaluations in distance education, the authors call for more assessments of cognitive outcomes, including comparisons with traditional systems; use of indicators beyond test scores, for example, dropout and failure rates, numbers of graduates and length of completion time; and studies of the role of motivation, contextual factors, and the influence of demographic factors on success. They also suggest more studies of costs and much more careful examination of issues of organization and management. These latter two categories of studies are badly needed. I am somewhat less persuaded about assessments that compare alternative approaches because I think it is a mistake to think that distance education is in competition with the formal system. Rather, I think distance education systems have demonstrated that they are most in demand when they provide an alternative route to goals shared by many people, but which cannot be reached by substantial numbers of them through traditional means, whether this be because of distance, expense, or constraints of scheduling. Furthermore, the evidence is already compelling that a good distance education system *can* lead to the attainment of learning goals. Thus, the need now is for much more careful study of ways to improve effectiveness and efficiency and, as the authors point out, particularly of the organizational structures through which such objectives can be attained. ■

Reviewed by Barbara Searle, an Educational Evaluator in the Department of Education at the World Bank.

Available from Pergamon Press, Ltd., Headington Hill Hall, Oxford OX3 OBW, U.K., for US $24.00.

2 *Information Technology in the Third World: Can I.T. Lead to Humane National Development?* by William James Smyser. (Boulder, Colorado, Westview Press, 1984, 183 pp.)

Information Technology (I.T.) in the Third World presents a liberal perspective on the process and effect of mass media, telecommunications, and computer technology in LDCs. The author explores in much detail the efficacy of I.T. and communications as agents of economic, social, and political development in the Third World. The logic, arguments, and interpretations are posed by the author to reflect a composite view of Third World people. In other words, the problems, actual or perceived, of utilization, acceptance, and adoption of I.T. in LDCs have been compounded by influencing forces from developed countries. Essentially, the author faults the use of I.T. because of its dominance by those with advanced technologies. In turn, he views I.T. as a viable option for humane development in LDCs. I.T., in effect, is both good and bad, cause and effect, problem and solution.

The author, somewhat apologetically, cautiously and continually qualifies the potential applications of I.T. in Third World development. He states that: 1) access to I.T. does not automatically produce changes—changes are not always positive—certain types of communication such as propaganda inhibit changes; 2) mass media has been viewed as a fundamental causal element of development, a concept rejected by LDCs; 3) good communications can change a person's perception of the situation, but it cannot, in itself, change the situation.

The author in conceptualizing his thesis attempts to develop a comprehensive definition of Third World communication. "Communication is far from a single independent variable. It is both a dependent and an independent variable in a complex set of relationships with social, political, and economic institutions and processes." Operationally, the definition remains obtuse.

The author's treatment of humane development and the role of communications is handled exceptionally well. He contrasts social, economic, and political development within the framework of humane development. The changes and the impact of I.T. and communications on development are systematically woven throughout the book. The question that serves as the title to the book is answered more than once and from

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different perspectives.

If there is a weakness in the book, it is the section on the technology and, in particular, the information on satellite communications. The data and the references are dated.

His final chapter which he titles "Conclusion: Requirements for Human Development," is much more than a concluding statement. It is, first of all, a synopsis that reflects both insight and sensitivity for people and places affected by the condition of communications. It is also a challenge and a plan of action for Third World leadership. In summary, the book is an excellent resource for those interested in learning about communication problems of Third World countries. ■

Reviewed by Louis Bransford, Vice President of ConferTech International, Inc. Dr. Bransford specializes in satellite communications, particularly in the planning and use of teleconferencing.

Available for US $15.00 from Westview Press, 5500 Central Avenue, Boulder, Colorado 80301, USA.

3 *General Introduction to the Techniques of Information and Documentation Work*, by Claire Guinchat and Michel Menou (Paris, France, Unesco, 1983), 340 pp.

This book fills an important gap in the fields of librarianship and documentation. In one single volume the principles and practices of these growing fields are explained in detail. For the people pursuing information careers, especially in developing countries, this book can serve as an important manual and textbook. In the foreword, the authors state their hope that the text "will succeed in strengthening the motivation and improving the skill of those beginning or pursuing a career in a library or information unit without the necessary basic training."

The entire field of information science is dependent on the organization of efficient library and documentation systems. This requires well-trained personnel who understand how their assigned tasks contribute to the system, and who understand enough about the principles of the system to see how their specific tasks might be more efficiently accomplished. The absence or shortage of trained staff is especially acute in developing countries, leading to serious inadequacies and an inability to build national information and communication systems.

This manual does not teach the skills required to perform a specific task. It does, however, explain these tasks and sets them in the proper context. This manual will not replace the need for basic training, but it will serve as a short-term remedy when training is not available and will also help prepare future students. This handbook is organized as a tool for self-training; that is, descriptions of the various operations and concepts are given in modular form so that the student need only consult the portion directly related to the task at hand. But, because of its comprehensiveness, this manual should not be overlooked as an important resource for schools teaching library and information science. Among the specific tasks discussed in this book are selection and acquisition, document storage, bibliographic description, contents description, classification, indexing, abstracting, information retrieval, and information services. Also discussed are basic bibliographies and reference works, language authorities, facilities and equipment, and methods for the evaluation of information storage and retrieval systems. The authors have also included chapters on international information programs, standardization, education and training, research methods, and other policy issues.

The authors have stated their intent to concentrate on "contributing to the preparation of personnel working in computerized information systems." Although they have tried to cover some manual techniques as well, the emphasis on automated processes is readily apparent. However, practitioners who rely on manual systems, for whatever reasons, can still benefit from the book. The principles of library procedures, which apply regardless of the processes used, are the primary subject of this book.

