



Food and Agriculture Organization  
of the United Nations



World Health  
Organization

# ICN2 Second International Conference on Nutrition

better nutrition better lives

## **Nutritional Deficiencies as Driver for Agriculture Value Chain Development: Lessons from the Field**

Paul Sommers<sup>1</sup>

---

<sup>1</sup> California State University Fresno Center for Agricultural Business [psommers@csufresno.edu](mailto:psommers@csufresno.edu)

Paul Sommers has been an active proponent for the integration of agriculture and nutrition for over three decades. He holds academic degrees in both agriculture and nutritional sciences and has taught both subjects as a faculty member in California State University system. As a field practitioner, he has promoted the link through a variety of channels including the United Nations, World Bank, USAID, Peace Corps, NGO's, and companies. Field activities have included on the ground technical assistance in over 55 countries; management of long term food security projects; capacity building through community based workshops and the publication of several field training manuals and "how to" books on the food production nutrition linkage for community outreach staff.

The designations employed and the presentation of material in this publication do not imply the expression of any opinion whatsoever on the part of the Food and Agriculture Organization of the United Nations (FAO) or of the World Health Organization (WHO) concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. Dotted lines on maps represent approximate border lines for which there may not yet be full agreement. The mention of specific companies or products of manufacturers, whether or not these have been patented, does not imply that these are or have been endorsed or recommended by FAO or WHO in preference to others of a similar nature that are not mentioned. Errors and omissions excepted, the names of proprietary products are distinguished by initial capital letters. All reasonable precautions have been taken by FAO and WHO to verify the information contained in this publication. However, the published material is being distributed without warranty of any kind, either expressed or implied. The responsibility for the interpretation and use of the material lies with the reader. In no event shall FAO and WHO be liable for damages arising from its use.

The views expressed herein are those of the authors and do not necessarily represent those of FAO or WHO.

© FAO and WHO, 2013

FAO and WHO encourage the use, reproduction and dissemination of material in this information product. Except where otherwise indicated, material may be copied, downloaded and printed for private study, research and teaching purposes, provided that appropriate acknowledgement of FAO and WHO as the source and copyright holder is given and that FAO and WHO's endorsement of users' views, products or services is not implied in any way.

All requests for translation and adaptation rights, and for resale and other commercial use rights should be made via [www.fao.org/contact-us/licence-request](http://www.fao.org/contact-us/licence-request) or addressed to [copyright@fao.org](mailto:copyright@fao.org).

FAO information products are available on the FAO website ([www.fao.org/publications](http://www.fao.org/publications)) and can be purchased through [publications-sales@fao.org](mailto:publications-sales@fao.org)

## Abstract

The search for effective ways to link agricultural resources to resolve nutritional problems has been an on and off challenge for more than 4 decades. Despite the impressive surge in effort over the past few years the fact remains genuine integration at all levels is very challenging. Why?

If our collective challenge is to solve specific diet-related deficiencies, effectively communicating that challenge is the clear starting point so that barriers to change are broken and awareness and demand for change is created. If approached in this way it comes down to a demand/ supply challenge.

My straight forward approach to managing field projects has followed this simple point. Starting with the specific maternal/child nutritional gap and/or illness in zone of influence the staff explored how that problem (demand) could actually be addressed when viewed as a driver for agricultural supply chain upgrading. In other words, diet-related problems like the under-consumption of certain foods containing micronutrients (e.g. iron or carotene); diseases (e.g. diarrhea) or food safety issues (e.g. aflatoxin) can be prompts for adding value to crops that can in turn contribute to the solution.

This represents a counter-intuitive response to most of status quo thinking about “nutrition” interventions. When viewed this way the key interventions from the technical support areas comprising agriculture, nutrition, health, business and cross-cut areas including gender and environmental resilience become contextual, strategic and clear for all. Nexus points are identified, messages are designed jointly and are mutually enforcing. Field activities are no longer implemented in isolation and at cross purposes.

This paper presents actual field experiences where using nutrition as the driver for all sizes of agricultural value chain activities does result in lasting change. The policy implications of this approach are also discussed.

## Contents

Nutritional Deficiencies as Driver for Agriculture Value Chain Development: Lessons from the Field.....	1
1. Introduction.....	4
1.1. Agricultural value chains: one current model .....	5
1.2. We Can Do Better .....	5
1.3. Do market driven solutions work to address nutrition problems? .....	6
1.3.1. Pathway #1 -Locally prepared “therapeutic” products. ....	6
1.3.2. Pathway #2 Unprocessed-fresh produce .....	8
1.3.3. Pathway #3 Health issues.....	9
1.3.4. Pathway #4 Food safety as driver .....	9
2. Some lessons learned: common pitfalls and ways to mitigate .....	11
2.1. Having the right management staff to get the job done .....	11
2.2. Agriculture and nutrition linkages are really about demand and supply.....	12
2.3. Social marketing/Behavioral change communications (BCC) are essential to creating demand	12
3. What are some tools practitioners need going forward?.....	16
3.1. Speaking the same language. ....	17
4.1 The Role of Governments .....	20
4.2 The Role of the Private Sector - making the value chain work.....	20
4.3 The Role of Development Agencies .....	21
Summary .....	25
Critical Issues.....	25
Policy Recommendations and Investment Priorities.....	26

## 1. Introduction

The practical linkage between food production and consumption, intuitively practiced at varying degrees by hundreds of millions of households around the world since the beginning of cultivation, remains an ongoing challenge for the world’s leading researchers and practitioners. After more than 5 decades and billions of dollars invested, the development community is still basically asking the same question: Why can’t the community of practice figure out how to close the dietary gap by getting Jayne or Johnny to regularly eat a handful of dark green leafy vegetables or ½ cup of orange pumpkin or sweet papaya? These and other nutrient dense foods are traditionally known and grown by communities long before development assistance arrived.

