



Making agriculture work for nutrition: Prioritizing country-level action, research and support

Collection of contributions received

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Introduction to the topic

Dear Members,

There is now considerable interest among international development organizations and practitioners in agriculture programming and policy to improve nutrition.

A recent "[Synthesis of Guiding Principles on Agriculture Programming for Nutrition](#)" has highlighted the increasing number of international development institutions formally weighing in on the topic – and found that the key messages are often similar. The synthesis identifies 20 principles independently voiced by multiple institutions for planning, implementing, and supporting nutrition-sensitive agriculture, as well as a number of gaps that limit action on these principles.

Building on the earlier FSN forum debate "[Linking Agriculture, Food Systems, and Nutrition: What's your perspective?](#)" and the synthesis, the objective of this discussion is to distill and **prioritize actions needed at country-level, research gaps, and support needed** out of the substantial international dialogue on improving nutrition through food and agriculture.

What are the main approaches we collectively see as most important? What are some practical recommendations that can more effectively promote, support, and guarantee the integration of nutrition into agriculture and food security investments? What research is needed?

This discussion is timed strategically before several influential meetings involving agriculture-nutrition linkages and your contributions will be made available at and incorporated into upcoming nutrition and agriculture-related meetings, such as the SUN, CFS (Committee on World Food Security), GCARD (Global Conference on Agricultural Research for Development), and CAADP Nutrition Workshop (Comprehensive Africa Agriculture Development Programme). Participation in this discussion will allow your voice to be heard at these agenda-setting events.

Questions:

Based on your own knowledge and experience in the area of improving nutrition through food and agriculture programmes:

1. If you were designing an agricultural investment programme, what are the top 5 things you would do to maximize its impact on nutrition?

2. To support the design and implementation of this programme, where would you like to see more research done, and why?

3. What can our institutions do to help country governments commit to action around your recommendations, and to help ensure implementation will be effective?

As you answer each of these questions, please share practical insights, evidence, and anecdotes from your personal experience researching, implementing, or advocating.

We thank you in advance for the time and thought you contribute to responding – time well-spent, we believe, for the influence your comments will have.

Facilitators:

Anna Herforth (consultant to World Bank and FAO)

Cristina Lopriore (consultant to EU Nutrition Advisory Services)

Contributions received

1. Lisa Kitinoja, the Postharvest Education Foundation, USA [first contribution]

Dear Moderators,

I would like to submit some answers the questions posed, based upon my fieldwork in horticultural development in over 20 developing countries and 20 years.

Based on your own knowledge and experience in the area of improving nutrition through food and agriculture programmes:

1. If you were designing an agricultural investment programme, what are the top 5 things you would do to maximize its impact on nutrition?

#1: I would make sure the programme paid attention to more than the production of food and increasing yields

#2: The programme would include interventions aimed at reducing postharvest losses, protectin nutritioral value and food safety during the period from farm to consumer.

#3: The value chain actors involved in food distribution and storage would be key stakeholders in the programme

#4: Consumers would be provided with training on food storage, processing and cooking with the aim of improving nutritional quality of the food supply

#5: Capacity building efforts in food and nutrition for extension workers, educators and government staff would be included in the programme.

2. To support the design and implementation of this programme, where would you like to see more research done, and why?

Many countries "know" they experience high levels of food losses and waste, but there has been little systematic measurement of the causes and sources of these losses. the first step to improving nutition and access to high quality foods is to find out where, when and why foods are being lost, damaged, or losing nutitional value (for exmample due to temperature abuse or pest attacks).

3. What can our institutions do to help country governments commit to action around your recommendations, and to help ensure implementation will be effective?

Assist with capacity building efforts, for example by offering short courses, study tours, workshops, etc on agriculture, food and nutrition development in each region of the world.

Dr. Lisa Kitinoja
The Postharvest Education Foundation
PO Box 38, La Pine, Oregon 97739 USA
Website homepage: www.postharvest.org
Follow us on Twitter: @PostharvestOrg

2. Syed Md. Zainul Abedin Abedin, Department of Agricultural Extension, Bangladesh

Dear All,

It is yet another important initiative of FSN for streamlining activities of food production and nutrition in the world under the auspices of the FAO of UN.

I am presenting my views against the three questions.

1. If you were designing an agricultural investment programme, what are the top 5 things you would do to maximize its impact on nutrition?

(a) I would conduct a survey across the country to identify the nutritional needs and deficiencies of the people of different age, sex, income and other relevant parameters to determine the possible direction of interventions.

(b) I would survey the availability of various nutritional elements from the locally produced crops, fruits, vegetables, fish, poultry, dairy and other sources for the above mentioned people.

(c) I would select the major food sources that supply the nutrition required by the people and focus most emphasis on these sources for interventions.

(d) I would organize coordinated and concerted programmes with the participation of relevant ministries, research, extension, credit and allied departments and universities in the government and private sectors to make a comprehensive action plan for implementation in phases.

2. To support the design and implementation of this programme, where would you like to see more research done, and why?

I would like to see more research on the following areas:

(a) Food varieties containing more nutritional values so that more nutrition may be available from less quantity of food

(b) Food safety issues to highlight safety in all stages to ensure food that are not adulterated, properly certified and safely consumed.

(c) Wastage or damage of food and nutritional contents in the field, shipment, storage and distribution systems due to pests, diseases, infrastructural problem, management, regulation, corruption and for any other mismanagement.

(e) I would organize to bring all international donors, UN and other bodies working in my country to support the implementation of our action plans under a single umbrella to ensure transparency and avoid duplication of activities, corruption and wastage of resources.

3. What can our institutions do to help country governments commit to action around your recommendations, and to help ensure implementation will be effective?

Your institutions can help country governments commit to action around my recommendations to help ensure implementation to make them effective by providing technical, financial, logistic and management inputs.

3. Eder Ortiz Roca, Universidad Nacional de Colombia, Colombia

Greetings

In countries like Colombia, politics and investment are directed to crops and sugar cane for biofuel, palm oil, coffee, cocoa and banana products that bleed the economy as they are exported as raw materials and do not represent large revenue the country, or skilled jobs, plus they do not represent any contribution to the nutrition of the consumer population.

Given that investment and policy is directed towards non-food or low nutritional importance, it is very difficult to successfully implement horticultural solutions such as organic farming, consumption on farms, urban agriculture and family.

4. Samwel Mbugua, Egerton University, Kenya

In my opinion the top 5 things to do to maximize impacts on nutrition would be;

1. At the planning stage incorporate a multi-stakeholder approach in the stakeholders platform to include nutrition practitioners to take care of nutrition interests.
2. Undertake a nutrition causal analysis that best shows likely pathways to nutrition outcomes for a given agric. investment and incorporate that in the baseline assessment indicators.
3. Include practical innovation systems that are cognizant of the food culture of beneficiary communities, capacity to benefit at cottage industry and household level, and not merely investments for mainstream markets and industries.
4. Considering much of the communities in need of this benefits have evolved over time through through subsistence food systems there at times solely for consumption there is need to integrate indigenous knowledge systems in to modern methods so as help individuals connect easily in to modern systems, and balance between consumption and market driven agriculture.
5. Undertake an impact assessment that captures nutrition outcomes and not only production and incomes expected from agricultural investments.

More research is needed to come up with a set of tools and frameworks that are harmonized and widely acceptable to measure agric. and nutrition outcomes based so as to provide a basis for cross cultural, season and regions learning.

On the government side it is important that governments come up with food and nutrition policies, this is the legal basis upon which governments can be made to account, and also the basis for financial commitments. In areas where policies exist their is need to track progress and support any weak links so as to make them practical and of direct benefit to communities.

5. Angela Olegario, International Fertilizer Industry Association (IFA), France

Dear Moderator,

I would like to kindly share this IFA/IPNI publication on “Fertilizing Crops to Improve Human Health: a Scientific Review” as it is probably the first of its kind.

Please find an abstract and the links below:

IFA/IPNI publication on “Fertilizing Crops to Improve Human Health: a Scientific Review”

Many studies have shown that enhancing crop attributes with the right fertilizer product at the right rate, right time and in the right place, can vastly contribute to the health of humankind. Given the important role of fertilizers in promoting food and nutritional security, it becomes all the more important to invest in research aimed at optimizing the benefits associated with their use.

Research needs to support the adoption of 4R - nutrient stewardship - to ensure that the right source is applied at the right rate, at the right time, and in the right place. This concept—embraced by the fertilizer industry—defines “right” as that most appropriate for addressing the economic,

social and environmental aspects of sustainability, all three of which are critical to sustain human health. Coupled with appropriate strategic changes to farming systems toward production of a better balance of foods to address the true nutritional needs of the human family, an emphasis on 4R Nutrient Stewardship in agronomic research and extension will enhance the benefits and minimize the potential negative impacts associated with fertilizer use.

The International Fertilizer Industry Association (IFA) and the International Plant Nutrition Institute (IPNI) recently published Volumes 1,2 and 3 online of the publication on “Fertilizing Crops to Improve Human Health: a Scientific Review”. [Volume 1](#) deals with food and nutrition security, [Volume 2](#) on health-functional properties of food and [Volume 3](#) focuses on fertilizer impacts on selected health risks associated with plant production systems.

Thank you.

Angela Bunoan-Olegario
Senior Agronomist
Agriculture Committee
International Fertilizer Industry Association (IFA)
28 rue Marbeuf 75008 Paris, France

6. James Levinson, Tufts University, USA

Wonderful idea, Friends,

And thanks to Anna and Cristina for organizing.

A few thoughts below

Best,
Jim

1. If you were designing an agricultural investment programme, what are the top 5 things you would do to maximize its impact on nutrition?

Nicely spelled out in the IYCN guidelines. I'd simply follow these - and also be prepared to do mitigation where early monitoring sees negative nutrition results

2. To support the design and implementation of this programme, where would you like to see more research done, and why?

Carefully following actual efforts to incorporate nutrition in ag projects and documenting results - including the attribution of particular results to particular project activities.

3. What can our institutions do to help country governments commit to action around your recommendations, and to help ensure implementation will be effective?

Insist that new agriculture projects have food security/nutrition objectives (which then will be evaluated) or, at a minimum, nutrition impact statements (the latter permitting input on the project from groups such as ours.)

7. Kanchan Lama, WOCAN, Nepal

1. If you were designing an agricultural investment programme, what are the top 5 things you would do to maximize its impact on nutrition?

1. **Gender disaggregated data:** Lack of formal identity of women as the household head or as the primary level farmer, often marginalize their involvement in the project cycle. There is a prime need to establish them as the primary level stakeholders. Conduct Gender Analysis at community level to demonstrate women's involvement in activity level and the gaps in their access to resources and the constraints they face due to unequal relationship in decision making power. The analysis will also document what indigenous knowledge the women already have and their use of local, nature based food items, such as seasonally available wild vegetables, herbs, fruits, birds, insects, etc. to improve nutrition. In the advent of modern food items, some rural communities residing near to road heads have been diverted from practicing their traditional knowledge, which is not helpful for both conservation of biodiversity of wild edibles and also for locally available organic nutritional knowledge systems.

(We can learn lessons from IPM, farmers field schools kinds of activities of FAO in field, where women have been used maximum limit to make project successful , however their indigenous knowledge have not been counted in nutritional aspects while making plans. In FAO's inter regional project "Empowerment of women in irrigation and water resource management for improved household food security, nutrition and health" (WIN), an approach was managed keeping women at the central, where women were involved at every stage of the project, from planning to evaluation and their knowledge about wild vegetables, herbs, roots and fruits as food supplement was documented and used for knowledge management on nutritional food preparation. The approach was effective also through collaboration under the coordination of Ministry of Agriculture among Ministries of Health, Women and Water resources, as well as FAO , WFP and WHO. However despite much appreciation, the Government institutions could not further the process.)

2. **Gender responsiveness of service providers:** Conduct assessment of the responsible service providers (public agencies, NGOs) in order to identify the areas of support to be provided for sensitization, enabling organizational restructuring, reorientation through developing a Gender Action Plan along with an Operational Strategy including setting rules (policies, systems, mechanisms) for accountability towards nutritional impact of agriculture. Without this kind of interventions, the efforts made at small holder farmers' level might remain to be a "temporary project approach" only and do not get mainstreamed in the strategic institutions. (Through "Women Organising for Change in agriculture and NRM"(WOCAN), I had facilitated a gender assessment within the Department of Agriculture in Nepal, where the then Director General (DG) Deep Bahadur Swarn remained highly supportive to bring in the senior level officials into the process. One Gender task force was formed and after developing ToRs for the task force collectively, the organization was assessed on gender mainstreaming in four pillars, e.g., political commitments, technical gender expertise, accountability and institutional culture. The strengths and gaps were analyzed and shared in the concerned groups. Later one Gender Action Plan was developed with indicators, of which some influence remained as of increase in number of women farmers in training (from 30% to 40%) and enhancing the already existing gender desk and gender working group, etc. However once the DG was transferred to another position, activities, focus remained weak in follow up and innovations. High budget cut in the government programs also caused certain constraints.

(Case of leadership): Another case of my work in Timor Leste inspired me which was some what different from Nepal. I used to work through UNIFEM as Gender advisor to Timor Leste Ministry of Agriculture and Fisheries between 2007 to 2009. I facilitated an organizational assessment to identify areas for gender mainstreaming, through a gender taskforce group formed for gender mainstreaming. My counterpart was Maria Fransisca de belo Asis and my location was in the planning unit of the ministry. I was fortunate enough to get two organizational leaders , one planning Chief, Mr Octavio de Almeida and another Fransisca to take leadership on gender mainstreaming from within the institution. The ministry used the findings of the assessment and developed a Gender Action Plan , besides mainstreaming gender activities and budgets along with

monitoring indicators as a system in the annual work plans. Most significant and shocking experience was that the honorable Minister made an unforgettable innovation by taking drastic action to appoint seven senior women officials in positions of departmental heads out of twelve, while the former ones were given status of consultants. One National Ministry taking such initiative is extremely important to give women's portfolio high importance and thus, the Timor Agricultural Planning Chief was also included in the National CEDAW reporting team 2008 in the DAW CEDAW reporting meeting at the UN, NY. My point is that until and unless there is organizational commitment at the level of leadership on gender mainstreaming, all the ad-hoc project efforts remain temporary and unsustainable. In case of counting on nutritional improvement in agricultural projects, women involvement is crucial at all levels, from grassroots to the top policy making level, besides sensitizing both women and men on the values in an organization)

3. Targeting women as the main stakeholders in agricultural program is the most important strategy for attaining nutritional objectives. The women are the ones who manage daily meals, at least for two to three times a day in developing countries. They are knowledgeable but need to be empowered on their self confidence for making decisions to plant green vegetables, use seasonally available locally grown nutritious food items for preparing food, specifically for the pregnant women and children and for themselves. With increasing trend of commercialized agriculture interventions made by development programs, certain challenges are being faced by the rural women farmers, such as, - (a) tempted to produce larger amount by using chemical fertilizer, (b) sale the best products and reduce consumption at household level, (c) spending maximum time and labor to produce double (more by women) and face health hazard, (d) the discriminatory social norms and values positioning women producers as the secondary party in making decisions, in accessing services, accessing technologies, accessing market and above all, deciding on preparation of household food that could be nutritious rather than tasty only. (Recently I worked in a USAID funded and Chemonics International implemented project titled as Nepal Economic, Agriculture and Trade Activity project (NEACTIVITY) in Nepal (2011 onwards) . The project rigorously adopted certain practical strategy to target women, particularly from the socially excluded groups, defined by the National Development Plan of Nepal. The project achieved more than 39% women staff, around 80% farmer group level and more than 60% as women farmer leaders and some as demonstration farmers. All project training ensured more than 50% women participation. However the strategic reasons for including women remained limited only to their role as actors, less as innovators and change agents related to household nutrition. The project aims at double production, thereby interaction by agriculturist technocrats with women farmers takes the trend of asking about their potentialities to join (and compete.!!!) men in producing more than before, in crops and cash. Gender roles and gender needs practical and strategic requirements made less importance. The issue of the increased food for household nutrition was not a focus in the project. Although the project contained defined indicators on nutrition, it was not given much priority, because technocrats had to remain too busy in managing technical performance of the project, besides managing the issues of lack of public responsibilities for supplying chemical fertilizer in time and required quantity. Moreover, gender specialist was never included in management related discussion rather treated as a specialist for the field technicians only. Furthermore, there was not any budget separated for gender actions under the PIRs. I had very little scope to work except requesting the component managers to consider gender integration in their programmes, but in absence of indicators defined under each PIR, there was very poor scope for me to proceed. Thus despite having a very good intention, sometime technically structured agricultural projects having too high ambition on double food production, leave behind the human aspects of development, provided human development indicators do not form a part of monitoring. In fact when any agriculture development project targets women, the project could be more meaningful if it related to the knowledge and skills and constraints of women at every step, benefiting project management as well as the household nutrition and health of the poor communities which is a big problem in developing countries. In Nepal more than 50% children below five years were found stunting -2011 National Survey of Health Status)

4. Creating access to land, women friendly irrigation and credit: The poor women farmers face a situation of landlessness, lack of irrigation and lack of access to capital and credit. Organize alternative provisions for land use and credit for women. There are examples of collective farming by poor women groups and managing food for household nutrition and livelihood objectives in Nepal demonstrated by NGOs. Without making provisions for land and capital, credit, and micro irrigation, agriculture development cannot expect the poor women farmers in participation and benefit sharing.