It is important for such a book to be comprehensive, and it is important for correct procedures to be taught. However, the reality of most situations will force information staff to bend or break established procedures in order to best serve the user. The procedures described in this book represent the best of "good library practice," and conform to the principles established by library and information science educators. Most readers will discover, however, that the principles cannot always be reduced to practice, and the *needs* of their particular clientele and the availability of key resources will serve more to determine the procedures followed than will the principles outlined by books and educators. At the same time, however, it is important that those pursuing careers in library and information science know and understand the principles. Only in this way can they determine which they can ignore, and what consequences to expect if they choose not to follow standard practices. Guinchat and Menou present the information in this manual as if all readers will be able to achieve the high goals established. This in no way diminishes the book's usefulness, but readers should be aware that good library and information services can be offered even if only minimal resources are available.

By using the modular-chapter approach, the authors hope that each chapter can be updated separately. Appendices written according to local specifications and conditions can also be added to each chapter. To be truly useful, the manual will have to be translated into as many languages as possible. However, if the English translation of the original French is any indication of the quality of Unesco translations, then independent, highly qualified translaters must be sought. It is unfortunate that Unesco chose not to support a project of this magnitude with a qualified English-speaking editor. The English text suffers from misused terms, unnecessarily complicated sentence structures, and a general feeling of heaviness. For the less skilled reader of English, these problems present a serious barrier to the thorough comprehension of the principles and practices the authors are working to explain. It would be hoped that future translation efforts of this very important and timely text warrant more attention on the part of Unesco.

This book is recommended for purchase by all libraries and documentation centers as a training and reference tool. Library and information science departments should also consider its purchase for use as a textbook and as a guide for the preparation of courses. Finally, all potential students of library and information sciences should read this book as it serves to introduce attractive career prospects. ■

Reviewed by Wendy D. White, Information Services Manager of the Board on Science and Technology for International Development, National Academy of Sciences.

Available from Unipub, Customer Service, P.O. Box 1222, Ann Arbor, Michigan 48106, USA; or from Unesco, 7 place de Fontenoy, 75700 Paris, France. (Price unavailable at press time.)

4 *Promoting Health for All*, edited by David Morley, M.D., Jon E. Rohde, M.D. and Glen Williams (Oxford, England, Oxford University Press, 1983) 333pp.

Three knowledgable and dedicated promoters of the concept of primary health care have joined in editing a compendium of case studies from 21 scattered contributors illustrating programs in countries as widely diverse as Cuba, Indonesia, China, Nigeria, Bangladesh, and Guatemala.

Hospital care systems, once considered the panacea for all health problems, envied by Third World countries, and thought of as the only means for delivery of first-class medical care, are no longer judged capable of providing the kind of care most people need. Primary Health Care (PHC), with its emphasis upon prevention rather than cure, stressing community participation and expanded use of the lower-level health worker as opposed to an over-dependence on medical personnel, received further impetus in 1978 with the now

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(**Checklist** continued from page 9)

famous Alma Ata Declaration. "Health for all by the Year 2000" became the goal of the 134 countries and voluntary agencies endorsing the concept of PHC, defined as "essentially health care made universally accessible to individuals and families in the community by means acceptable to them through their full participation and at a cost that the community and country can afford."

India, China, Cuba

Effective and affordable health technologies for dealing with the major health problems of the Third World are already at hand. Their implementation is the difficulty, and the obstacles are of a political and organizational nature. Political commitment and community participation in the organization of PHC are the two theories interwoven among the chapters of *Practicing Health for All*. The book discusses such programs as the barefoot doctors of China (now being upgraded and perhaps phased out), the voluntary agency work in Indonesia which evolved into permanent government programs (the "Ant and the Elephant" as author Mary Johnston of the Christian Medical Commission whimsically christens the tale), and India's early attempts at health worker training, reinforced in 1946 by the admirable report of the Bhore Committee proposing a national health program. Commitment, with a capital C, appears as the common theme among all the "success stories," and successful in many cases when operating with a lower level of financial commitment than other similar but less sanguine programs.

Cuba, despite an over-dependence on professionals and a surprisingly rigid medical hierarchy (a bit of *machismo*, not withstanding all the common man rhetoric?) has brought about remarkable achievements in its health care system since 1959. The vital statistics reflect the far-reaching socio-political changes that have taken place; infant and maternal mortality comparable to those of the industrialized countries; life expectancy at 72 years - the highest in the region; the dubious distinction of listing heart disease, stroke, and cancer as the most common causes of death.

With the Arusha Declaration (1975), another socialist government made its commitment to providing adequate health care for all its citizens. Yet, at the present time, the total development policies of the Tanzanian government and their specific strategies for eliminating poverty, ignorance, and disease have not been brought into line. The cure for the few, and a bias towards the urban makes the health ideal still far from realization.

In the state of Kerala, there is an emphasis, far beyond that found in the rest of India, on equitable socio-economic and political development. Income and nutritional status in this small state at the south-western tip of the Indian peninsula are among the lowest in the world, yet they have reduced fertility and mortality far below those of their more wealthy and supposedly sophisticated neighbors.

The People's Democratic Republic of Yemen, with a strong commitment to equality and broadly based people's participation, in 1973 nationalized the health sector, prohibiting private medical practice in order to mobilize all the country's scarce health resources. Coming onto the health development scene a bit later than most LDC's, they were fortunate in lessons learned from their predecessors and serendipitious also in the fact that they had already been promoting initiatives in the fields of environmental hygiene, rural development, and water supply, all health-contributory though not perhaps so labelled or recognized. Democratic Yemen is one of the few countries which may actually see "Health for All" (or at least the accessibility to) by the Year 2000. This same kind of interaction between health planners, political decision-makers, and community organizations which was present in Yemen also acted to produce innovative national plans in Indonesia and Ghana.

If political commitment and people's participation are two absolutes for the pursuit of successful programs, medical effectiveness and social impact are the final criteria for judging these programs' successes.