It is not so much a question of insufficient technical information. Type in “food security” in any search engine and 960,000.000 internet sites come up. Libraries around the world are full of hardcopies on every aspect of agriculture food and nutrition. Top academic institutions have offered courses, certificates and degrees in food security for years.

In the past few years there has been a resurgence of interest in tackling the linkage issue. There are now so many efforts and more to come that duplication is becoming a concern. Most of the efforts aren't even coordinating with one another. One could feel totally overwhelmed at keeping up with all the meetings /conferences /publications / communities of practice/blogs etc. Every group/program seems to think it has the right approach to solving the problem. And that in itself is a big part of recurrent problem: silos.

### **1.1.Agricultural value chains: one current model**

While integration theories abound amongst academics, in the past few years much discussion has been generated around development funding beginning to back the concept of using existing agricultural supply chains to address nutritional issues. The theory goes that if existing supply chains for say coffee, cocoa, and cashew nuts could be upgraded that the value added to that crop would translate into increased revenue and coupled with general nutrition education would indirectly contribute to improved food consumption and finally result in better nutrition. This approach is what some people understand to be nutrition-sensitive agriculture.

In reality this has meant so far that an agricultural value chain serves as *the* driver with nutrition figuring out where to fit in. Nutrition is still seen as finding its place within an agriculturally driven exercise usually with some type of “education” component. In my experience the value chain approach as promoted here continues to feed into the silo issue.

The collective challenge is how the community of practice breaks down their silos so that its combined knowledge, skills and resources are united and used towards the aim of food security.

### **1.2. We Can Do Better**

The marketplace is the nexus between agriculture, supply chains and consumption. As food market systems are expected to grow at all levels, especially post-harvest /processing, they have to be included as a main driver for addressing specific nutritional deficiencies through judicious use of agricultural resources.

The recent emphasis on market based solutions using a value chain framework as a driver for agricultural growth offers a real opportunity to improve nutritional wellbeing and health as well. How? Agriculture responds by supplying the demands for specific foods. Nutrition, through identification of specific dietary gaps, creates demand for foods to close those consumption gaps, thereby contributing to the creation of new or expansion of existing markets. These can be calorie- and or nutrient-dense/rich foods depending on the local situation.

Examples of market driven initiatives from the field ranging from micro/subsistence enterprises to multi-nationals will be presented that have put the improvement in the consumption of nutritious foods at the center and have shown that agriculture will respond to the demand created for specific nutrient dense/rich foods undersupplied in diets. Examples will be presented through primary principles and paths for addressing specific nutrition issues through agriculture.

### **1.3. Do market driven solutions work to address nutrition problems?**

Approximately 4 billion people subsist on less than \$2.00/day. That means they interact with the marketplace and most frequently with the informal /subsistence marketplace. So how do we build on this type of marketplace dynamics to address local specific diet related nutritional issues? How do we effectively use the paths available to us to achieve integration through the marketplace? The marketplace strategy is not a panacea as it needs to consider the different levels of consumers. The proposed strategy is appropriate in the long term as incomes continue to rise in both rural and urban areas. It is appropriate today for those with income to purchase at least some nutritious foods. For the resource poor with inadequate income to purchase a diverse diet throughout the year but who do have access to land in their homelot, growing nutritious crops missing in their diet for direct consumption is their best use of resources.

#### **1.3.1. Pathway #1 -Locally prepared “therapeutic” products.**

While traditional societies have a long history of healing practices from homemade preparations based on local flora and fauna, commercial products have entered the marketplace in recent years, from local to global, which serve as drivers for agricultural value chain growth.

#### ***Nutri-noodle***

The Nutrition Center of the Philippines has produced high-calorie, high protein ready to cook “Nutri-noodle” for several decades. It started with a commonly consumed product, instant noodles, and fortified it with vitamin A, fish powder and seasoned with iodized

salt. A pack of Nutri-Noodles provides 17% of the RDA for energy, 24% of the RDA for protein and 33.3 % of the RDA for vitamin A of a pre-schooler.<sup>1</sup>

### *Mango drink*

Demand for mango fruit juice, a good source of vitamin A and C continues to grow globally. Mango trees are primarily grown by small producers and are rarely managed for commercial purposes. Coca Cola, in response to the rising demand, has increased its interest in buying mangos from small plot growers. Coke's marketing power has opened up local and global supply chain opportunities for small growers. Coke is working with Technoserve in East Africa and Haiti to improve the productivity of small plot mango growers. The mango drink initiative is example of how using a market based approach can address the twin needs for income and improved diets. <sup>2</sup>

### *Pomegranate juice*

The global growth in demand for pomegranate juice is another example of how health/nutrition is a driver for value chain growth.

Before 2002 pomegranate was a virtually unknown crop outside of its traditional growing areas of the Middle East and south Asia. Since then the promotion, especially by POM Wonderful of the health properties associated with pomegranate has seen the demand for pomegranate products grow dramatically. In California, where POM is headquartered, market demand has resulted in the growth of a whole new supply chain. From almost no commercial growers before 2002, now some 30,000 acres have been planted in California and more are going in each year. The demand has created jobs throughout the chain from research and development to input suppliers, growers, farm personnel, processing, transportation, retail, etc. <sup>3</sup>

### *Coconut water*

The commercial growth in coconut water products in high income countries is another example of how health /nutrition drive value chains. Long known for its therapeutic value for rehydration amongst coconut growing communities in the tropics, coconut water sales are growing exponentially as a healthy rehydration drink for the sports crowd. In just the past few years it has grown so fast that sales will reach 1 billion dollars soon.<sup>4</sup> This demand could have far reaching economic implications for the many small plot coconut growers who often live along coastal areas and who are amongst the most food insecure.

