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1993

Fish Farming Project in Tanzania: Women's Involvement as Key to Alleviating Hunger

By: Barbara N. Benson, MS, RD

Barbara Benson, MS, RD (Nutritionist)
Meredith Murnyak, MS (Aquaculturist)
Fish Farming Project/Diocese in Arusha Region
Evangelical Lutheran Church in Tanzania

Abstract

Rural aquaculture is a newly developed method of food production in Tanzania. An existing project begun in 1984 in the Arusha Region has been successful in promoting pond construction and fish production. However, the presence of high protein food in the home does not necessarily improve the nutritional status or health of the fish farming family. While the whole family is involved in aquaculture, training efforts often focus on the men. Women, however, spend more time in both pond management and post-harvest fish preparation. Often the importance of the women's role and their training is overlooked. If fish farming, however, is to have a positive impact in alleviating hunger and improving the nutrition and health of fish farming families, training of both women and men is essential. Deliberate attempts must be made to involve women in planning and implementing extension programs. Training should use a holistic approach that deals not only with food production but also nutrition and food preparation, health and family planning.

Background

In 1984 an integrated fish farming development project was initiated by the Diocese in Arusha Region of the Evangelical Lutheran Church of Tanzania (ELCT). The project aims to teach fish farming techniques to increase food production and improve nutrition and health in the villages. The project focuses on small farmers and uses training by extension.

Initially farmers were taught individually on their own farms. As the number of ponds increased, the project's emphasis shifted to training volunteer motivators who promote and teach fish farming in their own communities. In attempt to broaden women's understanding and participation in the fish-farming project, bi-weekly women's meetings were begun in 1987 in several villages.

The Fish Farming Project (FFP) has been well received in Tanzania and could serve as a model to be used in other developing countries. As of April 1993 over 800 new ponds in 70 villages have been developed through the project. Unfortunately, the building of fish ponds and the presence

of high protein food in the home does not guarantee an improvement in the diet or health of the family. Without a basic knowledge of nutrition and food preparation, families could continue to live much as they have prior to involvement in the project. This paper focuses on fish farming in family-owned ponds as a means of combating hunger and improving nutrition for families living in rural Tanzania. Involving women in project planning, fish farming training, and nutrition education, and is crucial for the project's long term success.

Family Involvement in Aquaculture

The following is a division of labor typically seen in families involved in fish farming, based on the authors' observations and interviews:

Initiating project	Man
Pond construction	Man
Pond maintenance and repair	Man
Care and feeding of fish	Woman and Children
Intermediate harvesting	Women and Children
Final harvest	Man
Selling fish	Man
Preserving and cooking fish	Woman

This breakdown is for the "average" family and has exceptions. For instance, other family members, neighbors, and paid laborers often assist with pond construction. In addition, several women have developed fish ponds on their own in homes where men were not present.

At first glance it appears that the greatest number of the fish farming activities are done by men. However, a closer examination reveals that women spend a greater amount of time in actual fish farming work. The care and feeding of the fish are daily tasks that are essential for obtaining a good harvest. Although men have a primary role in the initial construction phase and later in the harvesting and selling, it is the women who give the most time and energy involvement in the raising of fish and later in food preparation and preservation.

Effect of Fish Farming on Family Nutrition

There are two main ways to harvest fish from ponds. Intermediate fish harvests can begin 3 to 6 months after stocking, as soon as the fish become large enough to eat (60-80 grams). Fish can be harvested for several months and are often kept by the women for family consumption rather than being sold. During this time fish can be a significant component in the family diet and have a good potential for improving the family's nutritional status.

The final harvest takes place when the majority of the fish reach a harvest weight of 80-120 grams. Final harvests are often managed by the man who determines the family's use of its fish

crop. If the goal in fish farming is to improve family nutrition then the majority of the crop is often kept for home consumption. However, if a cash income is preferred then the entire fish crop can be sold. Fish can also be excluded from the family diet after the final harvest when fish preservation techniques are not known and the family can only keep a 2 to 3 day supply of fish.

Therefore, in evaluating aquaculture development, while it is customary and relatively easy to report the number of ponds built and the weight of the fish harvested in a project, these factors alone do not accurately reflect the project's success nor the impact on the local communities. When the overall goal is to increase food production in order to improve the people's nutritional status and health, a thorough evaluation must consider how the fish produced are used within the family and the community. Preliminary studies have begun in this project to investigate this question.

Malnutrition is a complex problem that cannot be solved by the addition of high protein foods to the diet alone. Swantz (1985) lists a number of factors contributing to malnutrition in Tanzania including alcoholism, broken homes, frequent births, land shortage, traditional beliefs, and the economic situation of the society. Fish farming alone cannot be expected to make enormous changes in family nutritional patterns. A holistic approach to training which emphasizes the interrelatedness of food production and preparation, nutrition, health, and family planning is needed.

Aquaculture Training for Families

Successful fish farming which improves nutrition requires training that involves the whole family. It can be easy to overlook the importance of women in aquaculture since the work is started and completed by men. A compatible working relationship often develops between the male extension worker and the village men. Consequently men often receive the majority of initial and ongoing farming training. Women's participation and understanding in the project from the outset is essential. If women do not have a good understanding of fish farming techniques or the basics of nutrition and food preparation, their families are likely to experience little benefit from their involvement in the project. Unfortunately, it can be difficult to gain access to rural women and to develop avenues of training that are effective.

Although rural women are primarily involved in the agricultural sector, they do not naturally become involved in training activities. Often their excessive workloads and work in the home keep them from attending meetings and seminars. Nor can it be assumed that information provided to men will automatically be passed on to women at home. It can also be difficult for the extension worker to meet with the women during home visits, as women are often occupied with food preparation for these guests.

One approach to working with women that has been used successfully in East Africa is through women's groups (Crowley, 1985). The Fish Farming Project has found that women's meetings enable the extension worker to work with rural women more effectively. While in mixed meetings women are often shy and uninvolved, they participate more readily and take on

leadership roles when meeting with women alone. One key to the success of women's groups is to encourage and enable leadership within these groups.

An Integrated Agricultural Training Center is now being built by the Diocese of Arusha Region of the ELCT. Fish farming research, training and development will be major components of this center. Women's development efforts will focus on the training of community leaders who would serve as motivators to the rural women's groups. These women motivators would receive training at the center in fish farming practices, nutrition, food preservation and preparation, basic health care, and family planning. They would then work with their respective women's group in training, as well as planning and facilitating additional programs.

Conclusion

Fish farming is a new method of food production being used in Tanzania which involves the whole family. It is easy to overlook the significance of the women's role since men are often the decision-makers in the family who initiate the work and receive the most training. Encouraging women's leadership and training through a women's motivator education program is key to successfully alleviating hunger and improving the nutritional status of fish farming families.

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1994

Beneficial Nutrition Program Through International Alliance (Nutrition Foundation of India) With ADA or ICDA

By: Judith A. Beto, PhD, RD

I would like to propose an alliance between the International Committee of Dietetic Associations and the American Dietetic Association with the Nutrition Foundation of India. I have been fortunate to be an invited visitor on three occasions to various areas of India. I always return from each visit with a renewed sense of appreciation for the field I have chosen and the profound need for nutrition intervention in India.

Background

By the turn of the century, it is estimated that India's population will reach one billion people. Nutrition problems in India are vast. As a developing country, India suffers from uniform access to basic support services: lack of safe drinking water and sanitation systems along with insufficient supply and distribution of food. Major cities are linked by airline services but the cost is far beyond the reach of the average citizen. Instead, the population travels by extensive rail systems that require numerous stops and layovers to reach destinations. The access to medical care and preventive health services is developing slowly. Such care is available in large cities where government teaching hospitals exist.

Tracking of disease incidence and mortality is lacking. Hindu customs practiced by a large portion of the population require cremation by sunset and very few, if any, deaths are recorded. Public health is of concern but is shadowed by the bureaucracy and sheer number of patrons that require service. Poverty is a way of life. Yet many survive, despite the odds, to attempt to maintain a lifestyle that is interfaced with lack of adequate food, nutrients, and safe drinking water.

Personal Awareness

I have been privileged to visit India on three occasions as an invited professional guest. In 1987, I was part of a volunteer health care faculty organized by the Medical Council of India to share information on renal disease. In 1992, I was a session chairperson on nutrition at the fifth Asian Pacific Congress of Nephrology held in New Delhi. During this visit, I was an invited lecturer at the Childs Trust Hospital in Madras. In 1993, I returned to give a statistical lecture at the Postgraduate Institute of Medicine in Chandigarh. These visits have given me an opportunity over time to assess and evaluate the types of nutrition intervention that may be most effective.

Varsha Kalidasan, PhD, RD, is a dietitian from Madras that I have developed a professional exchange with over these years. Her interest, originally in renal disease, was balanced by an international exchange fellowship in Boston several years ago. While on the staff of Childs Trust Hospital in Madras, she developed a nutrition component for one of the few well baby clinics in

India. This private hospital, founded in 1979, receives support from the International Lions and Rotary Clubs. It offers extensive services, regardless of income, to a large portion of the pediatric population in Madras. The medical equipment and staff expertise is greater than most centers in India. The impact on children in this area has been remarkable. Childs Trust has been used as a WHO site for model vaccination programs. Currently, Dr. Kalidasan directs a hospital nutrition service in another facility in Madras and has been instrumental in sharing India's efforts towards nutrition with me.

India's Current Nutritional Efforts

India has several centers of nutrition interest. The Nutrition Society of India, a professional organization, holds annual academic sessions to share information and research. The National Institute of Nutrition at Hyderabad publishes periodic editions of *Nutritive Value of Indian Foods*. This center also trains many of the dietitians in India. Their education level is closer to our equivalent of a diet technician, currently appropriate for the level of intervention possible. Most hospitals are large open wards with minimal staff. The family is often expected to visit and be responsible for part of the care of the patient. Food service is very informal and bulk oriented in composition. Therapeutic diets are difficult to enforce within the hospital and almost impossible to enforce as an outpatient due to lack of specialty foods and economic issues.

Nutrition Foundation of India

The most valuable nutrition information dissemination is compiled by the Nutrition Foundation of India. This multidimensional organization is headed by C. Gopalan, PhD, a noted nutrition scientist.

Publications: The Nutrition Foundation of India publishes an impressive quarterly newsletter updating interested professionals on ongoing activities within the country. Topics noted in 1993 included:

> Child Care in India — Emerging Challenges
> Tumeric: A Potential Anti-Cancer Agent
> Integrated Child Development Services (ICDS): An Assessment
> Efficacy of Megadose of Vitamin A
> Prevalence of Diabetes in Indians

Publications are routinely compiled that are invaluable resources to a very literate professional society. Some representative publications include:

> *Special Publication 5: Women and Nutrition in India*, edited by C. Gopalan and S. Kaur. Highlights studies of nutrient requirements and RDA of girls and women, women and the health system, pattern of growth and development of Indian girls compared to adult Indian women, demographic consequences of low status of women in an Indian society, socio-economic and socio-cultural influences on nutritional status and women's roles.

Special Publication 8: Profiles of Undernutrition and Underdevelopment: Studies of Poor Communities in Seven Regions of the Country. Funded by the Ford Foundation. Presents studies of tribal, urban slum, and rural areas concerning nutritional status of children and adults.

Special Publication 9: Towards Better Nutrition—Problems and Policies, edited by C. Gopalan, 44 authors. Covers areas of community health and nutrition problems, women and child nutrition, foods and diets, energy metabolism, vitamin A, national nutrition programs, and nutrition and diseases.

Recognized Information Source: The Nutrition Foundation of India is an excellent clearinghouse of information. The publications are well written, professionally produced, and peer-reviewed. The Foundation appears to be well aware of the political ramifications within the country and has succeeded in surviving despite changing health agendas and funding. Culture is an essential part of food behavior. India has a rich and diverse culture that represents a wide array of health practices and beliefs. The Nutrition Foundation recognizes this diversity and strives to provide information and research within the culture.

Grassroots Approach: An alliance with the Nutrition Foundation of India would continue to reinforce that information needs to be disseminated from a recognized organization within the culture. Because of India's vast numbers, the most practical and simple project can have a profound effect on millions of individuals. These projects need to be designed and implemented with a community-based approach. The Foundation has recognized that the most successful programs to date have not been large-scale projects from the national government but rather have been those programs adapted locally that emphasize community involvement and delivery.

Communication Feasibility: English is the only common language and is spoken widely. Most, if not all, publications are in English. The alliance would be realistic. India continues to follow the formal British traditions of written protocol and committee format that would interface well with organization communication. Widespread telephone communication is not currently available in all areas, so the written publication format is the most logical basis for all communication.

