A Project of the Rotary Club of Devonport North
District 9830 & Food Plants International

Exploring the opportunities for Learn Grow in a new country or region

Introduction.

Learn Grow has been developed to address malnutrition and food security in countries or regions in need. By "unlocking" information on local foods immense food resources can be available and in the process:

- children who would otherwise die due to malnutrition will have a chance to live
- people who are suffering blindness due to lack of vitamin A may see clearly again
- food security can be significantly enhanced
- costly food imports can be reduced
- nutritionally related diseases that impair growth, cause intellectual disability and needlessly reduce quality of life can be reduced or eliminated

This paper has been developed to assist such parties interested in exploring the potential of developing a Learn Grow program in a region of interest. It assumes that a reasonable knowledge of the Learn Grow concept has already been gained but a concise overview is provided. Interested parties may already be actively engaged in projects in the region of interest and being aware that nutrition and food supply are important issues may wish to consider extending their activities into this area.

The problem

As global population approaches 7 billion, the number of people in developing countries going to bed hungry every day is approaching 1 billion and increasing. Western food-aid programs are failing to address this problem, yet the paradigms that help perpetuate this failure continue to be re-iterated. In acute food shortages, direct aid is essential, however, sustainable food security must involve self-help. Western food aid programs focus on Western food crops that are often do not grow well as they are poorly adapted or unsuitable for target countries.

They require high-cost inputs, that people earning less than $2 per day cannot afford and which inadequate supply logistics cannot deliver. They often cannot be produced sustainably, and more often than not, lack the essential nutrients to prevent malnutrition in the countries with the greatest need.

The Solution - Food Plants International Database

Tasmanian agricultural scientist, Bruce French, conceived a solution to address this problem by unlocking the resources available in local food plants. Whether they are native or introduced, by their very occurrence, local plants demonstrate their adaption to the prevailing environment and pest and disease pressures. Those that are well adapted thrive naturally, without the need for costly inputs such as seed, fertilizers and chemicals. Many such plants are edible, and if those with the highest levels of nutrients missing from the diet can be identified and cultivated, then significant potential exists to address malnutrition sustainably in developing nations. The only element missing from making this possibility a reality is the lack of information on the relevant food plants that would encourage people to incorporate

them into their own regimens for improving their own health and the health of their families. Recognising this need, Bruce French set out on a personal quest nearly 40 years ago to rectify this situation by creating the largest database of edible plants that has ever been developed. This database currently contains information on more than 22,000 plants from all countries of world, including names, description, occurrence, production information, edible parts, pictures and references. Most importantly, information on the food value is now included. What was a simple and good idea is therefore now a tangible possibility.

Learn◆Grow

The Learn◆Grow project was developed by the Rotary Club of Devonport North and Rotary District 9830 to help create awareness of this solution and encourage its application. Rotary continues to engage in aid programs in developing countries and one objective is to ensure a Learn◆Grow approach is incorporated into these projects. The many government organisations and NGOs from developed nations that provide food aid should not only be aware of the existence of this solution and its potential, but encourage or prescribe its incorporation into existing and new programs. This concept has real potential and is becoming widely recognised by those who possess the technical knowledge to understand its significance. If it fails to achieve recognition by major aid providers, the current ineffective paradigms will only be perpetuated. It is therefore vital that all organisations facilitating or delivering food aid consider the technical merit and significance of the resource that has been created.

How to determine need

There are many indicators of need, some are obvious but others are less so. From existing experience in the country or region in question it may be quite obvious that hunger and malnutrition are widespread and local people are desperately in need of assistance in overcoming problems of food supply. The following examples provide possible indicators to confirm and quantify the need. Some or all of these indicators and others may reinforce and confirm a need and the potential value on implementing a Learn Grow program to address that need.

Infant mortality

Statistics on infant mortality to age one and child mortality to age five are commonly developed for most countries. Approximately half the deaths of children in these age groups are directly or indirectly linked to malnutrition so it is easy to understand that these statistics are closely correlated with malnutrition and thus provide a prime indicator. The global average for infant mortality is around 50 per 1000 births so any country approaching or exceeding this number can be considered a priority. Similarly with child mortality the global average is approaching 70 so this figure provides a convenient threshold for indicating priority.

Malnutrition

Protein-energy undernutrition (PEU) is an deficit due to chronic deficiency of all macronutrients. It commonly includes deficiencies of many micronutrients. PEU can be sudden and total (starvation) or gradual. Severity ranges from subclinical deficiencies to obvious wasting (with edema, hair loss, and skin atrophy) to starvation. Multiple organ systems are often impaired.