(Case of WIN project: In the above mentioned WIN project, pro-poor women from excluded groups were organized through inter governmental government line agencies integrated planning approach to practice collective farming of vegetables to earn cash, increase purchasing power and to improve nutritional condition at household level. The land was obtained from village development committees, and in some areas, from landlords who had run away to cities in the fear of Maoist attack, in some places women took land on lease for collective farming. The FAO/GoN (government of Nepal) project

Invited partnership with IDE (International Development Enterprise), WFP and GTZ for assisting irrigation services for these women groups. The approach went very effective and project could help the landless women to produce vegetables to consume and sale. What we learned was that..there are resources within our approach, but we need to collaborate and coordinate for utilization by the real pro poor target women farmers at the end , for production and nutrition as well as improving livelihood. Land and irrigation are highly important for farmers)

5. Strengthen women 's leadership capacity/networking: The poor women farmers are hesitated to voice their needs , both practical and strategic and take lead in claiming services. Despite some existing service provisions within various programs in Government, NGOs, they seldom get information and sensitization about what and how to capture such funds and assistance. Even if they are informed, weak public level leadership discourage them from taking interest in these provisions. Agricultural programs should include social mobilization, gender sensitization and women leadership building activities with appropriate budget allocation. (investment on women's leadership in various agricultural projects in Nepal turned out to be very fruitful. Specifically for two reasons, (a) women farmers contributing more than 70% work in agriculture and (b) agriculture being feminized as a result of increased male migration for employment, women have been facing a situation where agriculture related activities have become their world. However due to socio-cultural discriminatory values and norms , due to traditionally established institutional barriers for women's inclusion in service provider institutions , women face maximum constraints to access information, resources , services, technologies and markets related to agricultural production. Due to absence of males in the villages, the rural women farmers often face problems to manage cultivation in their land, often leaving land fallow. However there has been insignificant efforts for empowering women in the sectoral development agendas, such as agriculture , irrigation, trade , etc. without which no any agricultural projects can achieve sustainable results, at least in countries like Nepal, where women are displaced from important managerial discussion processes despite being recorded as more than half of the contributors in agriculture.)

6. Monitoring, coordination and collaboration and networking through and with gender experts and organizations are essential activities that any agricultural programmes must adhere to.

2. To support the design and implementation of this programme, where would you like to see more research done, and why?

During appraisal level participatory research on "gender analysis in agriculture" (Harvard/FAO analytical framework) and analysis of gender differential impacts (Rani parker's tool) , analysis of practical needs and strategic interests of women (Moser's framework) are very important to form a part of research in the program appraisal-design, planning, implementation and monitoring stages. During the appraisal phase, a complete gender analytical research needs to be commissioned on

basis of which the project design includes a gender action plan for integration. As I mentioned above, the institutional assessment is equally important to facilitate an enabling environment for women farmers and policy makers to act through a joint approach. During design phase, a rapid assessment of institutional status on gender mainstreaming is important to identify the necessary activities to plan for capacity building of the implementers. (case from leasehold forestry project is relevant here. IN 1999-2001, I worked as a FAO technical expert for a IFAD funded national program titled as Leasehold Forestry and Fodder development project" (HLFFDP), where it was possible to identify need areas for building capacity of the government staff, including farmers. The Leadership given by the National project coordinator and the FAO's CTA remained crucial for success on actions related to gender mainstreaming. The government staff involved in the project received an ad-hoc but government circulated job description to implement project level gender promotional activities. The research team on appropriate technology also adopted certain gender norms which remained very helpful to produce women friendly technologies in the field.)

3. What can our institutions do to help country governments commit to action around your recommendations, and to help ensure implementation will be effective?

At the moment, FAO and such other multilateral agencies can help Nepal and other developing countries in the following areas:

- Assist facilitation of implementation of the National Gender Action Plans through Sectors
- Assist in research about women indigenous knowledge about locally available species from forest, river, rocks and land, such as, roots, herbs, vegetables, fruits, etc. and establish list of their nutritional value
- Support debates among activists, professionals to establish a definition on marginalization of women from access to opportunities, services and benefits as the "Sectoral Violence against Women (SVW)", which is not limited only to domestic boundaries but is severely faced by women within institutions governing agriculture and others
- Review agriculture, trade and Irrigation policies and make them sensitive to women's practical and strategic needs including values for indigenous knowledge on local food items
- Conduct research on impacts of climate change (also bio diversity) on the poor women and children, specifically on maternal health and nutrition, make strategies to address the identified issues/problems
- Support exchange visits among women farmer leaders to develop confidence and power through regional networks
- Assist research on women friendly technologies in the region so that Nepal can learn from others on improved technologies for women farmers saving time and labor and meeting market demands for quality.

8. KV Peter, World Noni Research Foundation, India

Noni (*Morinda citrifolia* L.) - a future tree for wellness and food supplementation

Undernourishment and imbalanced rice based food are staring the developing world. Anemia, stunted growth, infant mortality, low body weight at birth and micro-nutrient deficiency disorders are telling adversely the working capacity and the cascading effect is abject poverty and low purchasing power.

Plant based nutraceuticals are natural, available at homesteads and pro-nature and green.

Noni(*Morinda citrifolia* L.), belonging to coffee family Rubiaceae, is a time tested tree with Polynesian origin spread to Micronesia, Indonesia, Malaysia, Andaman and Nicobar Islands(India).

The tree adores temples in Indonesia and adjoining N.E.Asian countries. More than 160 nutraceuticals are isolated from the fruits. Forty-six Universities around the world conduct research on Noni.

University of Hawaii has contributed significantly.

There is an all inclusive World Noni Research Foundation, Chennai India to undertake and promote research on Noni-tree improvement, protection, clinical research, pharmacological studies and food science-.

The International Society of Noni Science, Chennai promotes research by holding National Seminars every year and publishes the journal International Journal of Noni Research. A monograph on Noni is available.

Divine Noni Gold, Noni soap, Noni tooth paste, Noni shampoo, Noni oil, Noni tree etc are a few products.

Many testimonials are available on the role of Noni in imparting health and wellness.

The tree is listed under Future Crops.

P I Peter, Kirti Singh and K V Peter
World Noni Research Foundation
Chennai-96 India

9. Elvis N. Njabe Limbe, Cameroon

Dear moderators,

nutrition in a global perspective affects both the producer and the consumer, the rich and the poor, either in the form of over nutrition or under nutrition. Agriculture is for sure our number one concern with respect to nutrition, but the whole supply chain from farms to consumers is very complex.

If improving economy of the society is considered the backbone of Agriculture, then government and organizations at regional and country levels should make policies, not just for agricultural high yields but also to protect the nutritional content and value of the produce.

The high yields (quantity) of produce should not be at the expense of nutritional quality. Many farmers backup their yield with application of chemical fertilizers, which does not only affect human health but also our environment. Studies and research centers should be set up to analyze and monitor the application of chemical fertilizers with respect to nutritional content and safety. At this time where food borne illness is rapidly increasing, the whole food chain should be covered using a traceability system monitored by well trained experts, to track the movement of produce and food product from farm to consumer's hand.

Therefore, intervention programmes which support and include both the producers and consumers should be setup from production, transportation and storage, to cover both urban and rural regions.

Elvis N. NJABE Limbe, Cameroon

10. Facilitators' feedback, Cristina Lopriore and Anna Herforth

Dear FSN Forum members,

Many thanks to those who have already contributed to this discussion – it is already very rich, with a variety of different perspectives.

Several themes have already emerged suggesting priority actions at country level. For example, starting with situation analysis (to determine what the nutritional problems are and possible solutions); measuring progress on nutrition objectives with appropriate M&E; focusing on food quality (including nutritional quality and food safety) rather than just food quantity; actions to empower women and put them at the center of investments; and collaboration across sectors.

What do you feel are the priorities? We encourage you to focus on what you would say if you were to advise a director of planning for agriculture; at that level, what are the most important things he or she should bear in mind, in order to make the investments work for nutrition?

Some research gaps have also already been mentioned; including the overall need for documenting results attributable to particular project activities. What other gaps do you see? How can research enable better investments in agriculture for nutrition?

And, what can our/your institutions do specifically to support the actions? Capacity building has been mentioned in a few contributions. Where do you feel capacity building is needed and how can it be done? Also coming from the contributions so far, how can multisectoral and multi-partner collaboration be done effectively and how can it be supported by all of our/your institutions?

To all who have given even any amount of thought to this topic, your contributions will further enrich this discussion. Thanks again to those who have taken the time to respond!

Best,
Anna and Cristina

11. George Kent, University of Hawai'i, USA

Greetings –

This discussion is on “Making agriculture work for nutrition: Prioritizing country-level action, research and support.” It is guided by positions taken by various international development institutions. Thus we have recognition of the national and global levels, but there is little articulation of the role of the local level in this framework. The local level is supposed to benefit from national and global action, but whether it has any role beyond that is not so clear. Sometimes it seems that the local level is simply expected to wait for instructions and benefits from above.

The concept of food sovereignty can be understood as referring to the localization of control in communities, based on increasing local self-reliance. In this perspective, the center of decision-making should be local. The higher levels should facilitate and support local decision makers in doing what they want to do, based in their own understandings of their interests. Under the principle of subsidiarity, the higher levels should serve the lower levels, and not the reverse.

There is room for debate about the wisdom of that food sovereignty approach. It could introduce what many would regard as inefficiencies in the system. However, the more critical questions are about who benefits, and who is harmed. Viewed globally, food is abundant, yet there are around a billion people who are food insecure, hungry. That certainly is a type of inefficiency.

We are asked, “What are the main approaches we collectively see as most important? What are some practical recommendations that can more effectively promote, support, and guarantee the integration of nutrition into agriculture and food security investments? What research is needed?”

People at ground level might ask how to establish stronger links between nutrition and agriculture, but they are not going to ask about it in terms of investments or research. Investments and research are likely to be under someone else’s control, and serve interests that are not the interests of the people at the ground. Why should the question be framed in terms of research and investments from above?

Maybe the linkage between nutrition and agriculture is something that should be built at ground level, not at the national and global levels.

Thinking about how these issues might look at ground level should lead us to reflect on how nutrition and agriculture got separated. After all, in pre-modern times, before the dominance of markets and before wealth accumulation became so important to so many, agriculture was undertaken to produce food, not wealth.

The separation can be illustrated by the shift from taro to rice production in Hawai'i in the 1860s. Taro and other foods were produced to meet people’s needs. One can eat just so much taro. Then settlers came along, and decided to produce rice for profit. Rice exports, mainly to California, reached more than 13 million tons in 1887. Long before that level was reached, the rapid displacement of taro by rice led the local newspaper to ask, “where is our taro to come from?” The disconnect between farming for food and farming for money became clear. The people whose taro supply was threatened were not the people who profited from rice exports.

If we are interested in restoring the linkage between agriculture and food, national and global agencies certainly should have a role, but maybe the main action should be at the local level, in the communities. The reconnection might come not from market forces but from the fact that people care about each other’s well being. If the purpose of communities’ food systems was to ensure that all their people were well nourished, we would have a world without hunger. There are now many people working to envision what constitutes a healthy food system, beginning at the local level.

If that makes sense, then the main role of agencies at national and global levels should be to do what they can to strengthen local communities, and ensure that people in those communities have the capacity and the motivation to take care of one another. This might look like a step backward toward pre-modern times, but maybe it is the right way to get beyond our flawed present to better post-modern times.

Aloha, George Kent

12. Osborne Sibande, Malawi

Governments should invest in agricultural extension services for nutrition by incorporating behaviour change and communication approaches. In some cases there is already a lot of good skills and knowledge, and technologies with agricultural extension and community nutrition front line workers but there are still challenges to influence positive behaviour and nutrition practices in the target communities. In most cases there has been good transfer of knowledge and skills to the target communities but behaviour change communication skills and capacity need to be strengthened where already available and be incorporated where missing.

Oz

13. S. Emmanuel Bleggi, Bread for the World Institute, USA

1. If you were designing an agricultural investment programme, what are the top 5 things you would do to maximize its impact on nutrition?

I also like the ICYN guidelines:

- assess the situation and needs of the targeted population
- harmonize with existing programming, leveraging LCSO activities and utilizing current best practices
- design an effective social and behavior change communication strategy with a focus on individual, household and community behaviors
- train and build local capacity to take over and sustain the program, and
- develop measurable targets, monitoring progress to the outcome; adjust targets or program direction at mid-point or earlier if necessary

2. To support the design and implementation of this programme, where would you like to see more research done, and why?

We need to develop definitions and measures for nutrition-sensitive activities taking place in the context of larger, non-nutrition activities (like livelihoods, value chain development, education etc.). We understand the pathway to improved nutrition (processes, activities, actions), but not so much the output and outcome indicators. Also, research needs to be done on developing secondary 'nutrition-specific' objectives for 'nutrition-sensitive' activities. What is the cost and value-added of nutrition-sensitive in complementary development sectors

3. What can our institutions do to help country governments commit to action around your recommendations, and to help ensure implementation will be effective?

Help them understand nutrition across sectors, and assist them in developing a corps of nutrition-minded professionals in agriculture, health and education. Enable to see that their investments in nutrition are smart, high-return actions that will be leveraged by donors and institutions.

14. Jane Sherman, FAO and Universities, Italy

Question 1: What are the top five things you would do to maximise the impact of an agricultural investment programme on nutrition?

There is considerable evidence (I have seven highly reputable studies on my list of references, including the World Bank and WFP) that nutrition education is an essential catalyst for sustained nutrition impact in agricultural, community and health projects, with a pivotal role in food security interventions, and particularly visible effects in projects dealing with homestead gardening. The same documents (and others) make it clear that simply increasing food supply or improving agricultural productivity frequently fails to have an impact on nutritional status, in particular of young children: stunting rates remain high in countries which have notionally achieved MDG1 through increasing food production.

This makes perfect sense: if you are not aware that your diet needs improving, or that your children fall ill because they lack a variety of micronutrient-rich foods, why should you grow, purchase or eat foods which will improve the diet? Why not instead buy a video or a mobile phone? Even if you are aware, you may not be aware enough: as one Indonesian peasant said "You see, television is more important than food".

In the light of the evidence, I was glad to see several references in the discussion to a "social and behaviour change communication strategy" (which I would call nutrition education) recommended in the IYCF guidelines. But in my naive picture there remain several questions about how agriculture translates into better nutrition through education. Here is one of them.

In the case of homestead gardening is easy to see how women who learn to feed their families better find a ready-made strategy for improving diet in their own backyards. But what about the urban population and others who source their food outside the home? Suppose we mount a successful behaviour change program (let's say, to eat more beans) and at the same time persuade farmers to produce more beans in the hope of increased market demand. Can/do these two initiatives march together in sync? How do market mechanisms work between supplier and consumer to make the magic work for better eating habits? Do we have convincing examples of such synergies?

Perhaps some participants have the experience to answer my question.

Jane Sherman
Nutrition education consultant

15. Meg Lunney, FAO, Chile

Malnutrition, both from the perspective of under and overnourishment, is complex and likely involves, in part, the globalization of trade, resource scarcity, and the nutritional translation from wholesome food products to those often processed containing high levels of salt, sugar, calories, saturated and trans fats, amongst others. In agreement with Mr. Kent's comment, local agricultural production has a great potential to impact nutrition. Building capacity of smallholder producers in countries which export a large proportion of their products, may in turn, increase the national supply of food for consumers, perhaps at a more affordable cost.

An example of such, is the Food Acquisition Program in Brazil (PAA), where, by law, a minimum of 30% of food products provided to public schools must be purchased directly from smallholder farmers. This program has helped to serve children suffering both from chronic undernourishment, as well as those with obesity, consume healthy foods required for growth and development. Additionally, the program has given smallholder farmers more stability and security in their lives and rewards agricultural practices which benefit the environment.