Judging Effectiveness

Medical effectiveness is judged by the quantitative indicators of morbidity and mortality, nutritional status and life expectancy. A strong plea is made by the authors for "a set of quantifiable indicators of community health status, nationally accepted and promoted, and adaptable for use in the semi-literate community." Social impact is even more difficult to quantify. Perhaps it can best be summed up as ". . . the community's increased level of awareness of health problems and capacity to organize itself to solve these problems." (Muller, *Participation in Primary Health Care Programs in Latin America*, Medillon, Nimeo, 1980.)

Just how many of the 134 countries who have opted for "Health for All" will actually achieve it by the year 2000 is problematical. Increased awareness and the capacity to organize to solve the most pressing of these health problems may be the level at which most countries will find themselves. The seeds of change will have been sown, however, and more particulars can follow. ■

Available for US $8.95 from Oxford University Press, 1600 Pollit Drive, Fair Lawn, New Jersey 07410, USA.

Reviewed by Sally Coghlan, Director of Information for the Technologies for Primary Health Care (PRITECH) Project.

New Book from Unesco

Although the book's focus is education, the appeal of Unesco's delightful photographic essay *It's Never Too Late to Learn* is universal. Subjects range from very young to very old learners around the world, reacting with joy, wonder, and occasional puzzlement to the world of books and formal teaching. The book is reminiscent of the New York Museum of Modern Art's timeless *The Family of Man*, in that the photographs, and the accompanying quotations used as captions, are chosen with an unerring instinct for the oneness of us all, in this case in the pursuit of knowledge. The quotes and text are in French, English, and Spanish; the 80 pages of black and white photographs are from Unesco's own Photographic Service. Dominique Roger who conceived the publication, and Monika Jost who did the layout, are both artists of high caliber who deserve high praise for this elegant publication.

Available in the U.S. for US $26.25 from UNIPUB, P.O. Box 1222, Ann Arbor, Michigan 48106; from Unesco, 7 place de Fontenoy, 75700 Paris, France; or from Unesco booksellers worldwide. ■

New Clearinghouse

Our recent Reader Survey resulted in a substantial number of responses indicating an interest in microcomputer applications for development. As our readers know, we have had several articles on microcomputer applications over the past two years, and will, of course, continue to cover the subject.

A resource that we would like to bring to your attention is a new AID-funded Clearinghouse on the *management* applications of microcomputers for development. Its purpose is to disseminate information to people in developing countries--especially people working in small businesses and development-related institutions in the public sector--about applications, software and hardware, training, and infrastructure. For this purpose the new clearinghouse has already begun publication of *MC Newsletter*. In addition, the Microcomputer Clearinghouse hopes to be able to develop a network of micro users who can provide technical assistance as requested. To have an effective network, there must be active participation, sharing of experiences and information on the part of persons of like interests. This newest sister clearinghouse hopes you will do just that! Write to them at:

Microcomputer Clearinghouse
319 Cameron Street
Alexandria, VA 22314 USA

(**Telecommunications** cont'd from page 2)

tion, and national and international trade and commerce. The recently released joint ITU-OECD study on "Telecommunications and Development" highlights the fact that "investments in telecommunications entail very significant economic and social benefits and contribute . . . to identifiable increases in gross national product. These increases . . . are greatest in the countries and regions with the lowest incomes."

One indication of the awareness and concern of decision makers regarding the importance of telecommunications was the United Nations General Assembly declaration of the year 1983 as "World Communications Year." The objectives of World Communications Year are, first, to provide the opportunity for all countries to undertake an in-depth review and analysis of their policies on communications development, and second, to facilitate the accelerated development of communication infrastructures. As the WCY Secretariat in the International Telecommunication Union has stated, *"These basic objectives are fully in line with the current concerns of all senior government officials, irrespective of the degree of development of their communications infrastructures. In view of the ever-growing importance of telecommunications, of the variety of the systems involved, and of the size of the investment required, it is easy to understand the . . . need for [a concerted effort] felt by all those called upon to take crucial decisions with regard to infrastructure for communications—that key factor in the social, economic, and cultural development of nations."*

The Communications Imbalance

The efforts that are being coordinated as part of World Communications Year in Africa have been designed to complement the activities undertaken under the U.N. Transport and Communications Decade in Africa, 1978-1987, which was declared in recognition of the urgency of developing transportation and communication infrastructure in Africa. Statistics reveal the severity of the communication problem, not only in Africa, but in other developing regions as well. In January 1977 there were 0.4 telephones per 100 population in Africa, 4.5 per 100 in South America, and 5.2 per 100 in Asia. This stands in sharp contrast to the 70.7 telephones per 100 population in North America.

Expanding on that picture, in 1977 developing countries as a whole had an average of 1.1 telephones per 100 population, while developed countries had an average of 33 per 100. In 1982, three-fourths of the 550 million telephones in the world were in only eight countries, and three-fourths of the 560 million television sets were in only nine countries. In other words, developing countries have 70 percent of the world's population, 20 percent of the world's gross national product, and 7 percent of the world's telephones and televisions.

> ***"A recent ITU analysis revealed that 90 percent of telephone service in developing countries is used by subscribers in industry, business, transportation, and government."***

Not only do developing countries have fewer telephones, they also have a strong imbalance in service that favors urban over rural areas. A recent survey of 27 African countries revealed that 53 percent of all telephones in those countries were in the capital city—this despite the fact that over 80 percent of the population typically resides in rural areas.

This urban-rural communications imbalance has far-reaching effects, not the least of which is the negative effect on national cohesion that results from what is in effect a dual urban-rural economy. A recent ITU analysis of telecommunications revealed that 90 percent of telephone service in developing countries is used by subscribers in industry, business, banking, transportation, and government. Lacking telephone service, rural areas increasingly also lack access to these important service sectors. Until policy makers learn to integrate telecommunications into the national planning process, the imbalance and its negative impact on national development and national cohesion are likely to prevail.