### 1.3.2. Pathway #2 Unprocessed-fresh produce

More than two billion people in developing countries – the vast majority of whom are women and children – suffer from micronutrient deficiencies. The expansion of horticultural crops can play a dynamic role in solving this global micronutrient crisis and in return increases incomes and job opportunities, particularly for women who in spite of cultivating small plots can often supply high value vegetables on a continuous basis.

Local markets around the world are full of locally produced nutrient dense fruits and vegetables and calorie dense grains, tree, and root crops. Small roadside vendors usually procure from local growers. So what examples are there that show fresh produce can be a target for value chain development?

In economically advanced countries the meteoritic rise of fresh kale is a case in point where nutrition/healthy eating is the driver for kale's spectacular value chain development. It is touted as a super food rich in vitamins and minerals. Long known in Europe and found in highland home gardens in East Africa, the USA is just in the initial discovery stage. It can be found year round in farmer's markets, in trendy restaurants, and in juice form in a variety of health drink shops.<sup>4</sup>

The blueberry is another example of a nutritious "super food" which has seen its value chain growth skyrocket. With the demand increase has come advances in crop science which has meant that berries grown traditionally in cooler wetter climates are now grown in warm climates include California's dry San Joaquin Valley.<sup>5</sup>

Over the past decades community based "nutrition oriented" food production projects in at risk communities have used a single crop strategy to improve consumption of a specific nutrient missing in the local diet. Local efforts to address dietary gaps using traditional crops have also proven to be successful. One example from the Pacific islands is the promotion of the "red banana", a traditionally consumed carotene containing food as a safe weaning food for infants and as a snack for young children. Households were encouraged to grow it to close the dietary gap in their homelot either for direct consumption and or for income in the local marketplace.<sup>7</sup>

Recently there has been a renewed effort on a large scale to promote specific crops to address specific nutritional issues with a market demand structure. Harvest Plus is one of the leading global agencies in this effort. They are currently undertaking promotional activities with several crops including orange flesh sweet potato and iron rich beans. Initial data show that promotional efforts are yielding positive results. Small plot growers are actively participating in these demand driven chains. Impact varies according to location. <sup>6</sup>

In sum, demand can be created for fresh food crops based on nutritional value and agricultural value chains can see growth by meeting the demand from rural markets where households produce their own food to large scale markets for urban consumers.

### **1.3.3. Pathway #3 Health issues.**

Can the prevalence of diarrhea or intestinal parasites be drivers for value chain growth? Are traditional indigenous crop-based pharmacies or a "living pharmacy" a potential window for value chain growth? Can demand grow for low input crops such as guava, papaya, and drumstick tree - multipurpose plants with nutritional and medicinal value? With the continuing rapid rural to urban migration, especially in parts of Africa, demand for traditional curative products is continuing to grow. Newly arrived residents may no longer have access to their medicinal garden plants. This has created demand for indigenous crops and accelerated supply chains from small growers in farming communities that didn't exist previously. 8

#### **Sea buckthorn (*Hippophae rhamnoides*)**

In Armenia, the bush is grown uncultivated on the shores of Lake Sevan. It is known as a traditional cure-all medicine. It is also very high in carotene. The ASME Project supported one of its clients to bring it from a home based preparation to a small commercial size operation where the product was sold through pharmacies. A leading fruit juice processing company offers sea buckthorn juice as well. While the product was known, strategic advertising from the pharma and juice sectors boosted demand and sales. This in turn led to modest job creation and growth in one of the more economically depressed areas of the country. 9

### **1.3.4. Pathway #4 Food safety as driver**

Can food safety concerns i.e. micotoxins, Avian Flu, also be drivers for value added agriculture? Can specific toxins in a supply chain be addressed by key actors thereby improving food quality and marketability?

#### **Aflatoxin**

As the interest in producing locally fortified pastes continues to grow local versions of the commercial Plumpy nut, a therapeutic product often based on peanut which is used to treat acutely malnourished children, is another example of how the marketplace drives income growth for small growers by addressing demand driven consumption issues. While the challenges are very real in terms of securing the necessary quality and quantity from local farmers, the fortified paste value chain offers opportunities to address these food safety related issues. One quality issue is the occurrence of aflatoxin especially in peanuts. There are specific production and post-harvest actions that can

be taken to reduce the incidence of aflatoxin. Recent work in Malawi has shown that supply chain actors will respond once the market signals are clear. So the fortified paste example shows how availability, access, and utilization (in this case determined by safety) can be addressed through market demand. 10

### Avian Flu

In 2004, Armenia was classified by the U.N. as being in the Bird Flu “risk zone.” Officially, there had not been one confirmed case of domestic poultry contacting avian flu or the H5N1 strain. However, rumors of bird flu spreading throughout Armenia and its potential economic fallout for Armenia’s poultry sector supply chain made up of small producers was a very real concern to the staff of the USAID funded DAI managed Assistance to Small and Medium Enterprise (ASME) Project. The project mission was to work with small and medium enterprises SME’s, primarily agro-based, to grow in order to compete effectively in the domestic and global marketplace. It had on-going program activities in the poultry sector. These were in the form of market demand and analysis and direct client support from the ASME staff. With sales diving, ASME’s primary challenge and direct project interest was to work with existing poultry industry clients to return them to competitiveness and profitability. ASME determined that the key was to rebuild confidence amongst poultry consumers that Armenian poultry was safe to consume. This demand creation embarked on a two pronged approach working both with private sector clients and the veterinarian service of the government. The entire poultry supply chain was thoroughly analyzed and hazard points identified. Fortunately most of the safety interventions were tweaking/reinforcing what the private sector did already so additional safety investments were not a major challenge. Government and private vets were provided with intensive workshops on avian flu. Commercial producers also received training. Home level producers of chickens, ducks, and turkeys received essential safety information through mass media. The public awareness campaign was also done through a mass media strategy aimed at reassuring the poultry supply was safe and that Armenian producers and veterinarians were working jointly to keep the supply safe.

