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IMPROVING NUTRITION PROGRAMMING

CAPABILITIES 931-11-560-023

Subproject: Analysis of Community Level Nutrition Programs

Grantee: Community Systems Foundation

Amount: $384,7(

Approved: _____
F. James Levinso
Director TA/N

Date: _____

Authorized: _____
Robert Simpso
Director TA/PI

Date: 3/23/77

MEMORANDUM March 11, 1977

TO: TA/PPU, Robert Simpson

FROM: TA/N for F. James Levinson

SUBJECT: Proposal for the Analysis of Community-Level Nutrition Programs, Community Systems Foundation (CSF)

The subject project was reviewed and approved on Thursday, February 24, 1977. The following AID offices were represented: TA/N, FFP, TA/PPU, ASIA/TR/HN, and LA/DR. Representatives from PHA/PVC and GC/TFHA were unable to attend but phoned their comments and approval. A representative from CSF also attended. The following summarizes major issues discussed at the meeting.

Scope of Project

The aim of this project is to cover in a 27-month period as many as 12 projects, of which five or six will be selected for in-depth analysis. In each case there will be a need to gather some additional secondary data such as economic trends and agricultural production data as well as analyzing primary health data including health/weight charts and morbidity surveys. This need for additional information may affect the project time frame but not the budget.

Coordination with Other Community Level Health/Nutrition Projects

The grantee will coordinate and share information with TA/H on its Local Action Project. In addition there will be close cooperation with the TA/H-funded American Public Health Association (APHA) project, which is evaluating low cost integrated health delivery systems in developing countries. Although the actual nutrition evaluation methodology under this project will be unique, attempts will be made to develop a common methodology with APHA for evaluating other project variables. In this way the two projects will benefit by sharing comparative data.

Maintaining Information Network

Institutionalizing the information network established among the projects as a result of this analysis will be encouraged. An important objective is to involve the actual participants of the projects in the evaluation in order to foster linkages in community health/nutrition projects. A workshop, as provided for in the grant, a newsletter such as that developed by APHA, and the newly established Nutrition Planning Information Service will be helpful means of maintaining and developing contacts.

Approach to Information on Community Development

The question was raised as to how the researchers plan to get at the community dynamics - the social and cultural aspects of the communities that may affect the success or failure of a project. For the most part the methodology will be open and the intention will be to "run with the data that's there", rather than approaching the task with too many pre-formulated ideas. Local sources will be relied upon heavily for information on community dynamics.

The difficulty of defining "successful" projects was another issue raised. While the ultimate measure is a change in nutritional status, many other variables may be considered as measures of project success. Although success is difficult to measure, the project will attempt to be as comprehensive as possible and will include community attitudes and variables which affect the process of community organization in addition to primary health/nutrition data.

Transfer of Methodology

With respect to transferring successful project methodologies, the view was expressed that whole projects or total concepts are more difficult to transfer from country to country, while relevant pieces of methodological information can be lifted out and transferred more easily. Additionally, during the methodology development period efforts will be made to learn how such a methodology could be incorporated into national nutrition surveillance systems.

PVO Involvement

CSF will make every effort to systematically involve private voluntary organizations in this project, specifically by including some of their projects among those reviewed and by asking them to serve on the project review committee.

It is requested that you authorize implementation of this subproject by signing the cover sheet attached to the project proposal.

Attachment to:
PIO/T 931-0023-
3175031

A PROPOSAL FOR THE ANALYSIS OF COMMUNITY-LEVEL NUTRITION PROGRAMS

Submitted By:
Community Systems Foundation
1130 Hill Street
Ann Arbor, Michigan

TO:
U.S. Agency for International Development
Washington, D.C.

December, 1976

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Attachment A - Logical Framework

Attachment B - Selected Curriculum Vitae

Attachment C - A Description of Community Systems Foundation's Program in Nutrition Planning

I. INTRODUCTION

This is a proposal to learn more about the most effective methods for improving the health and nutritional status of children in developing countries. We propose to do this by analyzing programs which have the following characteristics:

- they are defined and implemented at the community or local level;
- they target high-risk subgroups within the local population; and,
- they are based, at least in part, on community and family level diagnoses.

We are convinced that a systematic analysis of a carefully selected sample of these programs will permit us to define success in various circumstances (culturally, geographically, and operationally), and to identify the common elements which contribute to success. Such knowledge would greatly enhance the present and future capabilities of Community Systems Foundation and other national and international organizations concerned with the reduction of child malnutrition. Moreover, the process by which we propose to go about this task would create a network of institutions and professional persons who, having shared their knowledge and expertise (in connection with this project) about highly successful approaches, would be likely to continue to do so.

In short, then, our specific project objectives are:

1. to identify and accurately describe examples of successful, local community intervention projects in order to learn the nature of their success and the circumstances associated with success;
2. to report the findings in a manner which could assist an agency, organization or person concerned with the reduction of child malnutrition in replicating success elsewhere;
3. to create an international network of organizations and individuals who share common language for, and knowledge of, the elements required for successful community interventions; and,

4. to recommend ways in which national surveillance systems for measuring health and nutritional status can draw upon locally generated data used by these projects for their internal purposes.

II. PROJECT DESCRIPTION

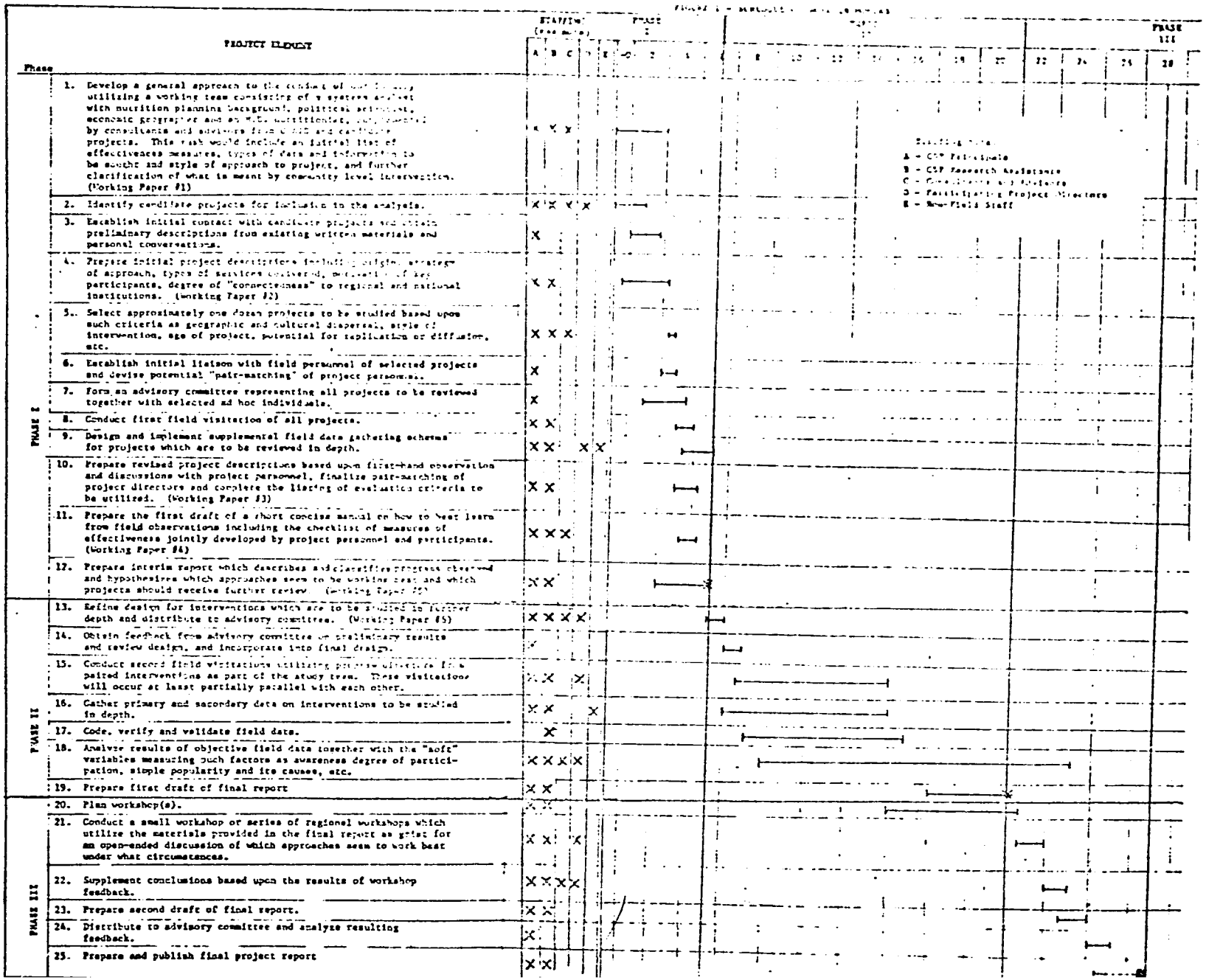
This project consists of three phases, the sequence and duration of which are shown in Figure 1, page 3 , extending over a 27 month period, beginning at the date of the contract approval:

Phase	Months	Cumulative Time (Months)
Phase I-Preparation and Initial Visits	5	5 (in addition to pre-contract efforts
Phase II-On-site Analysis	15	20
Phase III-Final Report and Workshop(s)	7	27

The project description in Figure 1 represents an example of a planning style that we believe has general validity and applicability. From our experience, it works for local communities attempting self-improvement action, for research and consulting firms planning pilot projects, and for government or large voluntary agencies mounting national or international intervention programs. The important attributes and sequence of activities characteristic of this method are:

1. To make a diagnosis, identify an issue or problem area and set a tentative goal or objective for the group with respect to the issue;
2. To conduct a pilot study and use feedback: decide on a course of action and immediately attempt to undertake that action on a small scale; note effects both measurable and unmeasurable and adjust project goals and procedures accordingly;
3. To conduct an inquiry or investigation: if success appears possible, proceed with full effort as modified; and,
4. Evaluate results, in terms of the level of success and potential range of environments for application.

Each phase of this program embodies these activities.


PROJECT ELEMENT
Phase
PHASE II
PHASE III
PHASE III
1. Develop a general approach to the conduct of the study utilizing a working team consisting of a systems analyst with nutrition planning background, political scientist, economic geographer and an M.D. nutritionist, supplemented by consultants and advisors from AID and cooperating projects. This task would include an initial list of effectiveness measures, types of data and information to be sought and style of approach to project, and further clarification of what is meant by community level intervention. (Working Paper #1)
2. Identify candidate projects for inclusion in the analysis.
3. Establish initial contact with candidate projects and obtain preliminary descriptions from existing written materials and personal conversations.
4. Prepare initial project descriptions including origin, strategy of approach, types of services delivered, characteristics of key participants, degree of "connectedness" to regional and national institutions. (Working Paper #2)
5. Select approximately one dozen projects to be studied based upon such criteria as geographic and cultural dispersal, style of intervention, age of project, potential for replication or diffusion, etc.
6. Establish initial liaison with field personnel of selected projects and devise potential "pair-matching" of project personnel.
7. Form an advisory committee representing all projects to be reviewed together with selected ad hoc individuals.
8. Conduct first field visitation of all projects.
9. Design and implement supplemental field data gathering schemas for projects which are to be reviewed in depth.
10. Prepare revised project descriptions based upon first-hand observation and discussions with project personnel, finalize pair-matching of project directors and complete the listing of evaluation criteria to be utilized. (Working Paper #3)
11. Prepare the first draft of a short concise manual on how to best learn from field observations including the checklist of measures of effectiveness jointly developed by project personnel and participants. (Working Paper #4)
12. Prepare interim report which describes and clarifies progress observed and hypotheses which approaches seem to be working best and which projects should receive further review. (Working Paper #5)
13. Refine design for interventions which are to be studied in further depth and distribute to advisory committee. (Working Paper #6)
14. Obtain feedback from advisory committee on preliminary results and review design, and incorporate into final design.
15. Conduct second field visitations utilizing pairing criteria for paired interventions as part of the study team. These visitations will occur at least partially parallel with each other.
16. Gather primary and secondary data on interventions to be studied in depth.
17. Code, verify and validate field data.
18. Analyze results of objective field data together with the "soft" variables measuring such factors as awareness degree of participation, simple popularity and its causes, etc.
19. Prepare first draft of final report
20. Plan workshop(s).
21. Conduct a small workshop or series of regional workshops which utilize the materials provided in the final report as grist for an open-ended discussion of which approaches seem to work best under what circumstances.
22. Supplement conclusions based upon the results of workshop feedback.
23. Prepare second draft of final report.
24. Distribute to advisory committee and analyze resulting feedback.
25. Prepare and publish final project report
STAFFING (Man Months)
A
B
C
PHASE I
PHASE II
PHASE III
22
24
25
28
Staffing Key
A = CSP Personnel
B = CSP Research Assistance
C = Consultants and Advisors
D = Participating Project Directors
E = Non-Field Staff

Phase I (Preparation and Initial Visits) will identify a list of projects which will tentatively be considered for analysis. Two decisions crucial to the successful implementation of this phase of the project are:

1. The definition of "nutrition intervention"
   At this stage of knowledge about improving nutritional status, it may be unclear how broad or narrow the definition of "nutrition intervention" should be. Are we only to be concerned, for example, with food supplementation, diarrhea reduction, breast-feeding programs, etc., or are we also to be studying less direct approaches, such as ones which provide an infrastructure that encourages the utilization of higher food production technology through better financing opportunities? We believe that, for the purpose of this study, "nutrition intervention" should include local health system interventions which have a major nutrition component but should exclude less direct interventions.
2. The definition of "effective intervention"
   Ascertaining which approaches are the most effective depends significantly upon which measures of effectiveness are selected.[1] Program characteristics and results which are measurable over the short run are usually very different from those measured over a longer period of time. Moreover, some measures of effectiveness are amenable to quantification while others, which may be equally important, are not. We believe that full consideration and appropriate weight should be attached to all forms of measurement.