A comparison of annual telephone capacity growth rates is also revealing: North America has an annual growth rate of 4.6 percent, Europe 8 percent, Latin America 10 percent, and Africa between 6.2 and 8.7 percent. In order to achieve the goal of one telephone per hundred people in sub-Saharan Africa, where the need for telecommunication development is most pressing, an annual growth rate on the order of 14 percent is required. Unfortunately, levels of investment in telecommunications in developing countries have historically been low, averaging 0.3 percent of the gross domestic product, which is less than half of the average annual percentage of investment in developed countries.

Generally speaking, developing countries share a common set of problems regarding telecommunications: a huge gap between supply and demand, a strong distribution imbalance favoring urban over rural areas, poor quality of service, a long waiting time for new service, and peak traffic demands that exceed network capacity.

Righting the Imbalance

Still, developing countries are striving hard to make inroads into resolving their national telecommunication problems. The goals for the U.N. Transport and Communications Decade for Africa include not only an average penetration of one telephone per 100 population, but other goals that address the gamut of needs in developing a sound communication infrastructure. These include surveying training needs and establishing basic training requirements for telecommunication personnel, surveying and evaluating existing management policies and management courses, establishing a planning office in every PTT and developing a fundamental telecommunication development plan, establishing a maintenance and operations unit in every country, providing full radio coverage and increasing the number of radios from 7 to 20 per 100 population, and becoming self-reliant in manufacturing certain items of communications equipment. Perhaps the most ambitious goal is to provide a public call office for for every 10,000 rural people, so that an individual has access to a telephone within five kilometers of his home. Another ambitious goal is to complete the PANAFTEL network, which is to link all 49 member countries of the Organization of African Unity.

Massive Effort Needed

The effort to meet these goals and those of other regions of the world requires a massive mobilization of resources, both human and financial. While the developing countries' telecommunication growth rates are relatively high, increasing them to meet unmet demand entails considerable difficulties in mobilizing the necessary institutional and financial resources. A review of published data shows that, excluding city networks, it is difficult to maintain growth rates in excess of 20 to 25 percent per year. A question that merits exploration is whether, given adequate levels of financing, the advanced technologies will make it possible to maintain higher network growth rates by requiring lower levels of skill at local levels and by facilitating the process of network management.

The projected expenditure for telecommunications worldwide in the 1980s is some $640 billion, of which some 50 percent will be for public telephone equipment, according to a recent Arthur D. Little study. In Latin America alone annual telecommunication expenditures are expected to leap from $2.52 billion in 1980 to $4.9 billion in 1990. Even that level of increased investment will only increase the number of telephones in service in Latin America from 20 million to 43 million, or from six per 100 population to 10 per 100.

Given the sizable amounts being spent by telecommunication administrations for modern equipment, the training of personnel to ensure the proper operation and maintenance of that equipment is extremely important. While most developing countries now have national training centers that can fulfill at least some of the need for basic and medium-level training, there is significant unmet need

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The A.T. Microfiche Reference Library: Information When You Need It

by Ken Darrow and Michael Saxenian

Despite the wealth of technical reference materials now available on proven village technologies, the vast majority of technical questions that arise in the field never get answered. Local organizations usually do not have appropriate technical references on hand, and those materials that are available are rarely indexed or organized in a way that makes it easy for project staff to locate needed documentation.

Piecemeal acquisition of reference materials, as the need arises, has generally been the only solution open to such groups. However, the obstacles to such an approach are formidable. Locating publications can be difficult and time consuming, the cost per item is generally quite high (a particular problem when ordering materials of unknown quality and applicability), and the typical wait of two to eight months for delivery of materials means that in most cases, by the time they arrive the project has either lost momentum or proceeded without the needed materials.

The net result is that people cannot find the technical information they need when they need it, and therefore most technical questions are set aside and forgotten. Project staff go without the benefit of learning from the experiences of others, and are forced to guess at things for which good answers already exist.

Ready access to relevant technical information would assist these people in significantly increasing their productivity. The best information tool for this purpose is simple and centuries old – a library. To meet the needs of village development the library must contain a well-organized and indexed collection of technical documents chosen for their applicability to village situations. However, until now, libraries of sufficient size have been prohibitively expensive.

Now, however, microfiche technology offers a low-cost alternative to expensive paper libraries. The A.T. (Appropriate Technology) Microfiche Reference Library, recently assembled by the Appropriate Technology Project of Volunteers in Asia, reproduces every page of original text of 872 carefully selected reference books and documents from around the world. Included are almost all of the books reviewed in the *Appropriate Technology Sourcebooks, Volumes One and Two*. The library contains more than 132,000 pages of indexed and organized reference material, with answers to the great majority of questions that normally arise regarding appropriate village technology. The *A.T. Sourcebooks* and a separate paper index provide indexing and views in paper copy of every item in the collection, so that it is *easy to find needed information*. Specific technical data can be found within minutes, while surveys of technical options can generally be completed within a few hours. Field and shop handbooks on all common topics are included for reference. Most significantly, the cost of the collection is about 1/20th of the cost to assemble the same collection in paper.

The low price of this technical reference library is made possible by microfiche technology. Microfiche is the lowest cost technology in the world for reproducing books. A microfiche library, in turn, is the lowest cost means of organizing and handling large numbers of reference books. The A.T. Microfiche Reference Library, with the electric microfiche reader included, costs only US$825. Many small development groups which would otherwise have no access to a substantial technical library will now be able to do research immediately in their offices.

Microfiche is a 4" × 6" (11cm × 16cm) sheet of film on which photographic images are made. Each sheet of microfiche in this library set can hold 98 or 133 pages of text (depending on the size of the page), reduced to 1/24th of the original size. The microfiche is read with a microfiche "reader," which magnifies the image on film back to its original size. We have found an excellent portable reader which we are offering with this set at a substantial discount (see below).