The strategy worked and after an initial decline in sales, consumption returned to near normal levels. The government has safeguards in place just in case. In addition, the Armenian public benefitted from a new and higher level of food safety that continues today. 11 This example is important as it shows the strategic support role government can play in adding value to an existing commercial supply chain.

So the marketplace works. Examples of 3 paths have been provided here as a start off point for further discussion. In each one of these cases acceleration of the marketplace was a matter of (1) creating demand through the optimal use of social

marketing/behavioral change communication, including IT/mobile technology, to get those critical messages to persons who are at risk couple with (2) the supply chain responding to specific in-demand market products in terms of quantity, quality, and timeliness thus improving availability and affordability/access and improving utilization.

These 3 general paths are designed to engage and encourage value chain participation by food insecure households due to the fact that each pathway is based on low input crops that are known and grown in the community and where gender roles are clearly defined. Their “worth” is highlighted thereby raising not only their income and food value but prestige as well. Through the pull effect of the marketplace, participation by resource poor households can be in several different ways from crop production to post-harvest and or through providing labor or technical services along the supply chain as well.

These pathways also build local resilience and sustainability as they work with existing crops and their systems as well as reinforce and upgrade local knowledge and skills.

For nutrition programmers the range of agricultural value chains presented here were designed to provide you with a better understanding of options for creating your demand messaging. The shorter the supply chain, the more local it is, the more the demand message is regarding specific nutritional deficiencies in the local community, and the more likely food insecure households can participate as seller or buyer as usually only modest amounts are required in small markets.

## **2. Some lessons learned: common pitfalls and ways to mitigate**

We have seen a range of examples showing that demand for nutritious food products can be a driver for upgrading agricultural value chains. So how does the community of practice ensure development assistance and resources are used effectively? What unique combination of management skills are needed to guide project staff? How do we make sure the words we use to describe interventions accurately reflect that expected action to be taken? Is the linkage about nutrition and agriculture or about supply meeting demand? What position do communications occupy in creating demand?

### **2.1. Having the right management staff to get the job done**

This sounds obvious but in reality finding truly qualified managers with a combination of skills and field experience in value chains, communications, agriculture and nutrition remains a challenge going forward. The manager has to know how all of these components fit together so that they are mutually supportive and all work towards the unified aim of improving food security. Studies have shown that very few projects

actually succeeded at real integration which may be an indication that the talent pool is limited of truly qualified managers .

I have run nutrition oriented value chain projects with technical specialists as staff and while there was nearly always a tendency to build a silo and retreat to their comfort level it was my management challenge to have them work jointly throughout the project cycle from design to implementation to monitoring and evaluation. Communicating to the staff from day one that their technical expertise is *contributing* to a high goal - food and nutrition security – and that the marketplace drives the project’s strategy was key to accomplishing integration.

## **2.2. Agriculture and nutrition linkages are really about demand and supply**

Once the program staff understands that, supply/demand issues drive project interventions they can then focus on their respective roles.

When implementing projects, use terms that clients and fellow staff will understand. Nutrition improvement is really about consumption. So we need to call it what it is. Our challenge is to identify ways in which to create demand for critical foods missing in the diet. What is missing? When? And who is most affected/vulnerable?

Nutrition promotes proper utilization thus creating demand. Agriculture responds by supplying those foods in demand. Once demand/supply issues for specific and targeted crops are made clear the nexus points for interventions (agriculture and nutrition) along the supply chain are strategic and sharp.

Agriculture needs to focus on improving the physical availability of priority crops as well as access/affordability so that growers meet the market demands and consumers purchase the product over a longer period of time at lower prices. Drawing up “hunger” charts jointly with nutrition staff that match annual fluctuations in malnutrition (low and poor consumption) with crop calendars and peak labor demands can help identify the array of potentially appropriate agricultural interventions that are demand driven.

## **2.3. Social marketing/Behavioral change communications (BCC) are essential to creating demand**

However often this is easier said than done right.

Some questions I have asked of project staff: Why didn’t the messaging strategy change behavior? It raised awareness but change is not happening. What about the message content? What about the messenger(s)? Do they have the needed power and or status to

affect change? Are the true decision makers that “approve” or “sanction” change hearing the message?

I have learned over the years that there are strong traditional “values” and perceptions of food as well as of the relationship between food and illness. For example a number of traditional societies equate their main staple with having eaten. They are concerned with filling the belly with their staple. Everything else is looked at as add on to the staple (and therefore optional).

How food is classified often differs sharply from Western concepts. In one country, a well-meaning nutritionist was presenting to a group of local women the food group concept. She created some giggling when she said mango and papaya were in the same group. One woman finally told her there is no way mango and papaya is the same. Mango was a prestige fruit while papaya was a “common” fruit.

Culture and custom around traditional foods is often very strong. Some foods are used for healing and at other times is part of a meal. There are often fables around specific crops.

