

PN-ABG-660
67181

VITAL

VITAMIN A FIELD SUPPORT PROJECT

A project of the A.I.D. Office of Nutrition
managed by the International Science and Technology Institute, Inc. (ISTI)

Prepared for

Office of Nutrition
Bureau for Science and Technology
Agency for International Development
Washington, D.C.
Contract No. DAN-5116-C-00-9114-00
Project No. 936-5116

**HOME & COMMUNITY GARDENS ASSESSMENT
PROGRAM IMPLEMENTATION EXPERIENCE**

The Tip of the Iceberg

by

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Report No. TA-2
Published June, 1990

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GLOSSARY

ADRA	Adventist Development and Relief Agency
AVRDC	Asian Vegetable Research and Development Center
CRS	Catholic Relief Services
FAO	Food and Agriculture Organization
FHI	Food for the Hungry International
FFH	Freedom From Hunger
FSP	Foundation for the Peoples of the South Pacific
HKI	Helen Keller International
NGO	Non-governmental Organization
PVO	Private Voluntary Organization
SCF	Save the Children Federation
UNDP	United Nations Development Program
UNICEF	United Nations Children's Fund
WVRD	World Vision Relief and Development

ACKNOWLEDGEMENTS

Carolyn S. Peduzzi and the International Science and Technology Institute, Inc. wish to extend their thanks to the many organizations and individuals who willingly discussed their experiences and the lessons they learned in implementing home gardening projects. Special thanks are also due to Jack Peduzzi Associates for editorial assistance, and to Alison Farnsworth for preparing the typed manuscript. The entire staff at ISTI also deserves recognition for their support, assistance and encouragement.

I. EXECUTIVE SUMMARY

As interest in the relationship between vitamin A deficiency and health problems increases, so does an interest in promoting gardening as a nutrition intervention. A variety of organizations and groups have either been involved in gardening or are becoming involved. Gardening is also moving from a secondary, tie-in activity to one of primary emphasis. This report reviews the operational experiences, problems and concerns encountered, and the lessons learned by both USAID and non-USAID assisted home and community gardening projects.

A broad range of constraints, difficulties, problems and concerns in implementing successful gardening projects have been elicited from organizations through personal interviews, telephone conversations and a review of monthly reports. The concerns most frequently voiced regarding gardening as a nutrition intervention can be divided into seven basic categories: environmental (water, soil, etc.); operational (lack of background studies, project funding, community participation); governmental (understaffing, weak government systems or lack of government support); material (seed quality, pests, fertilizers); extension (selection of extensionists and other human factors); human nature (motivation, conflicting activities, attrition, local perceptions); and post-operational concerns (evaluations, information sharing).

Given the wide array and number of concerns reviewed, several recommendations can be made. First and foremost is that water be easily accessible, for without this, the chances are slim that a gardening project will be successful. Secondly, a project should begin on a small scale and expand only after the initial stage is firmly established and well under way. Thirdly, gardening activities should not be the sole nutritional intervention, as there are many people (needy or otherwise) who simply will not engage in gardening activities; instead, gardening should be perceived as only one component in the overall goal of providing quality, nutritious food.

Several organizations have reached the conclusion that it is best to introduce one fruit and or vegetable rich in vitamin A at a time. Once the new fruit or vegetable has been accepted by a community, another can be introduced. It is recommended that all projects give this approach thorough consideration as it is a method likely to enhance project success.

It is apparent that preliminary feasibility studies, combined with vitamin A deficiency prevalence studies, contribute to an efficiently designed project. Similarly, initial baseline surveys provide a basis for future evaluations of a project. It is highly recommended that both the studies and the survey be implemented before a project is planned.

Lastly, it is recommended that gardens be encouraged despite all the obstacles listed above. For although it may be difficult to measure the degree of benefits derived, a garden can only enhance a household's dietary consumption.

II. INTRODUCTION

II.1 Purpose of Assignment/Scope of Work

The International Science and Technology Institute's Vitamin A Field Support Project (VITAL) places a high priority on increasing young children's consumption of vitamin A-rich foods to reduce the prevalence of vitamin A deficiency. While the required foods may already be available in households or markets, in some cases they must be grown in home and community gardens. VITAL is conducting a three-stage assessment of nutritionally oriented home and community gardening programs as a prelude to supporting specific gardening interventions. The three-stage assessment includes: (1) a gathering and synthesis of program implementation experience; (2) a literature review; and (3) a planning workshop. This report documents stage one.

The Consultant reviewed the recent operational experiences of home and community gardening programs for their nutritional focus. Emphasis was placed on USAID-assisted vitamin A projects, although similar, non-USAID projects were also explored. Specifically, the Consultant was contracted to perform the following work:

1. for USAID-assisted projects to:
 - identify all USAID-assisted vitamin A projects that include home and community gardening activities;
 - identify all USAID-assisted health and/or nutrition projects that include home and community gardening activities; and
 - prepare summaries of each project's interventions and reported results, problems and lessons learned, through information gleaned from interviews with project representatives and reviews of project reports.
2. for other projects to:
 - identify similar non-USAID funded projects from the same organizations as reviewed in number one above, and prepare summaries of each project's intervention and reported results, problems and lessons learned; and
 - identify similar projects of other (non-USAID supported) organizations and prepare summaries of these projects as well.

II.2 Methodology

The Consultant conducted personal interviews with relevant organizations located in the Washington, D.C. or New York City metropolitan areas. In the event a relevant organization was located outside these areas, the Consultant telephoned project representatives and requested written project reports. Given the 30-day time frame within which the information was collected, three constraints hampered the thorough identification of projects:

1. in several instances, the responsible or most knowledgeable representative was not available;
2. gardening project information frequently remains in the field offices, and as a consequence, headquarters often have only superficial information; and
3. gardening projects are often a spin-off activity from other projects and thus the details of the program are not available at all.

In light of these constraints, this report reflects a broad overview of gardening project activities, rather than the detailed description as originally conceptualized.

III. FINDINGS AND CONCLUSIONS

III.1. Difficulties Encountered

Gardening plots and projects have been part of development activities since the first missionaries set forth to assist those in need. Over the years the gardens have changed in size, scope and purpose, but many of the difficulties encountered along the way have remained the same. A renewed emphasis on the links between good nutrition and good health has pushed gardening projects more into the forefront of overseas development activities. Indeed, "preventive health" and "gardens" are now often heard in the same breath, and increasingly, individuals, groups and organizations are pursuing gardening as a nutritional intervention. As a consequence of this interest, the constraints, difficulties and problems involved in gardening activities are receiving more critical attention, helping to ensure that successful solutions are developed and adopted by gardening projects.

The concerns voiced most frequently regarding gardening as a nutrition intervention can be divided into seven basic categories: environmental concerns; operational concerns; governmental concerns; material concerns; extension concerns; human nature concerns; and post-operational concerns. These concerns will be discussed below as a basis for identifying common project difficulties and some of the solutions developed to counter them. The discussion will also serve as a basis for identifying some of the lessons learned in the process of recognizing and overcoming gardening project implementation problems.

III.2 Concerns Regarding Gardening as a Nutrition Intervention

III.2.1 **Environmental Concerns**

Water availability is the first consideration of any gardening project. Without easy accessibility to water, gardens cannot be cultivated -- at all. Water availability generally falls into two categories: too much or too little. Gardening projects have sought to control water availability in areas of intense rainfall, as well as in those subject to drought. In arid lands, wells, irrigation, mulch, terracing, run-off water and drought-resistant plants all contribute to successful gardens. Yet, of all the labor intensive tasks associated with gardening in drought-prone or dry areas, most gardeners consider hauling water to be the most onerous and time consuming. Water availability, therefore, often determines the size, location and popularity of a garden.

Some garden projects, particularly in Southeast Asia, must contend with too much water. Planting mixed gardens with canopy layers, raised beds, double-dug beds and drainage canals all help to control the water, as well as to conserve it during periodic dry seasons. A Mexican Latter Day Saints gardening project was washed out five times before the gardens took hold, only to see the rains followed by a long dry season. When the wet season finally did return, project promoters faced a discouraged congregation unwilling to start new gardens.

General environmental considerations determine the shape of a project. There is plenty of sunshine and water in the Altiplano region of Bolivia, but wind and cold discouraged gardening and garden promoters until Food for the Hungry (FHI) and Freedom From Hunger (FFH) introduced greenhouses, now immensely popular in the region. Unpredictable weather, such as floods, drought, wind and salt spray, can hurt the chances of a project's success, as evidenced in Bangladesh, the Sudan and in Kiribati. An epidemic may divert project priorities, as in Ethiopia; military coups, like the one experienced in Fiji, may hamper the day-to-day operation of a program -- or cause it to end altogether, as with a FHI project in Ethiopia.

Poor soil is often cited as a project inhibitor, although packaged fertilizer or organic fertilizers and compost can usually remedy the situation.

III.2.2 **Operational Concerns**

An absolutely necessary step, but one acknowledged by most organizations as one seldom taken, is a feasibility study. The lack of feasibility studies has caused programs to encounter an untold number of difficulties that could have been avoided had a study been conducted prior to program design. Generally, programs adjust and readjust their strategies, both weakening their effectiveness and wasting time. Now that gardens are becoming a primary program activity, however, it is in an organization's best interest to conduct a feasibility study. Currently, the International Eye Foundation is conducting an exemplary study prior to designing their home gardening project in Guatemala.

Both lack of baseline data and lack of knowledge of the prevalence of vitamin A deficiencies pose operational problems. Once again, a shortage of time and/or money and the addition of gardening as a secondary activity often preclude baseline surveys. It is only recently that vitamin A deficiencies have been recognized, and thus countries are only now becoming aware of the need to determine the extent of the problem. Limited available staff is also a prohibitive factor in conducting studies. Yet without these studies, there is no basis from which to conduct a program evaluation.

Most organizations agree that community participation is a *sine qua non* in developing a successful project. But when gardening is not the primary activity in a program, community participation is often not sought. Presently, UNICEF and UNDP both stress community participation in projects from the outset, having learned from past experience that their programs suffered in the absence of strong community support.

Determining whether a gardening project for improved nutrition should be directed towards market or home consumption seems to depend more on the orientation of the participants than the program promoters. According to Adventist Development & Relief Agency (ADRA), Save the Children Federation (SCF) and AFRICARE, African people want to grow crops that can be sold. A garden promoter can only hope that nutritious fruits and vegetables are in demand commercially, or make an effort to encourage the popularity of such crops. In the Pacific, nutritional promotions have a greater chance of success, as income from gardens is not as great a priority. In any event, the decision will be made based upon the participants' cultural inclinations and local market opportunities.

When home gardening for improved nutrition is the primary project, simultaneous project interventions will be necessary such as:

- a. nutrition education
- b. cooking demonstrations
- c. the introduction of new foods
- d. vitamin A capsule distribution
- e. growth monitoring
- f. income generation
- g. training of extension and community-based workers
- h. research/surveys
- i. coordination and collaboration of government and non-government systems and staff

Implementing this spectrum of interventions requires careful planning and timing.

A major handicap of many programs is that they are over-ambitious. Often, a serious nutritional problem affecting many proposed beneficiaries is identified, and the program tries to tackle everyone's needs simultaneously. The result of this overextension is that as many gardens as are begun one year disappear the next. AFRICARE's project in Nigeria is a good example of starting small and expanding only after the initial project is functioning completely and independently. This assures not only immediate project success, but the sustainability of the project into the future.

Once an organization's project funding ends, the project management is usually turned over to in-country nationals. SCF has found that country counterpart take-over is frequently not successful. As a result, the program lapses, and the intended long-term intervention dissolves. Since most organizations other than SCF have not yet reached this stage, the success or lack of success of country counterpart take-over has not been determined. However, the transition has often been viewed as not altogether successful in other projects conducted by international organizations.

Lastly, on a much broader scale, FAO and other organizations have found that while funding dollars are generally readily available for fully implementing health projects, this is not the case for agricultural projects with a mission of helping to improve community health. Money available for these projects often only supports the acquisition of seeds and tools but not the necessary project management and staff to successfully launch and sustain the project. However, because of recent emphasis on the links between adequate dietary intake and prevalence of vitamin A related deficiency, it is anticipated that funding for agricultural projects focussing on improved community and household nutrition, will increase.