History of Self-Evaluation: The Foundation uses problem-solving and critical thinking when evaluating existing programs. India is a country where resources are precious and very little is wasted. Manpower and efforts are treated the same. Extensive work has already been done in recognizing problems with inadequate performances and results in current nutrition efforts. Future alliances will benefit from this groundwork and assure resources are directed for maximum efficacy.

Proposed Alliance Priorities

I would suggest the following proposed activities to establish a beneficial nutrition program through an international alliance with the Nutrition Foundation of India and the ADA or ICDA:

Establish a publication exchange. The quarterly bulletin of the Nutrition Foundation of India could be abstracted in the *Journal of the American Dietetic Association*. The *Journal of the American Dietetic Association and Perspectives in Applied Nutrition* would be invaluable resources for research and education. Special publications of both organizations could be exchanged for similar purposes.

Share dietetic education criteria and standards. The current dietetic and nutrition education in India differs from the United States. As the complexity of the nutrition delivery system grows, the expertise and numbers of leaders in nutrition will need to continue as well. Experts within the country and within the culture will be challenged in the next century to provide nutrition parameters for a changing population. Poverty and malnutrition will continue to exist, but the rising numbers in the middle class will potentially bring "westernized" problems. In the United States, the CADI Study (Coronary Artery Disease in Indians) has shown strong evidence of insulin resistance, unique lipid profile, and links to dietary habits and sedentary lifestyle.

Develop a faculty exchange program. Nutrition experts from each country could benefit from an exchange of ideas face-to-face. Annual programs from both organizations could be videotaped and shared. Travel grants based on established criteria could be offered. Fulbright scholarships, already existing in the United States, could be encouraged to include a nutrition priority. The ultimate goal would be an opportunity to provide teaching and research information that could be used to train community educators in India that in turn would deliver the knowledge and services on a community level.

Share existing nutrition databases. The large Indian population in the United States is difficult to include in research protocols because of a lack of a nutrition database that provides accurate information on cultural foods. There are existing publications and databases in India that could be merged and adapted for use. Computer technology centers are rapidly growing in India and would benefit from selected information from existing American databases.

Support evolvement of existing nutrition education materials and programs. Many of the literacy and language problems found in the vast expanse of India are present in some areas of our own country. Techniques of simple communication with carefully selected messages could be shared. The use of television and satellite communication will grow and require new media skills that are already present in our country.

Summary

I believe an alliance with the Nutrition Foundation of India would clearly meet the criteria set "to work toward raising the nutrition health of the world community." The Foundation has put priority of work on nutrition in women and children that interfaces well with the research agenda of the American Dietetic Association. I have been privileged to share a tiny part of my expertise with this country and have found even the smallest contribution can make a difference. It would be an honor to assist in the formation of an alliance which would take tiny dreams and propel them into significant action.

1995

"Nutri-Net" (Proposed Use of a Geographic Information System (GIS) to Link Dietitians)

By: Amanda Frye, MS, RD

Overview of the Proposed Nutri-Net Project

The purpose of the proposed Nutri-Net project is twofold: 1) to create a database of nutrition and dietetic professionals throughout the world, and 2) to allow dietetic and nutrition professionals to create interactive databases about the populations they serve. Both of these databases will be stored, manipulated and accessed using a geographic information system (GIS). The Internet will serve as the vehicle to connect Nutri-Net and the users.

GIS is a computer software based system that manages, stores, queries, analyzes, organizes and displays data within a geographic context. The advantage of using a GIS is that multiple data sets can be integrated, overlaid, and visualized to clearly demonstrate interrelationships among the data layers. GIS offers the ability to study multiple data sets and detect interrelationships in them that would otherwise go unnoticed using traditional research techniques. The ability of GIS to visualize data leads to an easy understanding of these relationships.[1]

Nutri-Net will be an interactive database system of the world's nutrition and dietetic professionals. Nutri-Net will afford nutrition and dietetic professionals the tools to conduct in-depth demographic analyses; to develop spatial and statistical models; and to solve routing and allocation problems. Nutri-Net is interactive because any nutrition/dietetic professional or student belonging to a nutrition/dietetic organization will have the opportunity to access the system via a Nutri-Net World Wide Web (WWW) home page established on the Internet.[2,3] Dietetic and nutrition professionals will be able to contribute information, seek answers to questions, solve problems, discuss research or exchange ideas with other professionals.

Dietetic and nutrition professionals will be able to create multiple data sets that contain information about population subgroups they serve. Nutritionists and dietitians working within the same area of practice will be able to create, propagate and share data sets. This data can be analyzed and used to see trends that will enable professionals to make proactive decisions for solving problems. Nutri-Net offers great potential to improve the public's nutritional health throughout the world.

Nutri-Net has the potential to be a valuable asset in emergency situations. GIS has been used extensively in past emergency situations such as earthquakes, floods and hurricanes.[4] Nutri-Net could be linked to existing the GISs to better respond to a crisis. Since Nutri-Net uses a GIS, it will allow quick access to a roster of nutrition professionals that could respond to a crisis or offer advice in emergency situations that pose threats to a population's nutritional health, e.g., famine, earthquake, floods, hurricanes, etc.

A model of the proposed Nutri-Net system is shown in Figure 1. The following discussion will examine the Nutri-Net components in more detail. The role of GIS in the Nutri-Net system will be demonstrated throughout this discussion.

Nutri-Net Input

Nutrition Professionals Data Base {NPDB}

Nutri-Net will provide access to a database of dietetic and nutrition professionals throughout the world by using a geographic information system (GIS) linked to the Internet via a World Wide Web homepage.[2,3] The Nutri-Net World Wide Web site will provide the means for dietitians and nutritionists throughout the world to access Nutri-Net. The World Wide Web home page will serve as the directory for the Nutri-Net system.

The main data base for Nutri-Net is the nutrition professionals data base (NPDB). NPDB will be compiled from membership rosters of nutrition, dietetic and health organizations throughout the world. The **International Committee of Dietetic Associations (ICDA)** and National Dietetic Associations will serve as valuable resources in creating the NPDB.[5] Persons affiliated with more than one organization will only have one listing in the database. The NPDB will include membership demographic information, and areas of professional expertise. The NPDB will also include each member's electronic mail (e-mail) address in order to provide access via the Internet. E-mail will also provide users an inexpensive mode of communication.

One potential issue in developing a database like NPDB is protecting an individual's privacy.[6] Nutri-Net will circumvent these privacy issues by having members consent to the inclusion of their name listed in the database. Data such as salary ranges, specialties will have to be provided by members on a voluntary basis.

Nutri-Net's Interactive Database {IDB}

A second database in the Nutri-Net project will be an interactive database (IDB). The IDB has the potential to be the most powerful component of the Nutri-Net project. Dietetic and nutrition professionals will be able to build their own interactive databases by entering information derived from the populations they serve. Therefore, dietitians will be able to collaborate with their peers worldwide to build databases of mutual interest. These databases will be kept current, continuous, and provide data for dietetic and nutrition professionals working in the same area throughout the world. Nutritionists and dietitians will be able to analyze and discuss relevant problems and trends without waiting for national and international studies to be released several years later.

Various IDBs could be set up as template databases. A template database identifies what information is needed for the collection and entry into the database. Template databases could be developed for any area of practice or research interest. Practice Groups could take an active role in establishing these template IDBs to meet research needs.

Government and Other Databases

Government databases such as census data, city and county economic data, zip-code- based data are available via the Internet. Many other government and private databases are also obtainable through the Internet. These databases can be linked to and incorporated into the Nutri-Net's GIS or referred to as stand-alone references. These data sets can be combined with other data in the Nutri-Net GIS to make multi-layered analysis possible.

Meeting ADA Priorities Using Nutri-Net's NPDB and IDB

In 1994, the American Dietetic Association's (ADA) Council on Research identified the highest priority research areas for dietetics.[7] The Nutri-Net system would serve as a centralized collection point for data being collected from dietitians across the country .Each research project would have its own individualized IDB that would be stored in the Nutri-Net's GIS. Dietitians at all levels could be a part of the concerted effort to build needed databases and to meet research needs. This method of collecting data would be extremely economical. The following discusses several examples of how Nutri-Net can be used to carryout priorities identified by the ADA.

In the foodservice area, the Council on Research identified a need to develop a data collecting and reporting system to support a database for valid comparison of different foodservice systems. A IDB could be established by dietetic professionals working in foodservice. A template of the information to be collected could be established. The foodservice professionals at established sites could then collect needed information and enter it into a foodservice template database. Data collected then would be ready for analysis.

The Council on Research also expressed the need for the development of a National Nutrition Monitoring System to provide ongoing surveillance of food behavior and health status of children and adults. Once again, the Nutri-Net System provides an excellent means to establish a National Nutrition Monitoring System. Existing nutrition monitoring systems would become more accessible through Nutri-Net.[8]

Information from the IDBs can also be used to provide accurate and timely support for legislative issues. Current data can be quickly assembled, analyzed, and displayed in easy to read maps and charts. Nutri-Net's output of maps, charts, and graphics is important because graphical information is more quickly and effectively conveyed to its intended audience than text and difficult to interpret tables.

Nutri-Net will provide a forum for dietetic professionals to collaborate with colleagues throughout the world. Global research efforts can be facilitated by use of Nutri-Net's IDB system. Students will have the opportunity to communicate with other students and professionals throughout the world. These communications will provide a greater understanding of other cultures and their nutritional concerns. Through Nutri-Net, dietitians and nutrition

professionals will have the opportunity to make a difference in the health of individuals throughout the world.

GIS and its role in Nutri-Net

GIS is a suite of geographic and spatial analysis tools that have steadily grown and evolved in number and scope over the past 25 years. Through multiple systems, GIS applies tools to store, organize, and retrieve data in a geographic context. Within this context, data may be analyzed, overlaid, manipulated, queried and finally displayed to communicate the results. Today the use of GIS technology is pervasive in federal, state, and local government, academia, emergency response management, and business.[9,10,11,12,13]

The use of GIS technology in the nutrition fields has been minimal with use primarily confined to public health epidemiology and foodservice marketing. Geographic information systems offers many applications to improve a population's nutritional health. GIS can be used to isolate at-risk populations, and more importantly locate the professionals that can help the at-risk populations.

For instance, during the aftermath of a hurricane nutrition professionals could link into the local disaster management team's GIS system and identify the locations and best routes to groups of people who need their services.[11] Such disaster management GISs have been in use for the past five years including Hurricane Andrew, the Northridge Earthquake, and the Oklahoma City bombing.[4,13] Dietitians are faced with a variety of challenges during an emergency crisis.[14,15] Dietitians could use Nutri-Net to link into other GISs to find best routes for vendors to access a facility, to discover populations needing nutritional service, to find other professionals who could help in the crisis, to solicit advice from professionals who had been through a similar situation, and to find out updated information about the extent and severity of the crisis at hand.

The use of GIS allows dietetic professionals to quickly locate and communicate with other colleagues using the NPDB. GIS affords the advantage of the storage, maintenance, and operation of the NPDB and IDB. GIS provides unique and necessary services for both databases. The following is a fictitious example to demonstrate how Nutrl-Net's GIS would be used to locate and communicate with other professionals while improving public health.

A dietitian in Minnesota, noticed a trend in lead poisoning among members of the Latino and Hmong communities. Many of the dietitian's clients treat their children with homeopathic remedies. One person told the dietitian that she gave her daughter "Greta", a yellow powder, to treat her daughter's colic. Not knowing what "Greta" was, the dietitian accessed the Nutri-Net system to find out if anyone else had noticed high levels of lead poisoning among Latinos and Asian Indians. She also sent a message to find out what "Greta" really was. The dietitian targeted colleagues in the Mexico City and the Los Angeles areas to consult with nutritionists that typically dealt with a large number of these ethnic populations. The dietitian found that in the Hmong community the lead threat may come from the home remedy "Pay-loo-ah." Then, the dietitian discovered that "Greta" was almost 100% lead and so

was another homeopathic remedy, Azacron. Both of these potentially lethal powders are used as treatment for stomachaches (*empocho*} among the Latino community .The dietitian was able to consult with other professionals to discover the cause of an alarming lead poisoning trend. The dietitian was also able to analyze and map the lead poisoning incidences. Nutri-Net provided the dietitian the tools necessary to curb the use of the dangerous lead powders throughout the world.

Nutri-Net Output

Output is the procedure that allows the information from the GIS to be presented in a form suitable to convey the intended information to the user. Data from a GIS can be displayed in one of three formats: hardcopy, softcopy, or electronic files. Hardcopy allows for a permanent means of display. Maps, tables, charts and text are common hardcopy outputs. Softcopy output is the format of data viewed on the computer monitor. Electronic files can be stored using a variety of media such as floppy discs or tapes. These electronic files can be used to transfer data to another computer system for additional storage or analysis or to produce hardcopy output at a remote location.[1]

Data can be statistically analyzed in the GIS and results directly displayed in graphical form. Maps are one way to effectively display data and demonstrate interrelationships of the data. The attached map demonstrates how data can be visualized through mapping. This map demonstrates lead poisoning locations and incidences among different ethnic groups.