With these factors in mind, we have identified numerous projects (see Section IV) which appear to satisfy the three criteria for successful community-level intervention. Some have descriptions and others are

[1] See The Promotora Program in Candelaria: A Colombian Attempt to Control Malnutrition and Disease, 1968-74, W.D. Drake and L.F. Fajardo, Community Systems Foundation, Cali, Colombia, June, 1976.

merely listed. To review all of them would be unmanageable and probably cost-ineffective; hence, the necessity to pare down the list to a more manageable number while retaining a truly representative sample.

Project staff will then visit several -- if not all -- of these project sites to speak with project directors and others engaged in the implementation of the intervention. Each of these initial visits will last at least several days. We will offer the key project personnel at the sites a tentative list of factors to be considered in reviewing a successful project (see Section III) and seek their comments, amendments or substitutions for the items we have suggested.

At the conclusion of Phase I, we will compile and edit the remarks gathered during the on-site project visits in order to refine the checklist of elements identified as necessary and sufficient for successful intervention.

In Phase II (On-Site Analysis), we will attempt to arrange for an exchange of project directors or senior field researchers from those projects which emerge from Phase I as the best examples for study. We believe this "pair matching" approach is a crucial feature of this project.

We plan to have a person who is effective and experienced in his own project visit another project site where, in concert with personnel of the project being visited, he jointly conducts an on-site review of their activities. His objective will be to see what he can learn about their methods that would be of immediate value in his own project. At the same time, he will probably be able to offer useful suggestions to his hosts about their project.

We do not plan for the project directors to exchange visits but, rather, for each to visit a project different from the one whose director they hosted. In this way, directors would become familiar with two projects in addition to their own: one which they heard about from their visitor,

and one which they observed directly. Of course, it is not likely that all directors will be available for such exchanges. Our methodology does not depend upon this occurring in all instances; it is merely enhanced when the exchange does happen.

This on-site review procedure by project directors will be facilitated by the use of a checklist for success provided by project staff, based upon the results of Phase I. Since both the "host director" and "reviewing director" assisted in the development of this checklist, we believe the chances for more open discussion, for the creation of a spirit of learning, and for an enthusiasm in seeking new knowledge concerning what works best will be greatly increased.

In a further effort to obtain cooperation of personnel from subject projects, and because we feel there would be substantial benefit from their participation, we will form an Review Committee consisting of representatives from participating projects as well as certain individuals selected from U.S.A.I.D. staff personnel, university faculty and voluntary agency staff (Save the Children, CARE, etc.). The Advisory Committee will review material as it is developed during the course of the project in sufficient time to provide recommendations and guidance to the grantee on various project phases and elements.

The Phase II on-site reviews, which will take several weeks, will pay close attention to both measurable and unmeasurable aspects of the project, and especially to environmental factors which, through indirect or unanticipated ways were, in the minds of the directors, important to the conduct of the project. There could be local, cultural or physical circumstances which appear to be unique to the specific project. Special association or interaction between relevant government ministries or international voluntary agencies may exist. The motivations, style and morale of project workers from outside the community or project workers recruited locally, or the vision and leadership of people in the affected community may be judged to be the keys to success.

Measurable indicators of success would, as a first priority, consist of objective measures of final results wherever possible. For example, recorded changes in morbidity and nutritional status of children in the community over the course of the intervention would be primary data. Other measurements would be sought for instrumental indicators such as the number of local people participating in a program, the volume of new foods grown or distributed to vulnerable groups, or the level of other activities deemed indicators of success.

Conditions that are difficult to measure or are even unmeasurable can also be the basis for judging the success of an activity. These must also be considered first-priority items and every effort made to identify and record them.

Some intangibles have certain attributes that may yield to measurement to a greater degree than one might suspect. For example, it may be learned that an intimacy on the part of a change agent team member with the affected community is necessary for success and that this intimacy is only possible with sustained contact in the community. We would not be surprised if we found this hypothesis to be true. It would certainly be hard to get any objective measure of the depth of such intimacy. It would, however, be possible to develop some quantitative parameters around this very personal aspect of the intervention by recording the number of months a worker from the outside actually spent in contact with the target people. The number of workers recruited from the local community and their months of service represent other possible measures associated with an "intimacy dimension" for successful intervention. The point is that we will seek measurement wherever possible for the advantages measurements offer; to exclude these factors solely for reasons of quantitative convenience would defeat the purpose of this project. We assure you that our predisposition and orientation is in the direction of inclusiveness.

Phase II should generate many ideas (hypotheses) and supportive data about success in community-level nutrition programs. A thorough understanding

of these factors will make the final report version of the checklist for success more than a checklist; it could serve as a manual for the conduct of a project in which the workers are alerted to the variables most likely to be important and to some of the subtleties of their interaction.

Each project member will participate in several reviews. Hopefully, this will allow them to acquire sufficient breadth of understanding to prepare a final report detailing the experience and underlying philosophy which emerge as the product of the evaluation efforts. We have confidence that this method of drawing three or four knowledgeable people together, in the field, talking about what they are directly observing and drawing upon their experiences from elsewhere works extremely well. It fosters formulation of generalizations we need in order to translate the unique circumstances of a community-level or pilot project effort into useful generalizations for a wider audience while, at the same time, keeping the discussion pragmatic. The reports resulting from Phase II will be distributed to all participants and other interested people.

Phase III (Final Report and Workshops) of the project will consist of a workshop at a single location or regional (continental) workshops for the purposes of exchanging views, registering rebuttals or amendments to the final report conclusions, and cementing the international communication links created by the project. Formal papers might be presented for publication, or at least edited versions of the project working papers would be prepared for publication in order to disseminate the findings of the project to a wide audience and to fix the findings in a permanent form in literature available to health and nutrition planners.

III. METHOD OF INQUIRY

We have our own views about which elements are necessary for successful, community-level development. These form the basis for the checklist we will use to initiate a dialogue with local field coordinators regarding their projects. The field workers' perceptions of success may very

well be along different lines than ours. We must be careful that our interviewing procedure gives them full opportunity to express the insights they have gained from intimate association with a particular community and its problems, its methods of action, and how their own actions facilitated change for the better.

Our ideas about the context in which outside agencies operate in order to facilitate improvement in nutrition in a local, rural community amount to a theory of local intervention. The term "theory" is a bit too strong for our level of knowledge, although this is clearly what we hope to build from the results of this and other projects. Instead of labeling our line of reasoning a "theory", we call it a "checklist for success". We hope this more casual approach will allow us to establish more open and easy dialogues with the people in the field.

Measures of Project Success

The ultimate measure of success of a nutrition-related intervention is in the impact the intervention has upon the nourishment level of the target population. Although this appears, on the surface, to be a relatively easy characteristic to measure, it is, in fact, extremely difficult. Conditions unrelated to the intervention under study are constantly changing, seasonal effects are sometimes of major significance, and so forth. In short, controlling for all the non-intervention related effects in order to analyze the impact of the intervention under question is a large task.

Moreover, if we wish to understand why the intervention was successful we need to relate clinical changes in the target population to the setting in which these changes took place, both local and non-local. We must pay special attention to those characteristics which capture the process by which the intervention was implemented.

The final decision regarding the specific measures which are utilized will rest upon feedback from the initial site visits and joint discussions

with project staff and U.S.A.I.D. personnel. However, we will begin the project with an initial set of measures of project performance and systems characteristics. These measures fall into five general categories of observable phenomena, as described in the following sections.

A. Individual Child Nutrition Status Measurements.

The universally acceptable measure of nutritional status for children is size relative to age (such as height, weight or arm circumference). Weight-for-age is the standard most widely used, although weight-for-height and height-for-age as well as arm circumference are becoming more widely utilized. Weight-for-age reflects the effects of both acute or wasting malnourishment and height-for-age records chronic malnourishment. For the purposes of this project, the duration of the intervention and the type of data already existent at the field level will determine which type of analysis will provide the most information. For instance:

If the project has been in existence for several years and there is longitudinal data by child, a distinction can be made between acute and chronic malnourishment without the availability of height-for-age or weight-for-height data by measuring changes in child weight as well as actual weight levels.

If the project has been in existence for a relatively short period or there is no longitudinal data organized by child, it will be especially important to obtain height and/or arm circumference data as well as weight-for-age data in order to clearly show the effects the program has had upon acute malnourishment levels.

If there is little or no reliable field data and it is desired to set up a supplemental data-gathering system, it is important to establish the period over which the data can be gathered and whether each child can be tracked individually before deciding the sample size, frequency of observation and whether height and arm circumference

should be gathered as well as weight. Rather than saying a priori that all three types of data will be gathered, an analysis of the costs at the margin for each type will be made relative to the expected benefits accruing to each of them.

Data which will be considered are:

- Child weight by age and sex (including birth weight)
- Child height by age and sex (including birth weight)
- Child arm circumference by age and sex
- Census of births, deaths, migrations by age and by cause
- Population count for determining fertility, morbidity and child mortality rates
- Morbidity diagnostics by age and sex of child, such as:
  - diarrhea incidence (number of days per time period)
  - fever (number of days per time period)
  - respiratory or skin ailment
- Vaccination status

B. Family Status Measurements

Closely related to the anthropometric data for children are measurements concerning the status of the child's family. These records will be helpful in controlling for the variables which are not a part of the intervention as well as for analyzing the degree to which the intervention has been able to target upon the high-risk population subgroups. Analyses performed elsewhere by the principal investigator and others point to the importance of these factors in understanding why and how an intervention works or does not work.

Family level data which will be considered:

- Family size
- Age of family members (yielding both child spacing and consumption per person)

- Family feeding practices
- Education level of parent(s)
- Occupational status of parent(s)
- Period of time family has been in or exposed to intervention
- Marital status of parents
- Knowledge and use of family planning (rhythm, pill, IUD, other)
- Degree of exposure to hygiene education
- Degree of exposure to pre-natal attention including assistance at birth
- Family income
- Monetary expenditures on food or some other measure of food consumption

As is true for the individual-level data, it would be unrealistic to presume that all or even most of these types of information could be made available in any particular field setting. In addition, to the degree that supplemental data gathering is institute during this project, one of the fundamental design criterion will be simplicity and ease of application in the field by relatively unskilled para-professionals. This will call upon utilizing simplified health cards and other such devices which facilitate beneficial feedback to the participant at the time of data acquisition as well as useful summary statistics following analysis.

We have found useful a particular methodology for quickly determining nutritional status of a population, and it is proposed to utilize this approach in this project. It calls for establishing a community-level profile of malnourishment by age of child. This profile which is, in part, a "natural history" of malnourishment in a hostile environment, is predictable in general terms. Children born in a relatively healthy state often suffer a period of sharp but short-term malnutrition during weaning which results in acute malnourishment. If they survive, malnourishment (as measured by most standards in use) gradually improves with child age. The timing and degree of severity of the malnourishment in any particular instance is a function of weaning practices, environmental conditions, nutrient

availability, and other factors. However, the general characteristic of variations as a function of child age is universal in hostile environments. The methodology which we will employ calls for entering the field with the best estimate of this natural history based upon published or otherwise available data and then quickly calibrating the population in question with sample measurements. This, then, constitutes a baseline for future measures and can help determine the most useful stratification and other sampling issues.

The question of which nutritional standard to use is always a difficult one, especially when comparing different cultural settings. As part of this project we will continue to work on a simplified procedure (possibly computer assisted) which is capable of converting data based upon one standard to any other one. Preliminary work on this has already begun using eleven different standards.

3. Community-Level Indicators

All of the community-level, nutrition-related interventions proposed for analysis are located in environments that are far from ideal. Generally, poor sanitary facilities, lack of potable water, shortages of feedstuffs, etc., are contributing to the poor nutritional status of the target population. As a consequence, throughout the the period of analysis it will be necessary, in so far as practicable, to gather baseline data in order to control for environmental effects and to facilitate comparisons among projects. Such baseline data would include:

- Population and demographic characteristics of the community and area served by the intervention.
- Type of coverage of water systems, including degree of potability.
- Type of coverage of sanitary sewer or drainage systems.
- Character of housing stock by income and if possible, by geographic subregion.
- Sources of employment; unemployment and underemployment rates, etc.

- Variations in all of the above characteristics resulting from changes in season.
- Degree of linkage of community to other communities and the national economy as measured by migration patterns, employment sources, extent of cash vs. barter economy, etc.
- Description of the already existing institutions and individuals which affect the nutrition-related components of the community; e.g., number of types of food outlets, local speculators who buy and sell foodstuffs, educational facilities, transport infrastructure, etc.