III.2.3 Governmental Concerns

Weak governmental systems, understaffing and lack of cooperation between departments are cited as constraints on projects implemented by UNICEF, UNDP and FSP. "Without the coordinated and timely inputs of each of the sectoral agencies -- health, education, agriculture, village councils, etc. -- the long-term sustainability of any initiative will be jeopardized," according to Jeff Liew, project coordinator of UNDP's Integrated Atoll Development Project. Fortunately, weak governmental systems and related concerns are not present in every country. World Vision Relief and Development (WVRD), CARE and SCF report that despite having to battle against the tempests of Mother Nature, the government of Bangladesh is well organized, functions smoothly and is supportive of international projects.

III.2.4 Material Concerns

Traditional gardeners save, multiply and exchange cultivars, ensuring crops from year-to-year. But the need for different, more nutritious and durable varieties of plants to combat nutritional deficiency has required the introduction of seeds from external sources. Too frequently, fancy hybrid crops are promoted, which, while often having favorable characteristics (such as the ability to thrive in drought-prone areas) are unable to replicate these characteristics through their own seeds -- plants grown from the hybrid's seeds will not have the unique and

desirable characteristics of the parent plant. Such a situation makes it impossible to replenish the seed store from within. This lack of seeds has caused several programs to falter, such as the Adventist Development & Relief Agency's (ADRA) gardening programs in Kenya and Ethiopia. The problem can be eliminated in a number of ways: promote only pure strains, not hybrids, so that seeds may be saved; in areas where the importation of seeds is not difficult, arrange for a steady supply from Japanese, Australian, New Zealand, American or European seed companies, as UNICEF has done; and establish seed bed nurseries, and seedling and cutting centers to serve home gardens.

Though lack of tools and other inputs can be a problem, local distribution networks can be established, as SCF has done in Malawi. Generally, it is best to keep imported inputs to an absolute minimum; ideally, there should be no imported inputs at all.

Many projects promote the use of organic compost rather than manufactured fertilizer. However, garden projects oriented towards income generation frequently rely on the costly fertilizer, which contributes to a cycle of selling produce to pay for inputs. Fencing falls into the same category. Fencing usually is required to keep out small livestock, dogs, children -- even crabs. Though not as durable, fences constructed from local materials, including living fences, are far more cost effective and sustainable than purchased fencing materials.

Organic pest control from locally available materials, such as soap, tobacco, garlic and oil, is preferable to costly pesticides, which are often misused by villagers unaware of their hazards. Nevertheless, infestations can discourage gardening endeavors, particularly where large gardens have been cultivated.

Adequate storage and preservation facilities and techniques are frequently not available or known, limiting the year-round availability of nutritious food. In Nigeria, AFRICARE is assisting a village to build a storage facility to help ensure the viability and sustainability of its gardening program. Similarly, CARE is establishing a storage facility in Nepal. Not only can these facilities offer a means of providing food during the "hungry" season, they can also furnish a means of income generation, which can support the program participants and village extension workers, as is being done in Nigeria.

Garden models are not materials per se, but are often used as a framework for all other inputs. In the past, it has not been unusual for a garden model to be established in a country that is thousands of miles from the actual country, culture or community to which it will be introduced. Models that have been too rigid to adapt to local conditions have either failed physically, or have not been absorbed due to cultural reasons. An example of this is Asian Vegetable Research and Development Center's (AVRDC) garden model. Developed in Taiwan, it was

unsuccessful when transferred to the Marshall Islands. Increasingly, it has become clear to organizations involved in promoting gardening that certain essential inputs are ubiquitous to successful garden projects in any country; what differs from country-to-country is the blend of these inputs to adapt to the specific physical and cultural environment where the garden will be cultivated.

UNICEF has come to an interesting conclusion through experiences in its Family Food and Nutrition project. Program participants seemed to be overwhelmed by too many plants introduced into their gardens, prompting UNICEF to concentrate on promoting only one nutritious plant or fruit each year. This approach has proved to be extremely successful. UNDP's Integrated Atoll Project has experienced the same phenomenon. Similarly, ADRA reported that when the director of the Bazega Agriculture School left for a holiday, the local people who tended the garden devoted their time to only a few crops, neglecting many others. The idea of concentrating on only a few key crops is worthy of consideration.

III.2.5 Extension Concerns

Selection of gardening extension workers is critical to a project's success. It is universally agreed that agricultural extension agents should be trained in basic nutrition, and conversely that nutrition extension workers should be trained in basic agricultural/horticultural skills. The individual extension worker can greatly affect the outcome of a project. Foundation for the Peoples of the South Pacific's (FSP) GROW project in Papua New Guinea suffered because the extension worker selected by the government was a male. Culturally, this proved counterproductive in reaching GROW's target audience of women. Helen Keller International (HKI's VITAP program), which assists many different PVOs and projects around the world, has noted that the human factor can determine the success or failure of a program. Whether the extension worker is a good charismatic leader or an uninspiring promoter, can make all the difference.

AFRICARE reports that the overloading of extension workers, who are often unpaid volunteers, hindered the progress of their project in Nigeria. A multitude of projects often rely on the same person to extend the required information, skills and training. Consequently, the extension worker may be spread too thinly to attend to all needs, and thus certain projects do not receive the intended or requisite attention.

Many projects focusing on school gardens have appointed school teachers as extension workers. Despite the skills and good intentions of the teachers, school gardens have not always achieved the desired result. Leslie Brownrigg of the League for International Food Education stated in her 1985 book on home gardening as a nutritional intervention, that "school gardens generally fail to inspire home gardens." These words are echoed today by many working to

promote home gardens. While a school garden can enhance nutrition education and diet consciousness, supplement school meals and even generate some money, it will seldom result in a prolific planting of home gardens. If cultivation of a home garden is not one of the goals of the school garden program, however, then school gardens can be very successful. SCF has put extensive thought and energy into school gardens, with demonstrated results. A constant problem in all school gardening projects, however, is that all the participants -- students and teachers alike -- have periodic, and occasionally, long vacations, often during which time the garden is neglected.

Demonstration gardens are not as popular as they once were. UNDP, CARE, and UNICEF all feel that it is imperative to involve local people as quickly as possible in actual home gardening activities. UNICEF's Family Food and Nutrition project in Pacific island nations has skipped demonstration gardens altogether, and is concentrating instead on individual house sites. Door-to-door extension work has been found to be far more effective than demonstration gardens, which in some cases, may not be readily accessible to the community. According to Jeff Liew, project coordinator of UNDP's Integrated Atoll project, if a demonstration garden is necessary it should be started in a participant's backyard. Says Liew, "It [the garden] is then integrated immediately into the family system with all the perils of children, chicken and pigs. How well the garden survives under such real-life situations provides the 'standard' and model for other potential adopters."

III.2.6 Human Nature Concerns

Often, changing the dietary habits of a community takes a long time to effectuate because they are behavioral changes. Any home gardening project should proceed slowly and expect, initially, only moderate results.

Among the reasons cited for a lack of motivation by participants are: the lack of a reliable water source; an unclear comprehension of the link between nutrition and food; and the perception that gardening is an unpleasant activity. FSP, UNICEF and SCF have added gardening contests to their programs in an attempt to add an element of fun for participants, and all three organizations have received an enthusiastic response. Nevertheless, even where a water source and compost materials are readily available, laziness has often been expressed as a reason for not gardening by those who do not participate. Aside from laziness, not everyone will grow a garden. Often, those most in need are the least willing. UNICEF promotes gardening to all who are interested, whether or not they have nutritional problems, and hope that the idea will spread and be adopted by those in need.

Local perceptions can influence participation. ADRA was confronted by a situation in which people thought gardens were only for those who were blind; if no family members were blind, they felt they did not need a garden. Obviously they have been introduced to gardening solely as a means of combatting vitamin A deficiency, indicating the need for education about the variety of health benefits from gardening. ADRA also ran into an interesting situation in a remote, mountainous area of Honduras -- parents feared that the purpose of the health program targeted at their small children was to fatten them up so that they could later be stolen and placed for adoption. Some parents would not participate at all; others, who brought their children to the daily lunch program, refused to appear on weighing day because they did not want to lose their children when they became fat enough. Another problem was encountered by ADRA when some people accused the program of being "communist". This stemmed from the fact that the program attempted to inventory family land holdings, animals and daily food consumption.

Despite these problems, many projects do get underway only to find that the new, introduced, nutritious vegetable or fruit is unaccepted, as SCF found when they introduced the carrot in Malawi. Cooking demonstrations, combined with tasty recipes, seem to be the best method in overcoming this obstacle, unless unacceptance is due to cultural perceptions about the food. Frequently a food -- whether local or new to the culture -- is considered suitable only for animals or babies or old people with no teeth. FSP faced this cultural perception in Kiribati when trying to promote papaya and certain greens. Changing these perceptions is a very slow process; often the task is impossible given the time constraints within which the project exists.

Conflicting activities may limit the amount of time a participant can devote to gardening. In addition to all the activities associated with daily living, villagers are often confronted with choosing between several projects (often promoted by different organizations) that are occurring simultaneously within their village. In Kiribati, for example, SCF was promoting the construction of improved, cement block, tile-roofed homes, while at the same time FSP was promoting a Mixed Gardening for Improved Nutrition project. The villagers wanted to participate in both projects, and tried to, but in the end everyone ended up frustrated. It is not unusual to have two, three or even more projects simultaneously soliciting the people of a particular village. FSP and SCF finally worked out a complementary time frame, a condition necessary whenever more than one project hopes to be successfully implemented.

Strange as it may seem, holiday and vacations can seriously hinder a project. Schedules must be organized around formal holidays and staff vacations, not to mention the participants' holidays. Unexpected or unplanned absences for events such as funerals, weddings and birthdays, can cause enormous and often expensive

delays. FHI felt plagued by "holidays" in Ethiopia. In Kiribati, an important national workshop for which 30 people had been assembled on an outer island was delayed four days due to the unexpected return of islanders from Fiji -- where there had been a coup. The only probable solution to this type of constraint is to adopt a "so it goes" philosophy and attempt to work around the interruptions.

A high attrition rate exists in many home gardening projects. HKI notes that such projects need constant attention and follow-up, particularly before each planting season. After working through years on a pilot project on the outer island of Tamana in Kiribati, UNDP's Integrated Atoll Project Officer felt that the home gardening component was fully established. Yet within a year after he relocated to the main island of Tarawa, all but three of the original gardens were abandoned. FSP experienced the same phenomenon in both Kiribati and Papua New Guinea, as did ADRA in Ethiopia.

Urbanization is a continuing and increasing trend. As people move into the cities, they become cut off from traditional, daily food supplies, leading to dietary deficiencies. Unfortunately, few organizations address this problem. Interestingly enough, both ADRA and the Peace Corps have found that a particular group in the population that ordinarily drifts to cities and remains employed can be retained in their villages through small-scale, commercial gardening operations: school dropouts. Oftentimes described as aimless and troublesome, they proved to be the most successful candidates for gardening projects -- they have the time without the responsibilities of a home or family, and enjoy the opportunity to earn money. Many have become excellent extension workers. Related to urbanization is westernization. In countries like Guam, the people have become so westernized that they would rather buy their food than go to the trouble of growing it.

III.2.7 Post-Operational Concerns

Virtually every program director grumbles about the difficulties involved in conducting a Home Gardening for Improved Nutrition project evaluation. Frequently there is no baseline information, and if there is, the question arises: how does one determine the degree -- if any -- to which a garden has contributed to changes in that baseline information? This is an area that requires more research so that a reliable evaluation tool can be developed. As is, most reports merely list the numbers of gardens established (but seldom the numbers of gardens continued), the numbers of people trained and the types of vegetables promoted. Additionally, the headquarters of organizations seldom have detailed information on many projects since the reports never make it out of the field offices.

One final concern that was voiced consistently by the organizations, is that there is not enough exchange of information among the various project implementors. Often several organizations will be working in the same country, all with child survival programs promoting gardening, yet few know about each other's specific project activities. Not only does this situation create conflicts and confusion (several different methods being promoted as the "right way"), but a valuable exchange of information that could enhance a program's success does not materialize.

IV. RECOMMENDATIONS

Start Small. Given the wide array and number of concerns discussed above, the most important recommendation that can be given to a new project is to start small -- both in the program itself, and in the number of participants and garden plots. The smaller the project scope, the easier it is to handle the myriad difficulties that arise in building a project that runs smoothly, works successfully and has a greater chance of sustainability. Only when a project becomes firmly planted in a community should it consider expanding its scope and purview.