Summary

The proposed Nutri-Net project uses a GIS and the Internet to link dietitians and nutritionists throughout the world. Nutrl-Net consists of two databases [interactive database (IDB) and nutrition professionals databases (NPDB)] that are stored, manipulated and analyzed using a GIS. Nutri-Net is an excellent way to link dietitians and nutrition professionals throughout the world, to build international alliances throughout the dietetic community, to promote public health through nutrition by utilizing interactive data bases, and to provide a better understanding of the dietetic profession and the populations they serve.

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Linking the World's Nutrition Educators Via Cyberspace

By: William D. Evers, PhD, RD

Concerns related to nutrition and health from people around the world have many common themes and some specific regional considerations. Historically, dealing with questions from the general population has been left up to individuals or groups within a country or region of the planet. While international research fostered some collaborative efforts on large, well-documented nutritional concerns, solutions to day-to-day situations fell to the local nutrition professional or paraprofessional, usually with little or no access to help outside of the immediate vicinity.

A dietitian in southern Georgia might be able to interact with other dietitians within the state, at the land grant university or perhaps through the **American Dietetic Association (ADA)**. But all of those contacts usually involved several phone calls and/or letters and took days or weeks to accomplish. A health care worker in rural Australia had very little chance of responding to a question from a local constituent if the question required information not available there or nearby. Certainly the idea of contacting someone elsewhere in Australia or on another continent was rarely a viable option.

With the advent of the personal computer and the international networking of computers, this situation has changed dramatically. Communication barriers of time and space have been virtually eliminated through the use of electronic mail (e-mail) and the ability to transfer all sorts of information instantly over the entire globe. The following essay describes an ongoing and successful international network of dietitians and nutritionists who specialize in providing food and nutrition information to the general public outside of the clinical setting.

A computer network for state Cooperative Extension professionals was established in Indiana in the late 1970s. By the late 1980s e-mail had become a common method of rapidly transmitting information to all 92 counties in the state. In 1991, using this e-mail capability , the author began to dispatch a weekly article related to foods and nutrition (the Electronic Food Rap) throughout the state. In 1992 an e-mail "alias" or list of e-mail addresses was created. This allowed nutrition information to be sent to the single alias address, and that information was then sent to about fifty state university Cooperative Extension foods and nutrition specialists throughout the United States.

Around the same time, Purdue University Cooperative Extension started using a software package called Almanac which allows the establishment of a computer host for e-mail groups. An e-mail group is an e-mail address that contains many other e-mail addresses. Like an alias, the e-mail group can be used to send a single message to a large number of people at the same time. Unlike the alias, which can only be accessed by the creator, the e-mail group address is available to anyone. Almanac software, like other software of this type, also allows individuals to "subscribe" to a group, stores messages that have been sent, and permits the retrieval of archived messages.

Seeing the potential for this software, the author requested permission to establish an e-mail group for Cooperative Extension specialists. Using the original alias list along with other communications to colleagues, an e-mail notice was sent in April, 1993 to about 60 people. The notice included instructions on how to subscribe to the group (called fnspec_mg or foods and nutrition specialist mail group), how to send messages and how to retrieve archived messages.

The introduction in the notice contained the following statements:

I have just set up an electronic mail address group that can be used by you (or anyone else) for sending messages to anyone who has joined (subscribed) to the group. The purpose of the group is for foods and nutrition specialists to be able to contact a large number of their colleagues with only one message. The information that follows will tell you how to get your e-mail address on to the group list and how to use it to send messages.

In the first few weeks of the group (hereafter referred to as "Fnspec"), fourteen people subscribed. The author posted several messages just to provide "food for thought." Over the next several months more and more nutrition educators became aware of Fnspec and added their addresses. Most of the subscribers were other foods and nutrition specialists, many of them also members of ADA, working at the state or federal level in the USDA/state Cooperative Extension Service. The general "conversation" within the group centered around questions regarding consumer food safety questions, issues of nutrition misinformation, and requests for published materials and/or developed foods and nutrition programs on specific topics of interest to the general public.

As Fnspec expanded, nutrition professionals outside of the Cooperative Extension Service became aware of it and started requesting permission to join. When Fnspec was established, the author had contemplated the choices regarding the limiting of subscriptions. A conscious decision was made to put no restrictions on joining Fnspec so that the widest possible interchange of resources and ideas would be obtained. If, at a later date, this resulted in a diminishing of the professional atmosphere of Fnspec, restrictions could then be applied. So far, this decision seems to have been vindicated as Fnspec has grown and flourished with a diverse group of foods and nutrition professionals.

One of the early, non-Extension entities to sign-on was ADA through the National Center for Nutrition and Dietetics. The staff members at ADA provided answers to resource questions as well as giving Fnspec early exposure to ADA press releases on issues before the general public. Within months, ADA's decision was seconded by several other organizations representing government, academia and industry including: the Centers for Disease Control and Prevention; the National Agricultural Library's Food and Nutrition Information Center; the Nutrition Center at the Pennsylvania State University; the Kellogg Company; USDA's nutrition database operator through the University of Maryland, and other sections of USDA and the Food and Drug Administration; as well as some food commodity groups.

While organizations were discovering the value of Fnspec, other individual nutrition professionals were also learning of its existence. One of the major successes of Fnspec has been the connection of community nutrition/health professionals with those in academia and industry who are involved in basic food science research. There has been a genuine increase in the level of understanding about the concerns of the public related to the safety of the food supply, and the scientific facts regarding food safety. The food scientists have a better feel for how and why consumers have misinformed concerns over bacteria, pesticides, additives and health issues. Nutrition educators better understand what the research really shows about the health risks involved at various points in the food production process.

By the end of the first year Fnspec had over 100 subscribers. These included MS/PhDs, RDs, MDs, and home economists. And Fnspec had gone international! As more and more professionals discovered the power and potential of the Internet, more of them found their way to Fnspec. Also, those already on Fnspec were communicating with colleagues at meetings and via e-mail. Subscribers from the Netherlands, Australia and Canada have all become part of the worldwide network of professionals interested in educating the general public about foods and nutrition issues. Their participation has helped broaden the recognition of differing national health guidelines as well as unique foodstuffs.

An example of the international flavor of Fnspec is a discussion that occurred regarding a product called "vegemite." An inquiry from a consumer in the United States led to a message to Fnspec asking for information on the vegemite. The message resulted in a discussion running over several weeks and several continents. Vegemite is an Australian food that apparently is enjoyed immensely on that continent but has not gained much acceptance in the United States. The information on the product and its history, and the good-natured differences of opinion on its palatability were educational for those who participated in the discussion as well as those who just read the messages.

In the Netherlands, an advisory group to the national government found that Fnspec was a valuable source regarding various policies on health and nutrition issues which affect that nation as well. These policies addressed concerns by the public related to nutrition/disease and food safety issues. A recent posting for the Ontario Ministry of Food and Agriculture in Canada requested information on consumer guides about smoking meat.

After the first year the author began sending weekly Electronic Food Rap articles to Fnspec as well as the previously mentioned state-based group. The articles quickly demonstrated another value of Fnspec — the ability to multiply the exposure of information. Many of the subscribers were linked to other nutrition professionals either in their own states, through professional organizations or nationally. The articles were posted to many of these other sites resulting in broad dissemination of research-based food and nutrition information. The Nutrition Center at the Pennsylvania State University now places the articles on its PennPages electronic acquisition site. In one year, the articles were accessed and requested over 1,000 times.

Fnspec has been in operation for almost two and a half years and now has more than 350 subscribers. Over 3,000 messages have been exchanged between subscribers. Comments from subscribers in Australia have indicated that Fnspec provides the most consistent and factual information on nutrition yet found on the electronic interconnections. Another accolade came from the Nutrition Research Dietetic Practice Group (NRDPG) of ADA. NRDPG has its own e-mail group and postings are regularly exchanged between the two groups.

A recent food fad involved a substance called "Kombucha" or "mushroom" tea. Information regarding this tea was quickly posted on Fnspec and picked up by the NRDPG group. The information was used by a subscriber, an RD in the medical sciences at a state university, to provide facts to a local newspaper columnist. The RD stated, in an e-mail message to the supervisor of the Nutrition Research e-mail group:

Finding sufficient information to respond in a timely fashion would have required my dropping more important tasks to assist this journalist if I had not gleaned some little gems, printed them out, and filed for future reference. Thanks for the assistance!

The level of professionalism within Fnspec has remained consistently high, especially considering the open subscription policy of the group. Many groups on the Internet become nothing more than ideological pulpits for those with an unscientific fervor or a profit motive. Evidence of the quality of Fnspec comes from its subscribers including the editor of Bytingln, a computer newsletter for food and nutrition professionals. In an article entitled "A Personal On-Line Strategy," which dealt with how to wade through all of the extraneous information on the Internet, the editor, Sue Grossbauer, said:

Besides a few items on my "use-when-needed" list, I've found exactly two Internet options I'll stay with. One is the FNSpec group ... at Purdue University. The message postings, which are plentiful, are interesting. An e-mail question to a large group of professionals is an awesome way to answer a tough nutrition question, and certainly a more productive and fruitful method than calling everyone you know. Nevertheless, my "can't-miss" item is the "electronic food rap," sent to subscribers. The very first two of two I downloaded were of direct and immediate help in keeping me up with topics which Meta Media publishes. Others have helped me keep in touch with issues in nutrition I don't take enough time to read about. For me, they are a productivity-enhancer. That makes sense. (Bytingln 6(3):9-10, 1995)

As professionals around the world become more closely linked electronically, e-mail groups like Fnspec will play an increasingly more important role in providing an avenue for discussion and dissemination of information and ideas related to nutrition education for the public. Those involved in such endeavors will know that Fnspec is a place where proffered information is based on scientifically-sound research. If the information is suspect, Fnspec subscribers will quickly make it clear that there is disagreement regarding the facts presented. Colleagues in all countries will continue to expand their outreach because of the contacts and materials they have made through this project.

1996

Clinical Computer-Assisted Simulation Exercise (CCASE) as a Strategy for Distance Learning in the Philippines

By: Ninfa Saturnino Springer, PhD, RD, FADA

Introduction

Computers are changing the way people learn. Information is made available on demand at the touch of the keyboard anytime and anywhere. I propose the use of a computer-aided software to augment the continuing education program of the Nutritionist-Dietitians' Association of the Philippines (NDAP). Association members pass an examination before they are licensed; they are also annually required to complete 15 continuing education hours.

The Philippines is a country made up of more than 7000 islands. Air travel is used between major islands but between the smaller islands only ferry boats are available. Land transportation between towns or barangays consist, mainly of busses on often times poorly maintained roads. The information superhighway via world wide web presents a most convenient tool allowing access to learners, unlimited by continent, country, island, town or barangay.

The Problem

Early this year, I spent two months in the Philippines to complete my commitment on a Balik (returning) Scientist grant sponsored by the Philippine Department of Science and Technology (DOST) and the United Nations Development Program. In addition to my assignments with the Food and Nutrition Research Institute and at the University of the Philippines (UP), I was also asked to participate as a speaker in the continuing education program of NDAP. Approximately thirty members were in attendance at my session. Before beginning, I asked key questions to determine their level of knowledge on the topic. I was very disappointed at the lack of response. At the end of my presentation, the group, which had dwindled in size at this point, had only two questions. It was my feeling that the members were physically present only to "earn" continuing education hours. There was no way to evaluate what they had learned! The objective of this proposal is to improve the present continuing education program of NDAP.

Six of the top ten causes of death in the Philippines are pneumonia, tuberculosis, gastroenteritis, colitis, bronchitis, and avitaminosis, all related to malnutrition. The traditional rice-vegetable-and-fish diet pattern of Filipinos remains nutritionally inadequate in quantity and quality as confirmed by the results of the 1993 Food Consumption Survey conducted by the Food and Nutrition Research Institute. Competent health care providers such as nutritionists and dietitians can significantly impact the nutritional status of the population. Competency assurance can be demonstrated by an integrated continuing education and assessment program.

A Proposed Solution

The current trend in the United States towards reevaluation of professional competency assessment and assurance, not only in dietetics but also in nursing, physical therapy, pharmacy, medicine and occupational therapy, brings to the forefront the need to explore improved credentialing practices of nutritionists and dietitians in the Philippines. That proposed by the American Dietetic Association is described as "continuous learning that is self-initiated, self-directed and self-evaluated". CCASE is proposed as a strategy for upgrading the certification program of NDAP.

CCASE is an acronym for CLINICAL COMPUTER-ASSISTED SIMULATION EXERCISE. It is an interactive instructional software package that combines a database of case histories, a series of exercises, glossary, references, and multiple choice evaluation questions to assess the learner's knowledge. The original goal of CCASE was supplementation of the nutrition component of the nursing curriculum. It was designed to teach students how to interpret case studies and make clinical decisions.