An effective communication strategy aimed at creating demand needs to dive deep to how the crop is viewed by the community. For example the pigeon pea is grown throughout East Africa. In Kenya the story of “The Origin of Ndega's Grove” is very popular amongst the tribes of the Embu & Mbeere is. The story goes “Nthara was a really beautiful girl. A beautiful girl whose skin shone like *pigeon peas*.” Messaging can be built out from this fable. 12

In Haiti consumption of pumpkin primarily in Jou Mou soup is a tradition. While under French Colonial rule, Haitians were limited to eating a bland bread soup. They would not have been permitted to eat such an extravagant meal comprised of pumpkin, beef stock and other vegetables. This unique soup was created as a symbol of unity in the face of adversity. It was served to everyone at the first Independence celebration and Haitians continue this tradition today. Eating this soup on New Year's Day is a tradition passed on from generation to generation to celebrate Haitian Independence Day every first of January. Haitians believe the fight for equality isn't over yet. They believe the pumpkin soup gives them courage to persevere over oppression, both now and in the future. 13 The Jou Mou story was the basis for designing a pumpkin promotion initiative.

### **Pitfalls Avoided: Case Study**

United Nations Family Food Production Nutrition Project (FFPNP) - Sup-sup Gardens on Solomon Islands is another example of how locally designed communications were used effectively and changed behavior to create demand. This project also started with consumption gaps as the driver for change and growth in the supply of traditional foods for home consumption and income. The dietary challenge was the hidden malnutrition through the inadequate consumption of traditional micronutrient foods. One solution to closing the dietary gap was to promote gardening of traditional garden crops using a social marketing behavioral change approach. The impact of the project was immediate. There was nearly a 20% increase in new home food growing in the first year with many more households reporting an increase in crop diversity. Families surveyed reported an average weekly saving of 20% by growing their own sup-sup vegetables. Produce sellers also reported increased sales which they attributed to the sup-sup garden campaign.

The New Zealand Department of Scientific and Industrial Research Organization (DSIRO) report identified the key elements in the successful promotion of food gardening:<sup>14</sup>

- Thorough analysis of the factors impacting on child malnutrition;
- Fact based (Solomon Island National Nutritional Survey)
- Identification of solutions using existing knowledge, skills, and resources of households which were at risk nutritionally;
- Establishment of a neighborhood garden service center which provided: grower's exchange, planting material and garden supplies from organic and solid waste materials, demonstration plots for small-scale intensive food gardening;
- Technical assistance at both the garden service center, marketplace stall, through visits to individual gardens, and a mass media campaign.

Sup-Sup has been running as a national program for over 25 years and has spread to the neighboring country without support from the international development community.

Some additional success factors included an almost perfect name for the initiative. Although the project was formally known as FFPN Solomon Islands, it was commonly known as "sup-sup", a Pigeon English phrase meaning everything that goes into the soup (main meal).

Solomon Islands health services conducted a national nutrition survey. They had data which identified dietary gaps, when they occurred, and what they were.

Agriculture, nutrition and communications came together under the direction of the town mayor. He directed each unit, agriculture, nutrition/health, and communication to work jointly.

The project leader was well chosen: Community organizer was a mother who was one of them, lived with them in the same community. She rented a market stall once a week; she was good gardener and good communicator. The essential gardening and nutrition messages were simple to understand, relevant, and actionable by households. The project leader merely tweaked the consumption of self-grown food, which was practiced by women already before the project started.

Interventions were done through look and learn walkabouts. No power points, lectures of free stuff. The project leader announces she would be at a certain location and those interested would walk the neighborhood with her observing who was doing “best practices.” So the project started from existing knowledge, skills, and resources and built out from there.

#### 2.4 Do no harm

For far too long a number of “development” groups have followed the saying “do good things for the community and good things will happen.” Unfortunately in too many cases projects meant to promote self-help, self-reliance, improve consumption of nutritious foods and , increase incomes fell short or actually made matters worse.

There are a myriad of reasons and not all development groups operate in the same way, but in my observation in most cases the following were not done:

- Due to inadequate poor management skills, what often happens is that the priority population for agriculture is not the priority population for health, or the indicators aren't aligned, or the timing of activities doesn't lead to dual outcomes?

- Sustainability was not built in from day one. The very real need to achieve “deliverables” by a specific date means efficiency over integration. Product output over process.

- Genuine Local buy-in from the clients, local staff, and decision makers at local, regional and national was only on paper.

- Projects ignored the existing systems, especially markets, operating in the project area. Their goal was to reengineer market systems by ridding the farmers of those nasty middleman/woman functions. Most of these efforts end in failure.

-Projects are written to win the contract but are so complex local government staff do not have the resources nor level of skill required to implement effectively.

-Not understanding the existing structure, function, and value of the existing food systems at household and community level. An economic /nutritional framework is needed that reflects the real value of crops grown. The economic and nutritional benefits from mixed farming are invisible to most development agencies and governments because the methodologies they use for assessing economic activity, the most popular being GDP, and nutritional composition are not adapted to mixed farming.”

-Projects need to make sure they see the technical subjects (agriculture and nutrition/health) as support to the larger aim of food security. Not as separate components where magically their combined and uncoordinated efforts may have an actual impact. Households don't do it that way.

Their farm decision making is not based on let's just plant a bunch of crops and then decide what we will do with them. No, each plant is strategic. Its location is strategic. Its planting time is strategic. It has a purpose, often multipurpose. 15

How many projects truly following this line of thinking when determining interventions?