Have an Accessible Water Source. Crucial to any gardening project is the easy availability of water. If there is no water, there is no garden. Further, it is particularly important to remember (for the simple reason that not everyone will garden -- needy or otherwise) that gardening activities should be viewed as a supplementary component of vitamin A intervention programs. Also, gardens come and go too quickly to be the sole intervention. Marketing, access to nutritious fruits and vegetables, and distribution alternatives must be considered for those who choose not to garden for home consumption.

Promote One Vitamin A-Rich Fruit or Vegetable. Introducing one fruit and/or vegetable rich in vitamin A, and concentrating on the promotion of that one fruit and/or vegetable, appears, from the evidence, to be an excellent idea. Not only is the work of the extensionists and the labor of the participants greatly simplified, but operational aspects of the program are also made easier. This idea seems especially appropriate when it is realized that in most areas where gardening/nutrition projects are implemented, the variety of foods consumed does not change much from day-to-day. Once the particular fruit or vegetable has been established in the daily lives of the participants, another crop can be introduced. (This phenomenon has historical roots in the United States, where vegetables like spaghetti squash appeared seemingly out of nowhere and seem destined to remain. Tofu, too, is now a popular food.)

Collect Baseline Data, Conduct Feasibility and Vitamin A Deficiency Prevalence Studies. Feasibility studies, baseline surveys and vitamin A deficiency prevalence studies must ALL be preliminary steps in the development of any Gardening for Improved Nutrition project if later evaluations are to have any meaning at all. A project's design can be measurably improved, and its chances of success greatly enhanced, if the beginning steps are well laid. Moreover, subdividing the project participants into control groups (as HKI did in Indonesia) can further assist in the evaluation of a project and its components as it aids in determining the impact of specific interventions.

Share Information. The increasing number of gardening projects relevant to vitamin A deficiency has created a need for developing a system through which information covering all aspects of implementation are shared among organizations and project promoters.

Gardening is a Wise Intervention. Lastly, it is recommended that gardens be encouraged despite all the obstacles listed above. For although it may be difficult to measure the degree of benefits derived, a garden can only enhance a household's dietary consumption.

APPENDIX A

Gardening Projects as a Nutrition Intervention Arranged by Organization

ADVENTIST DEVELOPMENT & RELIEF AGENCY (ADRA)

Zimbabwe: A Seventh Day Adventist Agricultural Training Center oriented to commercial gardening is attached to an SDA boarding school in Zimbabwe. The students are men, or boys who dropped out of school. They attend a two to three week training session at the Center. From each group the best one or two are selected to stay on for up to a year for intensive agriculture, nutrition and marketing training, with the expectation that the student will then become an extension worker in his own village area. These extension workers generally develop their own commercial operations, but also help others.

The Agricultural Training Center focuses on 17 traditional and imported vegetables which are grown in rows. Nutrition was not emphasized because the sale of produce to recover costs is a necessity. Although the planting and consumption of the darker green and yellow vegetables is encouraged, neither the Center's garden nor the home gardens reflected this emphasis.

The Center found it difficult to attract women to the project for two reasons: (1) cultural and social roadblocks; and (2) men control the household purse strings and consequently want to receive the training.

The project was considered a success on two levels: (1) a vast area was covered through the Center's trained extension workers, who in turn developed their own commercial gardens and assisted others in their areas (Zimbabwe, Zambia, Sudan, Malawi and South African Homelands); (2) prior to the Center's existence, the boarding school to which it is attached seldom served vegetables other than collard greens. With the addition of the 17 varieties of vegetables to the three meals a day, the school nurse found that the average number of health complaints per day fell from 50/450 students to 5/450 students. Presently, other SDA missions and African countries are requesting the project.

The Director of the Agricultural Training Center has now left Zimbabwe to establish a similar center in Togo.

Togo: ADRA has funded and established an agricultural development program to spearhead an aggressive Self-Sufficiency Through Food Production project, which will train trainers for the 32 African countries where SDA is located. Based on its success in southeastern Africa, a bilingual regional and community agricultural training center is being established in Klobatene, Togo. Through Swedish funding, the center hopes:

- (1) to have trained a minimum of 20 regional and 30 local trainers in food production/health education by June 1992;
- (2) to have commenced satellite training centers in at least five other countries by June 1992; and
- (3) to have provided specific agricultural assistance to at least 10 country programs/institutions by June 1992.

The target groups are:

- (1) Regionally: institutional agricultural workers as well as economically deprived rural families; and
- (2) Locally: rural farmers and unemployed youths.

Burkina Faso: The Bazega Horticultural School and the Bazega Community Development project were begun in 1976 with the help of Swedish funding. The main goal of the school is to contribute to an increase in the production of food in the area, in order to reduce the enormous needs -- especially in times of famine -- by teaching intensive vegetable cultivation with a maximum use of labor. Wells, gardens, a clinic and health education are components of the program, which is intended to directly affect or involve 2,000 people living within a distance of 12 kilometers from the school. The project, evaluated by Sweden in 1984, was found to have the greatest impact in the nearby area and in certain cooperatives that sent many students to the school.

New vegetables have been introduced, with cabbage being the most successful, and cauliflower proving the most profitable. However, many of the gardens started no longer exist; those that do still exist were in place before the project began. This is primarily due to the lack of water, for many wells dry up during the dry season. Even trees that were planted have either dried up or were eaten by animals. The project stalled in 1983 following the death of the project leader, but picked up again, and is now reinforced and strengthened. Commercial gardening remains the primary objective, but deeper wells and nutrition education have promoted the sustainability of the project and results in increased nutritional health.

Ghana: In 1985 ADRA/I contracted with USAID to operate a food production and nutrition project in Ghana, headquartered in the town of Walewale, with three satellite sites in the surrounding Northern Region. An integrated development approach included nutrition education, increased food production and the development of potable water. Community committees were established to plan activities, gather baseline data, and work with project employees.

Children under age five and their mothers are targeted to receive nutrition and hygiene training. The community in general is encouraged to improve vegetable and kitchen

gardens, as well as the marketing of produce and economic development. The first phase of training, begun in January 1986, has been completed, and included: basic nutrition; food groups; balanced diet; food supplementation; food preparation; diet analysis; weaning methods; anemia and xerophthalmia; crop production; and money management. Dry season gardening combined with nutrition education is an activity exercised by women. Many of the unemployed school drop-outs undertook commercial gardening, which resulted in both employment and a strengthening of family relationships by reducing urban drift during the dry season.

Kenya: Begun in 1982, this ADRA project's objective was to reduce the infant mortality rate by reducing the incidence of protein-energy malnutrition. The beneficiaries were poor immigrants from the landless tribes of Kenya who worked in nearby forests. Fifty-seven families were targeted. The University of Eastern Africa trained 12 university students as Student Health and Nutrition Teachers to work with the 57 beneficiaries in growth monitoring for children aged five years and younger, nutrition education for the mothers of malnourished children and the establishment of kitchen gardens. Five school gardens were also established. Additionally, a nutrition subcommittee was set up to conduct cooking demonstrations and menu planning, as well as to conduct gardening and nutrition activities.

Prior to the implementation of the project, 115 children were identified as showing evidence of protein-energy malnutrition. When the project terminated in 1987, the originally reported severe cases of malnutrition no longer existed. The project continues independently with some success, although no formal funding has been done by ADRA for three years.

Ethiopia: Since 1983, ADRA has been involved in famine relief in Ethiopia. Its "Seed for Life" project provides tons of vegetable seeds in anticipation of food shortages, which are caused by extensive droughts in the southern part of the country, where people were starving or expected to starve soon. Forty individuals were trained as gardening extension workers. Although 87,000 families were reported to have established gardens, none were in evidence in January 1988. Lack of water dried up most of the gardens; lack of seeds was also cited as a problem. However, when both seeds and water are available simultaneously, ADRA expects that many of the gardens will be revived.

Ma'awi: A program is in place to promote the consumption of vitamin A-rich foods in the Thyolo District, but due to a lack of trained help, it has not yet begun.

Honduras: In 1985, ADRA contracted with USAID to operate a food production and nutrition education project in Lapaera, Honduras, a remote mountainous area. Children under age five and pregnant women are the primary targets of the project, but upgrading of economic food production is also a concern. The project team consists of a director, an agriculture and health coordinator and four promoters, who work in the Lapaera area with villagers in the 12 communities with the highest percentage of underweight children.

The focal point of each community project is the "lactario", where malnourished children under age five receive a daily food supplement through a CARE and PL480 food program. ADRA encouraged the addition of vegetables to the lunches. While there, the mothers received two, eight-hour cycles of health/nutrition education.

In Honduras, the men are the gardeners, thus they are the recipients of the horticultural training. School gardens and gardening classes, which have been incorporated into the school curriculum, are very popular. CARE no longer distributes food through the "lactarios", but ADRA fills the gap and successfully carries out its outreach program in this remote area.

AFRICARE

Nigeria: In 1988, in the Isiala Ngwa area, Imo State, AFRICARE started a small project in which 200 men and women farmed 12 hectares of land to increase and diversify food production. Imo State is one of the most densely populated areas of Nigeria, and Nigeria is the most populated country in Africa. Several years ago UNICEF estimated that 40 percent of the children under age five in Nigeria were moderately to severely malnourished; in the Isiala Ngwa area the figure was 18.8 percent. Poor child feeding practices reflected a general lack of basic primary health knowledge. In response to this lack of knowledge, AFRICARE, in 1986, trained 54 village mothers as Community-Based Workers (CBWs) to help deliver primary health care interventions.

Through the CBWs, mothers are being motivated and educated regarding proper diets, breastfeeding and weaning. The CBWs also encourage home gardening and the consumption of vitamin-rich foods. In just two years, the CBWs successfully helped reduce the rate of moderately to severely malnourished children in Isiala Ngwa to 2.2 percent.

The child survival project's CBWs have educated more than 4,000 registered women as to the importance of proper nutrition and the use of locally available foods to provide adequate diets. The CBWs teach the proper introduction of weaning foods, and the types of vegetables that can be easily grown in a home garden to supplement family diets. The major crops cultivated include improved cassava, varieties of yams, maize, peanuts, cowpeas, melons, garden eggs, mangos, bananas, guavas and pineapples.

While AFRICARE provided a small stipend to the CBWs, they insisted that the community absorb this expense. Although this proved difficult, the community's desire that the work of the CBWs continue resulted in the development of a community farm project. As conceived, the farm project would not only pay the CBWs, but its profits would either be recycled back into the farm or into other community health activities.

The farm project got off to a good start, but soon ran into marketing and storage problems. Thus AFRICARE decided that, beginning in 1990, it would support the

development of a marketing and storage facility operated by 15 CBWs. Once the facility is operating, the entire project will be self-sustaining and self-supporting. The 15 CBWs affiliated with the project will also provide a packaged supplementary infant weaning food, which will be produced from their own crops and sold to the community.

The nutritional success of this project, combined with its total absorption into the economic and social fabric of the community, has generated many requests for replication throughout Nigeria and the African continent.

Mali and Niger: Since 1988, vegetable gardening has been a thrust of AFRICARE's Child Survival project, but the programs are only beginning.

BENSON AGRICULTURE AND FOOD INSTITUTE (MORMON CHURCH)

The Benson Agriculture and Food Institute works throughout Central America and in many countries of South America. A primary objective of the Institute's small-scale agriculture program is to enable families and communities to become self-sufficient in their basic nutritional needs through integrated nutrition and primary health programs. This includes gardening, small-scale farming and education.

In 1988, the Institute held a conference on vitamin A deficiency in Utah. Plans to incorporate direct vitamin A interventions through home food production, nutrition education, and informed food purchasing, are presently being developed in many of their programs.

Guatemala: In 1982, a study was conducted to determine how a family's nutritional status could be improved if the family's income was fixed and its food purchased. The first step evaluated the foods the families were already purchasing, their source and price. It was found that the most widespread deficiency occurred in fruits and vegetables -- a full one-third of the families failed to get the recommended servings each day. Strategies were developed to alter the balance of foods purchased. Since 1982, home gardening has been encouraged, combined with raising small livestock, fruit trees and the gathering of wild edible plants.