In CCASE, data is stored in an Oracle database running on a Sun Workstation while networked Macintosh computers running SuperCard retrieve data and display the results in easy to read form. Over six years, CCASE has evolved into a user-friendly software package that includes both framework and specialty applications allowing faculty to develop instructional units related not only to nutrition but also to other disciplinary specialties. Authoring tools allow faculty to create or update specialty units and also allow them access to learners' responses and evaluation scores. Continuing evaluation of CCASE has demonstrated favorable learning outcomes. Upgrading of CCASE is continuing and soon a CCASE on the Web is scheduled for pilot testing. It is intended that this upgraded version of CCASE will be available globally on a subscription service. The School of Nursing and Office of Instructional Technology, in a continuing partnership in the University of Michigan (UM), support the project.

Four nutrition units have been completed: Nutrition Assessment, Nutrition Interventions in Non Insulin-Dependent Diabetes Mellitus, Nutrition and Pregnancy: Risk Factors and Interventions and Nutrition Therapy for End Stage Renal Disease. Authoring of units on hypertension and hyperlipidemia is scheduled.

In addition to reasons given above, using the upgraded CCASE on the Web presents other advantages:

1. NDAP members will be able to use CCASE on the Web from a computer running MacOS, Windows, or Unix, or any operating system that supports a web browser. CCASE will become a delivery vehicle for distance learning in a variety of learning settings or locations: colleges, universities, professional associations, centers, institutes, commercial organizations, etc.
2. NDAP members using CCASE on the Web units will be able to use all Internet features such as medical databases, references, newsgroups, dietetic on-line, and e-mail, allowing members the option of discussing issues with faculty and other members, and participating with colleagues in electronic communities.

3. NDAP faculty members will be able, with adequate technical support and documentation, to author, edit or upgrade course units from any computer any where, as long as it has a web browser and an Internet connection. In addition to units presently available and under development here, NDAP and UP faculty members can author units pertinent to health problems in the Philippines, such as interventions in chronic and severe malnutrition, and specifically those related to deficiencies in calories and protein, iron, iodine and vitamin A.

Protocol for Collaboration

Collaboration between UP, UM and NDAP had to be established in order to implement the distance learning partnership. Brief descriptions of these institutions are given below.

The UP system is the premier institution of higher education in the Philippines. It is a multicampus university with six autonomous units on 11 campuses and a 1,000 bed teaching hospital. The UP Open University (UPOU) was created in 1996 following efforts by the administration to democratize access to the university. UPOU's mission is to provide wider access to quality higher education by offering distance education beyond the physical boundaries of the conventional system. It provides support services to bridge the physical separation of teacher and student, the latter assuming autonomy of the learning process. It has established 13 learning centers on UP campuses and seven other cooperating state colleges and universities strategically located throughout the country. A diploma (or certificate) and two master's program are presently offered; many more, including a doctoral program and the NDAP continuing education program are planned for 1997. The UPOU homepage can be accessed at http://www.upou.org/.

Since the 1960's, UM has been one of the leaders in information technology in the United States. CCASE, likewise, was at the cutting edge of technology when adapted to distributed computing in 1990 and once more when CCASE on the Web is launched into cyberspace as planned for next year. The NDAP-UPOU project will serve as a global pilot test site for CCASE on the Web.

NDAP was organized 40 years ago, and presently has approximately 5000 members. Five years later the Dietetics Law was passed, requiring an examination to practice and the accumulation of 15 continuing education hours per year to maintain the license to practice. The continuing education program of the association is planned by a committee that schedules the date and location of the annual educational events. In addition to the annual convention, the association regularly holds update sessions, seminars, workshops and symposia on varied topics to meet the needs of the members. The proposed CCASE on the Web will be an additional venue for continuing education of nutritionists and dietitians. NDAP's committee chair for continuing education is Maria Patrocinio E. de Guzman.

Periodic and recent contacts with the two Philippines institutions facilitated the establishment of the partnership. Being a UP alumnus and also a charter member and former president of NDAP

has been a great help in this effort. The information infrastructure in the Philippines was spearheaded by the DOST. Most major cities have established Internet connection within the confines of higher education. I met DOST Secretary William Padolina during a Balik-Scientist conference this year. Upon inquiry by electronic mail, he referred me to his wife, Dr. Maria Cristina Padolina, who serves as Chancellor of UPOU. She is apprised of this proposal and is definitely interested in the partnership, having already identified a potential author from the UP faculty. Ms. de Guzman is a mutual personal friend and professional colleague.

Several matters still require clarification before the partnership agreement becomes official. First, a choice between a mirror or independent site has been suggested and needs be explored with UM. Second, the choice on where the learner's responses to the exercises and evaluation questions will be routed will depend on the answer to the first question. It can be made available to UPOU/NDAP through the UM subscription service. Or a combined high tech/low tech method is also possible. Responses, particularly to the evaluation questions, can be recorded using pen and paper and submitted at the learning center immediately upon completion. These arrangements are possible and flexible but written procedures are needed. Third, the subscription service fee will need to be determined. Fourth, CCASE on the Web and all but the recently completed unit on renal nutrition is copyrighted by the UM; renal nutrition is copyrighted to the authors. If hard copies are made of parts of the units, permission is needed to prevent violation of the copyright law. Policies on copyright and royalties will also need to be clarified. Fifth, procedures are also needed to recruit Philippine authors who will write and maintain upgrade of their units. Sixth, a procedure and schedule is needed for the continuing and periodic evaluation of the distance learning partnership. Finally, while interest in the project has been received from the three collaborating units, a memorandum of agreement will need to be developed and signed. It should include clarification of these issues, assignment of responsibilities and establishment of deadlines for each of the three collaborating institutions.

Conclusion

As we approach the third millennium, it is exciting to share CCASE on the Web with a developing country, across the Pacific Ocean to eleven or more different sites in the Philippines, enabling members of the dietetic profession access to information at the touch of the keyboard. It is a feat that I, as charter member and past president of NDAP and alumnus of UP, would have not dreamed of accomplishing. But distance learning is here and three members of these three institutions are eager to move forward via cyberspace. We invite other institutions to consider subscribing to CCASE on the Web for credit courses and staff training as well as a strategy for continuing education.

Units are now available on the following topics:

- Nutrition Assessment
- Pregnancy
- Cardiovascular Health
- Health Issues in Sports Nutrition

- Non-Insulin Dependent Diabetes
- End Stage Renal Disease
- Essential Hypertension
- Obesity
- Aging

For more information contact ninfa@umich.edu

1997

Amesbury for Africa and Esabalu Self Help Group: Sister Villages Ending Hunger Through Local Partnerships

By: Bernadette Lucas, MS, RD

In the words of Tip O'Neil, former Speaker of the House, "All politics is local." In the experience of the ordinary person, most of government is local too. Certainly we feel the impact of our local governmental authorities much more directly than we feel the impact of what happens in Washington or the statehouse.

However in the past the proposed solutions to undernutrition and malnutrition in the developing world have bypassed the local authorities in favor of national and regional initiatives. Often these macro-intitiatives fail to reach the local farmers and housewives they are designed to help. The problem of poor nutrition continues.

Sister villages is a completely unique approach that links local authorities in the developed and the developing world in partnerships to fight hunger and undernutrition. This model involves the following precepts:

1. Progress is achieved by direct citizen exchange between twinned communities in rural Massachusetts and rural Kenya.
2. There is an open-ended commitment by both partners to fight hunger and underdevelopment.
3. Long term assistance and training rather than short term results are stressed.
4. Self-sufficiency and leadership in the partner village are promoted rather than promoting dependence on outside aid.
5. The focus of the citizen volunteers is on developing direct experience of the problems facing rural African villagers. Direct involvement personalizes the fight against hunger and gives people the feeling that what they do to help truly does make a difference.

The first sister villages program began in 1988 under the auspices of the Technical Assistance Program of Sister Cities International. A registered dietitian Bernadette Lucas, a nurse and a doctor from Amesbury, Massachusetts visited the village of Esabalu in Ebusakami Sublocation of Western Province, Kenya. They completed a nutrition and health survey of the community and brought their findings back to Amesbury, a town of about 14,000 in Northeastern Massachusetts. The results of the survey were presented to local authorities at town hall, to church groups, school groups and service clubs in Amesbury by means of slide shows with lectures. By this means the Amesbury community was educated to the problems of Esabalu and a support group was established. The name of the group was Amesbury for Africa and it was formed as a 501(c)(3) charitable organization. Amesbury for Africa joined Sister Cities International as a member. The activities of the group were approved by the Amesbury Board of Selectmen who invited the newly formed Esabalu Self Help Group to become a sister village organization with Amesbury.

From the beginning, the purpose of the new organization has been to support citizen exchange. There have been 11 exchange visits from Amesbury to Esabalu. The visits have focused on health, nutrition, water, beekeeping, composting, teacher exchange and youth exchange. There have been 3 visits by Esabalu citizens to Amesbury .These have involved agriculture, health worker training, teacher exchange and youth exchange. The purpose of the outgoing exchanges has been technical assistance. The purpose of the incoming exchanges has been training and education of our Amesbury community regarding the problems of underdevelopment.

In our nearly ten years of exchanges we have found that the problem of undernutrition is really multifactorial. We have needed to do work in several areas in order to improve nutrition. These include:

1. improving the food supply,
2. improving community health
3. nutrition and health education and
4. water.

Better Food Supply

Loans of seed and fertilizer for growing hybrid maize was the first approach to increasing food yields on subsistence farms. The second project was a grant application to Heifer Project International for zero grazed cattle. This was eventually approved and now there are 54 zero-grazed animals providing milk. The milk has improved local nutrition, brought a cash crop to the farmers and generated high quality animal wastes for manuring the gardens. Beekeeping was the next innovation and this was initiated by having local farmers attend beekeeper training at Baraka Ag Institute in Molo, Kenya. The honey is a cash crop and the bees improve pollination and yield of local crops such as beans and squash. The most recent project is market vegetable gardening using sustainable agriculture. This will involve a practical trainee exchange with a farmer in Amesbury.

Improving Community Health

A farmer who is ill cannot farm. To improve community health the Esabalu Self Help Group formed a subcommittee for health. Ten women and one man became the Esabalu Health Group. This group sought and obtained training to be community based health workers through the Christian Health Association of Kenya (CHAK). CHAK helped them perform a door-to-door community health survey. In 1992 a CHAK nurse and the secretary of the health group came to Amesbury to inform healthworkers here of their findings. They attended a world conference on micronutrient malnutrition presented by INMED in Washington, DC. They returned to Kenya and initiated a series of appropriate technology initiatives including reducing high grass and standing water to control malaria, treated bed nets to protect small children from mosquitoes, handwashing outside latrines and dishracks to reduce helminths, and shoes to prevent hookworm anemia. They have initiated a system of home visits to dispense contraception, oral rehydration and health education. They also triage illness, teach health in primary schools,

provide prenatal and child clinics, deliver babies and run a community pharmacy (Bamako initiative).

Nutrition Education and Health Education

The Esabalu Health group provides training to new mothers to encourage breast feeding and instructs mothers of older infants in how to prepare high protein weaning foods (rather than maize meal porridge). They also train in oral rehydration and hygiene to reduce the malnutrition of parasites and disease. In addition a teacher from Amesbury has brought a program called Child-to-Child to all 5 of the village primary schools in Esabalu. This is a British NGO sponsored program which uses children as primary health educators. This is a vital service since the child who is in primary school may be the most educated member of his or her family. He or she can teach the kids at home and the parents in the importance of good nutrition through innovative games, skits and songs.

Water

Water has turned out to be a major problem in improving the nutrition of the community. There is a limited supply, it is often contaminated. Grade cows and kitchen gardens increase the water requirement for each family. Without it the food supply can't increase. During the dry season women and girls may spend half of a working day in obtaining drinking water. During the rainy season contaminated springs spread diarrhea and death.

Amesbury Rotary Club in cooperation with Kisumu, Kenya Rotary Club applied for and won a $300,000 Health, Hunger and Humanity grant from Rotary Foundation to drill deep boreholes and equip them with electric submersible pumps and onsite storage and distribution. The water project is in its first of three years and should supply water not only to Esabalu but to 11,000 people in the surrounding area.

The initial Amesbury/Esabalu relationship is now 10 years old and still going strong. But is this model of decentralized, friendship-based development between local authorities something unique or is it able to be replicated on a larger scale? Three years ago a second partnership was formed between Newburyport, Massachusetts and a village in Bura, Coast Province, Kenya. The Newburyport/Bura Alliance has had three exchanges from Newburyport to Bura and one exchange from Bura to Newburyport. They will be participating in the agricultural internship trainee exchange program along with Amesbury.