D. Intervention Characteristics

The previous measurement categories dealt primarily with the environmental setting and the ultimate program success in terms of nutritional impact. For the purposes of this study it is even more important to identify what the intervention-related causes were for the change (if any) in nutritional status of the target population.

What was the process by which the changes occurred, why was one approach successful and another not. In fact what is meant by success? Should not success be measured in part, in terms of ability to extend the intervention to a regional and national scale rather than merely demonstrate the ability to reduce malnourishment in a particular setting given sufficient resources? What seems to be the importance of the subjective and non-quantifiable factors upon the success of the project? It is particularly in this area of the evaluation where we will solicit responses from the key participants in the interventions in creating the checklist for success. However, as in the case of the previous categories of measurement, our team will enter the field with a set of questions and a structure (probably in the form of a branching questionnaire) for eliciting responses.

Examples of these kinds of questions which fall into the social-political category are:

- What was the process by which the intervention was brought into being, including an analysis of the professional and personal characteristics of the key participants, the sources of funding, the degree of community participation by type of community member in formulating the design of the intervention, and the extent to which the intervention is based upon a local diagnosis of the key problems.
- What was the nature of the support for the intervention at various stages of its development with respect to donor agencies, country government agencies, educational institutions, community leaders, etc.
- What is the relationship between cohesiveness among community subgroups or individuals and program success?
- What is the range of services offered by the project and to what degree does the success seem to hinge upon the breadth of these services and the degree to which they are integrated with each other?
- What is the nature of the linkages between the intervention and other on-going or previously existing programs at the local, regional and national level?
- What is the local popularity of the project as measured by such factors as degree of community knowledge about the elements of the project, general attitude toward it, and evidence of desire by the community members to expand the coverage or duration of the project?
- How do the various participants view their role in the development process and what are their attitudinal and behavioral antecedents? Do they assume facilitative or authoritative roles, etc. ?
- How well does the project identify the high-risk target population, and upon identification how well does it provide services to that population group?
- How does the referral system operate between the intervention and other nutrition or health related efforts?

- What are the specific methods employed in each element of the project? With regard to the food component, for instance, is the method of distribution via the health worker, through demonstrations in the home or health center, by food stamp coupon or through a subsidy to the already existing channels of distribution such as stores and wholesalers?
- How are the clients of the projects sought out, including the specific messages transmitted to them, and how were these messages developed?
- What are the staffing characteristics of the project in terms of employee education level at entry, degree of flexibility of entry criteria, the amount of training provided, the source of that training, the existence of clearly defined job duties, and how problem-oriented is the training curriculm?
- How was the staff recruited and motivated to perform their functions, including level and type of remuneration, status enhancement, potential for future career or education opportunities, etc.?
- Does there exist a mechanism and approved budget for a continuing education component for various staff levels of the project?
- What are the characteristics of the management system in terms of technical supervision, standardization of material resources, adequate supplies and equipment, assurance of direction to areas of need, and well-established referral linkages?
- What types of records are available to the project regardless of whether they are utilized for management or education efforts?
- What is the nature of the evaluation and feedback system? Does it provide information for both management-related changes in the program and for the efforts at continuing education? Does the program seem to have the flexibility to adjust to changing problems or to new information on existing problems?
- Are there ways in which these records can be used <u>both</u> for community-level purposes and for a component of a regional or national nutrition and health status surveillance system?

- Given the current configuration of the intervention, how replicable is it on a regional or national scale in terms of resources (both physical and personnel) available to the entire nation?

Economic Considerations

There are two general dimensions to the economic portion of the analysis: 1) the economic environment in which the community dwellers exist, and 2) the costs and nature of financing of the intervention itself.

We know that there are very strong linkages at the macro level between economic development and health status. This linkage is also true at the micro level as exemplified by the relationship between family income and nutritional status. Consequently we will attempt to obtain:

- Family income by subgroup within the community with special attention to the target population.
- Costs of various commodities available at the local level, such as housing, community services and especially foodstuffs.
- A record of changes in both costs and income over the duration of the intervention.
- A record of changes the national or regional economy has experienced during the intervention period and the implications these changes might have at the local level.

The cost characteristics of the intervention itself will tell much about the degree to which it is feasible to extend beyond the pilot stage. An analysis will be made which shows:

1. The method of financing the intervention, including sources of funding, overall budget and deviations between budget as implemented and budget as first conceived.
2. A break-down where possible, on costs of services provided in the intervention by service function or output and also by type of input such as personnel, materials, supplies, etc.

3. The projected cost of extending the intervention to the national level, based upon the above analysis and upon the characteristics of the country.

Since we are particularly interested in being able to compare interventions carried out in different parts of the world, we will attempt to express all costs in terms of ratios and percentages. For instance, costs of commodities will be expressed in terms of percentage of disposable income and costs of interventions will be measured in terms of percentage of GNP or some other more appropriate inter-country indice.

IV. PROJECTS TO BE REVIEWED

We have already identified more projects than would be feasible or appropriate to study in depth. In this section, we present a brief description of some of these projects and a listing of others. The listing is still incomplete. Some of the projects are certain to be included in the analysis, such as: Candelaria (1976) and La Union, Villa Rica and Buenos Aires, the Philippines projects and the Kasa program. Others may be substitutable for each other. During the first phase, and in fact prior to the funding of the project, work will continue on identifying programs and preparing brief descriptions of them. Upon completion of this task it is proposed that a joint decision be made between Community Systems Foundation and U.S.A.I.D. on the initial list of projects to be included in the analysis. Examples of selection criteria to be used are:

1. Accessibility to the program throughout the analysis period,
2. Age of project,
3. Style of intervention,
4. Potential for replication,
5. Geographic and cultural dispersal,
6. Substitutability,
7. Types of data available,
8. Pragmatic feasibility of implementing the analysis considering such things as logistics, support, infrastructure, locally available data gathering personnel, etc.

A. The Promotora Program Revisited - Candelaria, Colombia

In 1968 a new health program was initiated in Candelaria, Colombia. This program centered around health volunteer workers (Promotoras), girls between 16 and 21 years of age with at least five years of primary school. Following a six-month training period, they assumed the task of visiting all families with children less than six years of age every two months. The ten volunteers provided education on nutrition, hygiene and utilization of health services; gathered

data including child height and weight; and referred sick children to a Health Service Unit. The latter was staffed by four Public Health Nurses Aides and provided initial treatment of the most common illnesses. Pregnant and lactating mothers were also instructed in pre- and post-natal care.

The overall management of the Health Center was directed by a general practitioner (sixth-year medical student) and a Public Health Nurse. The major purpose of the program was to prevent disease as well as to reach children before any illnesses had progressed to a point requiring extensive and costly medical treatment.

By utilizing the volunteers to identify those children requiring further treatment, the time of the highly skilled health care personnel could be reserved for tasks appropriate to their skills. The direct participation of community members in the program increased its acceptability.

The results of this program were analyzed during 1976 and are reported in a recent CSF document.[2] Since 1974 the Promotora program as implemented in 1968 ceased to exist but has been replaced in part by a much less ambitious program.

The purpose of this further study would be to analyze the longer-term effects of the program with respect to: 1) residual learning and other community characteristics which are the result of the 1968-74 Promotora program, and 2) the way in which this Promotora program affects the implementation of a regional-national counterpart. Raw individual and community-level data has already been gathered for 1976 and should be available for analysis in the near future.

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[2] The Promotora Program in Candelaria: A Colombian Attempt to Control Malnutrition and Disease, 1968-74, W.D. Drake and L.F. Fajardo, Community Systems Foundation, Cali, Colombia, June, 1976.

B. La Union Promotora Program - Cali, Colombia

In January, 1976 a version of the Promotora program used in Candelaria, Colombia was initiated in a suburb of Cali, Colombia. This low-income suburb, La Union, has a population of approximately 100,000, all of whom will be eventually covered by the program. The program differs from Candelaria, in that the auxiliaries are paid rather than serving as volunteers and the ratio of Promotoras to population served is approximately one-tenth that of Candelaria. This program, managed by Dr. Alfredo Aguirre, M.D., has the cost and staffing characteristics of a program which, if successful, could be implemented nationally.

This program bridges the gap between the pilot project of Candelaria and a national effort. It would be particularly useful to analyze in terms of gaining a better understanding of the diffusion process. Discussions have already been held with Dr. Aguirre and a data collection program having many elements of the Candelaria project is already in place at La Union.

The Philippine Nutrition Program

In June, 1974 the Philippine National Nutrition Council (NNC) was created by President Ferdinand E. Marcos. Simultaneously, the Nutrition Center of the Philippines (NCP) was established by the First Lady, Mrs. Imelda Romualdez Marcos. These two events were indicators of the nationalization of a series of pilot projects carried out by health nutritionist Solon Florentino as well as as others. The characteristics of both the national program and the pilot efforts are similar to the Promotora program in Colombia, which would provide a rich setting for comparing the process of diffusion from pilot project to regional or national level.

In addition, some excellent documentation of various aspects of program(s) already exists and could be drawn upon during the analysis.

Examples of these papers are:

Income, Time, The Working Mother and Child Nutrition, by Barry M. Popkin, IEDR Discussion Paper, July, 1975.

Major Factors Affecting Rural Household Food Consumption, by Susan Gonzalo, IEDR Discussion Paper, July, 1976.

The Role of the Rural Filipino Mother in the Determination of Child Care and Breast-Feeding Behavior, by Barry M. Popkin, IEDR Discussion Paper, August, 1976.

M.C.H. Program - Kamkanyakumari District, Tamil Nadu, India

Since 1972 the Kottar Social Service Society (K.S.S.S.) has run a village-based nutrition supplementation, nutrition education, and health care service for pre-school children. As of June, 1975, this program was reaching on a regular basis more than 40,000 children, for whom growth charts were kept. Since that time, the program has expanded to encompass a larger number of children.

The management staff of K.S.S.S. is very small, numbering less than ten people. The effective outreach achieved in the M.C.H. Program is made possible by recruitment of more than 450 voluntary extension workers, all local girls who - with training - become the principal agents of the delivery system in the communities where they reside. The program developed and has expanded on the basis of extended deliberation with the communities involved, and reflects a consensus already achieved concerning what to do and how to do it. A particularly interesting feature of the program is that it is entirely self-supporting, the beneficiaries contributing the resources necessary to maintain the program in their communities (excluding Title II commodities). This program merits study because of its decentralized approach, its flexibility, its use of informal methods of communication and mobilization, its relatively low cost, and its supposedly high impact. The M.C.H. Program is but one effort undertaken by K.S.S.S. to stimulate social and ecological change in the District. Comparisons between this program and similar programs in at least the Philippines and Colombia should

provide useful cross-cultural characteristics as well as operational simulation.

E. Kasa Maharashtra Project - India

125 Kilometers north of Bombay in the state of Maharashtra is the Kasa Primary Health Center, serving a population of approximately 70,000 in a backward tribal area. Beginning in 1975 an integrated mother-child health/nutrition project was initiated at the Center which had a stated goal of developing an effective program capable of replication throughout the state.

This project has several distinctive features: 1) the selection of feeding program beneficiaries based upon "at-risk factors" and a diagnosis of severity of malnutrition, 2) the use and demonstration of locally available foods as supplements, 3) the training and use of local women as part-time social workers (PTSWs), 4) the integration of this project with ongoing government health and nutrition programs, 5) the use of a domiciliary and clinic approach for reaching the more remote villages, and 6) the use of simplified surveillance methods to enable PTSWs and beneficiaries to understand the significance of the problem.

The targeted goals of the program are to reduce mortality rates and the incidence of malnutrition, to increase immunizations against disease, to lower the birth rate and to increase awareness of health and nutrition.

Male literacy is 15 to 20% and female literacy is under 10%. Per capita daily income is less than 60 paise (seven U.S. cents), and malnourishment is likely in excess of 80% (using the Harvard Standard) of the children. The original budget of $100,000 U.S. has been reduced somewhat but all elements first proposed are still included, although the population covered has been reduced.

This project is of particular interest because it represents an example of the transition from a model project carried out at Palghar to one which has the economic and staffing characteristics which make it feasible for replication state-wide if successful. There are plans for the government of Maharashtra to take over the administration of the project in early 1977. In this manner it is similar to the effort currently being carried out by Dr. Alfredo Aguirre in La Union on the outskirts of Cali, Colombia, which is the transition model for many of the elements in the Promotora program in Candelaria, Colombia.

F. Integrated Child Development Services (ICDS) - India

To help ameliorate the problems of malnutrition, the Indian Ministry of Planning in 1972 suggested that a scheme for integrated child care services be implemented nationally. It is from this beginning that the ICDS scheme has taken shape. Beginning in mid-1975, the government of India instituted the program in 30 development blocks around the country - four urban, ten tribal, 16 rural, each having a population of approximately 100,000. The scheme covers 40,000 children and 16,000 pregnant and lactating women.

The objectives of ICDS are to improve the nutritional and health status of the children in the age group 0-6 years, to reduce mortality, morbidity, and malnutrition in the group, to educate the mothers on proper nutrition/health procedures, and to provide foundations for good psychological, physical and social development of the child. The package of services to be provided includes supplementary nutrition (preferably with locally available foods), immunization, health check-ups, referred services, nutrition and health education and pre-school education.