Secondly, shifting the focus to include the quality of food, as opposed to merely quantity, is important as obesity and associated non-communicable diseases are affecting countries worldwide. Institutions can help facilitate the implementation of policies which promote the holistic, community-based objective of agriculture, thereby enabling families to consume healthy diets, balanced in calories and other essential nutrients. In addition to promoting the intake of healthy foods, complete, honest, and comprehensible labelling of products may further generate awareness of which types of foods should be avoided. Campaigns which distribute information to the public, for example Elige Vivir Sano in Chile (Choose to Live Healthily: <http://www.eligevivirsano.cl/>), may additionally discourage the intake of foods which lead to overnutrition.

16. Rachel Nugent, University of Washington, USA

Dear All:

Thanks for the good discussion. As part of the anniversary of the UN High Level Meeting on Non-communicable Diseases, yesterday the ONE blog published a short piece on agriculture and food security (<http://www.one.org/blog/2012/09/19/food-is-linked-to-ncds-and-producers-must-respond/>) that urges a broader understanding of food security. This was much debated in the last FSN discussion, but here we are making the point that the formal definition is not lacking so much as the interpretation for programming purposes of what real food security is – including avoidance of excess calories without nutrition. Achieving that goal requires substantial changes in agriculture and food systems as my report details.

You asked what research needs to be done to narrow the gap between agriculture and good nutrition. Here are a few suggestions.

Improve understanding of causal links among agriculture, nutrition, and various health outcomes
Develop “mutual metrics” that are understood and endorsed by all sectors so they can work together on common objectives

Produce a generalizable measure of food diversity

Improve understanding of what influences consumer behavior to consume healthy food

Understand how to implement and measure the impacts of policy choices across sectors

Thanks.

Rachel

17. Moises Jorge Gomez Porchini Mexico

[Original contribution in Spanish]

1. Si usted estuviera diseñando un programa de inversión agrícola, ¿cuáles son las cinco cosas principales que haría para maximizar su impacto en la nutrición?

I.- Los cinco puntos principales que tomaría en cuenta son los siguientes:

1.- Me enfocaría en los pequeños productores, en los más rezagados (mujeres, discapacitados, indígenas, pobres), pues son ellos los que son más sensibles a sufrir hambre si sus logros no son los adecuados.

2.- Buscaría diversificar la producción, de tal manera que incluya diferentes tipos de alimentos, tanto vegetales como animales.

3.- Trabajaría con objetivos comunes, que hagan deseable el asociarse para los productores, pues solo por medio de agrupaciones se puede llegar a alcanzar la escala necesaria para poder participar en un momento dado en el mercado.

4.- Pondría mucho énfasis en la elaboración de proyectos que contemplen un esquema completo de negocios, que incluya el consumo local y la venta de excedentes, que tome en cuenta los aspectos socioculturales y medioambientales de la operación y que opere con fondos a largo plazo, que permitan el correcto establecimiento y desarrollo de las operaciones.

5.- Buscaría obtener siempre productos terminados, no materias primas, por lo que la integración sería clave para obtener tanto el valor agregado en el aspecto económico como el aporte de nutrientes dado por productos de buena calidad.

2. Para apoyar el diseño e implementación de este programa, ¿dónde le gustaría ver que se investiga más y por qué?

II.- Sería básica la investigación para desarrollar tecnologías que los mismos productores puedan después replicar. El desarrollo de variedades agrícolas o cruces animales con las que no dependan de otros para poder sembrarlas o criarlas sería básico. Sin embargo, yo considero que la mayor deficiencia no está en la falta de investigación, si no en la falta de difusión de esta investigación. El poner la información al alcance real de los pequeños productores es lo que en mi opinión tendría realmente la capacidad de hacer la diferencia.

3. ¿Qué pueden hacer nuestras instituciones para ayudar a que los gobiernos nacionales se comprometan a actuar siguiendo sus recomendaciones, y para garantizar que la aplicación sea efectiva?

Al revisar las aportaciones hechas a el actual tema o a cualquiera de los anteriores que se han tratado en este foro, queda claro que de alguna manera hay un gran consenso acerca de lo que se considera correcto hacer para mejorar la agricultura desde diversos ángulos y que es urgente e importante tomar medidas para frenar el hambre y la desnutrición en el mundo. Sin embargo, esto es bastante claro en el ámbito académico pero no ocurre lo mismo en el sector comercial y en las esferas gubernamentales, en donde los intereses comerciales y políticos siguen prevaleciendo ampliamente sobre el interés de la sociedad.

En mi opinión, para lograr que los gobiernos atiendan realmente las recomendaciones hechas por la FAO y demás instituciones, es necesario que su voz tenga una resonancia mucho mayor. En la medida en que la sociedad toda esté realmente informada de lo que ocurre en el mundo en el aspecto nutricional y sepa qué es lo que se tiene que hacer para corregirlo, podrá presionar para que se den los pasos en la dirección correcta.

El conocimiento compartido en este foro debe verse ampliamente hacia la sociedad, no poco a poco, para que pueda influir en la toma de decisiones. No quiero mencionar ningún nombre, porque forzosamente omitiría a alguien, pero he leído comentarios demasiado valiosos que yo quisiera que escucharan mis autoridades.

Difundir la información por todos los medios posibles (Congresos regionales, Conferencias, Publicación y difusión de libros y revistas, blogs, etc.) sería la manera de poner los temas de este foro en la agenda propia de las instituciones nacionales, de manera que realmente se aborden localmente y se logre la inclusión de todos los actores necesarios para su discusión e implementación (Autoridades, académicos, productores, periodistas, investigadores, comerciantes, ONGs, etc.).

Saludos desde México
Moisés Gómez Porchini

[English translation]

1. If you were designing an agricultural investment program, which would be the five main actions you would take to maximize its impact on nutrition?

I. - The five major aspects I would take into account are:

1. - I would focus on small producers, on those lagging behind (women, disabled, indigenous, poor), as they are the most vulnerable to hunger if their targets are not met.

2. - I would try to diversify production, in such a way that it includes different types of food, both from plant and animal origin.

3. - I would work with common goals, which make association desirable to producers, as the required scale to participate at a given time in the market can only be achieved through clusters.

4. - I would put high emphasis on the development of projects that consider a complete business scheme, include local consumption and surplus sale, take into account the socio-cultural and environmental aspects of the operation, and operate with long-term funds that allow a suitable implementation and development.

5. - I would target yielding finished products, not raw materials, so that the integration would be key for obtaining both the economic added value and the nutritional contribution due to its high quality.

2. To support the design and implementation of this program, what would be your preferred research field and why?

II. – Research would be essential to develop technologies that can be afterwards replicated by farmers. The independent development of agricultural varieties or animal cross-breeding would be basic. However, I believe that the major deficiency is not the scarce research, but the lack of dissemination of this research. In my opinion, making the information available to smallholders would really have the capacity of making a difference.

3. What can our institutions do to help national governments to commit themselves to proceed according to their recommendations, and to ensure that its application is effective?

Reviewing the contributions to the current or former topics that have been addressed in this forum, it is somehow clear that there is a broad consensus about what should be done to improve agriculture from different perspectives, and that taking measures to curb hunger and malnutrition in the world is both urgent and important. However, although this approach is quite clear in the academic field, this is not the case in the commercial sector and governmental domains, where commercial and political interests still prevail widely over the general interests.

In my opinion, to get governments to really address the recommendations made by FAO and other institutions, these should have a broader impact. To the extent that the whole society is really informed of the nutritional status of the world and knows what needs to be done to amend the situation, it will be able to put pressure to ensure that the necessary steps are taken in the right direction.

The knowledge shared in this forum should be widely spread to society, not gradually, so that it can influence decision-making. I do not want to name anyone, as I would inevitably omit someone, but I have read highly valuable comments that I would like to share with my authorities.

Disseminating the information by all possible means (regional congresses, conferences, publication and distribution of books and magazines, blogs, etc.) would be the way of putting the topics of this forum on the agenda of the national institutions, so that they can really be locally addressed, achieving the inclusion of all the necessary stakeholders for its discussion and implementation (authorities, academics, producers, journalists, researchers, traders, NGOs, etc.).

Regards from Mexico,

Moisés Gómez Porchini

18. Peter Steele, FAO, Italy

Colleagues,

Investment in nutrition needs stealth to succeed

Thinking differently

To make investments in nutrition work for nutrition – you have to dress ‘nutrition’ in different clothes. Nutrition is really difficult to sell at face value; the mover-shakers of the mainly donor-funded development world need to be attracted into investing in some other way – and you also have to encourage recipients to think differently. Would you rather have a high dam, a new capital city or a national nutrition programme if you ran the government? How do you want to be remembered?

Reading some of the original contributions a first easy-to-make assessment is that there are simply too many nutritionists involved with the debate, and insufficient (may be none-at-all) contributors from the politico-financial and commercial sectors. When you have a firm viewpoint, and particularly where it has a platform that is >100% morally sound, it is hard to step back and see the ‘trees in the forest’; that ‘forest’ is simply too large. But this is exactly what needs to be done.

Of course nutrition, human health, equality of choice, gender issues and similar are all deserving of investment. And, if your country is rich enough and has the right kind of leadership, the social

issues/investments of the day will continue to play a role in national development. You, representing the public, will ensure that this is the case. (Well, in an ideal world that is).

But what do you do if you cannot get access to sufficient public funding because, for example, you live in a poor country, you come from an isolated community, your people are not represented in government and so on (and this not forgetting the >60% of humanity who are illiterate, female, handicapped, elderly, young, unemployed and more – and frequently double or triple disadvantaged). You have to mobilize resources as best you can; and you have to promote, badger, provoke, encourage those better placed to take an interest. In short you have to use stealth, cunning, ingenuity and brilliance - to dress up your nutrition proposals (and others) within a guise that will 'sell'.

You have to advertise and sell your ideas. And if the recipient public sector where you live is not interested, then you have to sell into the donor community and/or the private sector (and, for best, both at the same time). Which means finding out what interests these sectors, and tailoring your proposals to meet their investment requirements. You need to get to know these people.

Allied to this is the need to 'think differently' – to put yourselves into the shoes/offices/Landcruisers of the people whom you need to meet; those whom you need to persuade to your point-of-view.

Access to funds

Earlier this year those of us in the development industries were presented with findings from a number of sources that showed of the order US\$21T (i.e. \$21,000,000,000,000 - say it slowly) was currently held off-shore in the international tax havens by the so-called 'super-rich'. Even this staggering figure may be substantially under-estimated, and it could be as high as US\$35T. Off-shore funds come from a number of sources – typically countries with mineral, oil and gas resources and, crucially, those that are controlled by minority cliques for which there is no redress at the ballot box. So, things are unlikely to change any time soon. These countries are led by Russia, Saudi Arabia and Nigeria, respectively, with estimates of US\$800B, US\$340B & US\$340B shifted off-shore during the past 20 years or so. The key issue here is simple to understand – once off-shore - these funds are no longer available for use within the country of origin.

So, what's this got to do with nutrition and the FSN debate? Hang-on, we're getting there, but you can probably already catch the drift of this particular contribution.

Ethiopia

Here is a short digression. Just on five years back I was involved with a food security project in Ethiopia – providing management from an office in Addis Ababa, working with the communities involved in the Northern Shoa and around Mekelle and generally trying to ensure delivery of socio-techno-economic packages for the estimated 90,000 target people involved. We had a budget of the order US\$4.2M; and it was the largest project of its kind with the agency of the day. We did reasonably well, and follow-on activities continue to the present with new management, more communities, similar objectives and more – more funds too.

We undertook nutritional surveys of selected communities to help determine delivery and success with meeting objectives, etc. Summarizing findings in isolated hill country in what is one of the poorest countries on Africa, nutritional determinants were of the order 47%, 11% & 43%, respectively, for stunting, wasting & underweight for kids <5 years old. Terrible health/emergency results that we were able to target with our budgetary support for local investment – food, schools, sanitation, energy, clean water and more. Equally, we used our network of contacts to promote the project and its needs within our local donor community; no good being successful in the field if those in the capital city remain unaware of things. (This means networking, people, publications & promotion.)

We also looked sideways into private sector investment, for example, exploring wool production & sales with the largest blanket manufacturer in the country (who manufactured mainly on the basis of imported used fibres), use of fuel ethanol as an alternative to manure, baby-food production, dairy-cow/milk industries and foreign tourism – a day's travel from Addis and the country provided pre-historic pristine walking opportunities (and the Ethiopian wolf *Canis simensis*); all it needed was a new rest house with clean beds and hot showers. And other opportunities.

Messages? You cannot sell the nutritional needs of your community easily when there are 80 million others in the country – most of whom face similar challenges. You cannot always plan on national-scale. But, all that said, Ethiopia country-wide has represented a success story for Africa during the past 10 years.

Country investment

But what if you need to plan nationally? Take a hypothetical country in West Africa - hypothetical remember. Consider an indigenous population of estimated 170M people with population increases of the order 2.5% pa and projected to be 475M by 2050 – already the issues are looking daunting. National planning is underway – always – and we know that GDP is rising of the order 7% annually (so, reasonable) on the basis of sector developments of which 'agriculture' dominates, but continues to trail manufacturing, services, oil&gas and others as a recipient of investment – yet estimated 70% of the population continue to depend upon agriculture for a living; and, coincident – coincident - 65% of the national population remains in 'abject' poverty – so, not just poor, but really poor (and this definitive sector is growing 5% annually).

Did someone mention 'oil&gas'? Responsible for 19% of GDP, the sector provides 95% of foreign exchange and >80% of budgetary resources in support of a complicated national management structure that encompasses 36 state governments and one federal government. What options for those budgetary resources filtering down to the man/woman in the bush/street? The commercial sector, by contrast, impacts on just about everyone. Sure, people make profits by participating – sometimes really useful profits – from cement, telecom, banking, manufacturing and, of course, oil&gas. In our hypothetical country all these sectors have made money. Could these entrepreneurs with their assets and advisors shift into agriculture, agro-industries and agro-services? Some have done so already.

Investing in agriculture

But their investment is piecemeal, relatively low-key and sometimes high risk. Further, industrialization of agricultural production means investment in technologies, equipment, structures, water, etc. and, crucially, limited numbers of high quality people. What of the masses in the country that are already poor, imprisoned in rural subsistence systems and with little or no hope of change, but occupying that same land that is needed for larger-scale investment?

From here-on you can shift into the smallholder/organized agricultural production models or the larger-scale plantation models that carry less financial risk (but the much more difficult socio-economic risks of landless people migrating). And, the key element of this particular contribution? Here-in is the wardrobe of clothes required of nutrition development.

You shift into national, regional and zonal development that channel blocks of investment across the focus land areas; this is land-linked to producer-zones-linked to agro-industrial-parks-linked to markets-linked to towns, cities and/or ports. Sure, this has objectives to boost agro-production, improve socio-economic performance, rural well-being and just about everything else required of people; but you don't bring nutrition in until the middle-game, when you need to count the number of school gardens, the number of kids attending secondary school, the number of buses linking producers to markets, the number of new jobs in the community and so on.

And if the title of the debate 'Agriculture working for nutrition' is too obvious – just think; with urbanization continuing apace worldwide that first generation born in the city will, like the

majority of people everywhere see 'agriculture at the supermarket' – and then it simply becomes that much more challenging to convince kids (and their parents) that nutrition and dietary patterns begins with crops, livestock, fisheries and the rest of the natural world.

Get the point?

Key words: Private sector investment.

PS. And that off-shore money to which reference was made earlier? Governments in the countries concerned are unlikely to change over-night and thus the complexity and challenges of sharing national resources within the mass population will continue; but you can't abuse, channel, cream and/or lose funds of this magnitude with agriculture as easily as you can with a 'pump-it-and-shift-it' industries like oil&gas. Don't lose sight of the key role of agro-production & agro-industrialization in the race to boost nutrition.

Peter Steele
Consultant, Rome

19. Kazi Eliza Islam, Heifer International, USA

Dear Facilitators,

Thanks for brining this extremely important and timely issue for discussion. With the growing need for feeding more people around the world, coupled with effect of climate change and natural disasters, agriculture sector is becoming extremely important to address food security and nutrition issues across the world. Though the theoretical relationship between agriculture, food security and nutrition is well recognized by the development community, the linkages between these 3 are often weak or even do not exist in practice. There are several reasons why agriculture fails to demonstrate optimum benefits to improve nutrition. I am trying to highlight some of those below with possible solutions:

(1) First of all there is a huge communication gap between academicians, researchers and practitioners. There are ample of evidences that demonstrate the positive relationship between agriculture, food security and nutrition, but very few attempt has made to translate those into practice, making sure that those knowledge are being used during, design implementation and monitoring evaluation of agriculture projects/programs. In many cases, practitioners are not even aware of the body of knowledge available in this sector or the various pathways that can link agriculture to improve nutrition.