Sister villages has worked once and is working a second time. The major restrictions to replication are the lack of interest in small towns in doing this kind of exchange and the lack of funding or support from any large organization or government agency. For example Peace Corps volunteers might very well be an ideal source to promote local twinning relationships between their hometown and their village posting. However we find little interest in pursuing this idea from the country director in Kenya.

The village committees in Kenya are not waiting around for more partners in the U.S. In 1994 they formed their own organization, Sister Villages of Kenya. This is a Kenyan based NGO and consists of 13 village self-help groups in three provinces (Coast, Lake and Western). There is even one sister village in Uganda. They correspond with each other and send exchange visitors from one village to another to teach each other needed skills. Esabalu may teach beekeeping to Mwengere and Musabwali may teach poultry raising to Foresto Faith Group. Every year they have an annual meeting. The last was held in Bura and involved 47 participants from all three provinces. Workshops on nutrition, on small scale savings/loan schemes and on small business accounting were well received.

Direct involvement, development education, bilateral citizen exchange, friendship, health education, agricultural training, and technical assistance. These are the elements of a successful decentralized program aimed at fighting hunger and undernutrition through local partnerships. We now know that local initiatives to combat world hunger can make a difference. Our involvement in Esabalu has helped achieve some progress in feeding the hungry. But living and working in Esabalu has also changed us. It is hard to put in words but each volunteer who has gone to Africa has returned with something special. Although materially Esabalu has less than we have, many of us feel that spiritually and socially we have less. As one Kenyan visitor expressed the paradox, "At home our stomachs may be empty but our hearts are full. Here in the States it may be the reverse."

Do they pray for us to have full hearts while we pray for them to have full stomachs? I wonder.

1998

FoodLinks: Promoting More Equitable, Sustainable Trade Between North and South

By: Sal J. Attanasio, RD, LD

(For the purposes of this paper, the term "North" refers to highly-developed/industrialized countries; the term "South" refers to less-developed/industrialized countries.)

Agriculture is essential to sustainable development. No other sector of international trade has a more direct impact on food security in less-developed countries (LDCs). Farming is a source of food and livelihood for millions, employing approximately 60% of people in the South. Activities related to farming also generate important savings for investment in rural economies, making possible improvements in infrastructure, education and health care. As such, rural communities are deeply affected by the increasingly global nature of trade and its impacts on small farmers.[1]

The globalization of trade has had mixed impacts on food security in developing countries. Free trade has increased employment and incomes in LDCs, improving health, longevity, and educational opportunities for many. Yet the benefits are not evenly distributed from region to region. For example, in much of Sub-Saharan Africa, civil unrest, economic instability and weak physical and social infrastructure discourage foreign investment needed to stimulate economic growth and social development Even in countries well integrated into the global economy, the benefits of trade do not often reach the poor. Too often, the South's "comparative advantage" in a global market lies in cheaper goods via low wages and poor working conditions. Less industrialized countries must also rely disproportionately on the export of raw materials, which command low, unstable prices in competitive markets relative to manufactured goods. Ironically, falling prices create incentives to step up production for export, decreasing prices further and depleting environmental resources upon which future food security depends.

Southern farmers also frequently lack access to food processing technologies and market demand information. They therefore tend to select methods of food production and processing which incur the least cost, rather than targeting the needs of specific consumers. This results in products which are low in quality, poorly-packaged, and limited to sale in local markets. It also contributes to a huge quantity of food wasted globally due to spoilage and mishandling.[2] Since developing country growers are often relegated to the bottom of the food production chain, very little of the value of these exports stays in the South; the bulk of agrifood profit goes to bankers, traders, processors and distributors based in industrial countries.[3]

Nonetheless, opportunities exist for developing country farmers to use free trade to their advantage. As globalization continues to blur national boundaries, consumers have become increasingly interested in culturally-diverse foods produced in environmentally sound, ethical ways. Northern food companies are seeking information and access to new and unique food products in an effort to meet these demands. In addition, markets are forming in Southern countries for low-cost, high-quality, nutritious foods across all income groups. Southern

producers grow, or have the capacity to grow, food products desired in these expanding markets.

FoodLinks, a project launched in 1996 by the Canada-based International Development Research Centre {IDRC), intervenes at this point Its mission is "(to create) partnerships among food producers, processors and marketers in developing countries and the North through the provision of commercial liaison and project management services, training, and research support, leading to increased capacity, employment and incomes for developing countries in a sustainable and equitable manner."[2]

FoodLinks' various activities each represent efforts by private industry to redress inequities in North-South trade relations. Its work is grounded in research which seeks to better understand free market dynamics and the means by which these forces can better promote development The project also improves the ability of poor growers to assess market demand for agricultural goods to capitalize on new, "niche" export markets. In the process, partnerships are formed with development-conscious Northern companies committed to fairer prices for Southern products and to social goods such as environmental sustainability, gender equity, and good labor conditions. FoodLinks also increases the access of poor growers to more profitable, "value-added" processing technologies higher up on the food production chain. Finally, it garners financial and technical support from a variety of donors, and coordinates activities with many partners to share best practices at the local, regional and international level. Thus, although it does not target nutritional well-being directly, FoodLinks has advantages over more traditional "food relief" approaches because it better addresses the poverty and lack of economic opportunity which underlie hunger.

FoodLinks' four broad objectives for achieving its mission are: 1) supporting research on product ventures and on market-based, sustainable development in general; 2) establishing product ventures; 3) building and expanding communication networks and 4) generating revenue.

Research

This component of the FoodLinks project encompasses the generation and evaluation of FoodLinks product concepts as well as the broader research described above. In initial, exploratory studies, FoodLinks solicits product ideas from a range of farmer and community groups, non- governmental organizations (NGOs), research institutions, and companies in both the North and South. Publicity via brochures, a Web page, Listservs and presentations at food industry trade shows and development conferences provide more ideas and also help promote the program. Information is collected using a standardized questionnaire which uses a scoring process to evaluate each proposal. Prospective ventures are evaluated on the basis of commercial viability as well as environmental sustainability , economic and gender equity and stakeholder participation in decision making. Approximately fifty product ideas are evaluated each year, of which ten or more (fifteen in its 1997-1998 project portfolio) are deemed worthy of funding and partnership development.[2]

Ongoing in all phases of FoodLinks ventures is research conducted by IDRC in collaboration with a variety of other development institutions. Its goal is to synthesize lessons learned in exploratory studies and to answer the broad question: "How can the market be used to promoted equitable and environmentally sustainable development for Southern farmers and producers?" Subtopics explored include the potential of various food industry subsectors to support sustainable development, gaps in the production-to-consurnption chain which keep poor producers out of the global economy and the potential negative impacts on local markets of expanding production for export. Though these efforts, FoodLinks ventures benefit from an always-growing understanding of global market forces and of how these can be used to benefit the rural poor.

Product Ventures

When a venture is deemed feasible by the above criteria, additional research and development (R+D) is provided to both products and processes to capitalize on market opportunities identified. This is accomplished in two stages. In the Project stage. R+D activities are carried out in both the North and South. Specific, measurable goals, action plans, performance indicators and timelines are established. Training of Southern entrepreneurs (i.e., in product and enterprise development and value-added technologies) is undertaken. A prospective business plan is drafted, including the identification of partnerships to be formed in bringing a particular product(s) to market. In the Implementation stage, selected private industry partners invest capital and business activity begins. Throughout operations, a range of social, environmental and economic impacts are closely monitored.

Networking

FoodLinks uses both existing and incipient information and communication technologies to create "knowledge connections" within and between developing countries, donors and development agencies. These linkages will promote information-sharing and cooperation in market assessment, product development, methodology refinement and project planning and evaluation. For example, FoodLinks used these technologies to solidify and expand its work with PRODAR in Latin America (a network established to link institutions promoting rural agroindustry in the region), which included the development of a product screening process. IDRC will continue to cultivate these connections via consultancies with its information technology partners. FoodLinks also plans to establish an electronic networking component of the Global Collaborative Post Production Research Network. Through this network. IDRC would collaborate in its production-to-consumption research with a host of actors in food and agricultural research in the South; these connections could, in turn, substantially increase co-funding to the FoodLinks Initiative.[2]

Revenue Generation

Although FoodLinks was funded primarily by IDRC in its first few years (i.e., in 1997. it received grant approval for $2.5 million Canadian). it ultimately aims to become self-financing via

expanded collaboration with a variety of donors. FoodLinks funds its activities in several ways, including contract services, co-funding, royalty arrangements, and grants. Efforts are ongoing to obtain co-funding and contract research with international agencies such as the World Bank, the United Nations Development Program (UNDP) and the International Fund for Agricultural Development (IFAD). This sharing of resources among partners to achieve economies of scale is especially desirable given declining development funding in recent years. Royalty income, which derives from innovative technologies or processes developed by IDRC, is a less labor-intensive source of funding. Strategies for obtaining large amounts of revenue relatively quickly from the private sector via grants and co-funding are continuously being developed.

FoodLinks is exploring ventures in different regions of the world, including Latin America and the Caribbean (LAC), Asia and Africa (primarily in the former two). In LAC, most projects originate from ideas provided by NGOs, farmer organizations and technical associations in the PRODAR network. To promote efficiency and local self-determination, IDRC will ultimately establish a FoodLinks office in this region and delegate the management of its projects to PRODAR In Mexico, efforts to link growers of organic foods to firms in Canada and the US will give IDRC the chance to test, "in vivo", approaches to development which are as diverse as its partners (i.e., the Rodale Group, World Wildlife Fund and Bancomext). In Southeast Asia, efforts to build export markets are being complemented by the development of new and interesting products for domestic and regional sale. For example, a cashew apple juice venture, launched in Vietnam, is likely to extend elsewhere in the region, initially to Sri Lanka. At this time, there are no FoodLinks ventures operating in Africa; however, IDRC is exploring opportunities in the region to market a variety of fruits, nutrient-fortified fruit drinks, honey and agroforestry products, among others.

FoodLinks has made substantial progress since its inception two years ago. Examples include:

- The launch of its first product venture. Mona Lisa bananas, grown in Costa Rica, are now sold by a major Canadian supermarket chain. The income generated has provided small growers in Central America with incentives to adopt the environmentally-sound system by which these goods are produced. The venture has also provided added revenue to IDRC via product commissions.
- The marketing of value-added processing technology. A Canadian juice processing company has agreed to adopt a cashew juice processing technology developed with IDRC support in Vietnam. As a result, Vietnamese growers benefit from the added income provided by the venture. For its part, IDRC receives a 2% royalty on sales of the product, which has fully recovered IDRC's investment in the processing technology. These funds will be re-channeled into Vietnamese communities by financing future ventures, scholarships for local capacity-building and agricultural and market research.
- Promoting alliances in agricultural research. FoodLinks has worked to connect Consultative Group on International Agricultural Research (CGIAR) centres with the Global Collaborative Post- Production Research Network. The CGIAR, a global consortium which funds and conducts research on crops relevant to Southern producers, will now have access to important developments in post- harvest research, including the

study of current versus optimal crop use, reduction of losses, market opportunities and incentives for farmers to adopt disease- or drought-resistant crop varieties.

- Links forged with key development agencies. FoodLinks project coordinators led promising talks with a number of bilateral donor agencies, UN agencies and development banks, including the World Bank, UNDP, IF AD and DANCED. Discussions concerned the potential for collaboration with FoodLinks on issues specifically related to food security, poverty alleviation and public-private partnerships in development

These achievements notwithstanding, FoodLinks coordinators do not consider their project the "magic bullet" to eradicate poverty and hunger. FoodLinks interventions typically target small rural farmers who would benefit from improved access to markets and more equitable terms of trade. However, it is not presently positioned to assist the millions of Southern poor who lack entitlements to even the most basic of food-producing resources, such as land, water, agricultural inputs and equipment Nor does it fully address the plight of women in developing countries, who contribute decisively to household food security yet often lack access to the means of food production and influence in family finances. Clearly, future efforts must be directed at mobilizing a range of civil society organizations to push for policies which ensure that global markets will benefit, not exploit, the poor. International cooperation is needed to set basic standards between industrial and developing country governments on policies concerning land reform, educational opportunities, employment, women's rights and the establishment of minimum wages. In this regard, FoodLinks' recent efforts to collaborate with large development institutions, which have substantial political clout and decades of experience promoting food security and alleviating poverty, are very promising.

FoodLinks has enormous potential to benefit Southern producers and Northern country firms alike. To the former, it can provide vital capacity-building at the community level in market assessment, product and enterprise development and food preservation and processing. Southern growers would then be better equipped to target more lucrative Northern and regional markets and to command a greater share of profit in the agrifood production-to-consumption chain. The cumulative effects of these developments on rural economies would be dramatic: increased employment, incomes, savings, physical and social infrastructure and environmental integrity. At the household and individual level, this would translate into enhanced health and nutritional status by means of improvements in the quality, quantity and safety of the food supply.