-Under the guise of improving income and household consumption, projects have provided incentives to cultivate staple crops using monoculture over existing polyculture. In one country where drought was severe those farmers who followed the monoculture advice went hungry. Those “conservative” farmers who didn't follow the advice had food to eat from their polyculture.

-Promotion of soybean targeted at women when households already produce and consume a variety of locally adapted and well integrated legumes. Why?

-Under the assumption that households (women) do not cultivate homelot “gardens “ agencies often provide free commercial packets of vegetable seeds, hand tools, fertilizer, and in some cases fencing. The strategy should be to identify ways to intensify, diversify or improve the productively productivity of existing crops already growing in the homelot.

### **3. What are some tools practitioners need going forward?**

How do we, as a community, equip ourselves with the essential tools to ensure nutritional deficiencies drive agricultural value chains? What do we need to learn about each other specialties? What are some options available to apply what we learn about our colleagues so we begin the process of true integration between agriculture and nutrition? How to we ensure that we do no harm with interventions?

### **3.1. Speaking the same language.**

The first step is breaking down the discipline silos. Households look at food security intuitively and apply the links as an art and science to what they cultivate, gather and consume. As a community we need to do the same.

Having facilitated numerous workshops involving both agriculture and nutrition specialist over the decades the pattern is nearly always the same: at the beginning they have little to no idea what the other person actually does and why they do it. They are eager to explain all about nutrition to aggies and aggies are just as eager to explain all of the technical aspects of growing crops to nutritionists. They have plenty of preconceptions about each other which turn out to be erroneous. But once they have to real opportunity to sit around a table to discuss one locally known and grown crop (agriculture) /food (nutrition) the misconceptions about each other begin to crumble. So what happens?

First they hear about the food “value” and the crop “value” from each other perspectives. Once they understand the value their next task is to explore why the crop is missing in the diet. Issues of availability, access, and utilization are discussed with a view towards how each sector can contribute to resilience. Each sector explains how it could provide resources to stabilize the crop’s availability, access and utilization. In the process of identifying issues and opportunities each side learns what the other does and how they go about doing their work. Nexus points for mutually supportive activities become clearer. This discovery of their “food security” colleague’s wealth of valuable knowledge, once set into a demand /supply framework, sets the foundation for joint planning.

Once this classroom exercise is completed the next phase is to ground truth their new found partnership in the real world by participating in a village immersion exercise.

### **3.2 Joint assessment local foods in their local context**

The next key element in the agriculture/nutrition literacy challenge is for technical specialists and programmers to undertake joint assessments of local food systems. This was an integral part of United Nations -FFPN annual regional skills training exercise. Each year the team (aggies and nutritionists) would undertake a 5 day

village immersion exercise where we would live in or near the community under study. Agriculture and nutrition staff worked together as a team to understand *the value* of the food supply chain to the households and the community at large, especially cultivated crops/livestock as well as access to community food sources (rivers, grazing land, wild plants). They would also gain an understanding of the gender roles associated with each crop/livestock. This initial training exercise led to an appreciation for the complexity of decision making undertaken by households to secure a steady food supply

After observing and collecting relevant information from the households, the assessment phase would begin. Nutrition staff would explain the nutritional value(s) of the different crops- seeds, roots, stems, leaves, fruits and when they were available in the cropping cycle. Aggies would explain to their nutrition colleagues the value of the farming system in terms of its structure (crops placement, mix planting, plant canopy) and function (income, direct consumption, social).

Once the *value* of the system to the households was understood by the team, then identification of gaps through mapping (agricultural and nutrition) what, when, and why were assessed, joint identification of potential interventions for incremental change were discussed using a do no harm lens. Understanding the dietary gaps also set the foundation for the social marketing /behavioral change strategy. The joint team explored with the households the barriers to changing dietary practices as well as learning about social/cultural triggers for change.

### 3.3 Identify key questions to ask at each point of the project design process

Most food insecure households endeavor to use their limited resources efficiently and effectively to secure food on a daily basis. So the questions that need to be asked have to address the cost and benefit to the client of the interventions proposed. Resource poor farmers will not use their limited resources without a link to demand and markets.

For example if *Canjus Cajan* (pigeon pea) is one crop that meets the criteria by addressing a location specific consumption /nutrition issue and offers income growth opportunities and is gender sensitive/neutral (fits into existing pathways) then the following are some of the key questions that should be asked in the design process:

Market demand (the what):

1. Quantity, quality, timing.
2. What is the demand throughout the year?

3. When are there shortages?
4. Why?
5. If imports are part of the local market supply when they are in short supply?

Solutions to the meeting market demand (to be included in the design process):

What technical interventions can be implemented to increase the quantity, quality and timing so that (1) Small growers realize a price premium (2) Consumers have a steady supply of pigeon pea (availability) at affordable prices (access) Market Demand (the how/utilization):

What are the triggers in the local community for creating demand for pigeon pea?

What would convince a household to grow more pigeon pea than they grow now?

Messages have to be targeted to the at risk group. How does one sell good health without selling good health? Most studies show that telling households “this is good for you” is not effective.

In my experience the most effective messages and messengers come from the local community. A change agent with sufficient social status can figure out how to create change and demand for locally grown and consumed foods. A main role from the development community is to provide the local agents of change with the key messages they need to know and perhaps some minimal resources to extend the message. Since it is a local solution, tweaking what households already know and grow, it should be a costly undertaking.

Stick to one message at a time: Often projects are overly ambitious and extend the entire Essential Nutrition Actions (ENA) package to the community. I have seen field activities where the staff is more concerned with getting through the ENA messages than if the messages are relevant to the situation of the households. Complimentary feeding with pigeon pea is a good ENA nexus point for agriculture and nutrition to address demand/supply .