Ecuador: In 1983, the Benson Institute joined the Ministry of Health in Ecuador in establishing a "Small-Scale Agriculture Project". Two pilot sites were selected: a small private farm and an orphanage caring for 100 children. The objective on the private farm was to determine whether the produce of one hectare of land could meet the nutritive needs of at least seven adults for one year. One-quarter of the land was planted with a cash crop; one-half was reserved for grain, soybeans and alfalfa for the family and animals; and the remainder of the land was set aside for vegetables. Rather than the traditional hill system, the land was planted in rows and fertilizer was used. At the orphanage, a larger area was planted.

Both pilot projects were considered a success. Broccoli, which was new to the area, produced extremely well and was enthusiastically consumed. The sale of cucumbers paid for the fertilizer. Squash produced better than tomatoes. The alfalfa, corn and soybeans were more than adequate for both the humans and animals. The project has since expanded to the mountainous Cotopaxi Province.

Mexico: The American Indian Services and the Benson Institute are promoting home gardens with SDA members in Mexico. Begun in 1984, 1,094 gardens were planted in a program that involves not only home gardens, but home food storage and family budgeting. Participants with little land started patio gardens. City dwellers planted their seeds in buckets and cans. Since too much or too little rain has often been a problem, some gardens were planted as many as five times in a year.

Mormon Church: Kiribati and Tonga (South Pacific): Through their own initiative, the church in both countries is tremendously active in providing instruction and materials for nutritious home gardening, as well as growing all the food necessary to supplement the meals served at their schools. In neither instance is their work coordinated with government programs. The church feels it can progress (and in fact is progressing) better through its own system.

CARE

While gardening is rarely the focal point in any CARE project, it is supported by substantial attention, effort and resources by both CARE staff and project participants. In most cases, the primary purpose of CARE's gardening activities is to improve family consumption of vegetables and fruits; its secondary purpose is to increase family incomes. In 1988, CARE produced an in-house publication, the Home Gardening Review, from which much of the information below was taken. An update is planned. Several current country reports were available, but for the most part the details of the gardening projects remain with the country directors and are not available at headquarters.

Africa Region: Generally, local preference, income generation and environmental adaptation, rather than nutritional concerns, determine which vegetables will be planted.

Mali: CARE currently implements two projects in the Macina Cercle that specifically address vitamin A deficiency. These projects, the Agricultural Development in Drought Zones project (ADDZ) and the Macina Child Health project (MCHP), have been collaborating since 1987 in promoting improved nutrition through gardening, nutrition demonstrations and health education. CARE also has three other projects with gardening components located in Dire, Djenne and Koro Cercles. However, the gardening component is relatively new to all three projects, as opposed to the ADDZ Project, which is in its fifth season of gardening.

The ADDZ Project currently works in 44 villages of the Macina Cercle. CARE staff provide a year-round program of agricultural extension services to villagers, mainly women. Among the activities promoted in the project are gardening and nutrition demonstrations, which are carried out in collaboration with the female health monitors of the MCHP. The nutrition demonstrations promote the use of garden produce, particularly those rich in vitamin A, such as carrots, cowpeas, sweet potatoes and green leaves.

At health education sessions, monitors emphasize the link between ocular diseases and malnutrition, a topic that had not been fully understood by village women until the monitors called attention to it.

Before each gardening session, the ADDZ agents receive refresher training concentrating on nutrition, including vitamin A deficiency recognition and prevention, as well as technical aspects of gardening. In the upcoming gardening session, CARE plans to introduce vitamin A promotion in their other agricultural and natural resource projects.

Lesotho: The Integrated Community Forests and Agricultural Resources Management project trains women's cooperative groups in operating seedling nurseries. Fruit trees are also promoted.

Niger: School children tend gardens which contribute to the school meals. To cover the operating costs of the school gardens, the schools sell the surplus produce and tree seedlings.

Sierra Leone: Gardening is a component of both the Village Marketing project and the Agroforestry Cropping Systems project. Seed banks have been established by CARE.

Sudan: CARE promotes gardens for improved nutrition in their Re-establishment of Household Gardens program.

Kenya: Gardening is a component of the Women's Income Generation project. Because income generation is the primary objective of the project, women will pursue gardening only if it is considered financially viable.

Asia Region: The nutrition value of vegetables and fruits is a concern only in CARE's India and Bangladesh programs.

India: Vitamin A deficiency is one of the major causes of blindness in India. It is estimated that 30,000 children become blind every year due to inadequate vitamin A intake. To deal with the problem, the government of India launched the National Blindness Control Program in 1970. In 1989, CARE began addressing the problem in Karnataka, southern India, through an educational program for mothers of children in need of vitamin A. Approximately 300,000 mothers are expected to be trained by this

program, which targets all the children under age three. Part of the evaluation of this program will measure the increase in the community's use of locally available, vitamin A-rich foods.

Bangladesh: Since 1980, CARE has had a Women's Development Program, which encourages nutritious vegetable gardens and fruit trees. In addition to helping to establish seed banks, CARE selects participants of the program to train as seed and seedling "vendors".

Nepal: In Nepal, a strong emphasis is placed on family nutrition and consumption. Gardens and fruit trees are encouraged as part of the Small Farmers Community project.

Thailand: Fruit trees and gardening are components of the Mae Chem AgroForestry project.

Indonesia: Home gardening and fruit trees as a way of supplementing the diet, are encouraged as part of the Maternal Child Health Program. Generally, the garden plots are too small for any surplus to be marketed.

Philippines: CARE supports health/nutrition projects in Ilo-Ilo and Guag provinces to supplement the diets of children and pregnant women.

Latin America Region: In Latin America, where family health is a primary concern, crops are usually chosen on the basis of their nutritional value. Local preference and availability of seeds are thus important considerations for these people.

Haiti: Vitamin A capsule distribution, nutrition education, and food supplementation are components of the Maternal Child Health Program. Gardening is supported by the Community Water Systems project in 23 communities.

Belize: Gardens are part of the Relevant Education for Agriculture and Production (REAP) project. The gardens are located at schools for use in the Practical Agriculture curriculum. The produce is consumed by the students, and any surplus is sold to the community.

Peru: Gardens and fruit trees are part of the PRODIA project (formerly Basic Infrastructure Development project). In addition to family consumption and market sales, participants exchange produce amongst themselves, enabling them to further diversify their diets at no added expense.

Guatemala, Ecuador, Honduras, Bolivia and the Dominican Republic: CARE has gardening projects in each of these countries, but no information was available through their headquarters office.

CATHOLIC RELIEF SERVICES (CRS)

Thailand: A vitamin A project was started in late 1987 in northeastern Thailand along the Laotian border in Phonpsi Region. Vitamin A deficiency does not appear in other regions of Thailand. CRS believes that the mild cases of vitamin A deficiency in Phonpsi are due to the fact that it is a poor region with sparse rainfall, where few green vegetables are available.

Dentists conducting an oral health program in the provincial schools were the first to detect the problem. Subsequently, CRS and the ministries of health and education facilitated a vitamin A program targeted towards the schools. Children were screened, and those in need received vitamin A capsules. Gardening, small livestock care and nutrition education were integrated into school activities. Mothers became involved with the school lunch program, so they also received nutrition education and some gardening tips.

CRS is presently in the midst of a midterm evaluation of the program to determine its effectiveness to date. However, the attrition rate has been high -- of the 30 schools originally involved, only 12 are still participating in the program.

The Agricultural Teachers project is a combined effort of CRS and the University of Khon Kaen, a school located 400 kilometers northeast of Bangkok. District school teachers come to the campus for a two-week gardening and nutrition seminar. They then return to their districts, where department of agriculture extension workers continue to work with them in establishing school gardens. The agricultural extension people, skilled workers who have all been trained in the United States, are ambitiously promoting gardening/nutrition programs. The Thai government wants to replicate the program throughout Thailand, reaching some 30,000 schools.

Latin America: CRS has water and irrigation projects in Latin America, from which gardening endeavors may have evolved.

FOOD & AGRICULTURE ORGANIZATION (FAO)

Malawi: Only in Malawi does FAO have a fully operational Home Garden Vitamin A project (although Burkina Faso, Mali and Vietnam are in the beginning stages). Started in 1989, the program conducted a baseline survey, which resulted in a list of vegetables that the project decided to promote. One hundred farmers and their families have been selected to participate, with the hope of expanding to 200 families. The program combines nutrition education with instruction in horticultural techniques. Mass media has been used to reach beyond the immediate participants. Vitamin A capsule distribution continues along with the gardening project.

Tanzania: FAO supports home gardening and food production in Tanzania.

Indonesia: FAO supports projects oriented towards home food production and the consumption of vitamin A- and carotene-rich foods.

FOOD FOR THE HUNGRY INTERNATIONAL (FHI)

Bolivia: Bolivia has the highest infant and child mortality rates in South America. The Altiplano Region, where FHI is working, has the highest child mortality rate in all of Bolivia -- 137/1,000 children die before reaching their fifth birthday. To help bring down the high rates of child mortality, FHI designed inexpensive greenhouses where nutritious foods can be grown. The Altiplano Region is a high, cold and windy place, where the sun shines nearly every day. As such greenhouses offer the best environment in which to grow food year-round. FHI's greenhouses are constructed from adobe covered with sun-resistant plastic, measuring 16-18 square meters in size. The rate of production of vegetables such as tomatoes, lettuce, radishes, cucumbers and carrots has been impressive.

The ministry of health has embraced a nutrition component of the program. An FHI project promoter, working with a government Health promoter, formed Mother's Clubs and taught child survival interventions. Since 1986, FHI has carefully developed its extension program and greenhouse structure. Spontaneous replication has occurred throughout the area. Based on the success of this experimental project, FHI hopes that by the end of the program in FY 1992:

- 1,260 families will be fully trained in the use and operation of greenhouses;
- yields will increase by 25 percent;
- 200 community leaders in 100 communities will be trained in child survival interventions, including health and nutrition education;
- 8,500 mothers will be fully trained in child survival interventions; and
- appropriate, replicable and family-level technologies that complement family greenhouses and/or wells will be developed (such as fish ponds).

Guatemala: A home gardening program targeting widows (from war, generally) and including other interested women, began as a spin-off from a community water system project. Vegetables are grown for home consumption, but potatoes are often sold. Though the program is not comprehensive, it does distribute seeds and information.

Dominican Republic: Commercial co-operative gardening project.

Ethiopia: Home and school gardening projects, coupled with nutrition education to combat vitamin A and iron deficiency, were shut down in early 1990 along with the

entire FHI program due to drought, floods, a meningitis epidemic, hailstorms, a preponderance of staff holidays, the main road washing out, a coup attempt and finally armed fighting.

FREEDOM FROM HUNGER FOUNDATION (FFH)

Nepal: FFH has been in Nepal since late 1985, working through the ministry of health and collaborating with the Family Planning Association of Nepal. The nutrition component of their child survival program, begun in late 1987, emphasized nutrition education, family gardens and seed distribution. Today 22,000 people living in 72 mountain villages are involved in the program. General nutrition is promoted through raising nutritious crops, with a strong focus on infant weaning foods. Cooking demonstrations by the nutritionists have been so well received that both infants and adults are enjoying the new foods.

Due to glacier run-off, water is not a limiting factor in gardening, but the steepness of the land makes it challenging. Most women plant a small garden plot just outside their back door to supplement the staple diet of rice and millet. Although gardening is seasonal, nearly all the gardens are started up again each spring. The gardeners save their seeds from year-to-year, and share them with neighbors.

Bolivia: FFH works in the high Altiplano Region, incorporating the popular greenhouses into their program. Nutritious crops are promoted to supplement diets. As in Nepal, the emphasis is on general nutrition rather than a specific micronutrient. Vitamin A deficiency is not a documented problem. Water is a limiting factor in gardening, but wells are usually established when constructing the greenhouses.

FOUNDATION FOR THE PEOPLES OF THE SOUTH PACIFIC (FSP)

Kiribati: FSP began its vegetable growing program in 1982, but due to bureaucratic delays within the government, the program did not get off the ground until 1985. But even then, the Home Gardens For Improved Nutrition project was caught in a conflict between the Ministry of Health and Department of Agriculture. Additionally, plans to work through the network of the National Women's Federation (AMAK), did not fully materialize, as the federation was working to overcome organizational and management problems. In October 1985, the project was delegated to the Department of Agriculture, and soon, a two-week National Mixed Gardening For Improved Nutrition Workshop was held, attended by all the outer island agriculture extension agents, AMAK island workers and government officials. As Phase I finally got underway, four outer islands were selected as sites for projects due to begin in early 1986.