The scheme centers around the village anganwadis who, in most cases, comes from the village in which she works. After three months of training, she is responsbile for pre-school education (forty children

between 3-5 years), supplementary foods (for those children in need), mothers' education in nutrition and health, making home visits, ensuring community participation and support, assisting the health staff, maintaining records, and coordinating local child-related matters in the village.

The expansion of the scheme from the 30 experimental blocks to 100 blocks is being considered in New Delhi. Aspects of this program resemble efforts made under the Narangwal project in the latter 1960's.

G. Jamkhed Comprehensive Rural Health Project - India

The Jamkhed Project is located in Ahmednagar District, 400 kilometers east of Bombay in Maharashtra state. Approximately 40,000 people in thirty villages are covered by the Comprehensive Rural Health Project. The area is principally agricultural but is located in a "chronic scarcity" zone due to uncertain and often deficient rainfall.

The Aroles, a husband and wife doctor team, established the program in 1970. They have constructed a small hospital in Jamkhed, while at the same time setting up an outreach system in the surrounding villages. The primary objectives of the project are to reduce under-fives' mortality by 50% (average rate before the scheme started was estimated in the range of 120 deaths per 1,000 live births), to train indigenous health workers, and to reduce the birth rate from 40/1,000 to 30/1,000. The project is based on finding resources within the community and activating people to identify and help solve their health problems.

After assessing the needs of the villages around Jamkhed, the Aroles have placed emphasis on nutrition services for the vulnerable. A village committee is formed through which activities such as supplementary feeding (using local commodities) are carried out.

Heavy reliance is placed on the village health worker (VHW) who is chosen in consultation with the village council. She conducts nutrition/health education sessions and the village feeding program, distributes contraceptive devices, collects vital statistics, maintains weight charts on the young children, and serves as the contact person for the mobile, higher level health staff on their weekly visits to the village. She receives constant training during the course of her work. Regular meetings are held so that all the VHWs can share their experiences and discuss possible solutions. The scheme is thought to be replicable in other areas and has engendered government interest.

H. Chimaltenango - Guatemala

Under the direction of Dr. Carroll Behrhorst and with the assistance of church groups from abroad, a community health and nutrition scheme has been established among the Indian population of the Guatemalan highlands. Seventy local "health promoters", who have been trained in simple treatment of local health problems, operate in fifty communities. The promoters have an average of 3 years of formal education, but after practical, field-oriented training can treat common ailments which make up the vast majority of ills in the poor villages. The community is responsible for the promoter and fees for his medicines and services are set by the local committee. The promoter, as a respected member of the community, also plays a role in such activities as literacy programs, family planning, and agricultural extension. Underlying causes of poverty and malnutrition are also addressed, - like land tenure and credit availability.

The emphasis in the Chimaltenango project is on preventive measures, especially in nutrition and hygiene, along with family planning. Local organizations make self-help measures possible. Services are adapted to the needs of the community

The program is thought to be reproducable elsewhere in Guatemala and in other countries. The government of Guatemala is reportedly using Chimaltenango as a model for setting up the health training program of the Ministry of Health.

I. Hanover Project - Jamaica

The Hanover Community Health Project - Young Child Nutrition Program is an extension of the scheme in Elderslie where the feasibility of the approach was established.

This is a joint effort between the Jamaican Goverment, Cornell University Medical College, and the University of the West Indies. The goal of the program is to reduce young child mortality by improving nutritional status through the use of locally available resources. Locally recruited and trained Community Health Aides (CHAs) learn to diagnose and treat malnutrition under the supervision of more highly trained health/medical staff.

The procedure followed is to obtain an accurate census of the district, weigh and measure each child under five years old, assign each child to a CHA, identify all malnourished children for subsequent care, and geographically define the area assigned to each health aide. Over a two-year period (1973-1975), approximately 6,000 children were covered by this scheme.

The principal tools used in the Hanover project to combat malnutrition are nutrition education and health services, with only a minimal reliance on supplementary food (DSM). Frequent home visits are made by the CHAs. Attention is concentrated on the most seriously malnourished, but all children in the vulnerable age group are periodically weighed to insure that there is no deterioration of their status.

The project has had considerable success in reducing the prevalence of malnutrition in children under four years old. Mortality rates have also dropped by more than 50% since initiation of the scheme in Hanover Parish. Discussions are now being carried out in Jamaica to expand the scheme on a nation-wide basis.

J. The Danfa Project - Ghana

The Danfa Project is an extension and further development of a comprehensive rural health program originally conceived by the Ghanian pediatrician, Dr. F.T. Sai. The project was started in the early 1970's and was to run for six years. The Ghanian Government is responsible for the service aspect of the project, while UCLA is primarily concerned with the evaluation of the scheme.

Danfa is one of the largest rural health and family planning projects in Africa, covering a population of approximately 55,000. Its objective is to test the efficacy of alternative methods of delivering family planning and health services to a rural population. Maternal and child health and family planning services are integrated based on the hypothesis that family planning will be most acceptable when it is combined with comprehensive MCH services which reduce infant mortality and morbidity rates.

The research design divided the population into four groups:

Area 1 - comprehensive health services provided and primary reliance on paramedical personnel;

Area 2 - existing Ministry of Health services augmented by family planning services similar to Area 1 and by health education services emphasizing family planning;

Area 3 - existing Ministry of Health services augmented only by family planning services;

Area 4 - no special inputs (control group).

Different methods and approaches to nutrition education and parent involvement are being tried and evaluated. Moreover, analysis of the social, political and economic impacts of the project are to be measured.

K. Mothercraft Centers - Haiti

The project was initiated in the community of Fond Parisien in 1964, although the community had earlier resisted a host of development programs. The Mothercraft center was designed to be self-eliminating, and was closed in 1969, after its primary goals were reached. New centers were later opened and by 1973 more than sixty Mothercraft centers were in operation in Haiti.

The centers' prime role is nutrition rehabilitation through maternal education. Considerable demands are placed on the community to provide for the centers, and continued involvement and demands on maternal participation are also expected. No medical facilities are connected with the centers. Children of all the community's families are screened and their nutritional status is recorded: the thirty most severly malnourished children are invited to participate. A child, as a rule, will only be accepted at the center if the mother agrees to work there one day a week and thereby profit from the education program. After a three-month period a new group of children are invited to replace the first group, and so on.

At the time of inception of the Mothercraft program 50% of the live-born children in Haiti did not survive their fifth birthday. Two-thirds of the surviving children in the lower socio-economic groups exhibited signs of protein-calorie malnutrition. Outside the major cities illiteracy was estimated to be 90%. Daily expenditures on food and fuel typically ranged between 7-12 U.S.¢ per capita between 1960 and 1970 and have not been substantially altered.

The goals are not set for optimal nutrition and growth. Rather, the centers aim at eliminating fatal malnutrition and reducing the incidence of second- and third-degree malnutrition among children under five years of age through the improved feeding, health and sanitary practices of the mother.

The Mothercraft centers in Haiti enjoyed the first systematic implementation of the principles set forth by Dr. Jose Maria Bengoa, which were later adapted in various forms in three continents. The centers represent a low-cost community-based, non-integrated nutritional effort. Their wide acceptance among the local population, and their documented nutritional impact and duration make the Mothercraft program a particularly valuable model.

L. Under-Fives Clinics - Malawi

Malawi is one of the world's poorest countries, with a yearly per capita income of approximately U.S. $60. Recently, it has made a major effort to improve the health and nutritional status of young children by providing widely dispersed, locally based Under-Fives Clinics (UFC) throughout the country. By 1972, 362 UFCs had been established and staffed with health auxiliaries. A halt or reversal of a thirty-year declining trend in the nutritional status of children under five has taken place since the beginning of the program.

Integration of voluntary organizations has been a major feature of the plan. Extensive cooperation with church-related health facilities was developed. Thirty Peace Corps Volunteers were used as catalysts to launch the program and to train auxiliary staff during the first two years. Today major emphasis is put on immunizations, malaria depressants and health care. Each center also provides health education, regularly incorporating cooking demonstrations into the program. Most clinics have a simple

kitchen and some poultry units and vegetable gardens for illustration.

The program intended to reach 60% of Malawi's under-five children in ten years. Approximately 40% are currently being covered.

Of a thousand live-born children in Malawi some 375 die in their first five years of life. Malnutrition has been found to be the primary cause of death in 20 to 25% of children brought in for hospital care. Malnutrition is also judged to contribute to another 35% of the child mortality in this age group.

The nutritional impact generated by improved child health and the education of the mothers makes this program particularly interesting. Under-Five Clinics are also in use in Nigeria, Zambia and Tanzania.

M. Papago Project - Sells, Arizona

The approximately 8,000 members of the Papago Tribe of Arizona who live on the southern Arizona reservation cluster in about 70 small villages. Some earn their living from the cattle which the dry land supports, while many hold government jobs or are on welfare. Approximately 3,000 to 3,500 Papagos participate in the U.S.D.A. commodity food program by virtue of their low family income.

The Papago Nutrition Improvement Program was begun in the early 1970's under tribal authority to carry out several village projects. These projects included: a diarrhea control program using home visits by nutrition aides, training in the preparation of nutritious commodity foods, education of mothers of young children in nutrition principles, gathering and preparation of native desert foods (a practice that has been nearly lost), and an analysis of food availability and price at local trading posts.

The measurement of nutrition problems and the evaluation of the effects of the various interventions have been done with varying degrees of rigor. The U.S. Indian Health Service has worked closely with the Papago Nutrition Improvement Program in their evaluation. An extensive and soohisticated information system has been developed for the I.H.S. hospital in Sells, Arizona, which has now been extended to all outpatient activity. This system enables the surveillance of nutritional status among Papago children on the reservation, as well as extensive data for relating nutritional and health data of family and community groupings. The diarrhea control program was very carefully evaluated, beginning with a study of how to predict the liklihood that a given child would have major diarrhea problems. The resulting procedure for predicting "at risk" children (based on such factors as birth weight, family size, and health status of home village) was combined with a model that defined progressive stages of severity of gastroenteritis to determine the appropriate treatment that the nutrition aide should give. The project was successful in terms of reducing hospitalization due to infant gastroenteritis (50% hospitalization in the "control" group versus 4% in the subject group).

N. Mapuche Indian Project - Nueva Imperial, Chile

Approximately 6 to 8% of Chile's ten million people are Mapuche Indians. More than half are subsistence farmers living on small reservations. Very little is known about their nutritional status.

In November, 1975 the national food and nutrition planning agency for Chile (commonly known as "COMPAN") initiated a community nutrition project in 38 Mapuche Indian reservations near the town of Nueva Imperial in South-Central Chile. The purpose of the project is to ascertain the extent and nature of nutritional problems among the Mapuche and to find ways to solve these problems, first in the study of specific reservation, and then by applying generalizations

to other reservations. CONPAN views this project as the first step in a national network of study communities which will enable CONPAN to monitor the effect of national policy on nutritional status.

The methodology of this project is based on that being developed and tested in villages near Cali, Colombia under a U.S.A.I.D. funded research study. The first step involved contacting representatives from each of the 38 reservations, which was accomplished by a team including long-time Mapuche residents. A baseline survey was completed in June, 1976: a doctor-nurse team collected anthropometric, health status and biochemical data on a sample of over 200 pre-school children; and 22 Mapuche college students obtained a wide variety of data on crops, economics, water, sanitary practices, consumption, and use of health services from the families of these children. Although analysis of this information is still progressing, a preliminary analysis led to a pilot intervention in one community. A community health clinic whose physical design followed that of traditional Mapuche community buildings has been constructed by local community members and will house a trained Mapuche health auxiliary who will deliver a number of nutritional services. Numerous other interventions will likely be made and evaluated on these reservations as a result of the analysis. Furthermore, CONPAN expects to maintain this area as a long-term study community, with periodic samplings of nutritional status.

O. Other Candidate Projects

In addition to the fourteen candidate projects mentioned above there are several others for which we currently have no written description but wish to consider. Examples include:

- Dona Elena, Puerto Rico
- Save the Children Federation, Honduras

- Panua New Guinea Project
- Selected projects enumerated in the paper by Merrill H. Shutt, M.D.[3]

PROJECT PERSONNEL

This project will be conducted and managed by several principals who have a broad range of experience in community-level interventions and in evaluating methodologies. In addition to these principals, we plan to involve project directors of some of the interventions studied, and doctoral-level research assistants at both M.I.T. and the University of Michigan.

William D. Drake will act as Project Director and will share top-level substantitive responsibilities with John Field, Luis Fajardo, John Nystuen, Dean Wilson, Barton Burkhalter, William Bertrand, and David Nelson. Curriculum vitas are included in Attachment B for these principals.

The following are background descriptions of project personnel.

Drake, William D.

Dr. Drake has just completed an analysis of some of the more significant aspects of the intervention(s) carried out in Candelaria, Colombia (this report is currently available from Community Systems Foundation). He has been a participant in the community-level experimental programs for the reduction of malnutrition in the Cali region of Colombia, as well as in Chile. Currently, Dr. Drake is assisting Save the Children Federation to develop evaluative methodologies for Honduras, Bangladesh, and other project areas.