As demand begins to take hold the key local supply chain actors for pigeon pea input supply, growers, village assemblers, town buyers can initiate discussions on how to grow value for pigeon pea. What are the production, post-harvest issues that they need to address to improve quantity, quality and timing?

## 4.0 The Way Forward Using Nutrition as Driver for Development Theme

### 4.1 The Role of Governments

The challenge for most governments with large food insecure populations is on the one hand they are expected to grow the agricultural sector where a sizable portion of the population live and work. On the other hand they have to deal with real and serious diet related health problems. The challenge is to design a policy where agricultural and rural incomes grow while diet related food problems are addressed at the same time. How does a government address issues around availability, access, utilization and resilience at the same time and in a mutually supportive manner? The marketplace for consumption of nutritious foods whether at village, regional, national or international level is one of the solutions.

Ministries of Agriculture- The marketplace strategy is compatible with their main task of working with small farmers to increase their productivity, income and in finding markets. As long as there is demand, agriculture will perform its supply function which increases availability and access/affordability.

Ministry of Health- The marketplace strategy is compatible with their task of addressing specific nutritional problems through food-based consumption solutions. The ministry of health identifies the demand for agricultural products by identifying specific at risk populations, when consumption risk is highest, why it is high, local food system components (cultivated and wild as well as post-harvest) and ways to tweak current culinary customs to close the dietary gap.

### 4.2 The Role of the Private Sector - making the value chain work

Once the ministries of agriculture and health spell out the demand and supply issues, the role of the private sector completes the circle. This sector is critical for long term investment, success, and sustainability.

The engagement by private sector players, from village to multinational, will depend on their niche in the marketplace. If the target market is fresh produce or community level processed foods for a village/ or small town and the supply chain is rather short and doesn't require large financing, then most probably most of players will be local actors. The focus on local food systems to solve local nutritional challenges is an especially good area for most development agencies to focus on as they can help build local capacity.

The farther the product's end market is from the production site the longer the supply chain becomes and the more complicated the chain is usually involving actors from outside of the local community. However, with larger players involved, especially buyers, their ability to grow the value of the supply chain is greater through their own resources by providing financing and or technical guidance to small growers.

The private sector also has the financial means and expertise to create demand for nutrient rich food products.

### 4.3 The Role of Development Agencies

A key theme that comes out from workshops taking place globally is that collaboration, coordination and networking are crucial if nutritional outcomes are to be attained and sustained within project zones of influence. But how? The *what* is easy, the *how* is hard. Where is the key nexus point for true integration? Development finance should be viewed as support for operational think tank work. Project staff have time and resources that the end users/clients don't have as they are busy running their daily lives. Resist setting up parallel project market systems under the guise of efficiency. Instead, the priority for assistance should be providing technical and strategic funding support to existing informal and formal food market systems with promising value chains, especially community based that address specific nutritional issues... Coordinated efforts towards a common purpose are core to the new paradigm. Approaches such as Harvest Plus where demand is created for specific dietary deficiencies and agriculture filling in the supply gaps should be adapted where appropriate. While a single crop/single nutrient approach is often easier for development agencies to support, consideration should also be given to groups of traditional crops that provide essential nutrients missing in the diet. Also the ever expanding opportunities made available through mobile technology should be another priority area for assistance

#### Final thoughts

In this paper I have endeavored to share some of my varied experiences on ways to truly integrate agriculture and nutrition efforts. I have shared examples of how nutrition is the driver for agricultural value chains. That these chains vary in size from the very personal of a women selling bunches of greens out of her home to multinationals moving food over continents. Creating demand for nutritious foods works. The challenge before our community may not be so much about how a nutrition "component" can fit into agricultural value chains.

This approach perpetuates silos as the arguments are often framed in terms of agriculture and nutrition or us versus them. If our community continues down this path integration will struggle and food insecure households will not realize the true potential of the services the community of practice can deliver to address their chronic food security challenges. From a field practitioner's perspective we are about delivering services that are meaningful and sustainable by households. The community of practice needs a unifying theme that can both contribute too in order to improve availability, access/affordability, utilization and resilience. The marketplace has always been one of the strongest nexus points in my experience for achieving genuine integration because it plays to the strengths and unifies both the agriculture and nutrition communities.

- 1 Solon, Florentino S.; Sanchez-Fermin, Liza E.; Wambangco, Lorena S., Strengths and weaknesses of the food fortification programme for the elimination of vitamin A deficiency in the Philippines, Food & Nutrition Bulletin, Volume 21, Number 2, June 2000 , pp. 239-246(8)
- 2 Technoserve, “TechnoServe’s Work With Fruit Farmers in East Africa Highlighted in the Financial Times ” [Technoserve](#)
- 3 Sellers, Tracy “Consumers develop a passion for all things pomegranate” Ag Alert® Magazine 2006
- 4 Darren Rovell “Is Coconut Water Headed for a Boom or Bust?” CNBC Sports 17 Apr 2012 <http://www.cnbc.com/id/47072121>
- 5 Manuel Jimenez, Francis Carpenter Richard H. Molinar Kathryn Wright Kevin R. Day,” Blueberry research launches exciting new California specialty crop” UC Cooperative Extension. 2003 <http://ucce.ucdavis.edu/files/datastore/391-211.pdf>
- 6 Harvest Plus “Vitamin A Sweet Potato” <http://www.harvestplus.org/content/vitamin-sweet-potato>
- 7 Let’s Go Local : Pohnpei promotes local food production and nutrition for health. FAO <http://www.fao.org/docrep/018/i3144e/i3144e12.pdf>
8. Cunningham,A.B . An Africa-wide overview of medicinal plant harvesting, conservation and health care Medicinal plants for conservation and health care FAO (1995)
9. USAID Armenian Small Medium Enterprise(ASME) Project Development Alternatives, Inc. (DAI) USAID. Bur. for Economic Growth, Agriculture and Trade | USAID. Mission to Armenia
10. “Working with women smallholders for safe groundnuts in Malawi 2013” <http://www.twin.org.uk/projects/working-women-smallholders-safe-groundnuts-malawi>
11. Bowman ,J.,Bell,J. Hawkes,P. “Prompt, Adaptable Training at Scale — Equipping Practitioners for the Fight Against Avian Influenza “ DAI Ideas VOLUME 4 NO. 1 May 2007
12. Chesaina, Ciarunji "Oral Literature of the Embu and Mbeere" East African Educational Publishers, Nairobi, (1997 ) <http://www.bluegecko.org/kenya/tribes/embu/stories-ndega.htm>
13. Soup Joumou - Haitian Soup of Freedom, <http://www.haitianinternet.com/articles/soup-joumou-haitian-soup-of-freedom.html>