(2) In many cases agriculture projects are heavily focused on increasing production and productivity while totally ignoring the social and cultural factors that prevent some vulnerable and marginalized groups (especially women and children) to be fully benefitted from increased production and productivity

(3) Due to lack of awareness or in some cases lack of political commitment, agriculture projects often are not designed with a nutrition objective in mind. In some cases even if it does have a nutrition objective, due to limited understanding about the relationship between agriculture and nutrition and/or the overall complexity and underlying causes of malnutrition, the project fails to take a holistic approach, that in turn fails to significantly contribute to nutrition. On top of these, due to lack of proper handling, processing, and storage, in many cases the nutritive value of crops, vegetables, milk or milk products are diminished or lost.

(4) The monitoring and evaluation system of agriculture projects/program often do not have appropriate or adequate indicators to capture and demonstrate projects' contribution to food security and nutrition.

So some of my suggestions would be to include:

(1) Strengthen collaborations, communications and coordination between researchers and practitioner, policy makers in agriculture, food and nutrition sectors

(2) Design agriculture projects with nutrition objectives and include some essential direct nutrition interventions such as nutrition education with especial focus on infant and young child feeding, promoting appropriate health hygiene and nutrition behaviour and practices, production of vitamin and minerals rich crops and vegetables, etc either through adding direct interventions or by linking agriculture projects with existing government or others health and nutrition projects/programs

(3) Design and implement monitoring and evaluation system of agriculture projects to capture nutrition benefits (include and operationalize appropriate food security and nutrition indicators)

(4) Take into consideration of social and cultural factors, address issues around social exclusions/discriminations, and promote women empowerment to achieve sustainable and larger impact especially on women and child nutrition.

20. Christine Andela, Cameroon

[original in French]

Je commencerai par dire que mon expérience de terrain me permet d'affirmer que dans les pays d'Afrique subsaharienne et particulièrement au Cameroun, le lien n'est pas fait de façon claire entre l'agriculture et la nutrition.

Sur le plan institutionnel, l'agriculture est rattachée au ministère de l'agriculture tandis que la nutrition relève du Ministère de la santé .

Cette organisation administrative n'est pas anodine; en effet, la nutrition est évoquée généralement en terme de "carences" et donc d'apports nutritionnels , et la solution aux problèmes de nutrition semblent relever de thérapie beaucoup plus de "politiques d'investissement dans l'agriculture" .

Si donc je devais élaborer un programme d'investissement agricole, les 5 principales mesures que j'adopterais pour en maximiser l'impact sur la nutrition seraient :

1.une vision de l'agriculture axée sur l'homme, son alimentation pour être en bonne santé et respectueuse de l'environnement

2.la promotion et la protection de l'agriculture familiale paysanne

3.des modes de production à faible utilisation de fertilisants et pesticides chimiques

4.l'accompagnement des petits producteurs et productrices en matière de production d'engrais vert

5.la valorisation des marchés de proximité

Les domaines de recherche à intensifier pour cela:

- les modes de consommation des ménages
- les modes de production
- les modes de vie des populations d'une communauté donnée (locale, nationale)
- l'impact des prix des denrées agricoles sur la consommation et la nutrition

Ce que les institutions peuvent faire au niveau des pays:

- s'assurer que les pays respectent leurs engagements sur la nutrition et la sécurité alimentaire et en matière de financement de l'agriculture: les y accompagner
- promouvoir la collaboration entre tous les acteurs impliqués dans les actions de sécurité alimentaire et de nutrition
- être transparent en matière de conseils donnés aux gouvernements en matière de programmes agricoles en communiquant sur les orientations proposées et en les mettant en débat parmi tous les acteurs

[Translation in English]

I will start by saying that my experience in the field lets me declare that in Sub-Saharan African countries, and particularly in Cameroon, there is no clear link between agriculture and nutrition. At the institutional level, agriculture falls under the Ministry of Agriculture, while nutrition is dealt with by the Ministry of Health.

This administrative organization is not without reason; indeed, nutrition is generally invoked in terms of "deficiencies" and therefore, of nutritional contributions, and the solution to nutrition problems seems to concern therapy more than "investment policies in agriculture."

If, therefore, I had to elaborate an agricultural investment program, the five main measures that I will adopt to maximize its impact on nutrition would be:

1. a vision of agriculture centered on the human being - the food they need to be healthy, - and respectful of the environment.
2. promotion and protection of peasant family agriculture
3. production methods with little use of chemical fertilizers and pesticides.
4. support for small producers (men and women) in the production of green manure
5. promotion of local markets

For that, the areas of investigation that need to be concentrated on are:

- consumption patterns in households
- methods of production
- the way of living of the people in a given community (local, national)
- the impact of agricultural commodities prices on consumption and nutrition

What institutions can do at country level:

- ensure that countries respect their commitments on nutrition and food security in terms of financing of agriculture: support them in this.
- promote collaboration among all those involved in food security and nutrition activities
- be transparent in terms of advice given to Governments regarding agricultural programs by communicating about the orientations proposed and opening them up to debate by all the actors.

21. Martine Rutten, Wageningen University, Netherlands

If you were designing an agricultural investment programme, what are the top 5 things you would do to maximize its impact on nutrition?

Answer:

1. I would first look at the population and its characteristics in terms of gender, age, disease burden

so as to identify nutrition needs. I would also consider socio-economic status as that in the end determines whether there's a market and whether government involvement is needed;

2. I would then look at the agricultural production capacity of the country, given the political context, trade context, climate, environment ...and other potential factors that predetermine the feasibility of the particular investment that is considered;

3. I would make sure that part of the investment is channelled to reducing food waste along the food supply chain from producers, to consumers, in transport, and the various stages in between;

4. I would invest in education programmes, television commercials etc. that would show how the food item in question is good for you, and how it should be consumed to maximise its impact;

5. I would pay attention to price developments (in view of the strong food price volatility observed in the last couple of years and the impacts this has on producers and consumers) and invest in storage facilities so as to avoid food going to waste.

To support the design and implementation of this programme, where would you like to see more research done, and why?

Answer:

1. More research is needed in the area of food waste, where it appears and to what extent, how it can be reduced or prevented altogether. There's limited data on global food waste and so little research done on potential impacts if we were to reduce it;

2. More research is needed in the area of interrelationships between agriculture, nutrition and health and economy-wide impacts and feedback effects (healthier labour force that is able to work longer and more productively, lower health care costs, improved well-being). This is largely due to these sciences operating largely independently from each other. It is changing, but slowly.

Important questions are:

a. What are impacts of changes in trade policies in bilateral or multilateral context or other economic policies and/or shocks on nutrition and health? Are there tradeoffs (e.g. between potential economic gains/losses and health gains/losses) and how do we deal with those?

b. Or vice versa, if we were to eat healthily, what would this imply for our agriculture/production system? Trade? And again what are the economy -wide impacts?

3. More research is needed in the area of food and nutrition security in relation to food price volatility

4. More research is needed in the role of women in securing household food and nutrition security

What can our institutions do to help country governments commit to action around your recommendations, and to help ensure implementation will be effective?

Answer:

1. It should provide a platform for all stakeholders and stimulate them to come together and push for ways forward

2. Provide technical assistance where needed

3. Make available statistics on food and especially nutrition security for use in research

22. Rwakakamba Morrison, Agency for Transformation, Uganda

Dear Moderator, for the case of Uganda,

For effective investment, I would look at the following;

1. For example, in 2008, Uganda crafted a Food and Nutrition Security policy that details practical interventions for arresting food insecurity, undernourishment and over nourishment. It will be interesting to audit the state of policy implementation. As far as I can recall, there was a clash of mandate on which ministry was to take lead in implementation- i.e. The Ministry of Health or The Ministry of Agriculture Animal Industry and Fisheries? Was it resolved? Is implementation process on rail? Are we achieving results?
2. The other aspect is about education and information on nutrition. Are households (rural, peri-urban and urban) exposed to ferment of information on nutrition? Take the example of Bushenyi district in western Uganda- it is one of the highest milk producers in Uganda with the highest level of undernourished children! Reason? All milk is sold out and less /none is left for children. Can we strike a balance between what goes to the market and what is served on the table?
3. Related to the above- with information and little bit of nudging from local authorities- surely every household in Uganda- save for slum-urban dwellers can have a small kitchen/back yard garden of vegetables/ fruits etc. Its' possible to have this culture here? Yes- it is possible if we invest in information and efficacy of local governments.
4. Uganda should put in place- a one milk cow for every household policy. Why? One-Milk will be available for families. Two- Manure (compost) to make other crops (variety) work. The contention is on the right breed and balancing inputs and outputs and context of a given household.
5. Make fortified and drought resistant seeds accessible for areas facing undernourishment and stunted children in Uganda (drought prone and conflict areas).

Regards,
Morrison Rwakakamba
Chief Executive Officer
Agency for Transformation (AFT)

23. Violet Kadenyeka Mugalavai, Moi University, Kenya

Greetings,

I wish to contribute to this interesting topic.

1. If you were designing an agricultural investment programme, what are the top 5 things you would do to maximize its impact on nutrition?
It is important to make sure that all the livelihood resources are available, accessed and controlled by both gender, and in sustainable.
Achieving food diversity by reviving orphan crops and developing models for nutrition sensitization, education and recipe development. This will work well through community women groups and schools especially targeting the girl child.
2. To support the design and implementation of this programme, where would you like to see more research done, and why?

Participatory projects are more appropriate than deep scientific research, which is already available and should be implemented. Climate smart, eco-effective and interactive livelihood groups can work together to implement good practices.

3. What can our institutions do to help country governments commit to action around your recommendations, and to help ensure implementation will be effective?

Our governments need to build and develop capacities of communities through devolved mechanisms so that resources and skilled experts reach the poor at the grassroots.

24. Salomeyesudas, Deccan Development Society, India

Dear Friends

We can make agriculture work for nutrition if we allow the practice of ecological agriculture to continue because of the bonus of uncultivated food we get from these farms will definitely answer some of the worst nutritional deficiency disorders.

Dry land Millet farmers' treasured their knowledge about their resources, about their ecological agriculture, about their well being, about their living interface with nature and passed on to generation to generation.

If we closely understand we find that a very important component of millet cultivation is its embedded biodiversity. On their lands one could see that millets stand next to pulses and pulses stand next to oilseeds and oilseeds stand next to vegetable. As a combination, millets, pulses, oilseeds and vegetables made a perfect combination of completely nutritious meal possible in the lives of the dry land people without having to spend a single paisa on outside food purchases.

Astonishingly within this gamete of ecological agriculture there is the issue of uncultivated foods which are also called as wild greens by people and designated as weeds by scientists. It is a kind of ecological agriculture pattern that sustains uncultivated foods. Certain crops in certain seasons in certain agriculture fashion allow lot of greens to come up on their lands without consciously cultivating them.

Addition of farmyard manure enhances the growth of these multipurpose greens on their lands. Light wooden ploughing will allow the delicate seed to be preserved and germinated easily where as hard tractor ploughing may destroy them.

Same way application of chemical fertilizers hardens the soil and germination of these delicious delicate seeds may not happen easily and application of pesticides completely makes them non edible as the pesticide directly falls and settles on these greens.

To enjoy the greens as food, fodder and medicine the dry land Millet farmers always kept themselves away from these chemicals. The embedded uncultivated foods are always handy to women on their every visit to farm.

Thank you

25. Paul von Hartman, California Cannabis Ministry, USA

1. If you were designing an agricultural investment programme, what are the top 5 things you would do to maximize its impact on nutrition?

Objectively assess the unique and essential nutritional profile of the whole Cannabis plant, without prejudice against the cultivation of "industrial hemp" strains. See www.cannabisinternational.org for more information about why Cannabis is in fact a "dietary essential."

2. To support the design and implementation of this programme, where would you like to see more research done, and why?

Research is needed to determine which lands are available for phytoremediation and for expanding the arable base, using highly adaptable and industrially useful pioneers crops inclusive of Cannabis.

3. What can our institutions do to help country governments commit to action around your recommendations, and to help ensure implementation will be effective?

Officially recognize the impact that current drug policy has had on food security and nutrition.

26. Gladson Makowa, Story Workshop, Malawi

1. If you were designing an agricultural investment programme, what are the top 5 things you would do to maximize its impact on nutrition?

1. promotion of indigenous knowledge and orphan crops would help. Most orphan crops have advantages over the ones which are being promoted now.
2. understanding the current status, advantages and utilizing it. In Malawi for example we have many goats which can provide milk to children and women to improve nutrition.
3. Behaviour change communication intensification. People need to know advantages of many orphan crops, goats milk, insects, mice and other foods. In Malawi people have little relish and plenty of starch on their meals, a habit that need to change and improve.
4. Legumes which provide nutritious food are a major source of income now that tobacco has no future. The conflict will be bigger now than ever before. There is a need to come up with more viable cash crops and utilize legumes as food.
5. Organic farming. Farmers discovered that applying manure twice work well in the same way chemical fertilizer does in maize. There is a need to encourage better manure making innovations, to reduce starvation, or low yield of maize, the major food crop.

27. Dianna DaSilva-Glasgow, University of Guyana, Guyana

I think the comments so far have all been great.

I believe it is important to match production with consumption. Therefore the first (1) thing that I would suggest is a stocktaking of the situation in the country with regards to nutrition and henceforth seek to identify gaps, what are we eating too much of or what aren't we eating in sufficient quantities? How wholesome is what we are eating? Are we producing the foods that are necessary to guarantee minimum levels of nutrition?

(2) I would also suggest that investment programmes be more crop or area specific so that we try to increase production of certain foods, emphasizing quality by supporting organic production; and we assess the difference in nutrition levels among various localities and try to support increased production and processing in foods where nutrition levels are currently at undesirable levels. Additionally, (3) I would support environmentally sustainable practices as this can aid in improving food quality and the productivity of land resources.

(4) I would also support a social assessment of the nutrition situation of the country and encourage targeting of vulnerable social fragments of society, such as single-parent homes, early school levels for increased support for production activities.

(5) Education is a major factor supporting nutrition. People making consumption decisions not only on their access to and capabilities to purchase food but also based on norms established by fore-parents etc. For instance, in Guyana put a lot of coconut milk in certain foods but coconut milk is high in cholesterol. We also put sugar in just about every food that we cook, which increases our daily consumption of sugar.

28. Angela Kimani, FAO, Kenya

Based on your own knowledge and experience in the area of improving nutrition through food and agriculture programmes:

1. If you were designing an agricultural investment programme, what are the top 5 things you would do to maximize its impact on nutrition?

Some of the main items to be done:

- Ensure the overall objective and the goals of the programme touches on nutrition,
- Ensure the problem statement identifies a nutrition problem that it want to contribute towards,
- Ensure there is at least one specific objective on nutrition. The objective should be SMART.
- Ensure there are specific / clear activities on nutrition that are indicated in the work plan. The activities should also have specific outputs,
- Ensure there are clear budget lines for the nutrition activities and human resource,

2. To support the design and implementation of this programme, where would you like to see more research done, and why?

- There is need to link the ALREADY done agricultural research to nutrition. The bigger challenge is that most agricultural research done does not (yet) directly benefit the small scale farmers, while they contribute a significant amount in food production all over the world. It may be benefiting the large scale farmers, or sitting in shelves. There is need to translate the successful researches into a language that rural small scale farmers understand and can implement.
- There is need to support the production of traditional crops, including vegetables. I know this has already been echoed many times, but there is need to practically implement this at community level.
- Nutrition education is another area that needs research. Which are the best ways of communicating and successful implementation of Behaviour Change Communication? Especially in food choices, cultural factors affecting food consumption etc
- In pastoral regions, there is need for strong research in the traditional milk and meat preservation techniques that are safe and acceptable, to be used in different regions. This is a grey area, that needs specific clarifications to assist in implementation of livestock programs that have an end objective of improving food security and nutrition- this has been a clear gap even in the horn of Africa, and has been raised severally.

3. What can our institutions do to help country governments commit to action around your recommendations, and to help ensure implementation will be effective?

- There is need to build nutrition capacity in agricultural institutions. (so that nutrition is no longer seen as a 'health' issue, but also an agricultural and food security issue),

- Support development of ag-nutrition specific tools (e.g food consumption tools) that will assist the agriculture sector 'understand' what improved nutrition means in an agricultural setting,
- Disseminate these tools as well as guidelines.
- Share case studies of where these have been done and lessons learnt/ recommendations for further improvement. This will give the country governments more confidence in linking agriculture to nutrition,
- Ensure agriculture-nutrition linkages are well embedded in country processes and policies e.g caadp, food and nutrition security papers and legislation.

Thanks,

Angela Kimani

Nutritionist

FAO- Sub-Regional Emergency Office for Eastern and Central Africa

29. Mahtab S. Bamji, Dangoria Charitable Trust, India

Dear all

The issue of agriculture for ensuring nutrition security is very important. The Indian National Science Academy (INSA) discussed the issue of "[Nutrition security for India: issues and the way forward](#)", in a symposium held on August 3,4, 2009. Based on the presentations and subsequent extensive discussion among fellows and other experts, a position paper was prepared. I am reproducing below the recommendations relevant to agriculture.