Vitamin A and iron deficiencies are targeted, though no formal survey was conducted. Local vitamin A- and iron-rich plants were emphasized in a mixed gardening system that used all local materials. At the end of the year a contest was held on each of the

participating islands. The village response was excellent. Gardens had begun appearing at many homes, and entire villages turned out for the contest. The following year the activities on the initial four islands were reduced so that two new outer islands could be added. However, in 1986 funding was cut, and FSP's program inputs were forced to discontinue.

At about the same time that FSP's funding cuts hit, UNICEF had just begun (after years of negotiations) its Family Food and Nutrition project; however, the project never took hold and quickly met its demise. With the Kiribati government's approval, FSP took over the management of the UNICEF project, while UNICEF provided interim funding to FSP. Now FSP was responsible for activities on its original six islands as well as UNICEF's four. Additionally, since UNICEF had been working through the Ministry of Home Affairs, the Ministry's resources complemented those of the Department of Agriculture.

Due to the increased number of islands, FSP's gardening/nutrition staff was augmented. Workshops, contests, nutrition education and horticultural activities continued on all ten islands. (At this time FSP also collaborated with the UNDP Integrated Atoll project on yet another island). When the FSP country director left the program in June 1987, UNICEF pulled out of Kiribati altogether.

Phase II of FSP's gardening/nutrition program began in April 1988. By this time a new FSP country director was in place, and leadership within the MOH was in the process of changing. The new FSP director conducted an assessment of the program and found it to be too widespread. On some islands gardens had been abandoned, and the nutritional component of the program was weak. The MOH, under new leadership, was very interested in supporting the project and absorbed responsibility for it. The number of islands being contacted was decreased to two per FSP staff member.

In early 1990, FSP requested Helen Keller International and John Hopkins University to conduct a survey to determine the prevalence of vitamin A deficiency in Kiribati. The results, based on 3,000 families (the total population of Kiribati is 65,000), documented severe deficiency. Consequently, the MOH has requested FSP to seek funding for a gardening/nutrition project addressing vitamin A deficiency.

Papua, New Guinea: A Grassroots Opportunity for Work (GROW) project was begun in 1987. The project is designed to increase the earning power of women through food marketing ventures and by training wife and husband teams in improved subsistence agricultural methods.

In 1989, an assessment of the project found that it had fallen far short of its initial goals of having several thousand farmers practicing GROW techniques within the first two years. This was due to the program's lack of follow-up extension services and the fact that only 29 percent of the trainees were women. The assessment concludes that this is

a consequence of the agricultural extension agent assigned to the GROW project being male rather than female. FSP is currently developing strategies to strengthen the project.

Fiji: The KANA Boarding Schools Meals project trains boarding school staff to plant gardens which supplement the children's meals. Fifteen schools in the western region of the main island, Viti Levu, are involved in the program. A number of head teachers have reported a notable drop in sick children (headaches, colds, boils, stomach problems) since the children's diet was changed to include fresh fruits and vegetables.

HELEN KELLER INTERNATIONAL (HKI)

HKI's involvement in the development and implementation of vitamin A programs throughout the world began in the early 1970s. Its programs encompass short-term interventions for the prevention of vitamin A deficiency (vitamin A capsule distribution), as well as medium-term (food fortification) and long-term interventions (nutrition education/social marketing and home gardening). Recently HKI developed a Vitamin A Technical Assistance Program (VITAP). VITAP assists PVOs in developing countries that -- according to WHO criteria -- are classified as having a vitamin A deficiency problem.

Bangladesh: Bangladesh's level of vitamin A deficiency is almost four times higher than WHO criteria. Moreover, although the soil in Bangladesh is fertile and potentially productive, there is a large gap between the requirement for, and availability of, vegetables in the country. Accordingly, HKI seeks to prevent mortality and blindness in Bangladesh through two programs.

HKI's Mobilization of Voluntary Agencies for Vitamin A Awareness, Promotion and Supplementation project mobilizes indigenous private voluntary organizations to promote vitamin A nutrition education and Vitamin A supplementation. HKI assists seven local NGO's (including CARE and two government organizations each of which has a home gardening component.)

The overall goal of HKI's Vitamin A Home Gardening for Prevention of Nutritional Blindness project is to reduce the incidence of nutritional blindness among marginal and landless peasant families through the cultivation of vitamin A homestead vegetables and education concerning the importance of vitamin A in the diet. In 1987 this project began working with 150 families (divided into 24 groups) in northern Bangladesh. Target families received two three-day training sessions on production techniques for different vitamin A-rich vegetables, vegetable bed preparation, compost making, seed production, food preparation and overall garden management.

Home gardens have been established around the homes, ringwells and even on roofs of the homes of the 24 groups of men and women involved. Every garden is supervised

monthly, and meetings are held to discuss issues related to home gardening. To date, all of the families are still growing gardens. Indeed, more than 50 percent of the target families continue to feed their young children vitamin A-rich vegetables from their gardens. HKI reports that, so far, no major problems have impeded the implementation of activities.

A baseline survey was conducted in 1988, and another survey has recently been undertaken to determine the impact of the project. Results are pending.

Indonesia: In April 1985, the Increasing Vegetable Consumption in Young Children project, supported by HKI and the Lions Club, began in Aceh, Indonesia. With the cooperation of Save the Children Federation, also working in the area, eight villages with a combined population of about 3,000 (589 families) were selected for the project. Home vegetable gardens were planted in six of the villages. The remaining two villages served as control groups (though at the end of Phase I they too started gardens). The purpose of the control villages was to determine the impact of nutrition education on vegetable consumption by children under age six. Of the six villages where gardens were planted, a special nutrition education program was implemented in only three.

A total of 70 home gardens were planted in the six villages. Project assistance included seeds, fertilizers, fences, tools and technical support as needed.

Community work is promoted through the women's organization (or PKK) that works at the village level. Usually the village PKK leader is the wife of the village leader. Home gardening was added to their other activities, which included monthly baby weighing, nutrition education and sewing classes.

A baseline survey was conducted at the beginning of the project and again in 1987 before expanding to Phase II. The second survey found that the types of gardens varied greatly from family to family. Some families chose to plant relatively few vegetables, while others grew large quantities. Everyone planted their vegetables all at once, rather than staggering the planting, as HKI advised. Some families who were not a part of the project began gardens on their own. And for the first time in history, the local market had vegetables for sale.

Phase II has expanded to 200 families in central Java, with plans to begin elsewhere in Sumatra. This project is augmented by HKI's child survival program, the MSG fortification project, and the Rovita project (which focuses on social marketing and food consumption studies).

Philippines: Pilot projects in rural and urban areas include capsule distribution and social marketing. Presently, plans are being developed to include a national vitamin A program.

Haiti: In the urban area of Port au Prince, HKI is investigating the best means of vitamin A distribution. Currently, there is no home gardening component.

Burkina Faso: The main objective of the Vitamin A Deficiency Control Program, a collaborative effort between HKI, UNICEF and the Ministry of Health, is to establish a control system in the four provinces of Yatenga, Bam, Sanmentaga and Namentaenga. One component of this project is the promotion of home gardens for the production of vitamin A-rich foods. (Due to lack of funds, however, HKI is withdrawing support).

Niger: Begun in 1988, the Vitamin A Deficiency Control Program is studying the best operational means to deliver vitamin A capsules. Plans are underway to introduce home gardening as a component.

Sudan: The Nutritional Blindness Prevention/Control Program for Drought Victims and Refugee Populations in Sudan does not have a home gardening component.

INTERNATIONAL EYE FOUNDATION (IEF)

Guatemala: IEF and the National Committee for the Blind and Deaf of Guatemala are participating in a joint vitamin A intervention project. IEF conducted a study to determine the feasibility of promoting home, school, and/or community gardens as a sustainable vitamin A component to a food supplementation (NutriAtol) program. The purpose of the study, which focused on garden projects in three regions of Guatemala, was to gather information on consumption practices regarding carotene-containing fruits and vegetables, and their sources. The results of the study will help determine if gardening should be included in a particular region and, if so, what strategies should be considered.

UNITED STATES PEACE CORPS

(1) Africa Food System Initiative (AFSI): AFSI is a long term (10 year) effort that assists up to 12 African nations in their struggle to reverse declining per capita food production and to attain self-sustaining food pilot project systems. During 1986, four pilots began in Lesotho, Mali, Niger and Zaire. The Peace Corps' role is to assist the development of local institutions and communities. In each country, program development began with a thorough assessment of existing food systems.

Lesotho: Peace Corps Volunteers (PCVs) are working in conjunction with a USAID agricultural restructuring project (LAPIS), in which women farmers in the highlands are being helped to increase their vegetable production in addition to regular field crops. Begun in 1986, the focus has been on dry season gardening and indigenous vegetables, combined with nutrition education. There is little extension service or infrastructure in the mountains. The people are not food self-sufficient, but rely on remittances from relatives in the lowlands to purchase food.

The village selection process is based on a village's interest, combined with the agricultural extension agent's interest and the village's willingness to provide housing for the PCV and suitable land for a community garden. Presently there are 15 volunteers in two south-central districts, each in a different watershed. The PCV is trained in agriculture, and is teamed with a government nutrition extension worker. Improving the food availability and quality of food consumption is emphasized, rather than overcoming a particular nutrient deficiency.

The growing season is short and arid. The main vegetables grown, in addition to corn, are cabbages, peas, potatoes, broccoli and kale. The PCVs are experimenting with "grow holes" (holes covered with cellophane) to extend the growing season. The university nutrition research program is looking at recipes other than sauerkraut to preserve cabbage. They are also researching different drying methods.

Mali: Volunteers in the agricultural sector are specializing in dry season gardens. They are also developing women's home and market gardens, and as a consequence look specifically at women's groups and work with/through them. Nutrition education and cooking demonstrations are added to horticultural training. In Mali, men traditionally garden, but the concept of dry season kitchen gardening is new and is presented as a woman's activity. So far it has been accepted. Currently, there are approximately 90 PCVs in Mali, many of whom are working under AFRICARE's gardening/food production programs.

Niger: Market gardens are being emphasized in the south where rainfall is plentiful. Northwest of the capital, 25 meter deep wells are dug to accommodate home gardens and fruit tree plantings. In both instances, the Peace Corps stresses nutrition education.

Zaire: The program in Zaire concentrates primarily on field crops and animal husbandry, but also includes dry season gardening and nutrition education. There are approximately 125 PCVs in Zaire today.

Mauritania: Nutrition is secondary to production, but the PCVs concentrate on introducing vegetables and demonstrating their preparation and use. The demonstrations focus mainly on women, but men are also involved.

(2) Peace Corps Outside of Africa

Dominica: Once upon a time there was a local fellow who was very good gardener. He was so good he liked to walk from school to school and talk about gardening to the children and teachers. The ministry of education decided that gardening should be institutionalized into the curriculum. Early PCVs helped adapt the gardener's techniques to all areas of the island and wrote the curriculum for school lessons. Today, one PCV is assigned to a single school and its community, and must meet objectives to satisfy both the national exam requirements and local needs. The PCV is thus both a school teacher and community agricultural worker.

Whereas school drop-outs were once a problem, today they are involved in the gardening projects. The Peace Corps emphasizes traditional crops and practices, but it is also developing a program to introduce a California-based "Life Lab" concept into the schools. Life Lab is a hands-on garden laboratory where students, exploring concepts in science and nutrition, learn by doing. The Peace Corps predicts that the implementation of the Life Labs will foster a greater understanding and achievement in gardening, nutrition, math and science principles.

Other Countries: At the time of the gathering of the materials and information in this report, the head of the Peace Corps gardening and nutrition section was on extended travel, and thus a full understanding of Peace Corps' other gardening programs was not possible.

SAVE THE CHILDREN FEDERATION (SCF)

Malawi: SCF first began work in Malawi at the MBalachanda Rural Growth Center in October 1983, and at the Nkota Rural Growth Center in July 1986. Funding is provided through USAID, Nchima Trust (UK), and the Canadian Mission Administered Fund, all of which supplement SCF's own funding base.

The two impact areas targeted by SCF have extremely high infant mortality rates. A baseline survey found that poor diets combined with poor nutritional knowledge have resulted in nutritional problems, including vitamin A deficiency. SCF has long had a Food Production Sector in its program. With the addition of a child survival grant, food production in Malawi focuses on eliminating vitamin A deficiencies. Activities incorporated through the Family and Community Nutrition Promotion Program include:

1. a survey of vitamin A deficiencies;
2. promotion of vitamin and nutritional understanding;
3. encouragement of better feeding patterns for children under age five;
4. promotion of home gardens containing foods rich in vitamin A; and
5. distribution of vitamin A capsules.