Northern country firms can also gain from FoodLinks. In a literal sense, it will open up a whole world of unique, quality food products for which there is rising demand in global markets. Improving Southern capacities in food production, storage and processing will also reduce the business risk associated with investment in developing country agrifoods. Furthermore, participants will enjoy the boost in their public image that comes from their support of products with a "social conscience".

Since its inception, FoodLinks has received substantial recognition as well as financial and technical support from private industry, NGOs and other donors. The donor community

acknowledges FoodLinks' leadership in an approach to rural capacity-building and income generation which is still quite new. Through project activities to date FoodLinks and IDRC have gained extensive knowledge and experience in food product development, communications technology and free market research in both Asia and Latin America. IDRC is encouraged by its progress in addressing the root causes of poverty in developing countries and by the prospect of using FoodLinks as an instrument of improved food security throughout the world.

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1999

Chronic Disease: The New Face of Poverty in Chile

By: Jennifer Shaw, MPH, RD

In developing societies, human, social and economic development is largely influenced by the nutritional condition of the population. Unemployment, lack of income, poor alimentation, adverse environmental conditions and lack of basic services continue to be a problem in Latin America. Chile is no exception. Over the last 25 years, Chile has experienced a large growth in its economy, and a shrinking rate of malnutrition, but not all have enjoyed its recent prosperity. The economic growth has resulted in a widening of the gap between the poor and the wealthy, preserving the rigid class structure that leaves a large segment of the population living an impoverished life of food and income insecurities. Though Chile has maintained growth rates of more than 7% annually, the wealthiest 10% in Chile have maintained 41% of the population's income while the poorest 10% have received between 1.4% and 1.7% of the total income earned in Chile between 1987 and 1996.[1] According to the National Population Census (CASEN), between the years of 1994 and 1996 the gap between the rich and the poor increased by a factors ranging between 13.12 and 13.83. In monetary terms, this income breach translates into household earnings of US $137.36 per year for the poorest 10% of the population and US $3,939.32 for the wealthiest 10% of the population, or an income gap between the poor and rich of a factor of 29. According to a UN report in 1997, "La Realisation des Droits Economiques, Sociaux et Culterels" these statistics place Chile in 50th place (out of 54 countries) regarding the difference between the highest and lowest income quintiles, or the gap between the rich and poor. In regards to overall poverty, the latest CASEN figures show that at the end of 1996, the poverty rate in Chile was approaching 3.3 million people or 23.2% of the total population. Statistics from the years between 1990 and 1996 show that women are more affected by poverty than men with poverty rates ranging between 23.5% and 39.3% of the population. These figures have decreased over the last 10 years, but reducing poverty levels has become more and more difficult.[1]

Whereas in recent history, the manifestations of poverty were malnutrition and infectious disease, the new faces of poverty are obesity and chronic disease. According to the Institute de Nutrición y Tecnologia de Alimentos (INTA), an institute for health and nutrition at the University of Chile:

"the major present and projected causes of death and disability in Chile are diet related non-communicable chronic disease (coronary heart disease, diabetes, obesity, hypertension, stroke and cancer). These can be ameliorated by a healthy diet throughout the lifecycle and by the availability of safe foods. The health challenge of foodborne disease has changed, new emerging pathogens have been described, changes of food production and processing have lead to new problems. Genetically modified organisms represent new concerns."[2]

Therefore, though Chile is still considered a developing country, diet related non-communicable chronic disease (coronary heart disease, diabetes, obesity, hypertension, stroke and cancer) has

now surpassed communicable diseases as the main cause of death. In 1998, infections contributed to less than 3% of all deaths. At the same time, chronic disease rates in Chile are similar or higher than those in developed nations like the US and Canada. Statistics from Chile between 1986 and 1987 demonstrate that for every 100,000 deaths 186.1 were from cancer, 117.3 were attributed to coronary heart disease and 103.7 resulted from stroke. During the same year in the US, the mortality rates for these same diseases were 190.7, 200.65 and 58.8, respectively.[3]

In Chile, the prevalence of risk factors for chronic disease is high and steadily increasing. A study done by Berrios et al in 1988 and 1992 in adults in the Greater Metropolitan area of Santiago de Chile shows an increase in alcohol consumption (57.1% to 61.7%), sedentarism (55.4% to 57.8%), hypertension (19.7% to 35.5%), hypercholesterolemia (33.8% to 43.3%) and a decrease in smoking (47.1% to 43.6%) in men. These same risk factor rates were even more striking among women. During the same time period, alcohol consumption increased (19.2% to 29.8%), as did sedentarism (77.4% to 80.1%) smoking (40.3% to 44.7%), hypertension (16.7% to 33.4%) and hypercholesterolemia (34.0% to 45.85%).[4] Berrios et al., Vega et al. and Albala et al. found rising rates of elevated cholesterol levels among poorer populations.(5) In Vega's study, 49% of the subjects in the high socioeconomic level and 47.5% of the subjects in the lower socioeconomic group had elevated cholesterol levels indicating that along with the growing gap in income levels, there is a heightening of chronic disease risk factors among low socioeconomic levels.

Obesity is also on the rise, especially in low income populations and children. National health statistics show that in Chile in 1996, 17% of men and 27% of the women were obese. At the same time, the prevalence of obesity increased with age and was more common in lower socioeconomic levels.[5] The growing number of obese in lower economic levels is a great concern due to the poor access to medical services, food and job insecurity and high stress that low income individuals encounter.

Childhood obesity has also grown while childhood malnutrition rates are as low as 5% (down from 15.5% in 1975). According to The Sistema Nacional de Servicios de Salud (SNSS) obesity rates for children under six years of age have increased by 56% over the last 10 years with a prevalence of 7.2% in 1995. Between 1987 and 1996 the proportion of obesity in children between zero and six years has doubled in boys (6.5% to 13.1%) as well as girls (7.7% to 14.7%). As a result, Obesity has become the most important nutritional problem in the child population in the lower-middle and lower classes.[5]

Despite the substantial increase in chronic disease and obesity, Chile is still experiencing some malnutrition and transmissible diseases albeit few cases. This epidemiological transition has come about due to large demographic changes and rapid urbanization and industrialization. The quick growth of the economy and a large rate of migration to and expansion of the cities (mainly the capital city of Santiago) has increased the risk factors discussed previously — all of which are associated with an increased incidence of chronic illness, accidents, violence and mental disturbances.

Behind these alarming statistics of chronic disease lie fragmenting social relations brought about by a rapid industrialization process and the economic stress of the growing gap between the rich and the poor. The large migration to cities has torn apart the family safety net as individuals must leave their families to work in the larger cities because of lack of job opportunities in their home town. Moreover, with the entrance of greater numbers of women into the workforce and a greater rate of urbanization and mobilization, the number of people eating one or more meals outside of the home has increased, along with the number of fast food restaurants. Added to this is the industrialization of the food processing industry, flooding the market with processed foods high in fat and sugars, and genetically altered produce. In this manner, the traditional Chilean diet, once rich in cereals, plant foods and low in fat and animal protein, has changed to one characterized by fats, sugars and processed foods. This typical Western diet has lead to a higher lipid profile among Chilean people. High fat intake, economic and personal stress, a fragmenting social network, and the sedentary lifestyle which is also becoming more frequent in Chile, are undoubtedly related to the change in the population's health profile.

While the rates of chronic disease and obesity among the poor are growing, the health system is struggling. Geared towards preventing malnutrition and infectious diseases, chronic disease monitoring and prevention programs are not yet equipped to handle the large demand. Nor is the system apt to deal with the social factors that are related to this crisis. The few prevention and treatment measures that do exist are geared towards the upper socioeconomic levels and not towards the increasing number of people with scarce resources and limited education that are experiencing many of the same types of chronic diseases that are typically associated with wealth.

In addition to the preliminary measures that the political and health authorities have taken, the greater population has come up with some of their own answers to the social, economic, and health problems they are experiencing. One very important measure is Urban Agriculture. The production of organic produce and small scale animal husbandry in limited spaces and the creation of microenterprise and microcredit groups are viable and sustainable actions that can help individuals overcome poverty and poor health. The self-reliance which accompanies the implementation of Urban Agriculture is an[6] important aspect which is not always included in nutrition interventions and economic development programs.

However, with few resources and little political power, populations with limited resources need support to organize. In the beginning, their efforts must be coordinated with institutions that they can rely on for technical support, training, credit and other resources. Through a strategy of production technology based in agroecological principles it is possible to develop a road to overcoming poverty which strengthens the organization and management capacity of low income people, improving the city's environment and creating a chain of initiatives that are economically viable. This focus aims to create wealth (economic and social) and well-being while considering human resources and materials (social and institutional) in order to overcome poverty.[6]

The Centro de Educación and Tecnologia (Center for Education and Technology or CET) operates along these principles. As a Non Governmental Organization (NGO) in Chile, CET has enjoyed great success in implementing Urban Agriculture as a method of sustainable economic and social development in populations with limited resources. Starting in 1986 in response to a Cholera scare, high rates of malnutrition due to poor food access, and food contamination from pesticides, as well as the transformation of the food system into a highly processed and global one, it now recognizes the need for chronic disease and obesity prevention programs, in order to combat these new plagues in Chile. Among their programs geared towards increasing food security, environmental reclamation and income generation CET administers an urban garden training program where peer educators train neighborhood groups in urban gardening and microenterprise. During the process, the groups form their own microcredit lending groups in order to pay for materials like seeds and to finance their small businesses. The model of organic food production that increases the participant's access to quality organic fruits and vegetables, not available in stores, provides each family with approximately 821 kg of food including fruits, vegetables, chicken, rabbits and bread all free of pesticides and/or chemicals. In the process, the family is able to meet more than their vitamin C needs, raise their iron and calcium intake and consume lower calorie foods. CET is currently working with 10 municipalities to implement the sustainable development model that they have developed and implemented in Tomé (a peri-urban city of 49,000 inhabitants in the South of Chile) one of their five locations in Chile. In Chile, approximately 85% of the cities and 75% of the counties have the same population size as the city and county of Tomé,[7] and given that Chile's socioeconomic indicators tend to reflect the population size, CET's interventions are very applicable to a large portion of the population. In fact, the expansion of the programs into the 10 new municipalities will extend CET's reach to approximately 85,000 people.[8]

CET's programming currently addresses food security issues, but does not reach as far as disease control and prevention, nor adequate care issues, such as hygiene, and usage of health services and health information, all of which are very important given Chile's current health profile. In this manner, as a Nutritionist, I have been incorporated into CET Tomé's work team of a veterinarian, agronomists, an economist, a civil engineer, a social worker and peer educators to expand their food security program to encompass these nutritional themes in order to achieve nutrition security as well.

Together, we are working to reshape CET's Food Security program to face the growing problems of obesity and chronic disease affecting Chile's populations. In this manner, we are applying CET's three work areas to develop the new programming: the development of human resources through the transfer of feasible technology to poor populations, systematic data collection of impacts and processes of urban agriculture and sustainable development and the on-going improvement of CET's program areas using both of the above.

In the area of human resource development, we are in the midst of developing a nutrition curriculum focused on changing the food habits and nutrition knowledge of the program's participants — low-income residents in the town of Tomé. This curriculum is prevention-based by nature and focuses on using what the participants produce in their homes to improve their

health and that of their families. The six encounters are activity-based and most of the discussion questions revolve around the participants own experiences with food preparation. Each class relates foods that the people typically eat with the appropriate nutritional concepts. For example, the fruit and vegetable class deals with vitamins and antioxidants and how to prepare the foods which contain these nutrients in a healthy and appealing manner. Other themes include food safety, cereals and energy, meat and fat consumption and activity and weight loss. The group meetings also serve as a time for sharing and drawing on the experiences of the other participants to solve common problems that they all face in the aspects of food preparation, health issues and social problems.

The curriculum is now in the testing phase. The social worker, a peer educator and I are field testing the classes and we are working with the Director on the theoretical and structural parts of the program. These experiences, the participants' evaluations of each course and peer educator inputs will be used to revise the curriculum and train the other peer educators to administer the courses to the neighborhood groups. We are also including an outcome evaluation, consisting of a pre and post test nutrition knowledge and practice questionnaire in order to document the nutrition program's effects. The participatory nature of these nutrition classes, as well as the involvement of the peer educators makes it a sustainable, comprehensive method of disease prevention. It is hoped that with the perfection of this model, other members of the CET network in Chile and Latin America will be able to adapt the curriculum to their needs, in order to improve the nutrition status of their populations.