Increased Availability and Access to Variety of Foods

1. Environmentally sustainable, nutrition oriented cropping pattern, using a blend of time-tested conventional and new technologies with appropriate safety checks. – Awareness and education of agriculture professionals at all levels and community–Ministry of agriculture (MOA), ICAR, State agriculture universities, MI&B.
2. House-hold food and nutrition security through decentralised, nutritionally oriented cropping pattern, homestead production of nutrient-dense vegetables, fruits, and animal products–poultry, dairy, fishery. Home grown food can ensure livelihood security, reliable and affordable food security and reduce rural urban and gender divide. - Awareness and education of agriculture professionals at all levels–MOA, ICAR, State agriculture universities, I&B.
3. Nutrition dimension should be main-streamed into national missions like Horticulture, Food security, NREGA and Rural Health Mission, with defined input and output parameters for monitoring. NREG scheme should be well structured to create assets that would help ecology and nutrition and develop skills. S&T institutions should be involved in its execution. –MOA, Ministry of rural development (MRD), MOH.
4. Orphan crops like millets should be revived. Increase in production of pulses should receive high priority. –MOA, ICAR, State agriculture universities, MI&B.
5. Efforts need to be made to bridge the gap between actual and potential productivity of all crops. –MOA, ICAR, State agriculture universities, MI&B.
6. Community gene, seed, grain and water banks, and crop livestock integrated farming will enhance nutrition security in dry land areas. – Agriculture extension, MOA, ICAR, State agriculture universities.
7. Post harvest technologies including establishment of modern silos, and food processing for value addition should receive high priority to prevent wastage of farm produce and generate employment. –MOA, MRD, Ministry of food processing industries (MFPI).
8. Public distribution system should be strengthened and basket of commodities increased to include millets, pulse and oils. –Ministry of civil supplies.
9. Export of Soya bean products should be stopped till availability of other pulses improves. Soya bean can be used to fortify wheat flour and other vehicles. - MOA, MFPI, Civil supplies.

Subsequent to publication of this paper, a more focused paper entitled "[Micronutrient security for India- priorities for research and action](#)". Both these papers are available on INSA web site. Hope this information is useful.

Mahtab S. Bamji
INSA Hon.Scientist, Dangoria Charitable Trust,Hyderabad

30. Syntyche Nakar Djindil, Wageningen University, The Netherlands

[Original in French]

C'est une bonne initiative que la FAO organise cette discussion pour explorer les lacunes de politiques, pratiques et connaissances liant agriculture et nutrition. Souvent les politiques/décideurs perçoivent et créent une distance entre agriculture et nutrition, en les considérant comme deux thématiques distinctes avec des programmes déconnectés. Cette vision est contraire à la place qu'occupent l'agriculture et la malnutrition dans le monde rural. Surtout, les pays à dominance agricole, l'agriculture est indissociable de la nutrition, une complémentarité sur laquelle se base la vie sociale et économique. La vie est organisée autour de l'agriculture, tout dépend de cette activité (alimentation, santé, cohésion sociale). L'agriculture offre une gamme de possibilités de survie et de connectivité sociale et donc un programme d'investissement agricole doit tenir compte de toutes ces composantes qui sont inter-liées.

Si vous étiez chargé d'élaborer un programme d'investissements agricoles, quels seraient les 5 principales mesures à adopter pour en maximiser l'impact sur la nutrition ?

1. **Foncier agricole et nutrition** : Foncier (y compris accès aux ressources communes) et nutrition en milieu agricole. Cette mesure consiste à - mobiliser des ressources pour la protection du foncier agricole, -analyser la relation entre le titre foncier, la production agricole, et la nutrition de la population.
2. **Développement des filières agricoles et nutritionnelles**: Cette mesure consiste à développer des filières agro-nutrition en se basant sur des connaissances locales pour faciliter leurs implantations et aussi favoriser la création des emplois communautaires. Ces filière doivent s'intéresser à connaître les valeurs nutritionnelles des aliments locaux, et améliorer les méthodes de conservations pour stabiliser les qualités nutritives et assurer la pérennisation des produits (agricoles et cueillette). Explorer les possibilités de fortifier et renforcer la qualité des aliments locaux pour répondre aux besoins nutritionnels (micronutriments et calorie) de la population en fonction de l'âge.
3. **Diversité agricole et nutrition** : Cette mesure consiste à diversifier les cultures locales en tenant compte des conditions climatiques, écologiques et des valeurs culturelles. Souvent, les produits cultivés sont monotones mais par peur et parfois ignorance, personne n'ose tester des nouveaux produits. Explorer des nouvelles cultures qui aideront à combler des déficits nutritionnels tels que les micronutriments (source de fer, vitamines, minéraux) et les protéines. Cette mesure doit aussi s'intéresser à tester de nouvelles variétés et mettre en place des unités de recherches axées sur la diversité des cultures qualitativement indispensables pour la nutrition des divers groupes d'individus.
4. **Agriculture, santé et nutrition** : Cette mesure doit se pencher sur la liaisons-agriculture-nutrition-santé. Couverture des besoins nutritionnels (calorie et micronutriments) et sanitaire. Les mauvaises conditions nutritionnelles et sanitaires font que les adultes soient souvent épuisés physiquement et moralement, et n'arrivent pas à travailler leur terre. La nutrition et la santé constituent la base de la productivité. Dans le milieu rural, l'agriculture qui demeure encore

traditionnelle (surtout pour de nombreux pays africains) dépend fortement de la capacité physique. L'indisponibilité d'un membre actif au cours de la saison agricole (maladie, migration, décès) peut entraîner la famille dans la famine et la malnutrition. La maladie, le décès, sont des événements inattendus qui peuvent facilement ruiner, et l'enfoncer dans une insécurité alimentaire chronique. Pour assurer la productivité agricole, il est donc indispensable de prendre des mesures concrètes pour assurer la nutrition et la santé des agriculteurs.

5. **Agriculture, cueillette (ou autre activité accessoire) et nutrition:** Cette mesure consistera à valoriser les activités locales qui sont complémentaires à l'agriculture et la nutrition des ménages. Par exemple dans la région du Guera où j'avais effectué ma recherche, la cueillette et les produits agricoles constituent des sources primordiales de nutrition de la population. Une bonne partie des ingrédients de la cuisine (sauce) provient des produits de la cueillette. C'est une activité qui contribue à sécuriser les produits agricoles et gérer les famines.

Dans quels domaines souhaitez-vous intensifier les recherches pour étayer l'élaboration et la mise en œuvre d'un tel programme, et pourquoi?

- **Promouvoir l'accessibilité aux services sociaux de base:** Donner la chance à la population surtout rurale d'avoir accès aux soins primaires, et aux marchés. Cette mesure va contribuer à protéger les produits agricoles et les réserver pour la nutrition familiale.
- **Renforcer les réseaux sociaux:** Les liens sociaux sont très indispensables pour sécuriser les activités agricoles. Il serait ingénieux d'identifier les réseaux sociaux locaux et développer des programmes autour en respectant les valeurs culturelles. Aider à la résolution des conflits...
- **Protéger-stabiliser les moyens d'existence et de subsistance :** Encourager la population à la diversité des cultures et aussi les moyens de subsistance. Par exemple apprendre des nouvelles activités qui concourent au bien-être.
- **Protéger les agriculteurs des enjeux agricoles:** S'assurer que les politiques agricoles étatiques ne soient pas des contraintes pour l'épanouissement de l'agriculture et des programmes de nutrition.

Que peuvent faire nos institutions pour contribuer à ce que les gouvernements des pays s'engagent activement en faveur de vos recommandations, et en garantir la mise en œuvre efficace?

- **Établir des critères et des indicateurs précis de suivi et de contrôle.** Faire des évaluations des délais raisonnables,
- **Mettre en place une cellule de surveillance- monitoring indépendante** (avoir l'œil sur les politiques agricoles étatiques qui souvent bloquent l'opération des activités des agriculteurs).
- **Élaborer des politiques consistantes** pour aider le gouvernement à respecter leur engagement envers la population, réviser/assouplir des politiques agricoles qui freinent le bon déroulement des activités agricoles.

[English translation]

It is a good initiative that FAO organized this discussion to explore the shortfalls of policies, practices and knowledge tying agriculture to nutrition. Often the politicians/decision makers perceive and create a gap between agriculture and nutrition, by treating them as two distinct areas with disconnected programs. This vision does not accord with the place occupied by agriculture and malnutrition in the rural world. Especially in those predominantly agricultural countries, agriculture cannot be separated from nutrition, on which interdependence social and economic life

is founded. Life is organized around agriculture and everything derives from this activity (food, health, social inter-relationships). Agriculture offers a range of ways of surviving and of connecting socially and, therefore, an agricultural investment program should take into account all these inter-linked elements.

If you were designing an agricultural investment programme, what are the top 5 things you would do to maximize its impact on nutrition?

- 1. Agricultural land tenure and nutrition:** land title (including access to common resources) and nutrition in the agricultural sector. This measure consists in - mobilizing resources for the protection of agricultural land tenure, -analyzing the relationship between land title, agricultural production and the nutrition of the population.
- 2. Development of agricultural and nutritional associations:** This measure consists in developing agro-nutritional associations based on local knowledge in order to promote their initiatives and also to help the creation of jobs in the community. These organizations should be interested in knowing the nutritional values of local foodstuffs, and improving storage methods to preserve their nutritional qualities and assure product preservation (farming and gathering). They should explore the possibilities of improving and reinforcing the quality of local foods to meet nutritional needs (micronutrients and calories) as a function of the age groups of the population.
- 3. Agricultural diversification and nutrition:** This measure consists in diversifying local crops while taking into account climatic and ecological conditions, and cultural values. Often, the products raised are monotonous, due to fear and sometimes ignorance no-one dares to try out new products. Exploring new crops which would help to overcome nutritional shortfalls, such as micronutrients (a source of iron, vitamins, minerals) and proteins. This measure should also become involved in the testing of new varieties and should set up research units concentrating on the diversity of those crops which are qualitatively indispensable for the nutrition of different groups of individuals.
- 4. Agriculture, health and nutrition:** This measure should concentrate on the links between agriculture - nutrition - health. Covering nutritional requirements (calories and micronutrients) and sanitation. Poor nutritional and sanitary conditions result in adults being often exhausted physically and morally, and unable to work their land. Nutrition and health are the foundation of productivity. In the rural environment, agriculture which is still traditional (especially in many African countries) depends very much on physical capacity. If an active member is not available during the agricultural season (sickness, migration, death) the family can be reduced to famine and malnutrition. Sickness and death are unforeseen events which can easily bring ruin, and trap the family in chronic food insecurity. To ensure agricultural productivity it is therefore essential to take concrete steps to ensure the nutrition and health of the farmers...
- 5. Agriculture, gathering (or other related activity) and nutrition:** This measure consists in enhancing the local activities which complement agriculture and the feeding of households. For example, in the Guera region where I carried out my research, gathering and agricultural produce are the primordial sources of nutrition of the people. A good part of the cooking ingredients (sauce) come from gathered products. It is an activity that helps to preserve agricultural products and handle famines.

To support the design and implementation of this programme, where would you like to see more research done, and why?

- **Promote accessibility of basic social services:** Give the people, above all the rural population, the chance to have access to primary health care and to markets. This step will help to protect agricultural products and save them for family nutrition.
- **Strengthen social organizations:** Social linkages are absolutely essential for preserving agricultural activities. It would be intelligent to identify local social networks and to develop programs around them while respecting cultural values. Help to resolve conflicts...
- **Protect and stabilize the means of existence and subsistence:** Encourage the people to diversify their crops and also their ways of subsistence. For example, by learning new activities which contribute to their well-being.
- **Protect the farmers from agricultural complications:** Make sure that in state agricultural policies there are no constraints for the development of agriculture and nutrition programs.

What can our institutions do to help country governments commit to action around your recommendations, and to help ensure implementation will be effective?

- Set up criteria and precise indicators for follow up and monitoring. Make judgments about what are reasonable delays.
- Put in place an independent unit for independent surveillance-monitoring (to keep an eye on state agricultural policies which often frustrate the activities of farmers).

Draw up consistent policies to help Government to respect their undertakings towards the people, to revise/modify agricultural policies which put a brake on the sound development of agricultural activities

31. Adèle Irénée Gremombo, independent consultant, France

[Original in French]

Avoir une bonne nutrition, c'est manger une alimentation saine et équilibrée en toute saison et en tout lieu, afin d'avoir une bonne santé mentale et physique.

1. Pour avoir une alimentation saine en toute saison, il faut conserver le surplus
2. Pour avoir une alimentation équilibrée, il faut diversifier son alimentation
3. Pour avoir une alimentation en tout lieu, il faut désenclaver certaines régions et favoriser la commercialisation des produits agricoles. Il faut donner les moyens à certains groupes vulnérables de pratiquer l'agriculture (femmes, chômeurs, élèves et écoliers)
4. Pour avoir une bonne santé mentale et physique, il faut manger et faire de l'activité physique

Fort de ce qui précède, je réponds aux questions

Si j'étais chargée d'élaborer un programme d'investissements agricoles, les 5 principales mesures à adopter pour en maximiser l'impact sur la nutrition seraient :

1. Filières vivrières : production, transformation, conservation, commercialisation;
2. Filières produits forestiers non ligneux en lien avec l'agroforesterie;
3. Petit élevage et aquaculture;
4. Education nutritionnelle : créer et renforcer les départements de nutrition dans les Ministères de l'agriculture. Ces départements s'occuperont de l'éducation nutritionnelle par

des émissions à la radio et à la télévision, par la rédaction des brochures sur la bonne alimentation.

Je profite pour vous dire que mon livre intitulé « [Guide de nutrition pour les élèves d'Afrique Subsaharienne : notes d'informations pour l'enseignement primaire et secondaire](#) » vient de paraître aux Editions Universitaires Européennes. C'est dans le but de montrer aux jeunes comment avoir une bonne nutrition.

5. Pistes rurales et fanceis.

Dans quels domaines souhaitez-vous intensifier les recherches pour étayer l'élaboration et la mise en œuvre d'un tel programme, et pourquoi?

- Transformation agroalimentaire, stockage et conservation, semences

Que peuvent faire nos institutions pour contribuer à ce que les gouvernements des pays s'engagent activement en faveur de vos recommandations, et en garantir la mise en œuvre efficace?

- Allouer 10% du budget national au développement agricole

Adèle Irénée GREMBOMBO
Ingénieur Agronome Nutritionniste
Msc en Nutrition Humaine et Santé Publique
Consultante Indépendante en Nutrition/Sécurité alimentaire
Paris (France)

[English translation]

To be well nourished, is to eat a healthy and balanced diet at all times and places, with the objective of having good mental and physical health.

1. To have a healthy diet in all seasons, it is necessary to preserve the surplus.
2. To have a balanced diet, it is necessary to diversify the diet.
3. To have good nutrition everywhere, it is necessary to open up certain regions and to enhance the marketing of agricultural products. It is necessary to give certain vulnerable groups the means to practice agriculture (women, unemployed, students and school children).
4. To have good mental and physical health, it is necessary to eat and be physically active.

With the above in mind, I now answer the questions.

If you were responsible for designing a program for agricultural investments, what would be the 5 principal measures to be incorporated in order to maximize its impact on nutrition?

1. Food producing organizations: production, transformation, conservation, marketing;
2. Non timber forestry products sector in tie up with agro-forestry.
3. Small animal husbandry and aquaculture
4. Nutritional Education: to create and reinforce the departments of nutrition at the Ministries of Agriculture. These departments will take care of nutritional education through radio and television programs, by the production of brochures on correct diet.

I use this opportunity to tell you that my book called « Guide de nutrition pour les élèves d'Afrique subsaharienne: notes d'information pour l'enseignement primaire et secondaire » [Nutrition guide

for children of Sub-Saharan Africa: information notes for teaching in primary and secondary schools] has just been published by Editions Universitaires Européennes [European Universities Editions]. Its purpose is to show young people how to secure correct nutrition.

5. Rural roads and farm tracks

In which areas would you wish to increase researches in order to back up the preparation and implementation of such a program, and why?

- Agro-food transformation, storage and preservation, seeds.

What can our institutions do to bring about the active engagement of state governments in favor of your recommendations, and to guarantee their efficient implementation?

- Allocate 10% of the national budget to agricultural development.