In developed countries, PEU is common among the institutionalized elderly (although often not suspected) and among patients with disorders that decrease appetite or impair nutrient digestion, absorption, or metabolism. In developing countries, PEU affects children who do not consume enough calories or protein.

Primary PEU is caused by inadequate nutrient intake. In children, chronic primary PEU has 2 common forms: marasmus and kwashiorkor. The form depends on the balance of nonprotein and protein sources of energy. Starvation is an acute severe form of primary PEU.

Marasmus causes weight loss and depletion of fat and muscle. In developing countries, marasmus is the most common form of PEU in children.

Kwashiorkor is associated with premature abandonment of breastfeeding, which typically occurs when a younger sibling is born, displacing the older child from the breast. So children with kwashiorkor tend to be older than those with marasmus. Kwashiorkor may also result from an acute illness, often gastroenteritis or another infection in a child who already has PEU. A diet that is more deficient in protein than energy may be more likely to cause kwashiorkor than marasmus. Less common than marasmus, kwashiorkor tends to be confined to specific parts of the world, such as rural Africa, the Caribbean, and the Pacific islands. In these areas, staple foods (eg, yams, cassavas, sweet potatoes, green bananas) are low in protein and high in carbohydrates. In kwashiorkor, cell membranes leak resulting in peripheral edema.

Blindness

Lack of vitamin A is essential for the functioning of the immune system and can lead to irreversible blindness. Each year more than 250,000 children become blind due to vitamin A deficiency. But before that, a child deficient in vitamin A faces a 25 per cent greater risk of dying from common ailments, such as measles, malaria or diarrhoea. Night blindness is one of the first signs of vitamin A deficiency but greater degrees of deficiency not only result in transient and permanent blindness but increased childhood morbidity and mortality and maternal mortality as well. Improving the vitamin A status of pre-school age children in developing countries can reduce childhood mortality by up to 50%.

Anaemia

Iron deficiency is the most common and widespread nutritional disorder in the world affecting a large number of children and women in developing countries. Over 30% of the world's population are anaemic, many due to iron deficiency, and in resource-poor areas, this is frequently made worse by infectious diseases. Malaria, HIV/AIDS, hookworm infestation, schistosomiasis, and other infections such as tuberculosis are particularly important factors contributing to the high prevalence of anaemia in some areas.

Iron deficiency affects more people than any other condition, constituting a public health condition of epidemic proportions. More subtle in its manifestations than, for example, protein-energy malnutrition, iron deficiency exacts its heaviest overall toll in terms of ill-health, premature death and lost earnings.

Iron deficiency and anaemia reduce the work capacity of individuals and entire populations, bringing serious economic consequences and obstacles to national development. Overall, it is the most vulnerable, the poorest and the least educated who are disproportionately affected by iron deficiency, and it is they who stand to gain the most by its reduction.

Impaired Growth

Zinc deficiency is the fifth leading risk factor for disease in the developing world. It is a functionally essential component of more than 100 enzymes, involving all metabolic pathways, has a fundamental role in gene replication and function, mediates the activity of growth hormone and supports immune function. Zinc deficiency is characterized by growth retardation, loss of appetite, and impaired immune function.

Zinc is not only essential, but because it is involved in so many important process may even be “first” limiting. This means it is the critical limiting factor in the diet. Zinc is especially needed in times of rapid growth and is therefore a particularly important nutrient for infants and young children. Zinc deficiency has been widely attributed to causing impaired growth in children.

Intellectual Disabilities

Eighteen million children per year are born with impaired mental abilities due to iodine deficiency. Nearly two billion individuals have insufficient iodine in their diets, including one third of all school age children. Populations with chronic iodine deficiency have been determined to have increased levels of mental impairment.

Iodine is a mineral essential for human development and growth. Iodine is needed to produce the hormones that regulate the thyroid gland. The most commonly known sign of iodine deficiency is goiter, the swelling of the thyroid gland in the neck. Iodine deficiency primarily affects the developing brain. It can also lead to cretinism, the most serious form of mental retardation and associated physical disabilities.

Identifying key nutritional issues

The local population may be hungry and/or malnourished, in obvious need and asking for help. Experience with an existing project may have created awareness of a need to address hunger or malnutrition and prompted action.

Statistics may be available from surveys of the population which indicate the level of nutrients in the population important to health and wellbeing. Information may be available on nutritionally related diseases or specific disorders that commonly occur in the population. Such information will help to confirm and quantify need and will also provide valuable information on where to focus. The UN website is a good source of information.