The program is fully integrated into SCF's community development efforts. In August 1988, Helen Keller International provided vitamin A training for 28 SCF staff members in Malawi. In turn, the SCF staff members trained community health workers and school teachers. Today, through the Rural Growth Centers and their outreach program, SCF provide women's groups and schools with nutritional and horticultural education, practical training and cooking demonstrations. Nutrition is now being introduced into school curriculums.

SCF considers vegetable gardens and food production to be central to their vitamin A program. At each Rural Growth Center there is a demonstration garden. Mustard, swiss chard, cabbage, pumpkin and carrots are among the vegetables grown, but the Center also raises poultry, rabbits and pigs. The Center promotes organic vegetable gardening techniques for both wet and dry seasons.

The Mkhota area reports that nearly 40 percent of the families have a home garden. One hundred - five farmers have been trained in improved horticultural methods; nearly all mothers have been involved in gardening/nutrition education.

Several problems have slowed progress in SCF's program:

1. Literacy: Literacy rates are low, particularly among females. This reduces long-term retention of facts and information. Today, SCF is developing alternative teaching methods;

2. **Water availability:** Limited water availability limits year-round gardening activities. Proposed solutions include boreholes, shallow wells and cultivating marshy areas;
3. **Input availability:** Vegetable seeds and other inputs are difficult to obtain. SCF proposes to set up local distribution networks;
4. **Cultural preferences:** Though carrots were introduced and grew well, they were not consumed because their cooking preparation was difficult and they were considered "strange". SCF will attempt to increase the carrot's popularity through cooking demonstrations;
5. **Care of school gardens:** Gardens are often neglected during holidays and vacations. SCF is encouraging more student involvement;
6. **Income generation:** The SCF women-in-development coordinator works through the Home Crafts Leaders, an organization geared towards income generation. The sale of produce is limited due to market gluts and poor infrastructure. Food drying is now part of SCF's program; and
7. **Program sustainability:** Though the project is well integrated into both the SCF staff programs and the village resource programs, funding for the vitamin A component ends in September 1990. However, an effort is being made to ensure project continuation. Communication links are being strengthened between the groups involved. Moreover, other international groups (FAO and the German government) are strengthening their parts of the project (housing, roads, capsule distribution).

Sudan: SCF's largest program is in Sudan, with a staff of 300. In 1986, the mother/child program was begun in two areas, one in the west (1,000 villages comprising 450,000 people), and one in the east that works primarily with Ethiopian refugees. A large child survival grant distributes vitamin A capsules, and encourages food production and nutrition education.

Working through women's groups, SCF promotes rain-fed gardens. Vegetables include snake bean, watermelon and okra. Since rainfall is limited and erratic, SCF is also developing dry season gardening, which concentrates on growing fresh greens.

During the 1988 rainy season, 60 home gardens were established in Merebea village. Forty more gardens are scheduled in a nearby village, which will result in a transfer of skills. In the east, 675 gardens were established in the Karhora and Um Gargur refugee settlements. Horticultural and nutritional training is conducted in all areas, east and west. A survey is now being conducted in each impact area to evaluate, socially and economically, the year's intervention.

Five water-yard gardens, using run-off water, have been selected as sites for starting community gardens.

The village of Um Dam Giediedim is converting a very fertile field, whose soil was traditionally used to make bricks, into vegetable and fruit production. A well with a pump will be installed. The site will also be used for practical training of extension personnel and others involved in the program.

Six school gardens involving 400 students have been established. Students and teachers have all received horticultural training and nutrition education through SCF.

The main problems encountered in the gardening programs are the lack of water, poor soil and pests.

Mali: Successive years of drought have reduced food crop production and exhausted stores of grain supplies. Rain-fed gardens, grown by women in the courtyards to complement the family diet with spices and vegetables, have suffered accordingly. SCF has recently become involved in Kolondieba Cercle in southern Mali, where they seek to enhance food production through the digging of wells and are developing garden activities through the building of small dams. In addition to the digging of more wells, a major component of this project is improvement of existing wells.

SCF expects that demonstration plots in gardens and fields will introduce improved growing techniques and revitalize dry-season garden activities. They are developing improved storage techniques, and hope that nutrition education will improve the villagers' eating patterns.

Gambia: SCF's most health-oriented program is in Gambia. An American health worker is posted in the country to study the extent of malnutrition and to carry out the activities of the child survival grant. SCF works in conjunction with the department of community development at a training center on the Northern Bank. Here, community development workers and extension workers are trained in management and appropriate technology, including gardening.

Traditionally, a Gambian family has a family plot but also works in a community plot. Because the communal plot is market-oriented, "promoted" plants are grown in them, with little concern for nutritious value. Production levels are low in the communal gardens, and during the time of water scarcity the gardens are abandoned altogether. By contrast, the family plots are better cared for and contain more nutritious plants.

For the past ten years, SCF has been working to alleviate the water problems in the community plots, as well as to introduce more nutritious crops. They are proposing a three-year Women's Agricultural Initiative, with assistance from Food For All. Hoping to benefit 1,200 gardeners as well as 30,000 area residents, Food For All would support

garden infrastructure improvements through well construction and fencing, while SCF would provide village-level technical support, project administration, and credit for seed and tool loans to women participants. SCF would also carry out nutrition education.

Tunisia: SCF trains female volunteer agricultural extension workers to promote home gardening for improved nutrition and to distribute seedlings. The pilot project trained 17 women representing 21 villages. Next year 86 women representing 100 villages will be trained.

Zimbabwe: SCF has a child survival program but no vitamin A program. The ministry of health's extension system is well-organized, and will absorb SCF's child survival activities next year. Though gardening is promoted, it is not specifically oriented towards nutrition.

Burkina Faso: SCF's gardening projects in Selo and Bazega promote both market and vitamin A rich vegetables. From mid-1988 to mid-1989, 441 mothers received training in the production and consumption of local foods rich in vitamin A.

Haiti: SCF works in a mountainous area of the Plateau Centrale in the Maissade Region, 150 kilometers north of Port au Prince. Travel to the region is made via motorcycles and mules. A child survival project and vitamin A project began in October 1988, focusing in part on the distribution of vitamin A capsules.

In the same year, a home gardening specialist headed up a home gardening program. Home, school and community gardens were targeted to serve 40,000 people. In each village eight to 10 farmers were organized into a cooperative for loans, supplies and other equipment and assistance. However, no strategy for implementing the gardening program was developed, and as of January 1990, the program was at a standstill. This is due to the fact that the government assigned the home gardening specialist to the department of agriculture, where most of his time has been spent working with cash crops.

In early 1990, a nutritionist from SCF headquarters visited SCF/Haiti to review the situation and develop a strategy for the program. A baseline survey was conducted in February/March 1990 and included an eye exam, a dietary questionnaire entailing a 24-hour recall and an observation of cultural habits, portion sizes and food frequency and the nutritional status of pregnant women and children under age five. The baseline survey tabulated 200 randomly selected children. Additionally, the nutritionist inventoried market foods and prices, seasonality of foods, as well as cultivation practices. A matrix was then made which showed the amount of vitamin A consumed over time.

SCF's future strategy will be to continue to work with the village farmers already organized, but to re-orient the program by adding a nutritional dimension. Mothers clubs are popular, and it is expected that they will become involved in the home

gardening program.

The SCF child survival program works with the ministry of health, which assigned four health agents to work with SCF, who in turn recruited 20 assistant health agents from the community. Five assistants are assigned to each health agent to work in a sub-sector. This "mobile technical team" will travel from village-to-village to mobilize community participation. Twenty-five "rally" sites exist for the 38 communities in which the teams work. The mobile technical teams will visit rally sites monthly. SCF staff will then do follow-up with the community.

Helen Keller International, World Vision, International Eye Care, International Eye Project and CARE are all also involved with vitamin A work in Haiti.

Bolivia: The current SCF vitamin A program objective is to reach 2,930 families, which includes 2,237 children under age five. Medium-term interventions, designed to improve family eating habits, include promotion of family gardens to produce vitamin A-rich vegetables. These activities are specifically directed towards pregnant women, weaning infants and school-aged children.

As a component of family gardening promotion, educational classes are carried out via cooking sessions with women's groups. SCF enlists volunteer health/nutrition and agricultural promoters to assist the program. Sixty percent of the health/nutrition promoters and 33 percent of the agricultural promoters have received training. Now they are in charge of supervising and training families in both traditional and new technologies for the production of vitamin A-rich vegetables. Families in Inquisivi Province have received training in:

1. appropriate and balanced diets, emphasizing the importance of the consumption of vegetables rich in vitamin A; and
2. new horticultural techniques at community demonstration gardens.

Currently, there are five demonstration gardens in Inquisivi, six in Licoma, and 17 in Circuata village. In Circuata, 17.5 percent (200/1,146) of families have a vitamin A-rich vegetable garden. For Inquisivi the figure is 6.8 percent (97/1,424).

Emphasis is also placed on promoting school gardens to educate children on the importance of a balanced diet and the need to consume vitamin A-rich vegetables. Eight percent of the schools in the area have gardens.

Before SCF began its program, vegetable consumption was limited to purchased onions, carrots, and tomatoes -- when they were available (Aug-Oct) and/or affordable. Today the gardens produce pumpkins, carrots, beets, celery, peppers, tomatoes, parsley, broccoli, onion, peas, cabbage and radishes.

Bangladesh: In the past few years SCF has been primarily concerned with emergency flood programs. Recently, however, its regular programs -- including the Child Survival Program -- have been reactivated. To help the villages become self-sufficient as quickly as possible after floods, SCF distributed fast-growing vegetable seeds, such as spinach, beans, potatoes, lettuce and peas. Training in the cultivation of nutritional vegetables has resumed. Fish, livestock and poultry are produced through demonstration projects and extension services.

One hundred eighty villagers have been trained in vegetable production in SCF's three impact areas. Vegetable seeds and seedlings for home gardens have been sold to 200 interested villagers. By September 1990, 100 villages will have received follow-up training on vegetable and wheat cultivation and the techniques of seed preservation. Nine SCF field staff members attended a four-day UNICEF training session on the prevention of vitamin A deficiency blindness.

Bhutan: A comprehensive primary health care program focuses on training villagers in health care and enhancement of overall family health awareness. Projects include kitchen gardening and nutrition education. SCF is working closely with UNICEF to develop health education materials.

The Norbuling impact area is organizing Gardening Clubs in each village among selected, interested households. Expected results include:

1. the selection of 25 households from four villages and the formation of clubs;
2. the training of 25-40 community members in home gardening techniques;
3. the provision of seeds and follow-up technical advice; and
4. the organization of Sershong Block garden competitions.

Indonesia: SCF provides technical assistance and training to local farmers and groups. The purpose is to intensify, extend and diversify the production of primary and secondary crops and animals in order to increase availability of local food, to improve nutrition and to raise incomes. Farmers are being encouraged to plant fruit trees on fallow land. Twenty families have been trained to grow family food gardens; 50 women have been taught how to cook nutritious food; and four women have received training in vegetable gardening.

UNDP: INTEGRATED ATOLL DEVELOPMENT PROJECT

The United Nation's Development Program's Integrated Atoll Development project is a regional project aimed at promoting self-sustained development on atolls to increase self-sufficiency to the greatest extent possible. The project began in 1985 in four coral atoll nations: Marshall Islands, Kiribati and Tokelau in the Pacific and Maldives in the Indian Ocean. In each country a pilot project was initiated among a community on one selected atoll. The program, which stresses integrated community development, is overseen by a U.N. volunteer called an Atoll Development Officer (ADO) who works and lives full time at the project site. All the ADOs have an agricultural background and are responsible for implementing the agricultural component of the project. In all four countries the first priority was water catchment and storage. This was followed by agricultural/food security -- spreading food availability throughout the year, reducing the use of imported foods and improving the quality of the basic diet.

Marshall Islands: The project began on Maloelap atoll in 1985. It promoted marine resources development, renewable energy, income generation, transportation and community skills development as well as home gardening. UNICEF's Family Food and Nutrition project (FFNP) in the Marshall Islands assisted with the home gardening/nutrition aspects. Peace Corps volunteers were also trained, and assisted with the project, but they are now gone and have been replaced by local health extension workers. There has been no baseline nutrition survey, so it is difficult to determine the impact of the project on nutritional status.