By emphasizing low-cost methods of food preparation, this program supports the socio-economic development portion of CET's methodology. In this manner, healthy and inexpensive alternatives to commonly purchased foods which are often expensive, highly processed and high in fat, sugar and salt are prepared during the classes, such as home made low-fat granola instead of sugared corn-flakes, and whole wheat bread instead of white. In the future, there will be workshops on bread, fruit preserves and dried fruit production for the women who have interest in selling these products to raise income for their families. Between the monetary savings of home food preparation and the increased income of microenterprise, the economic development achieved through this program will play an important role in the overall quality of life and health of the 500 or so families that the program currently reaches and those in the II cities in the region that are currently implementing CET's model.

The final component of the human resource phase of the program is one of self-development which occurs on two levels. The first is the level of the participant who, through the active participation format of the program is better able to care for the health of her family through food preparation and the generation (and/or savings) of income. The second is the level of the peer educators (or Monitoras) who will be trained to give the nutrition courses. During the process of training and working as a Monitora, the women increase their own self worth and self-efficacy. Not only does the knowledge and experience they gain through training and teaching change their habits and self-perception, but their earnings also boost their importance in the family structure and their freedom to make their own decisions.

CET's model and experiences are an important lesson for the rest of the country and Latin America in terms of improving food security and economic self-sufficiency. However, without sound nutritional assessment data, it is difficult to convince others of the important impact that CET's methodology could have on improving the nutritional status and reducing the chronic disease rates in low income populations. The second component of the program consists of a nutritional assessment project to measure the impacts of the urban gardening program on the participants and to assess the general nutrition status in Tomé. In this study, 100 families will be interviewed by various members of the team to determine their daily nutrient intake and their overall nutrition status. The study is now in the development phase with the help of the other members of the CET team. The current plan is to administer a 24-hour recall using a food list developed through a preliminary diet study carried out in March. The assessment tool will be administered two times to obtain a representative sample of the subject's daily consumption. A trained team consisting of the social worker, the Monitoras and a few participants in CET's Ecoclub, an environmental club for students from the ages of 12 to 18, will administer the questionnaire to 100 low-income women in Tomé. The experimental group will be 50 participants in CET's neighborhood garden groups and 50 women who do not participate in CET's programming will form the control group. Part of the investigation process will be to validate this dietary assessment tool to be used in other parts of Chile where the CET programs are to be implemented. We are also planning to collect height and weight data to use the Body Mass Index measure to document obesity. The diet intake surveys will be analyzed using a computer program developed by the computer technician at CET using the Chilean food composition tables, also to be used in future studies. The expertise of a Professor of Nutrition at the University of Concepción will also be incorporated in the data collection and analysis process. The results from this study will be used for three purposes:

1. To document the possible existence of a difference between the diets of people who have urban gardens and those who do not.
2. To document the nutritional status of Tomé's low-income population.
3. To reshape CET's current programming to meet the needs of its participants.

Given the participatory nature of the study, it is hoped that the process will also open the eyes of those involved in collecting the data to nutrition's impact on health.

As stated above, the third portion of CET's methodology is the improvement of the current programming. The development and testing of the nutrition curriculum and the diet study will serve to improve CET's programs and make it more applicable and helpful to the low income populations. In the future, this model will be implemented in the 10 other cities in which CET is currently implementing its model.

The current health problems in Chile will not be solved solely through medical treatment of chronic disease. Preventative measures that not only focus on health and diet, but personal and economic development must also be implemented. Up until now, CET has been working on solving economic, environmental and food security problems using a participatory and sustainable methodology. Performing a scientific study of the nutritional status of the

population and designing and evaluating a nutrition curriculum will give CET the power it needs to spread its effective programs to other populations in need. Only a prevention focused, participatory methodology will be able to lower the alarming rates of chronic disease in Chile and improve the social and economic conditions of Chile's population.

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Field Surveys to Assess the Nutritional Status of Burmese Refugees in Thailand: Basis for Recommendations for Humanitarian Programs

By: Teresa M. Kemmer, MS, RD, Major, USA

Project Summary

It is estimated that more than a million indigenous Burmese have sought refuge in camps along its borders. An estimated 114,000 of those refugees are now seeking refuge in camps along the Thai/Burma border. This population has not been evaluated critically and is at significant nutritional risk. It is urgent that nutritional assessments be completed in this high-risk population now. It is estimated that 13 million people die each year from extreme malnutrition and hunger related causes, nearly 35,000 per day; three quarters of them are children (Young, 1997). FAO/WHO (1992) estimated that there are 786 million malnourished individuals in the world that may be suffering from dietary deficiency, secondary malnutrition or under-nutrition. Many of these individuals are refugees that have fled their countries due to political unrest and displaced populations have an extremely elevated risk of nutritional stress. The main factors contributing to elevated nutrition stress are lack of food, security risks, high population density, inadequate food procurement and preparation, remote locations, and poor sanitation.

Refugees have been fleeing Burma since the early 1980s but to this date there is little published data on the nutritional status of this highly vulnerable population. The purpose of this study is to conduct a nutritional review and assessment in the refugee population in camps along Thailand's western border, shared with Burma. Evaluation tools will include dietary recalls, focus groups, key informant interviews, anthropometric measurements, and nutrient specific laboratory assays.

Specific Aims

The main objectives of this study are to determine the nutritional status of women and children (age 6 months to 10 years). This subset of the population is being evaluated since they are more sensitive to nutritional stress. The aim is to test the hypotheses:

1. Dietary intake for individuals residing in the refugee camps is inadequate to meet macronutrient and micronutrient requirements.
2. Individuals that have recently arrived (<2 months) in the camps have an increased prevalence of nutritional deficiencies as compared to individuals that have been in the camps for a longer period of time.
3. A portion of the ration that is provided to the refugees is being traded for additional foods to supplement intake and add variety. Only a portion of the ration provided is being consumed by the individual that it was intended for.

The study will provide an insight into the actual nutrition status of the Burmese refugee population by looking at food availability at the household level (Appendix 1), factors affecting nutritional deficiency outcomes (Appendix 2) and the nutritional status of individuals residing in the refugee camps. The goal of the study is to determine the extent of malnutrition and micronutrient deficiencies within the camps.

Overview of the Study

The scope of this research proposal is to conduct field surveys in refugee camps of Burmese in Thailand. Thai and U.S. team members will work together to gather information about the nutrition problems in the camps and the factors that demonstrate high relative risks for malnutrition. The project will serve as a model providing guidelines that can be exported to similar situations in other countries. Outcomes and recommendations based on the published research findings will assist in improving nutritional status in humanitarian missions throughout the world.

This research project brings together a variety of facilities and organizations in the U.S. and Thailand that will work together in a cooperative effort to ensure research project success. Miss Kongsomboon from the Thai Red Cross Society has been instrumental in coordinating research project requirements from within Thailand. Coordination and planning have been initiated with international nutrition experts, non-governmental organizations (NGO's), Thai Ministry of Public Health, University of Washington, U.S. Army Research Institute of Environmental Medicine (USARIEM), Armed Forces Research Institute of Medical Sciences (AFRIMS), Pennington Biomedical Research Center, and Burmese Border Consortium (BBC) in Thailand. The list of research team partners is in Appendix 3. They will work cooperatively in numerous capacities, i.e., support, laboratory analysis, nutrient analysis, personnel, equipment, facilities, and/or consultant.

Study Population

As of January 1999 there were approximately 114,000 refugees living within 16 refugee camps along the Thai/Burma border. The following Karen camps are tentatively selected for the survey work: Chumphon, population 275; Ban Don Yang, population 1,742; Nu Po, population 8,599; and Mawker, population 8,848 (Appendix 4). The research focuses on women and children (age 6 months to 10 years) since this population will best reflect the nutritional status of the population.

Refugees have limited or no income. Access to farmland, gardens, fishing, hunting, gathering, raising animals, and jobs is very limited. Security remains a problem. Food aid is being provided to the refugee camps. Rice rations are allocated per person on a monthly basis and each family also receives a share of calipe beans, oil, fish paste, chilies, and iodized salt.

Traditional food habits of the Karen consist of a diet high in carbohydrate that is primarily vegetarian. Protein is consumed in the form of fish, beans, and insects. Curry, onions and rice are

mainstays of the diet. Additional foods consumed include vegetable leaves, marrows, pumpkin, mushrooms, water-weeds, and hot peppers (Klaver, 1998).

Background Information

Most aid agencies report ongoing nutrition and food crisis within Burma. UNICEF recently reported 1 million children in Burma are malnourished. And information is poorest for the large groups of internally displaced persons (IDP's) clustered in the eastern portions of the country. To date no data on the nutritional status of Burma's emergency-affected population has been published internationally. Moreover, NGO's working in the camps have not produced standardized two-stage nutrition surveys among children, a deviation from standards followed in most other emergencies.

A mission evaluation report, noted that the rate of malnutrition might increase directly month-to-month based on the deterioration of the condition of the camp and/or indirectly by the influx of more malnourished people (Klaver, 1998). The report also addresses that current supplementary feeding programs have a variety of problems and need an evaluation study.

The lack of nutrition experts to backup the feeding programs is also an issue. As addressed in Dr. Paul Spiegel's report (1999), a majority of camps on the border report some vitamin B1 deficiency (Beri Beri), which was also common in past South East Asian refugee crises where refugees were dependent for extended periods on polished rice. Dr. Spiegel also reported that very few camps had properly completed the standardized two-stage cluster-sample surveys, making it difficult to record the prevalence of malnutrition among children under 5 years of age.

An International Rescue Committee (IRC) report stated that malnutrition has been observed as one of the major health problems in the camps (Menefee, 1997). Many refugees fleeing from Burma into Thailand, particularly children are susceptible to illnesses because of protein deficient diets. The unstable environment compromises health status, self-reliance, sanitation and nutritional status (Fox, 1996).

The causes of malnutrition are often complex and multi-factorial, especially in displaced populations. Due to the continued conflicts and population displacements in Burma, the refugees along the Thai/Burma border are a population that is at significant risk of nutrition related problems. Inadequate dietary intake and poor nutritional status plays a role in morbidity and mortality of a population by affecting the body's ability to fight and recover from disease. Individuals that are working within the Thai/Burma refugee camps express concerns relating to the nutritional crisis facing the refugee populations.

Data Collection Procedures

In the case of all the data-collection methods, the team will use two stage cluster-sampling techniques when identifying individuals or households. When registration rosters are available random sampling will be determined using a random number table. The imperative will be to

use randomization as a consistent approach that ensures general representation of the survey findings. (J Katz. "Sample-Size Implications for Population-Based Cluster Surveys of Nutritional Status" — 1995 American Society for Clinical Nutrition).

Biochemical surveys will be conducted among a representative sample of refugees. Serum will be analyzed for hemoglobin, serum ferritin, retinal binding protein (RBP), carotinoid profile (lutein, eaxanthin, betacryptoxanthin, betacarotene, lycopene), zinc protoporphyrin/heme ratio (ZPPH), mean cell volume, zinc, and vitamins A and E. Methods Reference: R. Gibson "Principles for Nutritional Assessment" (1990, Oxford University Press).

One key output of this project will be the operational insights about the feasibility of conducting blood sample assays within these refugee communities. This method will help uncover evidence of vitamin and mineral problems that are not elicited from clinic records or anthropometric measures.

Diet History surveys will be used to get an estimate of macronutrient and micronutrient intake and to outline general food diversity, availability, quality and quantity. The method of choice will be the 48-hour recall analysis, elicited via 1-hour long surveys with heads of households. Combined with information on nutrition values of foods, this will permit a best estimate of nutrient consumption and its adequacy. Information on region specific foods will be obtained from the Thai Ministry of Public Health and Mahidol University in Bangkok. Methods Reference: Pelto et al "Research Methods in Nutritional Anthropology" (1989, UN University, Japan).

Anthropometric surveys will be used to establish the prevalence of weight/height, body mass index (BMI), middle upper arm circumference (MUAC) and malnutrition among the population studied. Methods Reference: "MSF Nutrition Guidelines" (1995), Paris: Medecins Sans Frontieres.

Interview and market observation surveys will be the primary sources for information about how foods are used, how foods serve as a medium of exchange for social, political or other functions, and the extent to which food trade is an important predictive variable explaining prevalence of malnutrition. Methods Reference: Refugee Studies Programme "Responding to the Nutrition Crisis Among Refugees: The Need for New Approaches, Workshop Report" (1991, Oxford).

Food needs analysis will take into account the nutrition analysis, as well as interviews on program lessons to identify key recommendations for tailoring of food programs to help mitigate nutritional deficiencies in the future. Reference: Sphere Project "Minimum Standards in Nutrition" and "Minimum Standards in Food Aid" (1998, Geneva).

Timeline for Data Collection

The initial planning and coordination phase is underway and the pilot project will begin in the spring/summer of 2000. This research will allow a review of the nutritional issues and food security situation in the camps along the Thai/Burma border. The data collection portion of this research project will be conducted in the fall/winter of 2000. Data analysis will be completed

during 2001. The findings will be shared with the BBC and Thai Ministry of Public Health. The information will also be submitted for publication to ensure that the data obtained can be used to assist other NGO's, Ministries of Public Health, and the military in support of similar nutrition situations around the globe.