As Professor of Urban and Regional Planning at the University of Michigan, with a background in systems analysis (Ph.D., Operations Research), Dr. Drake has involved himself in the initiation and implementation of a broad range of interventions, including the founding and chairing of a metropolitan transportation authority (Ann Arbor, MI.), the first chair of the Interdisciplinary Ph.D. program in Urban and Regional Planning at the University of Michigan, and the founding and trusteeship

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utt, Merrill M., M.D., A.I.D. experience in the Development and Evaluation of Integrated Health Delivery Systems. Paper presented at the 104th Annual Meeting of the American Public Health Association, October 13, 1976.

of a statewide savings and loan association. His training and experience in Management Science (MBA) will help facilitate many operational aspects of project implementation and evaluation.

Dr. Drake will spend approximately 1/2 time on the project with the exception of certain critical project phases during which his commitment will be full time.

Field, John O.

Dr. Field brings a major social science perspective (Ph.D., Political Science) to the project which is enhanced by his research capability with regard to the operating characteristics of interventions. He was a Co-Director of the M.I.T. Indian Election Data Project, has taught at Madras University (India), and has participated in projects in Brazil, India, Honduras, Guatemala, and El Salvador. He has recently returned to the United States from an initial review of project sites in Papua New Guinea, the Philippines, and India.

Dr. Field has published extensively regarding the political processes involved in international development; a summary of these publications is included with his curricular vita in Attachment B.

Dr. Field will spend between 1/2 and 1/3 of his time on this project as a member of the principal staff.

Nystuen, John D.

Dr. Nystuen, an analytic geographer by training (Ph.D., Geography), is currently the Chairman of the Interdisciplinary Ph.D. Program in Urban and Regional Planning at the University of Michigan. He has extensive experience in Mexico, South-East Asia, East Africa, Turkey, Nepal, Colombia and Chile. His current research interests include: World Food Systems, Analytic Methodologies, Research Design and Evaluative Techniques.

Dr. Nystuen plans to devote 1/2 time to this project during his forthcoming sabbatical leave.

Fajardo, Luis F.

Dr. Fajardo is a pediatrician specializing in Nutrition Planning. He is currently serving on the medical faculty (Department of Pediatrics) at the Universidad del Valle Medical School, Cali, Colombia. He has had ample experience in the practical aspects of Nutrition Planning in his capacity as Co-Director for the project on Community Experiments in the Reduction of Malnutrition in Colombian Villages.

Dr. Fajardo will spend up to 1/3 time on this project at points where his expertise is in greatest demand.

Burkhalter, Barton R.

Dr. Burkhalter is experienced in nutrition planning, information systems, and project management. He has provided technical assistance in nutrition planning to the governments of Thailand and Chile over the last two years; he has also played a key role in the development

of nutrition planning research projects in Colombia, and was the Principal Investigator on an A.I.D. Office of Nutrition grant that reviewed and extended nutrition planning models. He is Professor (Adjunct) of Urban and Regional Planning at the University of Michigan where he has taught courses in Nutrition Planning and in World Food Systems.

Bertrand, William E.

In connection with the International Center for Medical Research, Dr. Bertrand has directed research on migration, field methods, and evaluation of health programs. He has also worked as a consultant to the Peace Corps on human ecology and rural sociology; and, his teaching and research experience in comparative societies, sociology of health, social problems and attitudinal measurement is expected to add much needed depth to the cross-cultural aspects of this project.

Dr. Bertrand's current positions include: Associate, Community Systems Foundation; Director, Behavioral Science Section, International Center for Medical Research, Tulane University (Ph.D., Sociology, Social Change, and Measurement) and the Universidad del Valle, Cali, Colombia; and, Instructor, Department of Epidemiology, Tulane University. He is now involved in the coordination of research activities for a large univerity-based research organization operating in the U.S. and Latin America.

Pradilla, Alberto

Dr. Pradilla is an Associate with Community Systems Foundation and Professor of Medicine at the Universidad del Valle in Cali, Colombia. He has extensive experience and numerous publications in nutrition and medicine. He has recently returned to Cali from a two-year assignment at INCAP in Guatemala.

Wilson, Dean H.

Mr. Wilson has had extensive experience in nutrition planning in Colombia, Chile, and Zaire and has provided technical assistance to numerous other countries. He is largely responsible for the theoretical development underlying the research programs now underway in Colombia. He has held numerous positions, including Professorships at the Universidad del Valle in Cali and the University of Michigan, Rockefeller Foundation Fellow, Board Member of Consumer's Union, and Director of the Industrial Systems Laboratory at the University of Michigan. He was a founder and served as first Chairman of Community Systems Foundation.

Nelson, David P.

As an Associate with Community Systems Foundation, Dr. Nelson (D.V.M., Ph.D., Nutritional Biochemistry) currently is on full-time assignment in Chile providing technical assistance to COMPAN, the national nutrition planning agency for the country. Dr. Nelson has previously served as nutrition advisor and food-for-peace officer for U.S.A.I.D.

in Ecuador, nutrition consultant to Catholic Relief Services, post-doctoral research fellow at INCAP and at M.I.T. in nutritional biochemistry, pathology resident at Angell Memorial Hospital, and Peace Corps volunteer in Ecuador.

Eckroad, James C.

Mr. Eckroad is currently on assignment as an Associate of Community Systems Foundation in Cali, Colombia with the project on Community Experiments for Reduction of Malnutrition in Colombian Villages. He has also provided technical assistance to Foundation projects in Bolivia, Chile, and Honduras, where he was Chief-of-Party for a nutrition sector assessment. Mr. Eckroad has focussed on the relation of water and sanitation to nutrition and on the teaching of nutrition planning principles to village residents. Previously he served with the Smithsonian Tropical Institute in Panama, the Environmental Simulation Laboratory at the University of Michigan, and as a Peace Corps volunteer in Colombia.

The following is a partial list of Consulting Associates with Community Systems Foundation, and who may be called upon for specific, short-term assignments in connection with this project:

Oscar Bolanos - A medical doctor currently serving as Auxiliary Professor at the Universidad del Valle.

Peter Cabban - A specialist in the operation of hospitals and institutional feeding programs, currently serving as Chief Executive of Community Systems Foundation (Australasia).

Richard Duke - A specialist in environmental sanitation and developer of the FAO food game, currently Professor of Regional Planning at the University of Michigan.

Charles Eisendrath - A foreign correspondent and journalist, currently serving as assistant professor of journalism at the University of Michigan.

Frederick Goodman - Professor of Education at the University of Michigan with extensive experience in gaming, information systems and faculty governance.

Peter Heller - Economist specializing in health care in developing countries currently serving on the faculty of the economics department and School of Public Health at the University of Michigan.

Paul Nickel - Development economist currently serving as Professor and Director of the Institute of National Resources, University of Manitoba, Canada.

Seth Reichlin - Anthropologist and Producer, currently involved in independent project filming sociology of communities around the world.

Donald O. Schön - Author and theoretician of social planning, currently serving as Ford Professor of Urban Planning at M.I.T.

William Woodward - Medical researcher specializing in diarrhea and associated diseases, currently serving as Associate Professor of Medicine, University of Maryland.

Giovanni Acciarri - Long-term resident of Colombia, faculty member at the Universidad del Valle and Ph.D. student in Urban and Regional Planning at the University of Michigan.

Merrill Flood - Mathematician with extensive publications and positions in operations research, information systems and theory of decision-making, currently Professor at the University of Michigan.

Rich Paullin - Former director of a cross-cultural training, research, and consulting firm in Tokyo, Japan; currently with the Nutrition Planning Information Service.

BUDGET SUMMARY

		27 Month Total
A.	Salaries and Wages (including Fringe Benefits):	
	Project Manager	$ 37,800
	Principal Staff (Field, Nystuen, Fajardo, Wilson, Burkhalter, Bertrand)	75,900
	Research Assistants	49,000
		162,700
B.	Consultants:	11,500
C.	Non-CSF Field Staff:	6,000
D.	Travel:	
	International	32,800
	National	4,900
	Per Diem	19,600
E.	Communications:	7,000
F.	Computer Processing (including key punching, tapes, portion of computer processing charges):	9,500
G.	Workshop Marginal Costs: (logistics planning, materials, supplies & staff but no travel of participants)	15,800
H.	Report Preparation and Distribution:	10,000
I.	Overhead at 37.5%:	104,900
	TOTAL EXPENSES:	$ 384,700

ATTACHMENT A

LOGICAL FRAMEWORK

SECTOR LEVEL GOAL	OBJECTIVELY VERIFIABLE INDICATOR (OVI)	METHOD OF MEASUREMENT (MOM)	ASSUMPTIONS
Reduce malnutrition in high-risk groups, by increasing the effectiveness of "community level nutrition" programs, particularly programs that: 1)aim at high-risk subgroups and 2)take action based on a prior diagnosis of the causes of the malnutrition.	(Not part of study)	(Not part of study)	1. Community level nutrition programs can be done on a large scale. 2. Community level nutrition programs of the type mentioned are the most likely to be successful.
PROJECT LEVEL GOAL 1. Identify 10-15 "successful" community level nutrition projects. 2. Increase understanding of the factors which cause success by testing certain hypotheses or suggesting new ones. 3. Find ways that community level nutrition projects can inform national policy. 4. Create an exchange network of organizations involved in community level nutrition programs.	OVI 1. Presence of positive results (malnutrition reduction) in each project. 2. Strong evidence confirming or disconfirming hypotheses. 3. Strong evidence from project sites demonstrating this. 4. Project Directors of study site programs take action to continue exchange.	MOM 1. Project report & records. 2. Project report & records. 3. Project report & records. 4. Project Director interviews.	ASSUMPTIONS 1. The methodology and data on changes in nutrition status due to project action is adequate in the study sites. 2. There will be sufficient variety in the study sites in causal factors to draw conclusions.
PROJECT OUTPUTS 1. Report of analysis on points 1,2,3 in Project Level Goal. 2. Exchange of Project Directors. 3. Workshop of Project Directors.	OVI 1. Existence of Report. 2. Presence of Project Directors at other sites. 3. Occurence of Workshop with Project Directors in attendance.	MOM 1. Project files. 2. Project files. 3. Workshop attendance records.	ASSUMPTIONS 1. Project Director turnover during this project is small.
PROJECT OUTPUTS 1. CSF staff & other project personnel. 2. Interest of project directors of study sites. 3. Evaluation & descriptive data from projects.			

ATTACHMENT B

SELECTED CURRICULUM VITAE

September, 1976

RESUME

NAME: William D. Drake

BIRTH DATE: April 13, 1936

CITIZENSHIP: U.S.A., Social Security #349-28-5456

EDUCATION:

B.S.E. Industrial Engineering, The University of Michigan, 1959
M.B.S. Business Administration, The University of Michigan, 1960
Ph.D. Industrial Engineering, The University of Michigan, 1964

CURRENT ACTIVITIES:

Professor of Urban and Regional Planning and Professor of Natural Resources, School of Natural Resources, The University of Michigan.

Participant in the "Community Experiments Program for Reduction of Malnourishment in Colombia, South America."

Participant in the program for evaluating community interventions in Candelaria, Colombia. Fundacion Para La Educacion Superior.

Panel Chairman, National Research Council Graduate Fellowship Evaluation Committee, National Academy of Sciences.

Board Member, Building Research Advisory Board (BRAB), National Academy of Sciences.

Member, Task Force Urban and Regional Systems, Commission on Sociotechnical Systems, National Research Council.

Trustee, Community Systems Foundation.

PAST ACTIVITIES:

Recipient, National Science Foundation SEED grant (For initiating a collaborative effort with the Universidad del Valle, Cali, Colombia), 1975 during sabbatical leave.

Associate Dean for Research, School of Natural Resources, The University of Michigan, 1973-75.

Founding Member, Michigan Savings and Loan Association.

Chairman and Charter Member, Ann Arbor Metropolitan Transportation Authority, 1971-1975.

Chairman, University-wide Ph.D. Program in Urban and Regional Planning at the University of Michigan, 1968-72.

PAST ACTIVITIES: (continued)

Member, Board of Directors of Comsumers Union of U.S.A., 1966-72.

Associate Professor of Planning, the University of Michigan, 1968-1969.

Member, Independent Study Board appointed by the U.S. Secretary of Commerce, for assessing the impact of governmental policies on regional economic development, 1967-1968.

Consultant, Ann Arbor Model Cities Environmental Task Force.

Consultant, U.S. Senate Antitrust Subcommittee.

Assistant Professor of Natural Resources, School of Natural Resources, the University of Michigan, 1966-1967.

Deputy Executive Secretary for Technology on the President's Commission on Technology, Automation and Economic Progress. Functions were to: 1) design and monitor projects and studies geared to reveal the impact of technological changes upon our nation - past, present, and future; 2) define these areas of unmet community and individual needs toward which application of new technologies might most effectively be directed; 3) assess the most effective means for channeling new technologies into promising directions; and 4) to draft portions of the Commission report, 1965-1966.

Associate Research Engineer, the University of Michigan, Institute of Science and Technology, Sept. 1963-Sept. 1964.

Independent Researcher, Center for Research on Learning and Teaching, the University of Michigan, 1963.

Lecturer, Board of Governors, Wayne State University, Detroit, Michigan, 1962, 1963.