Most of the costs of paper publications come from production, stocking and handling, and shipping. Master microfiche sheets are produced by photographing and reducing each page of text. Duplicates can then be made from these masters at very low cost. With microfiche, shipping costs are also quite low due to light weight and compactness. Stocking and handling costs remain quite high if microfiche publications are offered on an individual, title-by-title basis, but these costs can be greatly reduced if microfiche publications are offered as a single standard collection.

The Microfiche Reader

Microfiche is a very simple technology for the user, requiring only a "reader" with a strong lamp and a good lens, and electricity. We are offering an excellent portable reader, the Information Design "Cube," as an option with the microfiche set. The Cube is a rear-projection reader with a bright sharp image, allowing for comfortable use in nearly any lighting condition. The Cube is easier to use than other portable readers we have seen, and it requires no set-up prior to use. This unit is available for either 110-volt or 220- to 240-volt electric current, which is converted to 12 volts to power a long-life 25-watt lamp. Patch cords for 12-volt operation are also supplied so that the reader can be powered through the cigarette lighter of a car, or hooked up directly to a car battery or two motorcycle batteries for use in areas without line current. The Cube can be operated in any position, and tracings of complex diagrams can be made on paper placed against the screen. Unlike most rear-projection readers, the screen of the Cube is made of an extremely durable, uncoated plastic which can be easily cleaned with alcohol or any other solvent which will not dissolve plastic.

The cube measures 12" wide × 12" deep × 10" high (29cm × 29cm × 25cm), and weighs less than 9 lbs. (4 kg), making it fully portable for field operation.

Most microfiche applications up until now have been for low-cost document storage. The image quality of these microfiche has not generally been very high. This, in combination with microfiche readers which are unnecessarily difficult to use and produce an unsatisfactory image for reading, can make microfiche difficult to use. However, the microfiche provided in the A.T. Microfiche Reference Library are of the highest quality available; used in combination with the easy-to-use portable microfiche reader which is offered with the set, these microfiche produce a very sharp and clear image which can be comfortably read for long periods of time. Learning to use the microfiche library and reader takes only 15 minutes. In fact, given its superior system of organization, and the small physical size of the microfiche set (small enough to fit in a shoe box), many people have found that the microfiche library is actually *easier* to use than a conventional paper library.

While users of the A.T. Microfiche Reference library will not be able to make photocopies of the text on microfiche without special equipment (and many of the items are under copyright in any case), the entire

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Development Communication Report, published quarterly by the Clearinghouse on Development Communication, has a circulation of over 5,000. The newsletter is available free of charge to readers in the developing world, and at a charge of U.S. $10.00 per year to readers in the industrialized countries.

A center for materials and information on important applications of communication technology to development problems, the Clearinghouse is operated by the Academy for Educational Development, a nonprofit planning organization, and supported by the Bureau for Science and Technology of the U.S. Agency for International Development as part of its program in educational technology and development communication.

The views expressed in *Development Communication Report* are those of the authors and not necessarily those of its sponsors. Original material in the *Report* may be reproduced without prior permission provided that full credit is given and that two copies of the reprint are sent to the Editor.

Readers are invited to submit typed manuscripts of no more than 1000 words, and to send in photographs.

(**Microfiche** continued from page 12)
microfiche library can easily be carried home or to the field, or lent to a friend.

In tropical Third World conditions, the epoxy-coated "diazo" type microfiche used in this set is also far more durable than paper copy. Unlike paper books, diazo microfiche is not harmed by humidity or fungus. Because of the epoxy coating, diazo microfiche is resistant to scratching, and have a proven durability of 10 to 20 years.

Conventional libraries are too expensive for all but the best endowed Third World development groups. As the already high costs of producing and shipping paper copies continue to rise, the favorable economics of microfiche libraries will become even more compelling. The A.T. Microfiche Reference Library offers reproductions of one of the best A.T. libraries in the world, allowing local groups access to the information they need, when they need it. ■

Ken Darrow was a founder of the Appropriate Technology Project of Volunteers in Asia. He co-authored the *Appropriate Technology Sourcebook*, and is now setting up an appropriate technology information clearinghouse in Kathmandu, Nepal.

Michael Saxenian is the current coordinator of the Appropriate Technology Project of Volunteers in Asia.

For further information, write The Appropriate Technology Project, Volunteers in Asia, P.O. Box 4584, Stanford, California 94305, USA.

(**Telecommunications** cont'd from page 11)
for training at the higher levels required for managerial personnel. A recent ITU training needs survey found that, in 10 West African countries, there will be over the next decade an estimated additional requirement for 600 assistant engineers, corresponding to 48,000 student weeks of training. Existing training facilities are also ill-equipped to provide training in the new technologies, such as digital networks, satellites, and fiber optics.

Constraints to Development

The costs of developing communication infrastructure are obviously great, and the lack of adequate financial resources is one of the fundamental constraints to improving communication services. The problem is apt to reside in a shortage of available foreign exchange. The foreign exchange requirements of a telecommunication investment program are substantial—between 50 and 60 percent of the total required investment—primarily because the bulk of the equipment must be imported. Unfortunately, most developing countries have a shortage of foreign exchange, a condition that does not promise to improve. Although telecommunications is usually not first in line in the competition for foreign exchange, it can be argued that improved telecommunications will reduce the foreign exchange requirements of other sectors, such as transportation. Prudent planning will closely assess the range and extent of such effects.

The availability of local currency for telecommunications investment should not be a problem, as local telephone operating entities usually average at least a 15 percent annual rate of return in most developing countries. Unfortunately, telecommunication entities are often not free to control the use of telecommunication revenues. Most countries decree that not only must telecommunications make a profit, but that profit must be turned over in large amount to the government to meet the expenses of other sectors. Left to itself, the telecommunication entity could not only support itself but could subsidize rural service. As it is, rural service is often not provided for from the public treasury because it is not immediately and obviously profitable. Rural services have high costs (up to five times the cost for urban services) and low traffic volume. This situation is self-perpetuating; low demand begets high prices, which in turn beget low demand.