Adèle Irénée GREMBOMBO

Agricultural Engineer Nutritionist

Msc en Nutrition Humaine et Santé Publique [MSc in Human Nutrition and Public Health]

Independent Consultant in Nutrition/Food Security

Paris (France)

32. Final Year Economics Students (Group 4) University of Guyana [first contribution]

If we were designing an agricultural investment programme, the top 5 things we recommend to maximize its impact on nutrition are as follows:

1. Raise awareness to the targeted population on the importance of nutritional diet

This refers to the dissemination of information by nutritional experts or agents regarding the intake of foods that will supply the needed nutrition to the body. More so, research has consistently proven that women are more than likely to invest in the nutritional intake of her family and are more effective in delivering improved nutritional outcome (WBR, 2007). Therefore, the programme will facilitate the persistent involvement of more women in target communities, while remaining cognizant of their constraints, such as time and income, among others.

2. Promote and foster technological change through support of research and marketing

Research and development in agriculture typically leads to a higher value of crop or agricultural produce. Allowing the market to function unencumbered by output control policies tends to work, achieving lower prices for high value food, therefore increasing the accessibility to those who need high value food the most.

3. Encourage institutional support/participation

Developing countries often lack the collaboration among agricultural institutions in order to effectively execute projects or programmes. As such, we would advocate for the involvement of appropriate institutions in aiding the processes of agricultural programs at a broad policy level.

4. Increase the availability and accessibility of high value food in both rural and urban communities

Increasing food production through agricultural programmes increases the availability of food; however it does not ensure that the poor and vulnerable have sufficient access to high value food

since the quantity of food produced tells little about the nutritional value persons gain from consumption. Having said such, this can be attained by creating “sustainable and stable employment opportunities” that would increase availability of and accessibility to food, especially among rural households (FNSS, 2011).

5. Initiate and manage a crisis response agency

It is accepted public knowledge that developing countries (such as Guyana) are more susceptible to natural disasters, climate change and man made disasters. Often times the agricultural sector suffers the most from such unforeseen calamities and this can lead to a massive decline in food production and consumption. As such, we strongly advocate for the establishment and management of an effective response agency that will specifically address food production and consumption in times of crisis.

33. Anna Antwi, GD Resource Center, Ghana

Many people have contributed much to this discussion and still have room for more suggestions. Congratulations to everyone for your invaluable piece. My contributions are as indicated under the questions below.

1. If you were designing an agricultural investment programme, what are the top 5 things you would do to maximize its impact on nutrition?

- Identify gaps and major agricultural related nutrition challenges in the specified area. For example in Ghana it has been realized that vitamin A and iron deficient anemia are challenges in addition to Protein Energy Malnutrition in some areas. Based on the information gathered, I would develop programmes on:
 - Ensure diversified agricultural commodities
 - **Diversification of farm production** to include high Vitamin A crops like orange flesh sweet potato, green leafy vegetables, oil palm production
 - Encourage animal based that the poor can afford (small ruminants, poultry and fishery production and other local sources of animal protein
 - in addition, promote plant sources of protein like use of legumes, nuts
 - and promotion of quality staples
- I would also build into the programme environmental, land tenure, and land use planning issues to ensure security of land tenure and user rights issues so as to enable producers to sustainably manage land, improve soil fertility and other productive resources for continued production. As cities and towns expand, agricultural lands and production become extinct, so I would like to promote urban agriculture (crops, animals etc) and land use to ensure planners plan for agriculture and producers with expansion of towns and cities.

Education and awareness on changing environmental conditions including climate change will feature to cater for and prevent environmental degradation like:

 - Overgrazing on land/ overfishing in water bodies including marine resources
 - Deforestation
 - Biodiversity loss
 - Global warming
 - Non-renewable resources

These activities on natural resource base if not well managed will lead to under-nutrition in our communities
- Nutrition education for communities on the uses of diversified diets for different age groups, work / occupational groups and sex/ gender groups. This should be

accompanied by real practice of cooking demonstrations using locally available food sources (bearing in mind the multi-sectoral nature of nutrition to include water and sanitation, hygiene, gender, health, social protection etc)

- Identification of vulnerable groups (children and youth, females in reproductive stage like adolescence girls, pregnant and lactating mothers)
 - Micro-nutrient based farming and encourage home gardening (close to the household so that basic commodities like fruits, vegetables, quality and quantity staples are available to the poor households easily)
 - This method will also ensure food availability during off season, and provide incomes for the household/ family
- Provide credit for women to engage in agro- based activities from production to table (consumption)and also provide them with time and energy saving technologies that would support processing to provide long shelf lives and add value to agricultural commodities. This method will also reduce post harvest loss and make food available to households all year round
 - Ensure quality levels of agricultural commodities especially grains and cereals are free from aflatoxins, and other harmful micro-organisms. Thus food safety is very important and has implication for food handling and storage, and health of consumers.

2. To support the design and implementation of this programme, where would you like to see more research done, and why?

- I would like to see research in two main areas as not much has been done in these areas and also to make food accessible to the poor and vulnerable
 - Research to identify various nutrients from local food sources (vegetables, fruits and main staples) and its various uses in the diets of the people and how to prevent losses
 - Research into Bio-fortification of staples used by poor and vulnerable groups (especially of micro-nutrients that are lacking in staples that are frequently used (e.g cereals like rice, roots and tubers like sweet potato, yams, cassava etc)

3. What can our institutions do to help country governments commit to action around your recommendations, and to help ensure implementation will be effective?

- First, I would ensure the buy-ins of the government Ministries, Departments and Agencies sector leads, together with civil society organizations, Development Partners and in some cases the private sector
- Encourage Food and Nutrition Policy development with relevant sector participation like Agriculture, Health, Education, Women and Children, Social Protection, WASH etc
- Advocate for nutrition specific budget allocation and
- Ensure that there is proper Coordination and harmonization of nutrition programmes and there is an institution/ organization that lead in nutrition programming. Such a lead organization should be under either the Presidency or its vice's office
- Include and involve the most affected communities / people in nutrition programming and encourage their participation at all levels including conducting participatory M&E in implementation of nutrition activities.

34. Final Year Economics Students (Group 1) University of Guyana [first contribution]

Dear Members,

The remarks made thus far have been very interesting. Since, “Under-nutrition remains one of the world’s most serious but least addressed socioeconomic and health problems and is among the leading causes of child mortality” (ACF International), making agriculture work for nutrition is a tremendously important and timely issue for discussion.

If you were designing an agricultural investment programme, what are the top 5 things you would do to maximize its impact on nutrition?

1. Firstly, we would suggest an assessment of the nutritional status of the country/state or region and identify those households which are nutrition insecure by using various indicators. This will be done so as to indicate which areas will be targeted first (based on the magnitude of undernourishment) by the agricultural investment programme.
2. We would also recommend an increased cooperation among agricultural professionals at country level and institutional level that would foster a national nutrition strategy and action plan; this would require the allocation of adequate budgetary resources. Guyana, for instance, has a ten year Food and Nutrition Security Strategy (2010-2020). One of the aims includes ensuring that children and other vulnerable groups have access to food.
3. We would support regulations that allow smallholders to have some sort of comparative advantage in terms of increased market access and opportunities, especially for nutritious food.
4. We would also suggest adjustments in policies to be made preferable to individuals supportive of nutrition, including improvements made in food price policies, subsidies, trade policies and pro-poor policies. This would in turn encourage more investment in food nutrition.
5. Although the above points may lead to an increase in the accessibility and availability of nutritious foods, it does not give us a certainty that more individuals will consume it. This brings us to our next suggestion; using some form of moral suasion, like nutrition education, to communicate and advocate for nutrition, detailing the importance of nutrition and the consequences of under-nutrition. An important point to note is that there are also social and cultural factors that prevent some marginalized groups from eating certain nutritious foods.

35. Jean-Laurent Bungener, consultant, France

1) If you were designing an agricultural investment programme, what are the top 5 things you would do to maximize its impact on nutrition?

- establish fruit and medicinal trees to ensure vitamins (dry or fresh) medic and biopesticides availability and manage simultaneously microclimate and organic matter for soils;
- develop hydroponics near houses to ensure the production of self made vegetables, medicinal plants and fishes without using a lot of water during the rainy season;
- develop specific fields (children fields) that ensure women to find what is needed for children during their weaning (companions planting of leguminous and cereal plant);

- enhance grain storage capacity and condition and test various germination process for introducing fresh sprouted grain inside the diet;
- use of fruit dryer and fermentation process.

2) To support the design and implementation of this programme, where would you like to see more research done, and why?

Vertical cropping and hydroponic material, fermentation processing and solar sterilisation process.

Intensification is easier to practice near houses where ashes and water fall could be controlled and stocked. Tropical countries didn't develop aquaculture with little native fishes species. Food storage is uneasy and specific process like fermentation or sterilisation could help.

3) What can our institutions do to help country governments commit to action around your recommendations, and to help ensure implementation will be effective?

the design is biologically oriented. Ecology of terrestrial and freshwater from natural and artificial ecosystem, fermentation and sterilization process in pottery, botany and zoology.

Your organization could help government

- to make easier the access to scientific publication for young scientist
- Promote self made technology and help individuals in that way
- help to widespread the technology or techniques
- encourage recording of native knowledge and knowhow
- develop recycling of urban waste for agricultural use.

36. Final Year Economics Students (Group 2) University of Guyana

Greetings from Guyana!

Firstly we must agree with Ms. Dianna DaSilva-Glasgow post, (who's also from Guyana) and further say that indeed it is vital for any economy to match production with consumption.

With that said, below are our contributions to this interesting question:

"If you were designing an agricultural investment programme, what are the top 5 things you would do to maximize its impact on nutrition?"

- 1)Recommend an inventory of the current situation of the country's nutritional condition so as to make a proper evaluation. (By so doing it can be clear as to what really people are eating either too much of or too little of and if the portion sizes and quantities are sufficient or not).
- 2)Promote the sustainable production, processing, preparation, commercialization and consumption of safe, affordable, nutritious, high quality foods. Proper food control measures can be put in place to help prevent things like food contamination through food handling and so forth.
- 3)Another way to maximize the agricultural investment programme's impact on nutrition is to specifically target the percentage of people in poverty (be it large/small) by helping them to

have easy ACCESS to nutritional foods. The Government can provide food stamps and food vouchers or discount vouchers (of course this will be applicable to countries that may not have these measures in place).

4) Promote an increase in the institutional coordination and functioning for improved nutrition. Often times many countries do not have “that” collaboration among the agricultural institutions that is needed to effectively and efficiently execute programmes.

5) Finally, Education is the most essential tool that can be used to improve nutrition in any country. The emphasis on improving health lies solely with how the citizens view nutrition. Community-based nutrition programmes can be implemented in varying areas in the country so as to make people aware of the importance of nutrition to everyone’s life.

37. Facilitators’ feedback, Anna Herforth and Cristina Lopriore

Enormous thanks to all contributors so far. It is really encouraging to see many people engaging in this discussion and contributing some valuable thoughts and sharing experiences from their own work.

With just a few days left of this discussion topic (ending Wed. Oct 3), we'd like to strongly encourage anyone who has wanted to contribute but hasn't found the time to please do so even briefly!

To summarize recent responses briefly, many have placed high priority on empowering women, effective nutrition education, ecological approaches to production, diversification, reduction of food waste and decreasing post-harvest losses, improving lines of communication between stakeholders, and capacity building. Likewise, there are lots of good ideas for research and support around those (and other) themes.

One theme that has not come up much so far in this Forum discussion is the concept of "doing no harm". Could correcting harms of current policies or approaches be just as important, if not more so, as capturing new opportunities to make agriculture work better for nutrition? There have been a few comments expressing concern about the potential harms to environment and local culture. How can these (or others not yet mentioned in the discussion) translate into advice that you would give to a director of planning for agriculture for policy and programmes to improve nutrition by avoiding harm?

All the best and we look forward to hearing many comments (even very brief ones) in the final few days of the discussion.

Anna and Cristina

38. Lavinia Gasperini, FAO, Italy

I am suggesting to include in the **recommendations in the guidance notes and into its list of main messages**, to

- 1. Incorporate explicit education and training objectives**
- 2. Increase equitable access to education and training of the most vulnerable people, and especially rural people and women, and monitor progress in such Endeavour.**

Research in fact indicates that there is a high correlation between educational level and food security (See: FAO 2007 : Education for Rural People and Food Security:” and FAO 2009: Education for Rural People: Education, Training and capacity Development in Poverty reduction and Food Security and this is even higher than that of some agricultural inputs. Current literature indicates moreover, when education is associated with availability of credit and agricultural inputs, productivity and income increase significantly.

The research therefore points the direction to policy makers: **To ensure the inclusion of rural people in the education system and to provide alternative non formal** education to those that cannot get access to school or fall out. In fact, 4 out of 5 of today’s ‘illiterates (about 800 millions) are in rural areas and in least developed countries. **The farmers ‘field schools** is a very good example of talking the education and training needs of the rural people to foster their nutrition and that of the community, and not only that.

When planning country level action to foster food security and improve nutrition, it is good to include nutrition education in the curriculum. But it is absolutely not sufficient. Infact so many people do not go do school and will never benefit from such nutrition education. Moreover, there are many other skills for life (like reading, numbering, solving problems; marketing; conflict management) and other attitudes (self esteem, solidarity, participation ; etc) and values (justice; gender equity; respect for the environment etc) that people develop through schooling and are needed to become empowered of one’s one life, and get out of poverty.

In conclusion, interdisciplinary work is crucial, and this means to step out of the basket. Although nutrition education is important, It is not enough. Agricultural intuitions and organizations engaged in promoting food security and safety need to associate with educational institutions and organization to make sure that the rural people get the same services as the rest of the population. This is the basis to overcome the poverty trap, and the knowledge divide, which are at the basis of undernourishment.

Lavinia Gasperini
FAO, Agricultural Education and Training

39. Reimund Kube, International Agriculturist, USA

The baseline for it all should be education about the importance and value of biodiversity. In order to do no harm it is important to avoid additional dependencies for farmers. Solutions will not come from foreign countries, they have to be found or generated on-site. If foreigners can play a facilitating role here, ok. This means: caution with subsidized fertilizers, their use has consequences, and organic locally available material is more important, and more awareness raising and knowledge is needed. For small farmers besides food security risk avoidance is most important, this means, improved seeds are often needed, but they must be produced in-country and, no hybrids please! Dependencies on scarce resources (like money) means poverty, means harm.

Reimund Kube, International Agriculturist

40. Emilia Venetsanou, freelancer, Italy

Uneven access to labour, within rural communities, leads to actual hunger.

Service providers and decision-makers should not turn a blind eye.

The reasons for under-nutrition are several, interconnected and mutually reinforced and so have to be all the attempts of interpretation and remedy. Having said that, I want to draw the attention to the following aspects, related to subsistence farmers' sustainability and resilience:

- The “labour access” issue. Uneven access to labour within rural communities is a major determinant of food insecurity and poor nutritional status leading the lowest quintiles in Sub-Saharan Africa to trans-generational poverty.
- The “labour access” issue is poorly assessed and addressed. Social differentiation dynamics and inequality within rural communities are part of under-nutrition root-causes, yet are poorly assessed and addressed. Development practitioners, activists and policy-makers should not turn a blind eye. By doing so, several policies and field actions can result harmful.
- The way forward. Today we are equipped with public goods addressing food and nutrition security. Yet, they are not part of the professional culture of development workers so far. Effective communication between sectors and a “common language” are not yet in place. The way forward should be paved on Action-Research-Learning participatory systems. Networking and inclusive decision-making schemes, at all levels, are needed. Open debates as the current one are much helpful.

The “labour access” issue

If the reasons for the human shame of one billion hungry are several, interconnected and mutually reinforced, so have to be all the attempts of interpretation and remedy. Having said that, I want to draw attention to what I am convinced to be one of the major determinants of the structural hunger in rural communities in Sub-Saharan Africa. Labour and growing inequality in labour access, within rural communities, lead the two lowest quintiles to trans-generational poverty and actual hunger.

The subsistence farmers' sustainability and resilience is a core food and nutrition security issue. In the current context, the sustainability of subsistence agriculture is fragile and subsistence households are vulnerable. By definition, subsistence agriculture produces the strict necessary for the survival of the family. In a schematic way, inputs and outputs are equivalent and structural surpluses are not possible. In such systems, pursuing high increase of outputs leads to overwhelming pressure over the limited production assets; namely labour and natural resources, including land and forest. That impacts negatively on the environment and on the increasing inequality within rural communities. Pressure over environment and accentuation of inequalities further compromise the already fragile sustainability of households and ecosystems.

The persisting issue is that subsistence societies cannot produce structural, significant surpluses to be channelled, for instance, to the markets. What such societies actually do is allocating manpower unequally among its various groups. In short, someone has to go hungry so that subsistence-based communities as a whole can produce “surpluses”.