14. Schoeffel, P., C. Bolabola, and C. Ngirmidol. "The UNICEF Family Food Production and Nutrition Project." Evaluation Report. Christchurch, New Zealand: DSIR Social Science, Ilam Research Centre (1991).

15. Sommers, Paul. "Traditional home gardens of selected Philippine households and their potential for improving human nutrition." (1978).

## Summary

### Critical Issues

1. Compartmental approaches where agriculture and nutrition operate without genuine joint ownership of the food and nutrition security challenge have had limited impact.
2. A new way of thinking and communicating is therefore needed for multisectoral programs intended to improve household level food security.
3. The nutrition-enhancing agriculture value chain approach which responds directly to the demand of specific nutrients, is a central driver for this change.
  - a. The nutrition community of practice will begin to view value chains not as yet another approach to be incorporated in the design of projects and programs, but learn to embrace it as a tool which – when used strategically – can contribute to successfully address specific dietary issues communities are confronted with.
  - b. The agriculture community of practice will begin to expand their vision of the value chain approach and build on the idea that nutritional deficiencies can be seen as opportunities for value chain development or growth within market systems

The new thinking means building sustainability into interventions from day one by leveraging agricultural supply chains which are already in place. The good news is that fresh/ processed food markets operate globally from out of people's homes to roadside stands to large wholesale markets. Nutrition-enhancing agricultural value chain approaches build on these existing systems of supply/demand. Using the concept of nutrition deficiencies as driver for value chain development the following is crucial in designing interventions:

- c. Availability of nutrition data: Identification of specific dietary gaps (Which nutrients are missing? Who are the people affected? When do these gaps occur? Why?) Provides essential information for crafting location specific messages designed to increase demand for traditionally grown foods in order to close the identified consumption gaps.
  - d. Agriculture, using the value chain framework, supplies the crops in demand to the market.
4. A word about “value”. There is an immediate need build skills by holding food security practitioner academies in communities being served, especially agriculture and nutrition decision makers of all levels, so that they walk the fields together and understand that each crop grown is part of a farm and community food system essential for survival and that “value” for the vulnerable means multiple value

providing multiple functions well beyond a single economic or nutritional value which is often the main focus of interventions.

### **Policy Recommendations and Investment Priorities**

The challenge for most governments with large food insecure populations is, on the one hand, to be are expected to grow the agricultural sector where a sizable portion of the population live and work; on the other hand they have to manage serious diet-related health problems which create huge costs for public health systems. So how can governments create a win-win policy for both agricultural growth while at the same time addressing health issues related to specific dietary deficiencies? How can governments address issues of availability, access, utilization and resilience at the same time and in a mutually supportive manner?

Recognizing that the marketplace, from informal village kiosks to formal large wholesale centers, can be used as a tool for boosting availability, access/affordability and utilization as well as resilience and serves as one nexus point for food security, the current food security framework needs to be expanded to include the theme of nutritional deficiencies as driver for value chain development. This opens up policy opportunities for advancing formal and informal food market systems at a variety of intervention levels in new and strategic ways. Once the communities of research, education, and practice are aligned with this perspective it will enable nutrition improvement through agricultural value chains to move toward becoming sustainable.

The following are suggestions for discussion:

- 1) United Nations System: UN REACH (Renewed Efforts Against Child Hunger and Undernutrition) with its mandate and strategy of coordinated action of UN agencies, civil society, donors, and the private sector, under the leadership of national governments; offers a unique platform to pilot nutrition as a driver for agricultural value chain development. To start with, the stakeholders brought together by REACH select a few priority crops to start the process and then identifies their role in adding resilience and value to those crops through increased utilization, access/affordability, and or availability.
- 2) Policies which identify and promote groups of or individual high “value” nutritious crops will have beneficial revenue implications. Using nutritional deficiencies as a driver for value chain development should result in health care savings: Not only does the expansion of nutritious in-demand agriculture crops that are deemed high “value” economically generate income; they address specific dietary gaps and can

thereby prevent malnutrition. Once a general framework is in place it can be adapted into context specific regions and communities accordingly.

- 3) Private sector: Examples in this paper show that the private sector is capable of creating the demand for healthy/nutritious foods often with limited direct involvement by government. A policy challenge is for the public sector to strategically at community, regional and national level, in support of private sector actions which aim to increase the demand for healthy foods. One approach is for governments to address this through holding a series of local meetings with key actors and support actors to identify gaps to adding value including technical issues and relationships between actors and the specific role of government in supporting those improvements.