Government agencies involved with health, children, mothers, education and agriculture are normally prime sources of such information. An existing aid community is also a prime indicator of need and a good source of information. It is therefore a good idea to communicate with personnel involved with Non-Government Organisations and existing aid projects. Other potential sources of information include community organisations, women’s groups and missions, and there may be many others.

The most important information to determine in this process is to identify the key nutrients missing from the diet and those giving rise to nutritional related disorders in the population.

Investigation of diet

Having determined the important nutritional issues giving rise to malnutrition it is important to understand what key nutrients are present in the normal diet of the people in the region. Most regions where established populations exist would have developed with an established source of carbohydrate rich energy food, a starchy staple, available to sustain the population. This may be rice, corn, wheat, millet, sweet potato, taro, yam, breadfruit, banana or one of many others. To this will be added other plant or animal foods. It is useful to understand what other plant foods are commonly included in the diet and what nutrient value they contain. Many of the starchy staples are quite low in protein and other essential nutrients. In some cases they are quite abundant and are used to satisfy hunger while at the same time

exacerbating malnutrition. Agricultural ministries in many countries and the FAO are good sources of information.

Animal products and fish are good sources of protein and normally have good levels of many essential nutrients that help prevent malnutrition. If animal products make up part of the diet it is important to understand how often they are used and what amount is involved.

Investigation of typical diet in this way will enable a determination to be made as the likely levels of key nutrients that are present in the diets and what may be lacking. This will help determine whether it is worthwhile considering what local food plants may be available and what key nutrients should be considered when selecting possible locally occurring plants.

Food Security

Regularity of food supply is an important issue and the source of the major part of the food supply is a dimension of this. Some regions rely heavily on imported food. Sourcing such food may not only impact the economy of the country or region but may also impinge heavily on the available funds a typical family may have at their disposal. Poverty may render such people unable to sustain purchases of foods at all times or in sufficient amounts and this give rise to under-nutrition on an occasional or chronic basis. At the same time circumstance could give rise to imported food sources not being able to maintain supply through critical periods.

Food grown and sourced locally can be occasionally or regularly be affected by seasonal, climatic, environmental or pestilence events that give rise to shortfalls in supply. Such situations commonly predispose to hunger and malnutrition.

Increasing knowledge of local food plants that can form the major part of the diet can help ensure that supplies of essential foods are sustainably available at all times of the year, every year. The best way to ensure food security is to grow a wide range of food plants. It is likely that some plants are able to survive adverse conditions better than others and will help ensure sustainable food supply.

Historical and Cultural Issues

History and culture are key factors in the development of the foods that make up the typical diet in any country or region. The prevailing environment many have changed traditional diet over time. In some places animal products may have traditionally formed a major part of the diet but population growth and depletion of resources has often resulted in animal products being eliminated from or restricted in the diet. The same has often occurred with many foods that have been harvested from the wild. Such issues have forced change.

In other cases traditional foods have been gradually been eliminated from diets due to the influence of western foods being introduced and adopted because they are seen as being and seen as more civilised, more sophisticated or more nutritious. In some situations consumption of such foods is seen to confer an elevated status. Western diets are made up of a wide range of foods and normally include a range of animal products. For this reason malnutrition is rare in a western developed society. However, the plant food sometimes commonly included in western diets may be quite low in essential nutrients. Common examples of foods introduced into developing countries that have relatively low nutrient value include ballhead cabbage, lettuce and onions. In the face of this, traditional local food plants are slowly being

eliminated from local diets and are being replaced by foods that are less effective at addressing local dietary needs.

Thus food habits are deeply ingrained in any culture and will not be readily changed. As traditional foods get eliminated from local diets, much key information on them ends up being lost. Re-discovering their heritage and the immense value of their traditional foods can help raise interest in these foods. This can be further enhanced if the knowledge can be made available that incorporating local foods into their diet can make their babies healthy, avoid blindess, promote energy and wellbeing and also provide more disposable income.

Local Interest

Exploring and researching the issues already highlighted is likely to establish whether a need exists in the region and that it could benefit from the development of a Learn Grow program. In the process it is likely to have engaged with a range of individuals and organisations with an interest in malnutrition and food security in the region, who may not only help confirm the need but may also have an interest in further collaboration. In the development of any new program it is considered particularly useful to establish contact with a local organisation or group who would have an interest and commitment to engage in the further development of a proposed program. This is considered a particularly important precursor to success.

Further information

- Learn Grow website www.learngrow.org
- Learn Grow Volunteers Handbook
- Learn Grow Protocol for Engagement
- Learn Grow Volunteers Training Manual