The “labour access” issue is poorly assessed and addressed

In poor rural communities relying on subsistence agriculture, not all poor are equally poor. Social differentiation is largely relying on complex systems ensuring access to labour. Labour, since ever, is a core food security factor for small farmers in Africa, yet it is poorly addressed by the mainstream development analysis and action that consider African communities as “labour-surplus economies” and put forward the concept of the small farmers greater economic efficiency relying on “greater abundance of family labour”. Moreover, the issue of power-dynamics within communities, involving access to land, labour and food, is not trendy, as the people-centred and rights' approach mainly focuses on power (un)balance between the small-farmers / communities and the “others” (government, companies, and so far and so on); which of course is correct and relevant, yet not comprehensive enough.

Inequality does not stop at rural communities' gates. Development practitioners, activists and policy-makers should not turn a blind eye. Root causes of fragile sustainability of subsistence agriculture have to properly be assessed and addressed. Socio-economic research also has to come back on the agenda and in the field work. There is an issue on research, too. Research tends to be biased and self-confirming. Often, participatory research is poorly set-up and implemented with little respect for its very guiding principles as well as for scientific and methodological standards. We need robust Action-Research-Learning participatory systems. Several issues regarding the production and food systems should be back on the research agenda. We should, for instance, analyse and compare agricultural calendars by crop and working calendars discriminated by sex and age. We should have clear food systems' profiles by crop, including production and reproduction aspects also in terms of social differentiation.

Examples from the field in drops

The issue is complex, but I will try to give some examples.

Traditional societies have developed complex systems in order to ensure access to labour because, in the subsistence agriculture, labour is the limiting factor and not land. Such aspects have been well understood by and instrumental to the colonial rule. The chiefdoms and other traditional institutions, it is truth, give rights over land, but the real aim is ensuring rights over manpower. For instance, in Northern Mozambique, there are several schemes ensuring rights over labour, among which the rights of the first born who benefits from important labour services, the dominant lineage, the "slaves", still visible in the field, the displaced people, the crop and land rotation and land lending, just to mention some. Nowadays, a process of land concentration on the hands of few within the rural communities is taking place. In 1993, in Nampula Province, about 40-50% of the total land was held by only 25% of the subsistence producers that farmed between 4 and 5 times more land per household than the smallest 25%. The land accumulation has to be understood not in terms of property rights on land but in terms of farming capacity, i.e. the capacity of a farmer to have access to labour during the peak season. Actually, various studies show that the population does not feel that there is a lack of land. The smallholders rather complain about labour shortage (insufficient strength to cultivate and produce more, illness during peak agricultural periods, etc.).

In rural settings, seems to picture a situation where extreme poverty is very high (around 40%, i.e. the two lowest quintiles of rural population), better off situations are in phase of consolidation (around 20%, the richest quintile) and "grey" areas exist on the edge of the poverty line (the remaining 40%) moving in and out of poverty according to external conditions, such as family illness and deaths, climate hazards, loss of jobs and cash income. For most farmers food security varies with the agricultural calendar. That is, most farmers exhaust their reserves way before the next harvest. Under those circumstances, deprived from structural surpluses, particularly during the "hunger gap - lean season", the poorest households "sell" their labour literally for a plate of beans to the "better off" that are in a process of consolidation of assets' concentration. At this stage, selling "under-cost" their labour, the poorest households remain caught in the trap of trans-generational poverty, because the days worked in the plots of others are days lost in their own plot. And this is about a huge lost in the context of a subsistence system.

The way forward - building blocks

1. Policy-makers should not turn a blind eye. Root causes of fragile sustainability of subsistence agriculture have to properly be assessed and addressed by a food and nutrition security policy that, fostering sustainable development, acts on several lines; for instance:
 1. fosters mitigation (e.g. SSNs, provision of social services, supply of inputs);
 2. defines sound and appropriate agriculture development goals effectively addressing subsistence farmers (e.g. agro-forestry, innovation, environmental friendly and fair practices envisaging labour-friendly agricultural calendars);

3. refrains from goals that impact negatively on subsistence households (doing no harm);
 4. foresees integration of complementary sources of income (e.g. public works based SSNs, food processing, eco-tourism);
 5. where appropriate, contemplates measures addressing transition from the subsistence system to progressive intensification of the agricultural production process (e.g. micro-finance, small irrigation, extension and training, farmers associations).
2. Today we are equipped with public goods better addressing the food security issue (e.g. the voluntary guidelines on FNS and those on land, the new FAO strategy encompassing the Right to Food, inter alia).
 1. The policy response to food (in)security encompasses production growth, market capabilities (trade and labour), social protection (social transfers), emergency assistance, governance and rights strengthening.
 2. Governance and Human Rights need strengthening on the field. It is extremely beneficial having the “public goods” that we already have in terms of FNS and we need further progress. But we also have to work out there, in the communities, in a robust bottom-up action.
 3. The public goods on FNS are not yet part of the professional culture of the development workers, starting at HQ level. Corporate culture is not conducive to such an innovative and interdisciplinary task so far. Effective communication between sectors and a “common language” have still to be developed.
 3. Eventually, we have to leave behind the Washington Consensus and move forward to a smart balance between efficiency and equity, including a dramatic increase in ODA devoted to agriculture and rural development; which under the dominance of the neo-liberal paradigm has fallen from 17% in 1980 to 8% at the end of 1990s and to the 3% of ODA in 2006. (OECD report on “Aid to Agriculture”, 2001; European Parliament, 13 January 2009, On the Common Agricultural Policy on Global Food Security).

41. Daniel Bornstein, Dartmouth College, USA

If sub-Saharan Africa is to benefit from advances in agricultural productivity in the 21st century, investments in the so-called “orphan crops” – sweet potato, cassava, and millet, for example – will be crucial for strengthening the poorest farmers’ livelihoods and improving nutrition.

The 1960s Green Revolution, which averted famine in [India](#) and [Latin America](#) through the deployment of high-yield crop varieties, is often hailed as one of the greatest humanitarian achievements of the 20th century. Yet this effort focused largely on globally traded staples, neglecting locally important crops. The outcome partly explains today’s global malnutrition crisis. The countries reached by the Green Revolution became massive producers of rice, wheat, or maize, but at the expense of the crop diversity necessary for well-rounded diets.

See my Opinion article in the Christian Science

Monitor: <http://www.csmonitor.com/Commentary/Opinion/2012/0806/How-to-transform-African-farming-Return-to-orphan-crops>

Daniel Bornstein, Dartmouth College

42. Elisabeth Asiimwe, Agriculture Extension Student, Uganda

Greetings to all of you, I feel that nutrition can be greatly improved if the mode of agricultural extension takes a new twist that is if extensionists could partner with nutritionists to help deliver

dietary guidance in the production process to enable the farmers get the appropriate nourishment from the promoted crops and biofortification.

Also, it is all about gradual mindset change of the farmers through sensitisation; because not all people that are malnourished do not have the food. In fact, I know of many farmers (especially where men control the resources) who deny their children of milk and sell it to get cash for buying some alcohol to drink at the expense of their children's health.

To that cause, I feel that more research should be done on the linkages in Agriculture, Nutrition and health. The relationship between gender and control of agricultural inputs and output should also be studied and appropriate interventions made.

Also, malnutrition may also be cyclic whereby a malnourished mother gives birth to a malnourished child, and during their pre-birth visits, emphasis should be put on eating right in order to nourish the growing fetuses.

43. Ignatius Akhakhia Onimawo, University of Agriculture, Nigeria

Let me start by saying that I have not fully followed the discussion on this topic so I may be repeating what has been said already. This notwithstanding, I want to make this comment. Studies in Nigeria and some other African countries showed that malnutrition is more severe in farming communities than non farming communities. The reason being that most rural subsistence farmers sell their farm produce to buy non-food items while they consume what does not meet market value. This scenario underscores the importance of nutrition education and awareness creation at community level. There is the need to train Nutrition extension workers who will create awareness at the level of farming households on what and how feed adequately. This could make agriculture truly work for nutrition.

Prof. Ignatius Onimawo

44. Peter Carter, Climate Emergency Institute, Canada

For the future of food security and nutrition, global climate change from now on is everything for everybody

For the science referred to below, please see www.climatechange-foodsecurity.org

The 11,000 year period of relative climate stability in which agriculture developed is over — Lester R. Brown, Full Planet, Empty Plates: The New Geopolitics of Food Scarcity, September 2012

1. If you were designing an agricultural investment programme, what are the top 5 things you would do to maximize its impact on nutrition?

Invest in an emergency increase of world grain stocks to ~110 days of consumption to create a buffer against extreme weather. Establish UN controlled 110-day grain stocks in all regions.

Invest in economic instruments to phase out the production of biofuels, that exacerbate the reductions of crop yields from drought and emit carbon.

Invest in the development of small holder mixed farming that recent research indicates is more resilient to climate change.

Invest in global climate change impacts food security education for the public of all regions, for agricultural institutions, policy makers, and government staff.

Lester Brown's Earth Policy Institute provides the best readily available education materials for this. The Climate Emergency Institute (www.climateemergencyinstitute.org) has a full list of similar resources.

In particular, the most climate change vulnerable regions and populations have a clear right to

know the terrible food losses they are committed to.

In the case of global climate change, if we don't have the accurate science and currently committed global warming as our basis for planning, with the best will in the world we will end up largely wasting our efforts and resources.

Central to this education is the long known fundamental relationship between an impact and the "realized" (or transient) along with the "committed" warming, which is due to several factors. For example, because of the ocean heat lag alone, the realized/transient warming is only about half the full committed equilibrium warming – and global warming lasts for thousands of years. To illustrate this, a 2.0°C warming (the policy target) is devastating for the most climate change vulnerable populations, but people have not been informed that to avoid this we have to limit warming this century to 1.0°C. Global warming is effectively irreversible and so we have to allow no margin of error for tipping crops into decline – based on committed warming.

Tragically, none of this is being applied, hence the urgent need, above anything else, for education on the science.

Regarding education priority, the impression that developed nations are not vulnerable to crop and food losses must be corrected. We are all now committed to suffer serious food production losses because we are committed to far above a 2.0°C warming. Policy commitment is a literal end of the world for food production 4.4C by 2100 (Climate Interactive)

For C3 crops (rice, wheat, soybeans, fine grains, legumes) in temperate regions, ... models show decline at +1.25-2°C in global average temperature.

For C4 crops (maize, sugar cane, millet, sorghum), even modest amounts of warming are detrimental in major growing regions given the small response to CO2.

—NRC Climate Stabilization Targets, 2010, Impact Food

Save the Children Fund UK: "Identify and address the threats to nutrition from climate change and non-food land use: The global community, including the G8, the G20 and international nutrition governance structures, must identify and address the potential impact of climate change and increasing non-food land use on hunger and malnutrition."

2. To support the design and implementation of this programme, where would you like to see more research done, and why?

Research is needed on adaptation in general and regionally. People and policy makers should be informed that we have no research demonstrating if and how agriculture can be adapted to the multiple adverse impacts of global warming and climate change.

The new buzzword, "climate smart agriculture," is giving the impression that we know agriculture can be successfully adapted to climate change. It is not responsible language.

Research is needed for regional crop reduction risk assessment under global warming and climate change, as there is no such resource.

A study of risk should be based on:

- the total minimum unavoidable global warming from all sources of warming
- the warming that the world is committed to by the combined national policy pledges filed with the UN
- decline in yields from the model results, which should be taken from the time crops tip into decline in addition to the decline below baseline
- the worst case range from the climate crop model results (not the mean) should be taken, to partially compensate for the large number of large impacts not captured by the models

3. What can our institutions do to help country governments commit to action around your recommendations, and to help ensure implementation will be effective?

Develop and take part in the rapid education program described above, on an emergency priority basis.

45. Lisa Kitinoja, the Postharvest Education Foundation, USA [second contribution]

I have two short responses that I hope will be considered by the discussion forum as useful approaches to making agriculture work for nutrition:

- 1) include horticulture whenever agricultural development is considered -- fruits and vegetable are a good source of vitamins, micro-nutrients and phyto-nutrients at reasonable cost
- 2) pay more attention to reducing food losses and postharvest waste -- a lot of money, labor and natural resources are wasted on agricultural production if the foods are not eaten by people

46. Bhubanswor Dhakal, Nepal

Making Investments Work for Nutrition

The following contribution is based on my understanding that the food security (adequate calorie), nutrition (nutritionally balance diet) and safe food (from health and mental/cultural prospective) are different issues of food policy. This discussion is focused on the second one.

Q 1. If you were to advise a director of planning for agriculture, what would you suggest as the most important things to consider in order to make investments work for nutrition?

A. From my understanding and experience the most important thing to consider in order to make the investment work for nutrition is adequate understanding of ROOT CAUSES or SOURCES of nutritional problem. The problems can result from different sources:

- • Insufficient means (income to afford or land to produce) nutritional food.
- • Lack of access to nutritional food despite some means to buy.
- • Inadequate knowledge on nutritional requirements for particular health condition.
- • Inadequate knowledge on nutritional availability in locally and regularly available food.
- • Cultural problem in diet (cultural barrier to change diet or access the nutritional diet).
- • Personal behavior (taste preference, unable to manage or laziness).

Many Nepali farmers can produce sufficient vegetable in their land but insufficient consumption of vegetable is still a common nutritional problem. Generally people eat vegetable related products to make tasty/appealing of main staple food. They hardly know the quantity of vegetable they need in their diet to make their diet adequately nutritional. In such situation investment in awareness creation and extension/education should be done first and then investment to enhance nutritional production.

B. It requires development of institutionalized systems to make investment work for nutrition. If the work focuses to showing results quickly and caring little for ground reality and longer term problems similar to the work of international donor funded projects its effect might be temporarily. Printing the nutritional promotion slogans in vests or other clothes can give flash solution and may work temporarily similar to the development of international donor advised and funded projects. It is not a reliable and long lasting solution.

C. Local agroclimatic conditions, institutions and farming systems are other factors important to be considered to make the investment work for nutrition.

Q . 2. What gaps do you see in research to deliver effective results for nutrition?

Rural socioeconomic situations, institutions, farming systems, agro-ecological conditions and other causes of nutritional problems, the important determinants for nutritional food production, are changing over time. The changes of them vary with place or communities. In most of the nutritional problems countries or regions the problems and opportunities associated with the factors are interpreted and explained either based on values or opinions of powerful people (mostly expatriates or consultants of international donor agencies) or based on poor quality information. There are no quality studies or information to understand the problems and opportunities associated with the determinants, and deliver effective results for nutrition.

Q.3. How can institutions work together at country level to deliver effective results for nutrition?

Institutions are varying in resource holding for research investment, capacity of working, position of providing ground level information and ability to influence in policy or public decisions. If the institutions work forming partnership considering their strength to make effect in all important areas they deliver effective results for nutrition. However, international institutions do not work usually in this manner. I would like to share current case of Asian Development Bank (ADB). The bank assured Nepal government to support development of national agricultural plan. Then it developed a plan for the country using its consultants without discussing with stakeholders and government officials. It is very surprising how the foreign consultant know the current agricultural related problems and prospect in Nepal where socio-institutions are undergoing rapid changes. Stakeholders and government officials have put strongly objection on this practice the ADB has been behaving imperiously and responding hardly to them. How the national agricultural plan developed in universal planning template of ADB can work to deliver effective results for nutrition in Nepal which has a great variation of socioeconomic and agro-ecological condition across the country. I would like to cite an old case of the bank which advised Nepal government to reduce livestock of poor farmers while developing forestry sector master plan 1988. The government followed the plan and poor farmers and particularly remote communities have been main victim of the bad advice. The ADB consultants who had little knowledge of reality of Nepali farming conditions, had greatly guided the plan development.

The international institutions similar to ADB (e.g. the World Bank and IMF) commonly behaves domineeringly to institutionally weak countries despite the management of the agencies know their behaviors are professionally illegal. The government officials of developing countries cannot strongly object the illegal actions of the materially and symbolically powerful agencies to maintain working relationship. Inviting management representatives of those agencies to participate in this and discussing their bad official manners/ practices would make some contribution to delivering effective results for nutrition. I request current moderator to invite them and continue discussion on their counterproductive institutional practices.

Thanks for reading my opinions.

Bhubanswor Dhakal

47. Kien Nguyen Van, Plant resource Center of Vietnam, Vietnam

Dear everyone,

I would like some small ideas:

Generally, whole nutrient and health issues are under Ministry of health. However, that oriented and mentioned FAO here is various nutrient sources in agriculture products seen like as basic inputs to supply everything for mankind from foods, including energy, nutrient, drugs, ect. Then, the nutrient programmers should be considered as key indicates to assess the success of national programmers and also be integrated in other ones. In personal knowledge, there may be 3 ways recommended to obtain the purposes:

1. At community level, diversity of crop species needed to just improve livelihood and also secure to food and nutrients;
2. At crop breeding programmers, every crop should be studied towards multi use purposes such as multi-nutrient components. For examples, sweetpotato, potato
3. At national nutrient and health programmers, fresh, green and various food values are first indicates

Best regards,

KIEN

48. Jacky Ganry, former GFAR and CIRAD, France

1. If you were designing an agricultural investment programme, what are the top 5 things you would do to maximize its impact on nutrition?