There are additional constraints to the improvement of telecommunications, particularly in rural areas of developing countries. Related to the financing problem is the fact that there is a dearth of strong evidence of both the direct and indirect benefits of telecommunication investment, so that investments cannot be adequately justified. The International Telecommunication Union, the OECD, the World Bank, the AID Rural Satellite Program, and others have been conducting research to systematically identify and measure the benefits of investments in telecommunications so that the sector can gain a more competitive position in the allocation of scarce financial resources.

Finally, there are a series of internal institutional problems that must be considered as constraints to telecommunications development. Primary among these are the lack of financial and management autonomy of most operating companies, and the fragmentation of responsibility for telecommunications, with different operating entities holding responsibility for different services. Fragmentation leads to higher costs, prevents economies of scale, leads to too much variety in equipment purchased, and causes duplication of managerial functions in a climate of managerial shortages.

Conclusion

Robert Saunders of the World Bank suggests the conditions that would relieve such constraints and give operating companies the financial and managerial autonomy they require:

- expedited procedures for investment program approval;
- a good commercial accounting system;
- tariffs set high enough to cover costs and generate investment funds;
- simplified regulatory procedures;
- authority to collect bills, including those to government agencies;
- reinvestment of telecommunications funds in the telecommunications sector; and
- competitive salaries.

The importance of these and other actions to achieve adequate telecommunications development in all countries cannot be overstressed. As the members of the International Commission for the Study of Communication Problems (the MacBride Commission) stated in *Many Voices, One World:*

". . . Communications has become a vital need for collective entities and communities. Societies as a whole cannot survive today if they are not properly informed. . . . Self-reliance, cultural identity, freedom, independence, respect for human dignity, mutual aid, participation in the reshaping of the environment—these are some of the non-material aspirations which all seek through communication. But higher productivity, better crops, enhanced efficiency and competition, improved health, appropriate marketing conditions, proper use of irrigation facilities are also objectives—among many others—which cannot be achieved without adequate communication and the provision of needed data."

This article was written to reflect the issues and challenges prevailing in global telecommunications emphasizing their implications for developing countries. It set the context for a summary of discussions of "International Issues in Communication Technology and Policy," which took place at the Aspen Institute at Wye Plantation in the spring of 1983. ■

Sandra Lauffer is Program Officer for Telecommunications at the Academy for Educational Development, and Director of Information for the AID Rural Satellite Program.

Reprinted from *International Issues in Communication Technology and Policy*, a report published by the Academy for Educational Development, 1983.

(**ERIC** continued from page 5)
Forms for ordering ERIC documents and reprints of journal articles are also provided, as well as a glossary and a 42-item bibliography. Published by the ERIC Clearinghouse on Information Resources, this guide is available from Information Resources Publications, 030 Huntington Hall, Syracuse University, Syracuse, New York 13210, U.S.A. (order no. IR-63; $3.75 plus $1.50 for shipping and handling). It is also available from EDRS in microfiche for 97¢ or in paper copy for $5.65. ■

Barbara B. Minor, Publications Coordinator, ERIC Clearinghouse on Information Resources, School of Education, Syracuse University, Syracuse, New York 13210, USA.

Literacy Work in Peru

In June 1982 a support project for the multisectoral national plan for literacy teaching by audiovisual methods was launched in Peru.

Under this project national personnel are being trained to produce and use audiovisual teaching materials. Video and radio are being used to improve the effectiveness of the literacy campaign and broaden the area covered by the plan.

Extension workers in audiovisual education have been trained for literacy activities, as a result of an agreement with the Training Centre for Audiovisual Teaching Services (CESPAC), under the Ministry of Agriculture, and funding from a UNDP-FAO project.

The functions of the extension workers are to select target areas; to motivate the population in general, and illiterates in particular; to contribute their resources to literacy activities; to encourage the setting up of community literacy centers; to select and train literacy workers; to plan for the use of audiovisual equipment in these areas; to give advice and encouragement; to participate in evaluation and to draw up plans and strategies for the post-literacy stage.

The educational materials have been first prepared on videotapes for the Spanish-speaking population. After feedback has been received and the project has been evaluated, a second phase will be launched by radio, to obtain wider coverage and to adjust to the country's different sociocultural realities, in particular, to bilingual literacy teaching (Quechua-Spanish, Aymara-Spanish).

Research and evaluation form an integral part of the work in regard to both the production and the use of the materials. These activities, however, are not carried out 'from outside,' but by the same persons who are producing and using the audiovisual materials.

The overwhelming importance and the complexity of post-literacy work are realized. Forecasts have been made and practical measures have already been taken to tackle the problem as the literacy campaign progresses—preparation of local newspapers for communication within communities, readers, travelling libraries, etc. The project has since its inception been geared to the establishment of a system of lifelong education based on audiovisual methods.

For further information, please write to: Proyecto de Desarrollo de la Alfabetización y de la Educación no Formal a través de Medios Audiovisuales, Apartado 4480, Lima, Peru.

Reprinted from Unesco Adult Education Information Notes, *No. 2, 1983. Adult Education Section, Literacy, Adult Education and Rural Development Division, Unesco, 7 place de Fontenoy, 75700 Paris, France.*

(**Swamp Rice** continued from page 4)

dren), in a positive direction. These data therefore suggest that the majority of Semi-Developed and Undeveloped farmers are willing to employ improved methods of swamp rice farming if provided with the educational and material resources to do so.

The final section on felt information needs revealed the areas which might be addressed in an information campaign, from the farmers' point of view. A wealth of queries was produced for every indicator, but particularly those where practices and information levels were low. A relatively coherent pattern thus emerged between practices, knowledge levels, and perceived information needs.

Implications for Campaign

With the foregoing analysis in view, there appeared to be little doubt that a media campaign would be highly useful for raising information levels toward recommended practices of swamp rice production. At the conclusion of the survey, we agreed that the data generated on felt information needs should serve as general guidelines for such a campaign, with specific emphasis to be directed toward those sectors where practices and knowledge levels were particularly low and where attitudes could be positively shifted.