Independent Researcher, Project on the Use of Computers in Engineering Education, Ford Foundation, Ann Arbor, Michigan, 1961.

Teaching Fellow, Regents, the University of Michigan, Department of Industrial Engineering, 1959-1963 (part-time).

Staff Member, A.T. Kearney & Company, management consultants, Chicago, Illinois, 1959-1962 (part-time).

Junior Engineer, Chrysler Corporation, Central Engineering, Highland Park Michigan, summer 1957.

Junior Engineer, Ford Motor Company, Scientific Laboratories, Dearborn, Michigan, summer, 1955.

Laboratory Technician, Ford Motor Company, Scientific Laboratories, Dearborn, Michigan, summer, 1955.

PROFESSIONAL AND HONORARY SOCIETIES:

Phi Kappa Phi
Phi Eta Sigma
Alpha Pi Mu
American Institute of Industrial Engineers
National Society of Professional Engineers

PROFESSIONAL AND HONORARY SOCIETIES: (continued)

Michigan Society of Progessional Engineers
Operations Research Society of America
The Institute of Management Sciences
American Association for the Advancement of Science

PUBLICATIONS:

The Promotora Program in Candelaria: A Colombian Attempt to Control Malnutrition and Disease, 1968-74, Community Systems Foundation, Cali, Colombia, with Dr. Luis Fajardo, M.D., June, 1976.

Malnutrition, Child Morbidity and the Family Decision Process, with Mr. Peter Heller, University of Michigan, Ann Arbor, Michigan, Discussion Paper, September, 1976.

Demand-Responsive Transportation Systems: The Ann Arbor Approach, Proceedings, Transportation Research Board Summer Meeting, August 7, 1975.

The TELTRAN System: Progress Toward Implementation of Public Transportation in Ann Arbor. January, 1975, Ann Arbor, Michigan.

Dona Elena Revisited: A Review of a Rural Development Program in Puerto Rico, Urban and Regional Planning Program, University of Michigan, Ann Arbor, 1974.

Indirect Effects of Planning Projects in Developing Nations - A Position Paper. Drake, W.D. and Nustuen, J.D. Program in Urban and Regional Planning, University of Michigan, August 15, 1974

Towards the Development of Improved Planning Methodologies, the University of Michigan, Ann Arbor, 1974.

The Substitution of a System of Linked Advanced Technologies for the Traditional Step-by-Step Development Pattern in Developing Nations, Drake, W.D. and Cooper, C., 1969.

Analysis of Water and Water-Related Research Requirements in the Great Lakes Region. Committee on Institutional Cooperation (Staff Coordinator), 1968.

Regional Effects of Government Procurement and Related Policies, Report of the Independent Study Board, U.S. Department of Commerce, November, 1967. (Board Member).

Technology and the American Economy. (Serving as Deputy Executive Secretary for Technology), National Commission on Technology, Automation and Economic Progress, Washington, D.C., January, 1966.

The Design and Implementation of a Competitive Bidding Strategy. Unpublished doctoral dissertation, Department of Industrial Engineering University of Michigan, September, 1964.

PUBLICATIONS: (continued)

Development of Competitive Bidding Strategies for the Wholesale Distribution Function - Interim Report, Department of Industrial Engineering, University of Michigan, September, 1963.

Management Decision Simulations, "Periodic Report of Industrial Engineering Research," Department of Industrial Engineering, the University of Michigan, October, 1962

An Analysis and Comparison of Three Management Decision Simulations, Industry Program, Engineering Summer Conference, University of Michigan, June, 1962.

The Design of a Stochastic Decision Simulation, paper presented at the National Convention, American Institute of Industrial Engineers, May, 1962.

The Electronics Industry in Michigan and the United States, Industrial Development Research Program, Institute of Science and Technology, University of Michigan, March 1962.

VITA MARCH, 1976

NYSTUEN, JOHN D.

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University of Michigan
Ann Arbor, MI 48109
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Birthdate:

EDUCATION

AB	1953, Geography, The University of California, Berkeley
MA	1957, Geography, The University of Washington, Seattle
Ph.D.	1959, Geography, The University of Washington, Seattle

EMPLOYMENT AT THE UNIVERSITY OF MICHIGAN

Instructor, 1959-61; Assistant Professor, 1962-63;
Associate Professor, 1964-68; Professor, 1968-present;
Chairman, Ph.D. Program in Urban and Regional Planning, 1975-present

OTHER THAN MICHIGAN

University of California, Berkeley, Visiting Associate Professor, academic year 1966-67.

University of Minnesota, Minneapolis, Visiting Associate Professor, spring quarter, 1965; and faculty member of NDEA summer institute for advanced training of college teachers, July 1965 and July 1967.

Northwestern University, Evanston, Illinois, faculty member, summer field course in urban research methods, July 1963 and August 1964; and faculty member of the summer conference on recent advances in computer methods in geographic research, NSF conference, August 1963.

EXPERIENCE

Consultant, urban and regional planning (nutrition planning), Community Systems Foundation, Ann Arbor, Michigan and CONPAN (Santiago, Chile), July-August, 1975.

AAAS/NSF Chautauqua type short course, course director, Central Division. 1972-73.

Research Consultant (branch bank location), Manufacturer's National Bank of Detroit, 1967-1972.

Visiting Geographical Scientist Program, Association of American Geographers, 1969.

Consultant and member of the Research Advisory Committee, American Academy of Transportation, 1965-66.

Consultant on Land Use Forecast, Detroit Regional Transportation and Land Use Study, 1965-66. Detroit Metropolitan Area Regional Planning Commission.

EXPERIENCE (con't.)

Research fellow and co-director, Cedar Rapids Urban Travel Study, Regional Science Research Institute, 1961-65.

Principle Investigator, Project on Inter-urban Travel, Institute of Science and Technology, The University of Michigan, 1962-63.

Research Associate, Transportation Study of Coastal Southeast Asia, Quartermaster Research and Development Command, Ann Arbor, 1961.

Research Associate, Central Place Study, University of Chicago, ONR contract, Summer 1960.

UNIVERSITY COMMITTEES

Geography Department: executive committee (elected) 1972-74, 1975-77,Chrmn.; space and equipment committee, 1972-75; departmental candidacy committee, 1973-present.

Literature, Science and Arts, College of: academic judiciary committee, 1975-77; promotion committee, 1971-73;

Board in Control of intercollegiate Athletics, 1975-77.
Executive Board, Center for Research on Economic Development, 1975-present.
Committee on the Ph.D. Program in Urban and Regional Planning, 1968-present.
Advisory Committee, Urban Mass Transit Authority research and training grant, University of Michigan, 1972-present.
Director, Metropolitan Community Research Project, 1965-present.
Elected to Senate Assembly,1971-74.
University Relations Committee, 1971-73.
Senate Assembly Advisory Committee for Financial Affairs, 1969-71.

NATIONAL COMMITTEE MEMBERSHIP

Member of the Commission on Geography and Afro-Americans, Association of American Geographers, 1972-present.
National Academy of Sciences Committee on Remote Sensing Programs for Earth Resource Surveys of the Division of Earth Sciences, 1966-present.
Committee for Seminar Series in Quantitative Geography, National Science Foundation, 1966-72.
Associate Editor, Geographical Analysis (journal), 1968-72.
Chairman and Editor, Michigan Interuniversity Community of Mathematical Geographers, 1963-1968.

ASSOCIATIONS

American Geographical Society
Association of American Geographers
Regional Science Association
General Systems Society
American Association for the Advancement of Science
American Institute of Planners

FIELD EXPERIENCE

Mexico: 10-day field study of rural settlement, land use and transportation on Mt. Orizaba, Puebla State, Mexico. April 21-30, 1967 (sponsored by the Institute of Tropical Studies).

East Asia, South Asia, East Africa, Turkey: sabbatical leave 1970 (eight months) around-the-world trip, January-August 1970. Observation and analysis of low income housing in twenty non-western metropoli.

Field study of Nepalese society and national development (Nepal, February-April 1970). One month spent in remote regions.

Colombia, South America: two-week field trip for observation and analysis of low income housing in Cali, Colombia and environs. March 1972. Sponsored by the Institute of Tropical Studies.

Colombia and Chile: Consultant to Colombian (FES) and Chilean (CONPAN) agencies concerned with food production and delivery systems in relation to community malnourishment levels. Two months (July-August 1975). Unpublished report, "Nutrient Flow Model for Chile," CONPAN, Santiago, Chile and Community Systems Foundation, Ann Arbor, Michigan, 1975.

PRIMARY PROFESSIONAL INTERESTS

Theoretical/mathematical geography, urban locational analysis, urban land use and transportation planning. Urban and regional planning applications to improvement of the quality of life of low income people in developing nations--particularily nutrition planning.

BIBLIOGRAPHY

"Land Use Dynamics in a City of Strangers," in Detroit Metropolitan Politics, John W. Smith, (editor), East Lansing, Michigan State University Press, (forthcoming, 1977).

Nystuen, John D., "Nutrient Flow Model for Chile," CONPAN, Santiago, Chile and Community Systems Foundation, Ann Arbor, Michigan, 1975.

with John F. Kolars. Physical Geography: Environment and Man, New York: McGraw-Hill Book Company, 1975. 344 pages.

with John F. Kolars, Human Geography: Spatial Design in World Society, New York: McGraw-Hill Book Company, 1974. 281 pages.

with John F. Kolars, Geography: The Study of Location, Culture and Environment, New York: McGraw-Hill Book Company, 1974. 448 pages.

with Donald R. Deskins, Jr., "Direct Observation as a Learning Strategy: Pedestrian Density and Functional Areas in Atlanta," Southeastern Geographer v. 13, no. 2 (Nov. 1973):105-126.

with Gary W. Shannon, "Marriage, Migration and the Measurement of Social Interaction," International Geography 1972, pp. 491-495. Papers, 22nd International Geographical Congress, Montreal 1972, University of Toronto Press, Toronto, Canada.

"Boundary Shapes and Boundary Problems," Papers , Peace Research Society International, v. 7 (1967):107-128.

"A Geographic View of Scale and Complexity," in International Geographical Union, Proceedings of the Commission on Quantitative Geography, Worcester, Massachusetts: Economic Geography, 1970.

"A Theory and Simulation of Intraurban Travel," Quantitative Geography Part I: Economic and Cultural Topics, Studies in Geography, no. 13, Northwestern University Press, Evanston, Illinois, 1967. pp. 54-83.

"Effects of Boundary Shape and the Concept of Local Convexity," Discussion Paper no. 10, Michigan Interuniversity Community of Mathematical Geographers, December, 1966. 22 pages (multilith). Available as part of item no. OP-33067, University Microfilms, 300 Zeeb Road, Ann Arbor, MI, 1965.

"Mass-Energy Costs, Uncertainty, and Interface Efforts in Generalized Transportation Systems," Proceedings, Tenth Ann Arbor Industry-Education Symposium, College of Engineering, University of Michigan, November 1965. pp. 91-103.

with Duane F. Marble, "An Approach to the Direct Measurement of Community Mean Information Fields," Papers and Proceedings, Regional Science Association, v. 11 (1963):99-109.

"Identification of Some Fundamental Spatial Concepts," Papers, Michigan Academy of Letters, Sciences, and Arts, v. 48(1963):373-384. Also reprinted in Spatial Analysis, Brian J. L. Berry and Duane F. Marble, editors, Englewood Cliffs: Prentice-Hall, Inc. 1968, pp. 35-41; and as item G-171 in the Bobbs Merrill Reprint Series in Geography, 1968.

with Michael F. Dacey, "A Graph Theory Interpretation of Nodal Regions," Papers and Proceedings, Regional Science Association, v. 7 (1961):29-42. Also reprinted in Spatial Analysis, Berry and Marble, eds., pp. 407-418; and as item G-170 in Bobbs Merrill Reprint Series in Geography, 1968.

BIBLIOGRAPHY (cont'd)

"Analysis of Customer Movement and Retail Business Location," Section 4 of Studies of Highway Development and Geographic Change, by William L. Garrison, et al. Seattle: University of Washington Press, 1959. pp. 180-22[illegible]

OTHER ITEMS

Selected addresses and professional papers:

"Bank Site Analysis in Marketing Research," Business Development Conference, Michigan Bankers Association, September 25-26, 1969, Bellaire, Michigan.

"Some Concepts and Measurements of Urban Travel Behavior," A paper presented to the Annual Meeting of the East Lakes Division, Association of American Geographers, November 1967, Windsor, Ontario.

"Roads and Communications: Analysis of the Transportation Network," Part IV of Analysis of Geographic and Climatic Factors in Coastal Southeast Asia, Department of Geography, the University of Michigan. Final report to Quartermaster Research and Development Command, March 1962. pp. 143-176.

"The Role of Barriers in Simulation Models," An invited paper presented at the Conference on Spatial Simulation Systems, University of Pittsburgh, December 1964.

"The Rank of Cities in a Region," A paper presented to the Western Section of the Regional Science Association Meeting, Nevada Southern University, Las Vegas, Nevada, March 1962.

"Christaller in English," A review of Central Places in Southern Germany, by Walter Christaller, Landscape, v. 17, no. 1(1967):37-38.