In 1987 the project expanded to the national level in the areas of agriculture and nutrition. The ADO is now located in the capital, Majuro, working with the Ministry of Development, which is responsible for agricultural training and food production. Key development workers within the government (public health, UNICEF and others) have formed a team of integrated rural community developers called the National Corps Group. This group is involved in planning and management to help the outer islands determine their project priorities.

Due to the dependance on USDA foods for the past twenty-six years, most of the Marshallese have forgotten basic agronomic and horticultural skills. With the recent suspension of these foods, the islanders have been forced to become self-reliant. Unfortunately, they are not particularly motivated. Though the government is receptive to ideas, it lacks the institutional framework to carry them out. Consequently, each island is a separate entity. The UNDP emphasizes local foods and material, and tries to mobilize the islanders. It plans to provide financial assistance for another 10 years.

Kiribati: UNDP began its program on Tamana atoll and initiated all aspects of an integrated community development. Beginning with the establishment of a demonstration garden/nursery, where 20 key village representatives were trained, the ADO started an intensive Mixed Gardening for Improved Nutrition program. Vitamin A and iron were the two nutrients stressed, as well as proper weaning foods for babies. By 1988, 87 percent of the families in Tamana had a home garden. The ADO then relocated to the country's capital, Tarawa, to form a National Corps Team to nationalize the project.

An Island Development Committee, which plans and writes proposals with the assistance of UNDP, is now located on every island in Kiribati. When the government decides to use it, Kiribati has a strong institutional framework, and consequently the project continues to go well. However, there are only three home gardens left on the original island of Tamana. The ADO attributes this to a long drought followed by a long rainy season subsequent to his departure to the main island, but is content that the skill and potential to garden remain intact.

Tokelau: Tokelau is comprised of 1,500 people living on three atolls. All 1,500 people are New Zealand citizens; many have visited New Zealand and therefore know about foods/nutrition/western lifestyle. They are well educated and highly literate. The government is well established and the women's groups well organized. Consequently, the desire to grow nutritious food for the family exists and is promoted. The people both supply and purchase from an agricultural store maintained by the government.

The government emphasizes horticulture, and Samoa has contributed training and financial support. Through the women's groups, the atoll project has been able to enhance gardening skills and nutrition education. Community compost trenches have been established, as well as home and community gardens. Within three years of the start of UNDP's efforts, Tokelau took over all agricultural activities and is presently developing its own nutrition posters. The concept of institution building is strong in Tokelau -- the people plan for their own sustainability.

Maldives: The Integrated Atoll Project is run entirely by a well-structured, rigid government, with UNDP providing some money and the training of a local development worker who will take over the planning and management of the project. The original pilot project on Mulaku was successful, and now the government plans to expand and transfer its methodologies to two other islands. The ADO attributes the success of the project to the hardworking nature of a people determined to be self-sufficient. Though the islands are heavily populated and have a developed cash economy, there is ample space for gardening, as the land is rural. Since there is no private land in the Maldives, the government allocates parcels of land for a home lot. One can also ask for a farm lot for gardening.

Nutrition problems are visible and prevalent, but have not been documented. The predominant meal is fish, curry and rice with greens. Local crops are augmented by imported foods (primarily from India), as well as food from the bush. Of the four countries where UNDP has been involved, gardening has been the most successful in the Maldives. Seed banks have been established, and are used and maintained. Surplus is easy to sell, so the commercial production of vegetables is now being promoted. Trading vessels collect produce from the outer islands and bring it into the capital, providing a source of consistent trade.

Cook Islands, Tuvalu, Federated States of Micronesia: These three countries were added in 1989. Recognizing the lengthy social mobilization process, UNDP is trying to "do it right this time". The Integrated Atoll Project began by forming National Corps Groups, which will identify the needs, the how and why of each project and the project's components.

UNICEF: PACIFIC REGION

UNICEF's Family Food and Nutrition project (FFNP) began in 1985 in Fiji, the Marshall Islands, the Federated States of Micronesia, the Solomon Islands and in Tuvalu. Kiribati was added in 1986, Palau in 1987. FFNP aims to strengthen dietary consumption through the promotion of nutritious, quality foods which are planted and eaten throughout the year. By stressing the use of local crops and materials, the program addresses the deleterious effects of a reliance on inferior imported foods, a problem prevalent throughout the Pacific that has been compounded by increasing population and urbanization.

Marshall Islands: FFNP's program (known as the Family Food Garden project in MI) embraces four outer islands (Namrik, Jaluit, Mejit and Likiep) as well as the urbanized area of Majuro. From the beginning, the program was focused on children, stressing the need to improve the quality of food. A Marshallese working with the social services department has headed up FFNP's program since 1985. On each island he has a local counterpart who is paid by the government. The project began by planting a demonstration garden, filled with a variety of vegetables and fruit trees, in each community. When the effort failed at the community level, he eliminated the demonstration gardens and concentrated on a house-by-house approach, focusing on those who were interested and hoping that those in need would follow at a later date. This approach has worked. He introduces one new crop each year, focuses on its production and its use in a meal (for instance, sweet potatoes are presently being grown on Namrik, with an emphasis on how to cook and eat them).

Since a nutritional survey has never been conducted, FFNP has not been concerned with emphasizing specific nutritional benefits of certain foods, but rather with the availability and quality of foods in general. UNICEF's role has been to provide technical assistance

to the project and to make available local plants and materials. They have also advertised FFNP's program on TV and radio, and produced a video series on Marshallese foods (for instance, there is a video on pandanus and another on pumpkins.) Currently the government is interested in the program and is increasing its funding, which has enabled UNICEF to decrease its financial support.

The project director's success with the program has increased the demand for his services. Unfortunately he is spread too thin. He does not have enough staff (Peace Corps volunteers used to work in the program, but presently they are not available) and his job with social services requires that he work on other projects as well.

Federated States of Micronesia: FFNP's program, which was begun in 1985 and coordinated by a U.N. volunteer, has concentrated on the State of Ponape. Beginning in 1990, however, the government wants the program to expand to include the other three states -- Kosrae, Yap and Truk. Since the states are separated from one another by great distances and have different cultures, the program will have to be tailored to meet the needs of the individual states. Generally, American culture has had a negative influence on the traditional ways of the people. One result is that they have acquired a "hand-out" mentality and thus are not easily motivated. In an attempt to address these various problems, UNICEF is considering hiring a national coordinator to lobby its program before the government of the Federated States of Micronesia.

Ponape: Originally FFNP's program began in the countryside, but now it is moving into urban areas. The staff has increased to four highly trained skilled women who work under the auspices of the agricultural department. Acting as a team, they concentrate on the production of foods, nutrition, consumption and child and infant foods. Ignorance of nutritionally correct weaning foods has been a problem in Ponape, as it has been throughout the Pacific.

Truk: The John Hopkins Survey has shown an exceptionally high rate of vitamin A deficiency, so FFNP's program will focus on vitamin A. The strategy will be to distribute vitamin A capsules, as well as to increase the consumption of the proper dietary foods. Since these foods already exist in Ponape, and since the people there have had nutrition education, the program will attempt to change cultural and behavioral patterns which prevent the eating of these foods. A U.N. volunteer, newly hired to work in Truk, will be setting up a garden center. In addition to displaying various gardening materials and tools and holding cooking demonstrations, the center will promote a garden containing a mixture of local vegetables and imported vegetables (such as chinese cabbage) that are high in vitamin A. Although FFNP plans to concentrate on vitamin A-rich foods, the dietary impact of its program will be difficult to determine because of the lack of personnel needed to evaluate changes. But the hospital, which will distribute the vitamin A capsules, will make an attempt to monitor the program.

Yap and Kosrae: There will be local project coordinators in these two states and FFNP's program will not concentrate on vitamin A deficiency. Although no one yet knows why, the people in these states seem to have adequate levels of vitamin A. Dietary practices seem to be culturally ingrained -- whereas people from Yap and Kosrae who have resettled in Ponape continue to show adequate levels of vitamin A, Truk people who resettle in Ponape continue to show a deficiency.

Palau: Eighty-five percent of Palau's population lives in an urban area. Thus FFNP, which began working in the country in 1987, concentrates its efforts on urban projects. It coordinates its activities with the Palau Community Action Agency (PCAA), a non-governmental agency that works through the women's clubs. PCAA is easy to work with because there is very little governmental involvement in its activities. FFNP has a good chance of seeing its program succeed in Palau. Because PCAA is made up entirely of local people (who are thus already "on board" to work), and because the agency is involved in a variety of community concerns (such as youth and sanitation), FFNP has the unique opportunity of integrating its programs with others so as to reach a large percentage of the population.

Since the government provides no monetary assistance, PCAA does its own fund raising and receives matching grants from USAID. UNICEF provides technical assistance in the form of social marketing -- video, radio and printed materials. It also helps fund a garden center, which gives direct support to low income communities. Palau has been heavily Americanized, however, and the people are not easily motivated to get out and help themselves. They prefer to work jobs that enable them to buy food, rather than grow nutritious, quality food for themselves. However, UNICEF reports that progress is being made.

Tuvalu: FFNP's smallest program is in Tuvalu, where the agricultural department consists of a staff of one. The department has trained health extension workers in every village on every island, and thus the inputs are in place and readily available. The department wants the extension people, who have conducted workshops in their villages, to emphasize food crops as well as cash crops so as to reduce the reliance on imported foods. UNICEF does not know whether a vitamin A problem exists in Tuvalu. The people, who are Polynesians, eat more leaves than Micronesians. (Thus the small I-Kiribati population -- Micronesians -- who live in Tuvalu, may have vitamin A deficiency. UNICEF provides money for planting crops and for shipping materials from island to island, but the government provides the bulk of the funding. Save the Children, which had an agricultural program in Tuvalu, is closing its Pacific offices.

Kiribati: After years of negotiation, FFNP finally found a foothold with Kiribati's Ministry of Home Affairs in 1986. Their program began shortly after a similar project was launched by the Foundation for the Peoples of the South Pacific (FSP), Home Gardening for Improved Nutrition, through the department of agriculture. An I-Kiribati woman was selected as national coordinator for FFNP. Along with the outer island

agricultural extension agents, she received nutritional and horticultural technical training through UNICEF's agricultural training program in Tuvalu and FSP's program in Kiribati. Local plants and vegetables were emphasized in the program, as well as the use of locally available materials. Nutritional aspects were also stressed. Family seed packets were created, each containing a small variety of seeds and planting instructions.

FFNP began work on four outer islands, distinct from the four islands where FSP's program was already in progress. The coral atoll islands of Kiribati are small, as is the population, which allowed the coordinator to work with key outer island representatives in conducting gardening/nutrition workshops for the island residents. A demonstration garden was established on each island, and individual family gardens were implemented. The program suffered a setback when the coordinator left one year later. As a result, UNICEF decided to place the program into the hands of FSP, whose own program was going strong at the time. This arrangement sustained the program for another year, at which time the FSP director left the program. Shortly thereafter, disputes within the government over the management of project led to UNICEF's decision not to pursue further efforts in Kiribati.

Fiji: Since July 1984, UNICEF has been supporting the activities of the National Food and Nutrition Committee (NFNC). NFNC's community-based activities include gardening for improved nutrition, nutrition education, cooking, infant weighing, social marketing and other related activities. The NFNC, headquartered in Suva, works through the ministry of health. Community-based health workers are the primary extension workers, but receive assistance from selected NFNC village leaders and agricultural extension agents. The health workers are not paid for their assistance, and thus decide for themselves how much time they will devote. Generally, however, they contribute a great deal of time. The coup of 1987 has slowed down project activities due to logistical problems as well as shortage of personnel in the rural areas. A health survey conducted in 1980 did not find vitamin A deficiency to be a serious problem, though the quality of the diet was found to be declining. NFNC is currently conducting a "Good Foods" campaign which encourages people to buy better foods. All levels of the media are involved, including the use of in-store displays. NFNC is also encouraging and supporting a consumer led-boycott of junk foods. NFNC activities operate throughout Fiji.