Given the potential radio audience and the popularity of "Farming Magazine," radio would be the principal carrier of the campaign, particularly in the southern portion of the country where medium wave service is reliable. In the northern short-wave territory, programs produced for radio would be also used for cassette listening groups organized by the regional communication officers. Both sections of the country would be shown slide presentations conveying information appropriate to each of the seven indicators of swamp rice development. Logs would be kept by the communication officers of dates and types of presentations to individual villages.

As a final pre-campaign note, it was suggested that extension agents should be deliberately exposed to the same material as the target farmers to ensure a consistent and accurate flow of information. Ideally, print support would also be made available to extension agents to reinforce the audio and visual presentations.

In summary, while the advantages of baseline data for media production decisions are frequently expressed, such data are rarely gathered systematically in Third World rural communication projects. The campaign to be put into motion here, even though based on a very limited budget, stands an excellent chance of accurately addressing real needs of an important segment of the Sierra Leone farming community. ■

Gary Coldevin is currently Director of the Graduate Programs in Educational Technology, Concordia University, Montreal, Canada H3G 1M8.

Scriptwriting Contest

The Asia-Pacific Institute for Broadcasting Development (AIBD) has announced a competition on Scriptwriting for Production of Training Materials.

For Whom

It is open to participants from member countries of the institute in the Asia-Pacific region.

- Instructors highly experienced in video/film production in training institutions operating for broadcasting.
- Writers, producers, directors, cameramen, editors, sound recordists, make-up artists, animators of National Film and TV organizations.

How to Compete

- Participants should send to AIBD not later than 31 AUGUST 1984 a script or story-board on a 3 to 12 minute program to be produced in any of the formats such as videotape, 16mm film, slides or slide tape, for training TV professionals at basic or advanced levels.
- Four topics have been selected for this first exercise: technical aspects of camera work; care and routine maintenance of equipment; editing; make-up for television adapted to the Asia-Pacific Region.
- The winners will be granted travel fares and per diem expenses to come and produce the program at AIBD. Special arrangements could be made for production in their own country.
- Application forms and further information regarding conditions and regulations are available from AIBD, Bukit Putra, P.O. Box 1137, Pantai, Kuala Lumpur, Malaysia. ■

Free Devcom Catalogue

World Neighbors, an international development organization working with people in Asia, Latin America, and Africa to promote effective development, human dignity, and self-reliance, has just published a new catalogue of development communication materials. The catalogue describes 41 filmstrips, nine flipcharts, six booklets, four books, and two newsletters on health, nutrition, family planning, and food production.

These materials have been developed by World Neighbors to be used in person-to-person education to help families learn to produce more food and improve their health.

The catalogue is available free from World Neighbors, 5116 North Portland Avenue, Oklahoma City, Oklahoma 73112, USA.

(**Microcomputers** continued from page 16)

The Role of Microcomputers

Such support can be provided by the microcomputer, which, being flexible, can be adapted to suit the needs of the user, and is available at prices well within the reach of most developing countries. A lower-range microcomputer of 32,000-48,000-character memory can process almost all the health indicators needed for the affordable and medically justified health programs for a population of 200,000. Storage and printing are easily provided. No special rooms or facilities are needed—just a clean desk-top and a power point. Even the expertise required is far less than for a traditional computer. The whole configuration will cost at most US $5,000. The data can be processed and the information outputs printed in 10 working days (60 hours) maximum, leaving as many working days for the gathering of data and the distribution of information up and down the hierarchy. These figures have been confirmed in Egypt where, following a pilot study carried out with WHO collaboration, microcomputer-based information systems are now largely operational in Fayoum, Ismailia, and South Cairo provinces.

The use of microcomputers at the intermediate level not only solves the problem of the central processing of large amounts of data and that of timely output of information; it increases the number of users, thereby helping the technology to be transfered successfully. It also disciplines and trains people in planning, logistics, and objective measurement, and allows for the wide diffusion of health information among medical and health-related personnel within the health service. It addresses the primary health care level, where assistance can be most effective.

Transfer of Technology

Criticism of the transfer of microcomputer technology to the Third World usually stresses its effect on employment, difficulties of maintenance, lack of expertise in developing applications, and cost. But such criticisms are unjustified.

Traditional computer technology, a more demanding and expensive resource, is already in use in the Third World—in airports, banking, the armed forces, and medical research. To operate a computer is not to know how to construct one; and many people in the Third World can do the former. Many if not most of the developing countries, in which good health and sophisticated technology—aircraft, cars, brain scanners, oil refineries, weather stations, hydroelectric and various industrial plants—exist alongside disease and poverty, have secondary school graduates who can be trained to operate and service a microcomputer. This was found to be the case in Egypt.

It cannot be denied, however, that the transfer of technology has its problems. One of them is that commercial competition has resulted in the proliferation of hardware components, similar in function but sufficiently diverse to prevent the universal use of a single item of software for a specific application. This lack of international standards creates a trade dependency. Another problem is that of language. Modification of hardware to allow input and output in native languages is both possible and simple, but expensive. Systems analysis and software development and acquisition are also expensive. Yet these are problems that can be solved (indeed, they have been solved in some instances) and do not justify failure to exploit microcomputer technology.

". . . Those responsible for health matters in the Third World must be made aware of the potential of microcomputers. . ."

An International Effort

For some time now it has been part of the work of WHO to identify health objectives and to develop health indicators, concepts, and guidelines for national information systems. It is now time to examine more closely the logistics and implementation of such systems and to develop national expertise in microcomputer technology and its uses.