BIOGRAPHICAL SUMMARY - December 1975

NAME: John Osgood Field

DATE OF BIRTH:

ADDRESS:

PLACE OF BIRTH:

NATIONALITY: American

TELEPHONE:

MARITAL STATUS: Married
(no children)

EDUCATION:

Harvard College, B.A., 1962; Stanford University, M.A. (Political Science), 1964; Ph.D. (Political Science), 1973.

PROFESSIONAL EXPERIENCE:

Current: Research Associate, Center for International Studies, M.I.T., and Associate for Research and Training, International Nutrition Planning Program, with principal responsibility for nutrition planning workshops and the Advanced Study Program; Lecturer, Department of Political Science and Department of Nutrition and Food Science, M.I.T.

Previous Teaching: Lecturer (part-time), Department of Political Science, Boston University, 1969-71; Teaching Assistant, Department of Political Science, Stanford University, 1964-67; Visiting Instructor, Pachaiyappa's College, Madras University (India), 1962-63.

Previous Research: Co-Director, Indian Election Data Project, M.I.T., 1969-1974; Visiting Research Scholar, Centre for the Study of Developing Societies, Delhi, 1968; Research Assistant (in India), Cross-National Project in Political and Social Change, Stanford University, 1965 (summer and autumn); Research Assistant, Stanford Studies in International Conflict and Integration, Stanford University 1964-65.

Consulting and Related Activities:

a. Academic: Political Science consultant to the Princeton-Brookings Income Distribution Project on "Health, Nutrition and Income Distribution," June 1974.

b. Overseas: In Brazil for USAID, April 1975; in India for CARE and Catholic Relief Services, January 1975; in Honduras for Community Development Foundation, December 1974; in Brazil for USAID, June 1974; in Guatemala and El Salvador for INCAP, January 1973.

PUBLICATIONS:

"Political Ethos and the Structure of City Government," American Political Science Review, LX, June 1966 (second co-author with Raymond E. Wolfinger).

"Ideology in the Public's Conceptualization of the 1964 Election," Public Opinion Quarterly, XXXIII, Fall 1969 (first co-author with Ronald E. Anderson).

"The Sino-Indian Border Conflict: An Exploratory Analysis of Action and Perception," in John H. Sigler, John Osgood Field, and Murray L. Adelman, Applications of Events Data Analysis: Cases, Issues, and Problems in International Interaction, Sage Professional Papers in International Studies, #02-002, July 1972.

Politicization and System Support in India: The Role of Partisanship, monograph C/74-12, Center for International Studies, M.I.T., August 1974 (portions presented at the Annual Meeting of the American Political Science Association, Chicago, September 1974).

Electoral Politics in the Indian States: The Communist Parties of West Bengal (Delhi: Manohar Book Service, 1974) (first co-author with Marcus F. Franda; portions presented at the Annual Meeting of the Association of Asian Studies, New York City, March 1972).

"How Tribal Constituencies in India Vote" (second co-author with Myron Weiner), in Myron Weiner and John Osgood Field, ed's., Electoral Politics in the Indian States: Three Disadvantaged Sectors (Delhi: Manohar Book Service, 1975).

"India's Urban Constituencies" (second co-author with Myron Weiner), in Myron Weiner and John Osgood Field, ed's., Electoral Politics in the Indian States: The Impact of Modernization (Delhi: Manohar Book Service, 1976, in press) (presented without appendices at the Annual Meeting of the Association of Asian Studies, San Francisco, March 1975; portions to appear in Comparative Politics, 8, January 1976).

Electoral Politics in the Indian States: Party Systems and Cleavages (Delhi: Manohar Book Service, 1976, in press) (co-editor with Myron Weiner).

"Nutrition and Development - Dynamics of Political Commitment Food Policy, I, November 1975 (first co-author with F. James Levinson; originally prepared as "Nutrition and Development Revisited: The Dynamics of Commitment" for the International Conference on Nutrition

and Agricultural Development in the Tropics, Guatemala City, December 1974; to be included, in abbreviated form, in Nevin S. Scrimshaw and Moises Behar, ed's., Nutrition and Agricultural Development: Significance and Potential for the Tropics (New York: Plenum, 1976, in press)).

ENTATIONS (not already published):

ndia's Strategy of Political Development and the Public's Response," lecture presented at the Cincinnati Council on World Affairs, Cincinnati, February 1973.

"Political Parameters of Nutrition Planning," basic talk, with variations, presented at three nutrition planning workshops in 1975.

REFERENCES

Professor Myron Weiner, Department of Political Science, Massachusetts Institute of Technology, Cambridge, Massachusetts, 02139.

Professor F. James Levinson, Director, International Nutrition Plannin Program, M.I.T., Building 20A-222, Cambridge, Massachusetts, 02139.

Professor Sidney Verba, Department of Government, Harvard University, Cambridge, Massachusetts, 02138.

Professor Raymond E. Wolfinger, Department of Political Science, University of California at Berkeley, Berkeley, California, 94720.

ADDENDUM - August 1976

MARITAL STATUS:

Married (one child)

"Beyond Humanitarianism: A Developmental Perspective on American Food Aid" in Peter G. Brown and Henry Shue, Food Policy: U.S. Responsibility in the Life and Death Choices (New York: The Free Press, 1977 - forthcoming) (first co-author with Mitchel B. Wallerstein).

UNPUBLISHED MANUSCRIPTS:

Partisanship in India: A Survey Analysis, doctoral dissertation, Department of Political Science, Stanford University, March 1973.

"The Soft Underbelly of Applied Knowledge: Conceptual and Operational Problems in Nutrition Planning," International Nutrition Planning Program, MIT, July 1976.

REVIEWS:

Reviewer of books and manuscripts for The MIT Press, American Political Science Review, Journal of Developing Areas, Comparative Politics, and other journals.

OVERSEAS COMMITMENTS:

Consulting in Papua New Guinea for the Foundation for the Peoples of the South Pacific, November 1976.

CURRICULUM VITAE

Name	Title	Birthdate
Luis Francisco Fajardo	Auxiliar Professor Department of Pediatrics Universidad del Valle Cali, Colombia	
Place of Birth	Nationality	Sex
Santa Rosa, Colombia	Colombian	Male

EDUCATION

Institution and Location	Degree	Year
Colegio Ortiz Tunja, Colombia	B.A.	1958
Universidad del Valle School of Medicine Cali, Colombia	M.D.	1966
Massachusetts Institute of Technology	Master Sciences Bio-Chemistry and Metabolism	1973

Research Interest

Child and Community Nutritic

RESEARCH AND /OR PROFESSIONAL EXPERIENCE

Co-Director	Proyecto de Nutrición School of Medicine Universidad del Valle Cali, Colombia	1974 to present

Auxiliar Professor	Universidad del Valle Department of Pediatrics Cali, Colombia	1973 to present
Visiting Instructo	University of Harvard Department of Pediatrics Boston, Massachussetts	1971- 1972
Associated Instructor	Universidad del Valle Department of Pediatrics Cali, Colombia	1969-1970
Residency in Pediatrics (3 years)	Universidad del Valle Department of Pediatrics Cali , Colombia	1966-1969

PUBLICACIONES

1. Linares, F.A., Pradilla, A.G., y Fajardo, L.F.
"Estudio Comparativo de dos tipos de leche en polvo".
II Reunión Científica Soc. Latinoamericana de Nutrición, Pag. 2(

2. Fajardo, L.F., Pradilla, A.G., Linares, F.A.
" Metabolismo de Calcio en Malnutrición Proteico-Calórica".
II Reunión Científica Soc. Latinoamericana de Nutrición, Viña del Mar, 197(

3. Linares, F.A., Pradilla, A.G., y Fajardo, L.F.
"Evaluación de Lipasa Lipoproteica en desnutrición infantil"
X Reunión Soc. Lat. Amer. de Invest. Pediatricas, Pag. 3
Sierra de la Ventana (Argentina) 1970

4. Linares, F.A., Pradilla, A. G., y Fajardo, L.F.
"Evaluación Biológica de un nuevo alimento proteico".
II Reunión Científica Soc. Lat. Amer. de Nutrición, Pag. 65
Viña del Mar, 1970

Pradilla, A.G., Linares, F.A., y Fajardo, L.F.
"Aminoaciduria en Malnutrición proteico-calórica".
X Reunión Soc. Lat. Amer. de Investig. Pediatricas, Pag. 4
Sierra de la Ventana (Argentina) 1970

Pradilla, A.G., Linares, F.A., y Fajardo, L.F.
"Estudios biológicos con Maiz Opaco- 2
Primer Seminario Nacional sobre Maiz Opaco- 2
Bogotá, 1970

Fajardo, L.F., Pradilla, A.G., Linares, F.A., and Robertson, W.V.
"Bone accretion in severe protein and caloric malnutrition"
XII th International Congress of Pediatrics, Vienna, August -September 1971

Linares, F.A., Fajardo, L.F., and Pradilla, A.G.
"A new high protein course of the fight against infantile malnutrition".
XIIIth International Congress of Pediatrics, Vienna, August-September, 1971

Pradilla, A., Aguirre, A., Fajardo, L.F.
"Application and Approach in Community Work"
In Press on At Risk Factors and the Health of Young Children. Ed. Jelliffe Gabr.
Cairo, 1975

10. Fajardo, L.F.: "Revisión analítica sobre la Investigación en Nutrición Humana" 1960-1973
Libro actualmente en edición por Colciencias.

11. Fajardo, L.F.: "Programa Educativo para el consumo de soya a nivel rural"
Presentado en la Primera Conferencia Latinoamericana sobre la proteina de soya
México, Nov. 11-14, 1975

12. Fajardo, L.F.: "Parámetros Nutricionales para la evaluación de proteina de origen vegetal."
Presentado en el II Seminario avanzado sobre Tecnología de Alimentos".
Bogotá, Octubre 30- Noviembre 6, 1975

13. Fajardo, L.F.: "Intolerancia a la Lactosa en niños". Presentado en el Congreso Colombiano de Pediatria, 1975

14. Fajardo, L.F.: "Metodología para el Diagnóstico de la Desnutrición."
Presentado en el Congreso Colombiano de Pediatria, 1975

15. Fajardo, L.F.: "Niños de bajo peso al nacer. Estudios Bioquimicos y antropometricos".
Presentado como Ponencia oficial de la Sociedad de Pediatria del Valle del Cauca al Congreso Colombiano de Pediatria, 1975.

16. Young, R.V., Fajardo, L.F., Murray, E.,
"Protein Requirements of man: Comparative Nitrogen Balance response within the sub-maintenance-to-maintenance range of intakes of wheat and bean proteins".
The Journal of Nutrition, Vol. 105, No. 5, Mayo 1975.

ATTACHMENT C

A DESCRIPTION OF COMMUNITY SYSTEMS FOUNDATION'S PROGRAM IN NUTRITION PLANNING

A DESCRIPTION OF COMMUNITY SYSTEMS FOUNDATION'S PROGRAM IN NUTRITION PLANNING

Purpose and Philosophy

The general purpose of Community Systems Foundation is to undertake scientific, technical assistance and educational activities designed to assist disadvantaged groups to increase their well-being in their own way, by their own effort.

Presently the Foundation is focussing its attention on ways to reduce malnutrition. In April, 1973 the Foundation adopted the following resolution:

> "... whereas the improvement of nutrition throughout the world is a major and growing problem which interrelates with many aspects of the quality of life, therefore (Community Systems Foundation) selects as (its) immediate focus the

This decision was motivated by the enormous and continuing magnitude of the problem in the world (where one estimate claims that more than two-thirds of the 800 million children alive today in developing countries are expected to encounter sickness or disabling disease brought on or aggrevated by protein-calorie malnutrition), by the startling findings on the consequences of malnutrition (where malnutrition has been strongly linked to sickness, death, mental development, learning impairment, poor bone development, low energy, and general malaise), and by the belief that current scientific understanding of nutrition within the human body is sufficient basis on which to mount a systematic attack on malnutrition at the level of the community and the society.

Three principles guide the Foundation's search for solutions to p s of malnutrition.

1. Groups and their constituent individuals must take responsibility for their own well-being in order for interventions to be lastingly effective. Since they best know local conditions

and will be charged with ameliorating them, it follows that with assistance they should structure solutions to their problems.

2. Every step from the production of food to the ultimate absorption of its nutrients by human cells constitutes a potential hemorrhage point for losing vitamins, minerals, protein fats and carbohydrates. Thus, growing more food may make little difference if much is lost in transport; mixing balanced diets may matter only slightly if within the home, some family members systematically exclude others from adequate meals. Finally, even if an enriched and enlarged nutrient mix is delivered into the hands of every individual, the food payload may fail to reach their cells because of diseases such as diarrhea which flush them out of the body before they can be absorbed. This cell-to-cell approach, termed the Nutrient Flow Theory, is a model of the factors which cause malnutrition in a community or society.

3. The process or problem-solving is guided, essentially, by scientific principles. The goal is to improve nutritional status. Actions are taken based on hypotheses gleaned from past experience. The results are evaluated and form the basis for the next round of actions. Limited actions are taken quickly, in the form of field tests and pilot projects, as opposed to engaging in lengthy prior efforts of "desk planning." Planning is viewed as a learning process in which a community increases its ability over time to identify and implement more cost-effective solutions to malnutrition. The learning is more rapid when it adopts scientific principles and compresses time. Moreover, when individuals are guided through the scientific method in search of solutions to their problems, they become familiar with the approach and can apply it to other areas of their lives.