Data collection will be completed in two phases: The pilot phase will take approximately 3 weeks and is a preliminary visit to Thailand to coordinate the research project. Survey tools will be tested for validity during this phase. The camps that can be accessed will be outlined and demographic information will be obtained. Data to be gathered will include the numbers in the camps, percentages of infants and children between 6 months and 10 years of age, number of women, registers if possible, and the NGO's working in the proposed camps.

The second phase will be the actual data collection from within the camps and will take approximately 6 weeks. All anthropometric measurements, key informant interviews, dietary intake records and laboratory assays will be obtained within this timeframe.

Data Analysis

A combination of qualitative and quantitative data analysis methods will be used to obtain pertinent information for use in assessing the nutritional status, dietary intake and dietary adequacy of the refugee population. Analysis will use weight/height index values, BMI, MUAC, laboratory values, dietary intake records and key informant interviews.

Height for age is an indicator of chronic malnutrition. Weight for age is a composite indicator of both long-term malnutrition and current malnutrition. Weight for height is an indicator of acute malnutrition that tells if a child is too thin for a given height. MUAC is a simple fast and good predictor of immediate risk of death, and can be used to measure acute malnutrition. The results will be expressed as Z scores to allow international comparisons as well as for statistical reasons. BMI is easy to calculate, it correlates with subcutaneous total body fatness, and has statistical properties well suited for screening.

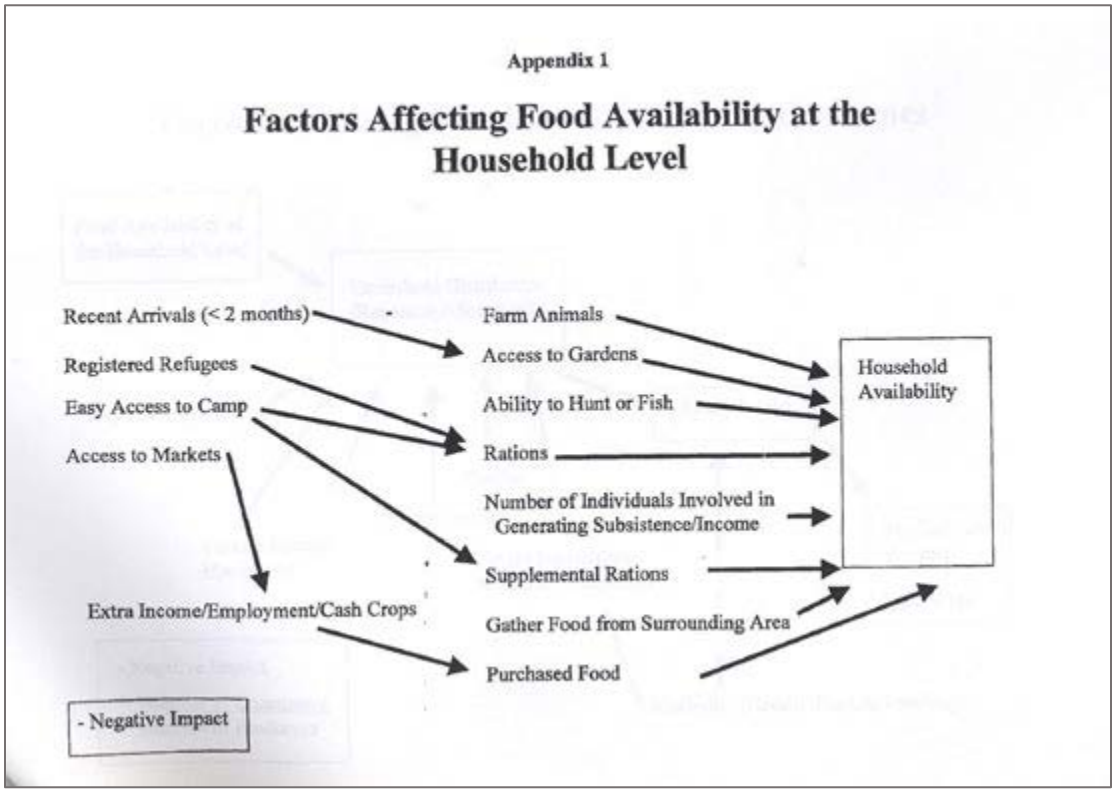
Dietary history surveys and key informant interviews will be assessed to get an estimate of macronutrient and micronutrient intake and to outline general food diversity, availability, quality and quantity. Combined with information on nutrition values of foods, this will permit a best estimate of nutrient consumption and its adequacy. This data will be evaluated against the reported ration provided. This data will also provide an insight into household eating habits and utilization of supplemental foods.

Lab data will be analyzed to determine the prevalence of micronutrient deficiencies. Serum will be analyzed for hemoglobin, serum ferritin, RBP, carotinoid profile (lutein, eaxanthin, betacryptoxanthin, betacarotene, lycopene), ZPPH, mean cell volume, zinc, and vitamins A and E. Laboratory data analysis and dietary intake data analysis will be conducted by Pennington Biomedical Research Center at no cost to the project.

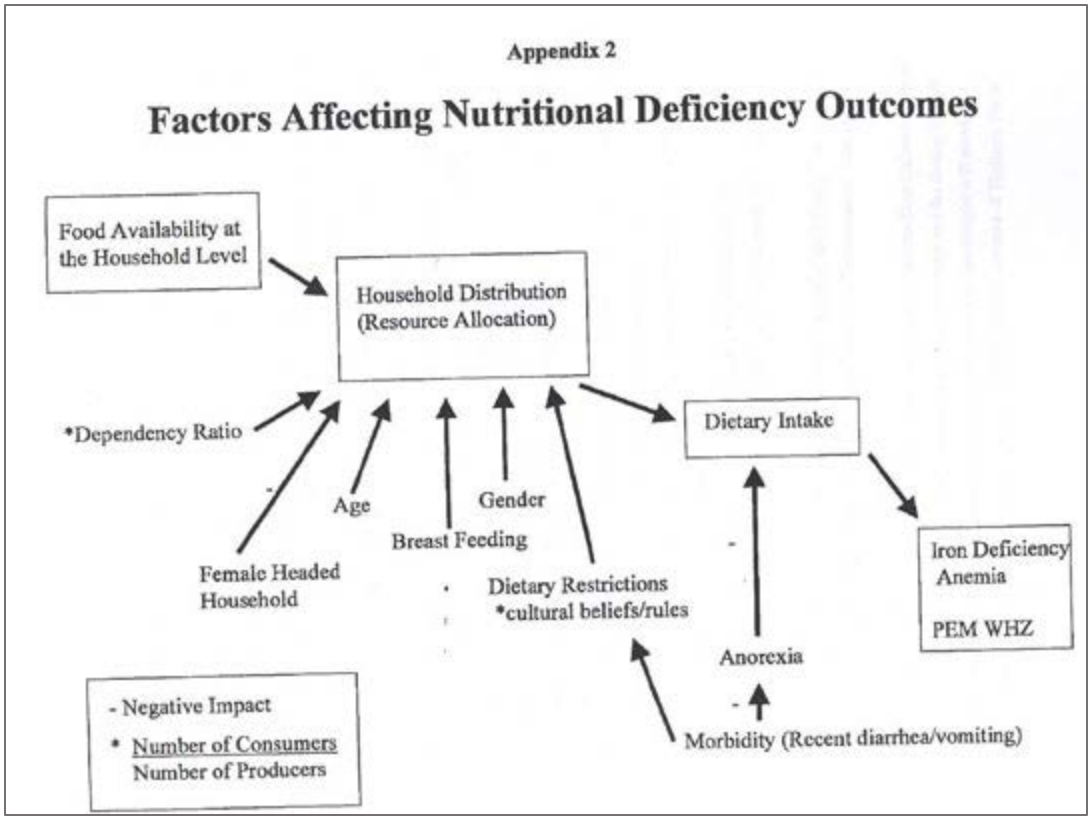
Significance

This collaborative research effort conducted by team members from Thailand and the US to determine the nutritional status of this significantly at risk Burmese refugee population is urgently required. The outcomes of this research will include an up-to-date nutritional assessment and will provide an insight into the actual nutrition situation within the camps along the border. During the field surveys, the team will gather data using biochemical surveys, diet histories, anthropometric measurements, key informant interviews, and market observations. The project assessment methods will serve as an exportable model to be used within similar emergency situations in other countries. Outcomes and recommendations based on the published research findings will assist in improving nutritional status of refugees and displaced populations around the globe.

Appendix 1



Appendix 2

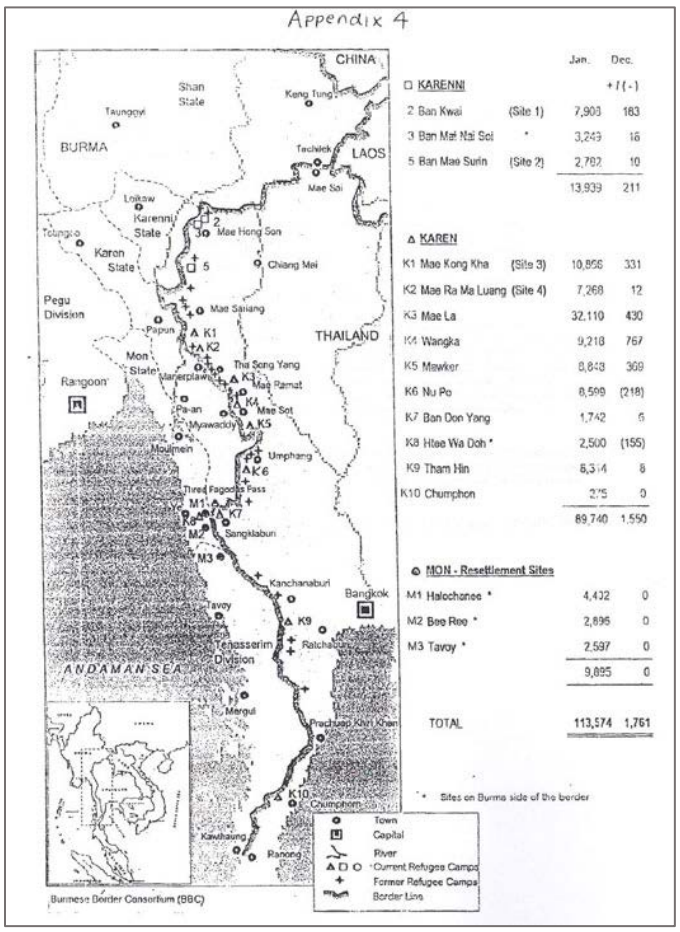


Appendix 3: Research Team Partners:

1. Principle Investigator and Team Leader: Teresa Kemmer, MS, RD, Major, USA, Registered Dietitian, University of Washington, Doctoral Program. International Committee of the Red Cross Health Emergencies in Large Populations graduate.
2. Thai Team Member: Wantanee Kongsomboon, Assistant Director of Relief and Community Health Bureau, Thai Red Cross Society; International Committee of the Red Cross Health Emergencies In Large Populations graduate, USA; Seminar on Emergency/Disaster Medicine JICA, Japan; and Disaster Management Course ADPC/AIT, Thailand.
3. Team Member/Consultant: Steve Hansch, MPH, Director, International Humanitarian Programs, Congressional Hunger Center, WA, DC. Works with NGO's, Congress, Administration, media, and foundations to improve humanitarian aid.
4. Team Member: Maria Bovill, Captain, U.S. Army Research Institute of Environmental Health, Registered Dietitian, MPH, Nutrition and International Health, University of California Berkeley.
5. Team Member: Lab technician or biochemist. Coordination is in progress to determine if this team member will be traveling from the US or will be from within Thailand.
6. Additional Team Members: Various refugee nutrition experts will be tapped as the project schedule permits their inclusion.

7. Consultant: Battina Shell-Duncan, PhD, faculty and academic counselor, University of Washington, will be advising on this research project. She has done extensive nutritional anthropology research in Kenya.
8. Consultant: Harris R. Lieberman, PhD, is Deputy Chief of the Military Nutrition and Biochemistry Division of the U.S. Army Research Institute of Environmental Medicine (USARIEM) in Natick, Massachusetts.
9. Consultant: Pennington Biomedical Research Center, Louisiana State University, Baton Rouge, LA will be completing the nutritional analysis on the assays and the dietary records. Sahasporn Paeratakul, MD, faculty member and nutritional epidemiologist will provide consultation and help facilitate coordination with the Nutrition Institute of Thailand. He is originally from Thailand.

Appendix 4



The completed study of this project has been reported in the [Journal of Nutrition Vol. 133:4143-4149, 2003].