WHO's Division of Information Systems Support, in collaboration with a number of technical programs at headquarters and in the regional offices, is studying with several developing countries the usefulness, operation, and costs of microcomputers in health statistics, health literature, and health system management. Technical cooperation can and should become broader in scope. One need of developing countries, for example, is for simulation studies to determine the need for microcomputer technology that will yield information useful to decision-makers—information, that is to say, that will help in monitoring progress towards health objectives, identifying further health needs, and implementing new target-oriented activities. Such studies could indicate, among other things, how large and how densely populated an area should be to produce useful statistical information at low cost. Once the optimum size for such a unit has been established, it will probably become clear at what hierarchical level in the health services system microcomputers could be placed more effectively, although this will, of course, also be influenced by the availability, at the different levels, of secondary school graduates who can be trained to operate microcomputers.

Other action is needed. Those responsible for health matters in the Third World must be made aware of the potential of microcomputers. Member States will require cooperation in choosing and testing hardware and in negotiating with industry over service charges, e.g., for adapting hardware and software components to local needs, including local languages. Finally, it is essential to carry out research aimed at developing flexible and versatile software packages and low-cost hardware for wide-spread use in health activities.

Microcomputer technology is compatible with the conditions prevailing in the Third World. To transfer it to the field of health will require coordination at the international level under the auspices of a body such as the World Health Organization. ■

Dr El Kholy is Secretary General to the Board of Health, Ministry of Health, Cairo, Egypt. Dr. Mandil is Director, Division of Information Systems Support, WHO, Geneva, Switzerland.

[1] International Seminar on Informatics Support to Health Management Systems, Cairo, 1-8 December 1982. The full report of the seminar (unpublished WHO document, ISS/83.3) is available to professionally interested persons on request to Dr. Mandil.

[2] El Kholy, A. & Mandil, S. H. The relevance of microcomputers to health improvement in developing countries. This paper will be published in full in Information and management, the international journal of information systems applications.

Reprinted by permission from the WHO Chronicle, *37(5): 163-165 (1983).*

Summer Seminars on The New Technologies

The School of Communications of California State University at Chico has announced a four-week Summer Institute on Telecommunications and the New Information Media. Divided into four one-week conferences, the schedule is as follows:

- Satellites, Teleconferencing, and Broadcast Telecommunications (July 15-20)
- Interactive Video Technology (July 22-27)
- Microcomputers and Electronic Information (July 29-August 3)
- Working Field Trips (August 5-10)

Costs are US $1,800 for the entire month, or $525 a week. There will be informal sessions as well as formal presentations.

Designed as a forum for international leaders in media, business, education, and government to explore new developments in communications, the Institute is limited to 50 participants.

For further information, or to apply, write: International Summer Institute on Telecommunications, California State University at Chico, Chico, California 95929, USA. ■

Microcomputers and Health Improvement in Developing Countries

by Aziz El Kholy and Salah H. Mandil

What are the difficulties associated with the collection of adequate health data at the periphery of a national health care system? And what is the relevance of the microcomputer to analyzing these data, extracting useful health information, and conveying it quickly to the decision-makers? An international seminar[1] was convened by The World Health Organization (WHO) in Egypt in December 1982 to discuss these questions and to see how the host country's recent experience with microcomputers could contribute to answering them. The following article, based on a background paper[2] prepared for the seminar, argues that the use of microprocessors in health information could be the most important single factor in improving management and thus bringing health for all within reach.

Microcomputers have become available at the right time. In the last two decades medical science has made available a host of effective and relatively inexpensive interventions that are capable of saving countless lives: vaccines against the killing childhood diseases such as diptheria and poliomyelitis, oral rehydration therapy for diarrhoeal disease, cheap safe drugs for schistosomiasis. Simple, reliable diagnostic techniques allow better forecasting of epidemics as well as improved management of individual cases. Still other drugs and vaccines are already on the horizon.

But to adopt such interventions without adequate evidence of their effectiveness, and without confirmation thereof in the local setting, can lead to what has been called "the nicest possible type of inflation." If the new medical technology is to be put to good use, information systems must be developed as a basic element of the national health system. Timely and suitable health information is indispensable for ensuring the progress and cost-effectiveness of health care programs, as well as for rational planning and training. The key to generating and disseminating this information may well be the microcomputer.

Design and Implementation of Health Information Systems

The WHO Inter-Regional Consultation on National Health Information Systems (Costa Rica, 1979) recognized that health information systems must be made capable of delivering information for specific health service aims over a long period. This presupposes:

- health service aims that are capable of being identified and quantified, and
- medical interventions that are genuinely effective and locally affordable.

These, then, are the prerequisites for the design of the health information system. For its implementation, data must be collected, stored, processed, analyzed, and interpreted; the resulting information must be printed and disseminated; and feedback must be obtained. The timeliness of the information is a necessary condition for its use. Here the critical factors are the volume of data at the processing level and the remoteness of the intended recipient of the information.

Data are usually collected at local health centers. Since the work of collection is relatively light, the data are amenable to hand manipulation. It is at the later stages that problems arise: the expertise and facilities needed for the processing, analysis and interpretation of the data and for the printing and exchange of information are usually not available at the peripheral level nor may they be cost-effective to establish there. Such facilities can be provided by an expensive central computer, but in a large country with poor communications there will be lengthy delays at both ends, in the relaying of the data and in the dissemination of the resulting information. Such delays totally defeat the purpose of data collection, which is the timely use of the findings for decision-making.

A logical alternative would be to do the assembling, processing, analysis, and interpretation of data and the publication and exchange of information at and from an *intermediate point* in the data-cycling process, between the national focal point and the peripheral health care units. One would have to determine in each case the optimum population size to yield meaningful information on morbidity, disability, and mortality and on the effective use of available resources. For a large number of developing countries, a population of 200,000 would perhaps be reasonable since it could generate potentially usable data even on diseases with low case-fatality or disability rates. Nevertheless, the problems of hand sorting and processing, data analysis and interpretation, and printing facilities would still remain. It would appear therefore that, even at an intermediate level, the minimum requirements of an information system cannot be met without the support of appropriate technology for data processing and information dissemination

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