II. Nutrition Program

1. Demonstration Areas. Community Systems Foundation believes there is a need to demonstrate that less developed areas can reduce malnutrition

using a systematic attack on the problem. If such demonstrations can be achieved in several countries throughout the world, three purposes would be served. First, malnutrition in those countries would be reduced; second, valuable experience would be gained on how to put together the pieces of scientific and technological understanding to solve the problem; and third, other countries could see that it was possible.

Accordingly, Community Systems Foundation wishes to assist developing countries and funding agencies to accomplish this objective by providing appropriate long-term and short-term in-depth technical assistance for a limited number of such programs. Currently, the Foundation is involved in two such programs, both in South America. In Chile, it is working closely with "CONPAN", the national nutrition planning agency for Chile, to design national nutrition policy and programs. The equivalent of three full-time Foundation advisors have been working in Chile over the past year helping CONPAN to put into operation the problem-solving principles noted above. For several years, several Foundation personnel have been working to reduce malnutrition in communities near the city of Cali, Colombia. Now, working closely with the Universidad del Valle and with F.E.S., a private non-profit Colombian educational foundation, Community Systems Foundation is expanding this effort throughout the state of Cauca, which will serve as a demonstration area for nutrition planning and feed information into the national nutrition planning group in Colombia.

2. Applied Research. Deeper understanding is required of: 1) the causes of malnutrition at a societal level, 2) the types of countermeasures which successfully combat the problem in different environments, and 3) the processes which best accomplish these countermeasures. The Foundation undertakes such research. For example, it is currently involved in community-based research programs in Colombia to test procedures for diagnosing community malnutrition and methods for teaching about the causes and consequences of malnutrition to rural school children. Also in Colombia, it is involved in a long-term

analysis of the impact of various interventions carried out over a seven year period in the village of Candelaria. In general, the Foundation prefers to base most of its applied research in the demonstration areas where it can work jointly with members of the local groups.

3. Information Dissemination. Reducing societal malnutrition has proved to be a very difficult problem; therefore it is important that useful experiences and scientific results be effectively disseminated to communities and societies who are attempting to systematically reduce malnutrition. For example, the Foundation believes such information may provide the vital margin for success in the demonstration areas in which it is involved. And for this reason, it is committed to the effective dissemination of results of its own applied research and other activities. An important part of the Foundation's overall program is to work for the establishment of an effective world-wide system to identify and disseminate such information.

4. Training and Leadership Development. The Foundation incorporates opportunities for training and leadership development into most of its activities. It works with educational institutions, to assist them to build nutrition planning curriculums, to provide opportunities for field experience for students, and to provide financial support. Participants in the program come from a variety of countries and backgrounds, with varying educational levels and areas of concentration. For example, currently there are seven participants in the program -- three from Colombia, three from the U.S., and one from Ghana; two are in lower levels of education and five have had varying types of undergraduate and post-graduate education at different U.S. and foreign universities.

5. Short-Term Technical Assistance. The Foundation accepts short-term technical assistance assignments in countries and communities interested in reduction of malnourishment and improvement of well-being, when such assistance is well-conceived and does not materially interfere with other Foundation programs. Such activity can be an effective way of transfering the experience gained by Foundation personnel.

In addition, it can be professionally rewarding, and can assist in developing other demonstration areas that might become part of the Foundation program or part of a larger network of demonstration areas that can share experiences.

III. Organization and Personnel

Community Systems Foundation is a non-profit, scientific research foundation incorporated under the laws of the State of Michigan. It is legally classified as a "public", tax-exempt foundation which can receive tax-deductible gifts.

It is a small organization, but with a long history (since 1963) of programmatic success and sound financial operation. The Board of Trustees consists of respected scientists and educators interested in the goals and programs of the organization.

Foundation personnel, the people who do the work, are selected because they share several characteristics. First, of course, is that they believe in the goals of the Foundation. Second, they have capability, usually but not necessarily technical in nature, which is useful in carrying out the Foundation program. For example, current personnel bring such diverse skills as systems analysis, medicine, sanitary engineering, anthropology, rural sociology, journalism, food technology, and management Third, they have a concern not only with the substance of their knowledge, but also with the processes by which their knowledge can be acquired and used by others. And fourth, they share a humanistic outlook which leads to respect and sensitivity for other individuals and other viewpoints, and which dictates that the people with whom they work are viewed first as human beings rather than as instruments for the achievement of a goal.

Some of the Foundation personnel devote most of their professional time to Foundation activities; others do so but for discrete periods of time (for example, a year or two), while others have primary affiliations elsewhere and are available for short-term or part-time assignments.

They bring various skills to the work, and live in various parts of the world. Most of them have worked together on various projects and, as noted above, share certain characteristics in common. Thus, Foundation personnel form a widespread but responsive network located in several major university centers in the U.S., South America and Australia bound together by shared goals, philosophies and work. For administrative purposes, Foundation personnel are classified into one of these categories:

1. Associates. Persons who are available for field assignments and can commit a major portion of time to Foundation activities
2. Consulting Associates. Persons who are available for specific assignments on a short-term or part-time basis.
3. Associates-in-Training. Persons receiving on-the-job training, some of whom are receiving formal credit towards a degree.

IV. Nutrition Projects

1. Colombia

1-1: Theory Development. From 1971 to 1973, a theory of the causes of malnutrition at the societal level (termed the Nutrient Flow Theory) was developed based on data and experiments run in Cali, Colombia. This effort was funded by a grant from the Rockefeller Foundation.

1-2: Village Studies. A project to test the applicability of the Nutrient Flow Theory in Colombian villages is underway with funding from the Office of Nutrition, U.S.A.I.D. The basic hypothesis of the study is that the Nutrient Flow Theory can be used to diagnose the causes of malnutrition in a village, and the treatments designed from this diagnosis will in fact reduce the malnutrition. The intervention process into the community is being varied from village to village. For example, in Villa Rica the intervention is being done primarily by Colombian professionals who comprise the research team in

conjunction with local workers from the health clinic, while in Buenos Aires the students at a local high school are being taught the causal theory and diagnosis procedure, and then they are carrying out the diagnosis and treatment themselves. It is worth noting that the high school teaching methodology may go beyond the project, in that the scientific method is being taught by doing experiments, so that the students acquire confidence to take action which influences the world in meaningful, predictable ways.

The village work has involved a variety of sub-projects, for example:

a) Malnutrition surveillance systems.
b) Measurement of crop production and description of food distribution channels.
c) Measurement of food intake, water and sanitation at the household level, and food purchasing behavior.
d) Development of a system for increasing the local consumption of soy. (This was the first treatment prescibed in the village of Villa Rica.)

1-3: Longitudinal Study. A variety of socio-economic and health data has been obtained for nearly all the children in the village of Candelaria every three months over seven years. This rich data source is being analyzed to determine the effect of various interventions, particularly the Promotora Program, made during this time, and to evaluate various relationships; for example, the use of various standards of malnutrition on changes in the malnutrition rate, and the effect of inflation on malnutrition. The work is being funded by a contract from U.S.A.I.D.

-4: Demonstration Area. Results of the various activities near Cali are being provided to the national nutrition planning agency for Colombia. Plans are underway to set up and evaluate

a series of pilot projects that could become national programs, including food stamps, direct food distribution, environmental sanitation and water, production of more nutritious crops, fish ponds, and nutrition education.

Chile

Chile has a long history of commitment to the solution of its nutrition problems. "CONPAN" is the recently established semi-autonomous government agency with wide-ranging powers to recommend and regulate national nutrition policies for Chile. The Foundation has provided technical assistance to CONPAN since August, 1974. In general terms, the Foundation's assignment is to assist CONPAN in building an effective planning process. More specifically it is assisting CONPAN in designing and implementing a variety of programs.

a. Nutrition Surveillance System. Assistance in the design and testing of a surveillance system to determine changes in the malnourishment rate in various locations in the country and among various groups of persons. The design process has included evaluation of existing data collection system, sampling designs, consideration of alternative definitions of malnutrition, quality control, uses.

b. Information System. Design of a system for the collection and analysis of data on the factors contributing to malnutrition. This includes a variety of data on agriculture production and socio-economic variables as well as the logic for relating this information using the nutrient flow model.

c. Breast-feeding Programs. Designing and evaluating a sequence of pilot projects to increase the number of mothers who breast feed for 6 months.

d. Pre-School Food Supplements. Designing and evaluating a pilot project to test the effect of providing supplemental food to malnourished youngsters at health centers.

e. School Feeding. Designing procedures for improving efficiency and effectiveness of school lunch and breakfast programs.

f. Sanitation and Water. Designing a series of studies and experiments in urban and rural environments to determine what type of water and sanitation interventions are most cost-effective in reducing malnutrition.

g. Indiginous Population Project. Implementation of a project to involve indiginous people in the measurement of malnutrition and analysis of its causes in several indian communities.

his major demonstration program has been supported financially by ontracts from the U.S. Agency for International Development and

3. Zaire

Community Systems Foundation has provided periodic short-term technical assistance to the Government of Zaire, since September, 1973, with the objective of helping Zaire to develop a major demonstration program in nutrition planning. To date the major effort has been devoted to working with government officials in the design of measurement studies, pilot projects and test site selection. The effort there has been funded by U.S.A.I.D. and the Rockefeller Foundation.

4. Bolivia

In April and May, 1974, the Foundation cooperated in a health sector assessment of Bolivia, under a U.S.A.I.D. contract for short-term technical assistance. A team of four Foundation personnel looked at the nutrition and sanitation components of the health sector.

5. Honduras

In August and September, 1975, the Foundation provided short-term technical assistance to U.S.A.I.D. in completing an assessment of the nutrition sector in Honduras. The Foundation had responsibility for the environmental sanitation component of the assessment, as well as responsibility as chief-of-party.

6. Thailand

In January, 1976, the Foundation provided short-term technical assistance to the Government of Thailand, to assist them in the development of a five-year nutrition plan. Special attention was given to the design of a massive pre-school child feeding program, and a program to train agriculture extension agents in ways to diagnose and treat community malnutrition. This effort was undertaken in cooperation with Trans-Century Corporation of Washington, D.C. under a contract from the Office of Nutrition, U.S.A.I.D.

7. Australia

In 1973 the Foundation helped to establish an affiliate organization in Australia, called Community Systems Foundation (Australia). The new organization has an Australian Board and has focussed studies in the health care field, including hospital productivity, institutional feeding, and health facility planning.

8. United States

a. Applied Research. During 1973 and 1974, the Foundation investigated the effectiveness of various models of nutrition planning. This work was completed under a grant from the Office of Nutrition, U.S.A.I.D.

b. Document Center. The Foundation maintains a library of documents relevant to nutrition planning at its home office in Ann Arbor which are disseminated to the various field activities.

c. Training. The Foundation is currently providing financial support and on-the-job training to several graduate students from the University of Michigan.

V. History

From its founding in 1963 through 1972, Community Systems Foundation applied scientific principles to the operation of hospitals, and to a lesser

extent, to local governments, libraries and educational institutions in the U.S. and Canada. The emphasis was on rational, systems-oriented approaches to organization programs.

Approximately 250 different hospitals and medical centers provided funds to the Foundation in order to acquire technical assistance in management technology. Over 1200 systems improvement projects were completed as a result. Often the projects were undertaken as part of a cooperative program under the auspices of a state hospital association. Eventually, funding was also acquired from the U.S. Public Health Service and from the Social Security Administration to undertake various applied research and policy studies.

The personnel who accomplished these hospital studies were, for the most part, young graduates of engineering and business administration from a few U.S. universities. In addition, there was a large component of student technicians, many of whom subsequently became full-time staff. The training proved to be very effective; the process of designing a study, collecting data, analyzing, drawing conclusions and then defending those conclusions before department heads and administrators, and most important, implementing the recommendations developed a significant number of leaders in the then newly emerging field of hospital management science and technology. The staff grew to nearly 100 individuals working from 8 regional offices.

It is generally recognized that this Foundation program was largely responsible for the present significance of the field of hospital management science and technology. Its efforts provided early demonstrations of the application of management science to all areas of hospital operations; the results encouraged hospitals throughout the country to purchase this technology; it demonstrated how to structure management science programs in individual hospitals and in a cooperative way through hospital associations; and it recruited and trained a large number of professionals who now constitute a large proportion of the field.

The Foundation completed studies in several other community areas. Its systems projects in libraries were compiled into the first book of case studies in the field. A variety of planning studies were undertaken for educational institutions and major regional planning agencies, for example in the development of population predictions, land use models, and computerized urban data banks. One of the most significant efforts was the application of systems analysis and group process techniques to problems of the governance and management of public housing communities.

In January, 1973, the Foundation put into effect a plan which divested its operations in consulting for hospitals and other U.S. institutions, and refocussed its program to the improvement of nutrition in developing areas. This major change in direction was motivated by several factors: the recognition that its pioneering program in U.S. hospitals had succeeded and could best be disseminated further by other organizations, by the success of its project in Colombia, South America which had focussed on community nutrition problems, and by the belief that malnutrition was an increasingly important problem in the world.