Solomon Islands: UNICEF supports the urban Honiara "Sup-Sup" project run by the Honiara Town Council. The town council is a government agency, but since it is comprised of various social departments it operates fairly independently. The "Sup-Sup" program works through women's groups, church groups and town groups. Health clinics, run by the town council, identify communities needing support and assistance. They have proved to be an excellent referral service for appropriate, direct action. The "Sup-Sup" project not only provides nutrition and horticultural information, but it has a garden service center and runs a media campaign. Urban gardening in the form of containers and/or maximizing available land and space is emphasized by the project. Since women

are responsible for putting food on the table, they are highly motivated to grow rather than buy it. The "Sup-Sup" program has been so successful that the department of agriculture wants to expand it nationwide and blend food crop with cash crop areas.

Presently the town council is completing a nutrition survey, but the prevalence of vitamin A deficiency is not included. It is not known whether there is a vitamin A deficiency problem or not. However, the height/weight measurements collected thus far show that 25 percent of the children are undernourished (having attained only 80 percent of their potential).

UNICEF: AFRICA REGION

Burkina Faso: In this country, UNICEF's program focuses on gardening and the distribution of vitamin A capsules. In 1987, a pilot project was begun in four northern provinces (Ban, Nanmatinga, Sanmatinga, Yatanga) where vitamin A deficiency is highly prevalent. UNICEF is collaborating with GTZ (a German organization). Helen Keller International provided a training of trainers workshop, in which three doctors and 33 nurses were trained in vitamin A problems and treatment. The pilot project included activities such as nutrition education, home gardening at school, women's groups for vitamin-rich food, distribution of high potency vitamin A capsules, operational research and social mobilization.

Gardens have been established at 25 primary schools and four day care centers. Seventeen women's groups are involved in the gardening programs. UNICEF identifies 50,000 beneficiaries, including 6,000 school children. They have targeted 1,240,000 beneficiaries for the future.

Central African Republic: UNICEF's role here is basically to support a water project (bore holes) with a gardening component. A national workshop has been held on nutritional improvement. A French church organization trains 16 trainers each year in nutrition education, food production, animal husbandry and hygiene. Gardening and cooking lessons are taught to the women who work in the bore hole project. School children and the creation of school gardens are also part of the project.

Gambia: UNICEF is supporting a food security program in conjunction with the department of community development. Twenty women's garden projects and 27 schools have started gardens. Local and imported vegetables and fruits are used in the meals provided at the schools. Sale of some of the produce supports the gardens.

Mali: A vitamin A survey found that vitamin A deficiency is more serious than originally thought. A joint WHO/UNICEF project, active in 200 villages, aims at improving nutrition through the strengthening of health services and family food production.

A food security project is planned for the Segou Region, and although plans are not yet finalized, it will focus on women and children, gardening and capsule distribution.

Mauritania: An integrated nutrition project seeks to improve the nutritional situation of pregnant women and children in the Inchiri, Adran and Tagant Regions. Food security is a serious problem in these regions, and the malnutrition rate is high. More than 33 percent of pregnant women are anemic, and many suffer from vitamin A deficiency. Project activities include the distribution of provisions through 37 community food centers in three regions, nutritional surveillance, nutritional supplements to pregnant women and 12 village vegetable gardens that include fruit trees.

Mauritius: Nutritional problems are due more to use of imported, refined and processed foods, than to lack of food. Obesity is prevalent. A kitchen garden project, targeted at unmarried women with children, promotes 50 gardens. Tools have been distributed to the women. The quality foods they produce are fed to the children, and any surplus is sold for income. Nutrition education is included in the project.

Madagascar: A former UNICEF food security program in Tolagnaro and Vohipeno Provinces emphasized staple food production enhanced with fruits and vegetables. Presently, the National Committee on Nutrition is studying the levels of vitamin A deficiency problems. Beginning in 1990, UNICEF will assist in the training of area based nutritionists to carry out a program involving vitamin A-rich vegetable and fruit production.

Nigeria: Past UNICEF programs concentrated on basic food production and information. UNICEF will assist with vitamin A deficiency studies in 1990.

UNICEF: SOUTHEAST ASIA/ASIA

Bangladesh: UNICEF supports the Bangladesh Rural Advanced Committee's (BRAC) child survival program. BRAC is implemented in 59 "upuzilas" in 14 districts to provide vitamin A education, and is advocating growing vitamin A-rich vegetables and fruits. The impact of the program will be assessed in 1990.

Cambodia: Within the Family Food Production project, one provincial and two regional "institutes" have initiated vegetable gardening, animal husbandry and fish farming. Through UNICEF, families have received vegetable seeds, seedlings, fruit trees, fuel wood trees, chickens, fish, ducks and cement rings for wells. The project has been so successful that schools now want to participate.

Vietnam: UNICEF's nutrition project has three components: general nutrition; nutrition in primary health care; and food. The household food security project focuses on family food production. Two districts of eight provinces have been presented with home gardening techniques and seeds. Six hundred people have been trained; 6,500

families were reached during the first six months of 1989. Many other families are following in spontaneous replication.

The gardening program follows the traditional Vietnamese approach, which consists of an integrated ecosystem of vegetable gardening, fish breeding and animal husbandry, relying on the use of recycled human, animal and agricultural wastes for the production of fertilizer and animal feed. It is hoped that 15 provinces will be reached by 1991. The program is implemented through the Association of Vietnamese Farmers (VAVINA).

The Vietnamese government is attempting to control iron and vitamin A deficiencies. The Prevention and Control of Vitamin A Deficiency project, using existing maternal/child health facilities and staff, will be implemented in 15 provinces. Already 450,000 children under age five have received capsules. Posters and videos have been produced as part of the project.

Bhutan: UNICEF has helped sponsor a national level workshop in Tashigang. Among other things, the workshop focused on the importance of kitchen gardens, and the importance of adding green and yellow vegetables and fruits to the traditional diet of rice and chili.

WORLD VISION RELIEF AND DEVELOPMENT (WVRD)

Mauritania: Since its inception in January 1988 as part of the child survival program, WVRD's two-year vitamin A program in Assaba Province has:

- established 23 pilot gardens;
- taught villagers how to sun dry vegetables;
- held 22 food demonstration sessions, aimed at incorporating new vegetables into the local diet;
- developed slide shows and songs to promote the consumption of green and yellow vegetables;
- increased the consumption of carrots from zero percent to 23 percent, and green, leafy vegetables from three percent to 31 percent; and
- decreased the prevalence of night blindness from five percent to 1.9 percent.

The second phase of the program will begin in 1990 and will last for three years.

Tanzania, Zambia, Nigeria: As part of their child survival program, WVRD trains rural health workers to promote family gardens and improve nutritional practices.

Ghana: Funded through World Vision, women's groups are organized around the child sponsorship program. When women gather to have their children weighed, they are encouraged to plant kitchen gardens.

Senegal: In the dry Louga Region of northern Senegal, home gardening is combined with women's empowerment activities. While children are being weighed at the health post, their mothers take turns watering the post garden. Sixty percent of the produce is consumed by the participants, and the remaining 40 percent is sold. Another facet of the program promotes the horseradish (drumstick, Moringa) tree as part of the projects' tree planting component. To date, 88 villages have planted more than 4,400 trees.

Haiti: World Vision's child survival program began in 1987 on La Gonave Island. In 1989 a vitamin A component was added. The vitamin A project is targeted at 17,500 children under age seven and 15,500 women aged 15-45. WVRD is attempting to integrate vitamin A capsule supplementation, nutrition education and the promotion of gardens, fruit trees, and fish farming into their existing child survival programs.

Bangladesh: The existing WVRD program addresses 80,000 people, of whom 94 percent receive vitamin A capsules. WVRD now wants to introduce home gardening as a long-term intervention, and plans to emphasize the consumption of Moringa and sweet potato leaves.

APPENDIX B

**Organizations Promoting Gardening Projects as a Nutrition Intervention
Arranged by Country**

Africa Region

Benin	Catholic Relief Services
Burkina Faso:	Adventist Development & Relief Agency *AFRICARE Helen Keller International Save the Children Federation UNICEF
Central African Republic	UNICEF
Chad	*AFRICARE
Ethiopia	Adventist Development & Relief Agency *AFRICARE Food for the Hungry International
Gambia	Save the Children Federation UNICEF
Ghana	Adventist Development & Relief Agency *Catholic Relief Services *Peace Corps *Rotary International World Vision
Kenya	Adventist Development & Relief Agency CARE
Lesotho	CARE Peace Corps

*project was not reviewed in report.

Malawi	Adventist Development & Relief Agency FAO Save the Children Federation
Mali	AFRICARE CARE Peace Corps Save the Children Federation
Mauritania	*Catholic Relief Services Peace Corps World Vision
Niger	AFRICARE *AVRDC CARE Helen Keller International Peace Corps
Nigeria	*AFRICARE UNICEF World Vision
Senegal	*AFRICARE World Vision
Sierra Leone	CARE
Sudan	CARE Helen Keller International Save the Children Federation

*project was not reviewed in report.

Tanzania	*FAO World Vision
Togo	Adventist Development & Relief Agency
Tunisia	Save the Children Federation
Zaire	Peace Corps
Zambia	*Save the Children Federation World Vision
Zimbabwe	Adventist Development & Relief Agency Save the Children Federation

Asia Region

Bangladesh

CARE
Helen Keller International
Save the Children Federation
UNICEF
*World Relief
*World View International
World Vision

Bhutan

Save the Children Federation
UNICEF

India

Action for Food Production
CARE
*National Council for YMCAs
*Royal Commonwealth Soc. for the Blind
*World Vision

Maldives

UNDP

Nepal

CARE
Freedom from Hunger

Sri Lanka

*Foster Parents Plan
*Sarvodaya
*UNICEF

South Asia Region

Cambodia

UNICEF

*project was not reviewed in report.

Indonesia	CARE *FAO Helen Keller International *Lions Club Save the Children Federation
Philippines	CARE *Foster Parents Plan Helen Keller International *Save the Children Federation
Thailand	CARE Catholic Relief Services
Vietnam	UNICEF
Pacific Region	
American Samoa	*World Vision
Cook Islands	UNDP
Federated States of Micronesia	UNDP UNICEF
Fiji	Foundation for Peoples of S. Pacific UNICEF *World Vision
Kiribati	Foundation for Peoples of S. Pacific Mormon Church UNDP UNICEF

*project was not reviewed in report.

Marshall Islands	UNDP UNICEF
Palau	UNICEF
Papau New Guinea	*Adventist Development & Relief Agency Foundation for Peoples of S. Pacific *World Vision
Solomon Islands	UNICEF *World Vision
Tokelau	UNDP
Tonga	Mormon Church *World Vision
Tuvalu	UNDP UNICEF
Vanuatu	*World Vision

*project was not reviewed in report.

Latin American Region

Belize

CARE

Bolivia

*CARE
*Esperanca
Food for the Hungry International
Freedom from Hunger
*Project Concern
Save the Children Federation

Brazil

*Esperanca
*Inter-American Foundation
*Rotary International

Dominica

Peace Corps

Dominican Republic

*CARE
Food for the Hungry International

Ecuador

*CARE
Mormon Church

Guatemala

*CARE
Food for the Hungry International
International Eye Foundation
Mormon Church

Haiti

CARE
Helen Keller International
Save the Children Federation
*World Relief Corporation
World Vision

*project was not reviewed in report.

Honduras

Adventist Development & Relief Agency

Mexico

Mormon Church

Peru

CARE

*project was not reviewed in report.

APPENDIX C

Persons Interviewed During Review Process

Adventist Relief & Development Agency	Ken Flemmer Doug Havens
AFRICARE	Gabriel Daniel Anthony Williams
Andean Rural Health Care	Bonnie Boyd
CARE	Louis Ringe Mary Dirac Rudi Horner
Catholic Relief Services	Kathy Mink Douglas Boderick Bill Rosteter
ECHP Development News	Staff
FAO (ROME)	Franz Simmersbach
Food for the Hungry International	Lynne Morrell Shari Schoenhals Robin Shell
Freedom from Hunger	Ellen Vor der Bruegge
Foundation for the Peoples of the South Pacific	Pat Monihan
Helen Keller International	Anne Ralte Nancy Haselow Karima Kerby
Mormon Church	Rick Van de Graaff
Oxfam (U.S.)	Betty Richardson
Peace Corps	Paul Olsen Rick Record
Rodale Press	Staff

Save the Children Federation

Jim Worstell
Mohammed Monsour
Wendy Slusser
Linda Banell
Peter Laugharn
Karen Le Ban
Heather Danton

UNDP (Fiji)

Jeff Liew

UNICEF

Daniel Toole
J.P. Greaves
Paul Sommers (Fiji)

WVRD

Milton Amayun