- 1) Support an action plan to promote the production of crops naturally rich in micronutrients and particularly fruits and vegetable, paying major attention to their availability all year round (seasonality, transport, post-harvest/storage and market management), with a careful balance between national/local production and importation.
- 2) Encourage such agricultural production through incitative measures in terms of financial returns for the producers and in terms of rural development
- 3) Support an action plan to promote the consumption of food naturally rich in micronutrients and particularly fruits and vegetable, strongly connected with the production plan.
Pay major attention to the affordability and price of the products. Don't consider biofortification as a panacea. Pay more attention to food products naturally rich in micronutrients
- 4) Support all actions in favor of a better information and education of the consumers, with adapted messages for targeted groups, for better and more balanced diet . For developing countries, consider mal-nutrition (lack of micronutrients) as important as under nutrition (lack of calories) taking into account the explosion of NCDs. Avoid confusion between over-nutrition and mal-nutrition, etc....
- 5) Encourage integrated multistakeholders actions linking consumption to production and agriculture to nutrition, health, natural resources management, transports,....

2. To support the design and implementation of this programme, where would you like to see more research done, and why?

- relation between the type of production (conventional, integrated, organic,...;) and the nutritive quality of food
- the nutritive quality of underutilized crops , particularly fruits and vegetable with an aim of better valorization of the current genetic diversity
- objective evaluation of comparative advantages of food products naturally rich in micronutrients (particularly F&V) and biofortification
- psycho - sociological studies for better information and sensibilisation of consumers

3. What can our institutions do to help country governments commit to action around your recommendations, and to help ensure implementation will be effective?

Encourage actions such as PROFEL/PROFAV , which are conducted jointly by FAO, WHO, GlobalHort,...

http://www.fao.org/agriculture/crops/news-events-bulletins/detail/en/item/92762/icode/?no_cache=1

<http://www.globalhort.org/media/uploads/File/PROFEL/Current%20Status%20of%20Fruits%20and%20Vegetables%20Production%20and%20Consumption%5B1%5D.pdf>

<http://www.fao.org/ag/magazine/FAO-WHO-FV.pdf>

49. Sharon Gordon, USA

Designing Complete Nutrition Gardens and Vitamin Gardens

For areas with adequate land near dwellings for Complete Nutrition Gardens:

Complete nutrition gardens (CNG) provide all the calories and nutrition that a person needs while increasing soil fertility and minimizing water use. If each country designs and tests CNG for the

various regions of their country and the preferred foods of their area, families can be provided with a plan that will make it possible for them to meet their nutritional needs. Initial research has focused on annual food plants, minimizing garden space, and the same diet year round in order to get the gardens going as quickly as possible. This is a good place to start since it improves local nutrition as quickly as possible. For inspiration see research by Albie Miles:<http://www.cityfarmer.org/albie.html>

To increase the diversity and resiliency of the food system, it would be beneficial to use the same framework and add the following components to the CNG system:

- CNG plans for each growing season in the region
- Permaculture and Edible Landscaping
- A graduated plan that allows people to steadily add perennial food plants each year until they have all they need while still maintaining space and light for the annual food plants
- Edible Landscaping of public places
- Easy(hens for eggs) and more challenging livestock(goats and cows for milk, cheese)
- Double Insulated unheated greenhouses and winter harvest techniques
- Beekeeping
- Natural and Low Tech food storage and preservation techniques
- CNGs that incorporate the above techniques to spread the gardening, harvesting, and food preservation workload more evenly through the year

For areas with small plots of land around dwellings, allotments/community garden plots, patio or balcony container gardening, roof top gardening

Where there is a substantial portion of land but not enough for a CNG for each family member, families could be encouraged to grow a percentage of the CNG that fits on their land.

Where people have very small gardening spaces, the research and garden designs could focus on crops that provide nutrition which complements the local grain and legumes diet. Look for foods that provide flavor and nutrition, are very productive, are diverse in color, can be preserved easily with low tech methods such as drying, or which need to be consumed shortly after harvest. Items such as garlic, sweet or hot peppers, parsley, cilantro, tomatoes, and leafy greens could be key ones with which to begin. Where people are endangered by malnutrition, the quickest way to change their lives is through the planting of the colorful small round radishes. The radishes and their leaves can be eaten beginning three weeks after planting.

If people are using containers, raised beds, or Salad Tables, ensure that they are using food safe containers and untreated/nontoxic wood.

To promote research by both the public and professional agriculturalists, consider having a contest to see what people can produce in a small Vitamin Garden such as 4 foot by 25 foot (100 square foot) or a 10 square meter(1.2m x 8.34m) plot. To encourage accurate data collection, enter participants into the contest based on reporting data at regular intervals rather than on total yield. For inspiration see Rosalind Creasy's 100 square foot garden which produced over 235 pounds of produce from one summer planting season. By including spring and fall plantings, the gardener could harvest triple the amount or more.

<http://www.motherearthnews.com/Organic-Gardening/Square-Foot-Gardening-Food.aspx>

To reduce the amount of land used for growing cooking fuels, and so that more land is available for growing food in any size plots, promote the dual use of solar cooking and fuel efficient stoves.

[For more resources follow the link \[Ed.\]](#)

50. Agnes Luo Laima, Zambia National Marketers Credit Association, Zambia

1. Improve food reserve centres by providing quality housing facilities and store room.
 - (i). Practice organic farming opposed to conventional farming
 - (ii). Empowering small scale farmers to have capital equipment e.g oxen triddle pumps, tractors etc
 - (iii). Farmers to use recommended hybrid seeds
 - (iv). Establish markets and selling depot
2. Africa has more potential for research because it has to graduate from old systems of farming to modern.
3. To sit down with country government to design and a unique plan that will accelerate implementation agriculture policies.
4. I would also want to note here that the super goal in agriculture has resulted in good health people reduced mortality rate in both human and domestic animals. In Africa most farmers used to abandon land on assumption that it has lost soil nutrient so they practiced shifting cultivation which resulted in cutting and clearing more land for farming, but now they are able to practice crop rotation.

51. Cecilia Murcia, Universidad Cooperativa de Colombia, Colombia

Dear friends:

Which agriculture investments would you suggest that can improve nutrition? and can you think of interventions that at the same time correct other harms of current approaches and policies, thus creating further opportunities?

The central problem of rural poverty is access to land, water and capital to fully develop this potential. What technology? Sustainable alternative technologies to minimize the impact on ecosystems and human health.

However, the full autonomy of farmers and exercise of their rights of participation and citizenship and political representation as differential and plural group must be ensured.

This requires: educate and train farmers with the use of virtual platform and didactic manuals; creating healthy habits; innocuous production processes; rescue o traditional production techniques that were replaced by high-impact technology (chemistry); rescue of the traditional culture and solidarity that allows the farmer to be happy with their beliefs and the way to keep the land, preserving their traditional language, cultivate native products without genetic changes; guidance on mutual aid and barter. The farmer must to be able to choose their representatives

and are not used in political processes; farmers must be involved in some processes of transformation of the products (Agribusiness).

Another important factor to be considered in the formulation of policies on food and nutrition is the protection of fertile land; intensive agriculture and minery exploitation is impacting fertile territories and countries end up having many desertified lands, so, it's time to reflect these issues.

Cordially

Cecilia Murcia Garcia

52. Final Year Economics Students (Group 4) University of Guyana [second contribution]

We put forward the following ideas as part of the first question posed on the top five things to be done as part of an agricultural investment program to maximize policy impact on nutrition. They are listed in brief, as follows:

1. Raise awareness to the targeted population on the importance of nutritional diet
2. Promote and foster technological change through support of research and marketing
3. Encourage institutional support/participation
4. Increase the availability and accessibility of high value food in both rural and urban communities
5. Initiate and manage a crisis response agency

2. To support the design and implementation of this programme, where would you like to see more research done, and why?

In keeping with these five initiatives, we see key areas that would benefit from intensified research:

1. Knowledge of farm incomes - especially of lower income 'peasant' farms that often elude the informational net of relevant institutions.
2. Knowledge of disaster/climatic impact - knowing how adversely a disaster or inclement weather affects low income/disadvantaged communities both in financial terms and in terms of 'well-being' and the degradation of individual livelihoods can prove useful in the design phase of an agricultural policy. However, one should remain cognizant that in LDCs this information may not always be available or reliable.
3. Knowledge on the different communication channels so as to encourage high income countries to invest in the promotion of nutrition in LDC's, whether through the private and public sector, NGO's or any other means of communicating information across to LDC's.
4. Knowledge is most needed in areas of agriculture such as nutrition and health, in the LDC's, so as to encourage individuals to make wise nutritional decisions in order to take better care of their health and by extension expand the demand for healthier agricultural products.

53. Economist Views On-The-Go, University of Guyana [first contribution]

Dear Moderators, Facilitators and Contributors,

Addressing Question 1 -**The five top things to ensure maximum impact of the agricultural investment programme on nutrition are as follows;**

1. **An extensive assessment** of the country's portfolio of agricultural output and imports is required so as to determine the level of nutritional value associated with it. This is critical because it gives much insight as to whether the current supply is sufficient to adequately provide citizens with a healthy diet. Additionally, this would indicate the size of gap that exists between the level that is required and what is supplied.
2. **Research and training.** Substantial research is required so as to determine the types of crops that are conducive to the current conditions in the country which would provide the nutritional benefits that were previously lacking. Upon completing this feasibility analysis, the next critical step would be setting up of training hubs around the country so as to equip farmers with the necessary information and skills on how to achieve high levels of output (both in quantity and quality).
3. The **provision of the necessary tools** to enable farmers to successfully implement and accomplish the goal of "producing products with high nutritional value". These tools include; micro finance programs, extension services, adequate supply and access of equipment to farmers.
4. The **provision of more effective and efficient market facilities** so as to allow the populace to have easier access to products with higher nutritional values. This is very vital because food security not only entails the production and availability of products but that there be easy access to them.
5. **Sensitization programs** throughout the country so as to enlighten the populace of the importance of these products and the role they play in enhancing their lives through an increased nutritional intake when consuming these products. This can be done via seminars, television advertisements or the distribution of brochures. Also, it will be very effective to institute a sensitization program at the school level and thereby initiate a change in the way the young populace views food consumption and nutrition.

Please do look forward for another posting from us addressing question 2 before Wednesday October 3, 2012. In addition the contributions made so far are interesting.

54. Economic Agri Advisors EAA, University of Guyana

Question 1 – *If you were designing an agricultural investment program, what are the top five (5) things you would do to maximize its impact on nutrition?*

The following are five (5) points that can be put in place when implementing an Agriculture Investment Program to maximize its impact on nutrition:

1. **Nutrition Awareness:** One of the major factors that can either impede or catapult the success of a program as it regards to maximizing nutrition is Awareness. It doesn't matter if the project will lead to substantial strides in improving greater life expectancy in individuals etc, without proper awareness, the target groups will never know about the essence of a program. A point to note, is that the target groups are pregnant woman and young children (from two (2) months to twelve (12) years) and Guyana has placed significant effort in making sure that those

target groups are aware of the benefits of a healthy and nutritious diet. Moreover, in order to target those groups the following should be used, namely; advertising through the media and other forms such as: one on one discussion with nutrition specialist or through call in programs, secondly, newspapers, posters and billboards- sensitizing individuals on eating a nutritious meal every day. Thirdly, implement education awareness program targeting school children; this can take the form of guest lectures and discussion at pre- natal clinic for pregnant women. Fourthly, there is need to modify the school curriculum, in that emphasis should be placed in teaching a course in nutrition, to toward enlighten children on all the issues surrounding the area of nutrition.

2 Food availability – It is vital that governments ensure that farmers have sufficient market and/or non-market incentives to produce food (particularly, whole foods that are essential for balanced diets). Further, the expansion of farmer field schools, increase access to more affordable fertilizer and the expansion of cold and dry storage facilities all will ensure that food remains available so that they maybe consumed within their appropriate dietary amounts. Guyana has taken initiatives such as the grow more food campaign to ensure that Guyana is in a position to combat rising food prices and to secure the availability of foods within our economy. There’s room for improvement however, as the campaign could be more specific about which crops to grow and could use the opportunity to advocate for the return of Orphan Crops: primarily those traditional crops that are too often neglected and rich in nutritional content.

3 Food Access – Governments must ensure that they upgrade their physical supportive infrastructure in both remote and populated regions within their jurisdictions. This is to assure access to food by all sections of the population in all areas of the country irrespective of incomes and general development. Monetary access to food is essential to ensure that sufficient incentives exist for families to want to eat healthier diets. Various food price policy programs could be erected along with voucher programs based on a means tested approach. Of course, there is no substitute for employment creation and this is always a good place to start to secure monetary access to food. To have a fully national program of nutrition improvement, the government could ensure that supermarkets, fast food outlets and restaurant chains sign a joint agreement with the government as it relates to the preparation and sale of foods that are balance in terms of nutritional requirements (fats, carbohydrates and proteins).

4 Food Stability – The gains of consuming affordable foods in their proper dietary proportions could be eroded by the volatile supply of food and the mere instability of its supply could cause people to cut back on certain staples due to the accompanying price fluctuations. The development of seed banks and the establishment of emergency reserve stocks could reduce the volatility of food supply during the course of a year. The development of climate change mitigation strategies and the use of flood resistant crops would all aid in ensuring food security by less food fluctuations. It is of the utmost importance to say that any farming practice must be done in an environmentally sustainable way, failure to do this would inevitably undermine the argument for ensuring the stability of food supply.

5 Proper Utilization- This point deals with changing the individual’s mindset as it relates to a healthy diet. If affordable food is available, there’s little guarantee that they will be consumed in the right amounts. This could be because of the lack of knowledge, and points to an obvious place of policy intervention. Rampant educational campaigns and advocates need to emerge so as to sensitize the populace about proper nutrition consumption. Governments should collaborate with stakeholders, agronomist, ago-economist and other professionals from the agriculture sector in order to make better decisions on nutritional policy and programs. Governments should be

able to incorporate support actions into agriculture programs to create markets incentives for farmers and consumers as it regards the proper utilization of foods.

Question 2 - *To support the design and implementation of this programme, where would you like to see more research done, and why?*

Too often we place great emphasis on the design phases of a project and with the help of donor agencies we have come to master the art of policy design and concept notes. Consequently, the efficacy of these projects suffers due to insufficient emphasis on the implementation phase, which too often lacks any clear and measurable targets and benchmarks. Guyana has drafted a food and nutrition strategy for 2010-2020 that delineates its policy positions and even identifies constraints that need to be removed to achieve food security along the lines of a healthy and balanced diet. Thus, much research needs to be in the area of developing comparable indicators to ensure we could consistently/accurately measure success or failure of projects. Research in the area of institutional design that is best for the assurance of the proper implementation of projects are vital, since many developing countries suffer from high levels of rent seeking and corruption. It is important that we equip these countries with the best institutional structures so as to secure sustained funding from donor and international agencies. Research in these areas is vital and become even more essential as Guyana begins to draft its food and nutrition action plan, which is primarily the implementation phase of its strategy. Finally, research within the area of nutrition and men since much of the research focuses primarily on women and children. For instance the Basic Nutrition Program in Guyana focuses mainly on women and child nutrition.

Question 3 - *What can our institutions do to help country governments commit to action around your recommendations, and to help ensure implementation will be effective?*

International agencies need to incorporate the five points we had identified (as essential to ensure proper nutrition within the context of an agricultural program) within their global policy framework on agriculture food and nutrition. Further, they need to ensure that member countries of FAO and other organizations sign on to the global policy framework on agriculture food and nutrition with clear targets and appropriate indicators and measurements. These are sure ways of ensuring governments commit to action around our recommendations. Alternatively, we could have a global summit to discuss these essentials for food security and proper nutrition and have countries sign on to commitments and programs to ensure the successful achievement of these. These global organizations could also ensure quality assurance with regards to the implementation phases of these projects by having progress reports done by governments and international agencies. These reports should be comprehensive and have an overall aim of determining the effectiveness of the implementation phase.

55. James Breen, FAO consultant, Ireland

Dear Sir/Madam,

As crops need up to 20 elements for their proper growth and nutrition and we depend on plants and the animals that eat them for food, we must ensure that a sufficient supply of all necessary elements are available to food crops. Conventional solid fertilizers do not provide a workable way to supply trace elements due to the difficulty of mixing and spreading evenly very small amounts of copper sulphate into a ton of fertilizer. As trace elements are removed by crops and not replaced in fertilizers, the nutritional value of crops is diminished. Vegetables grown in different parts of a country may have, as a result, very variable amounts of trace elements or elements such as

magnesium which are needed in relatively large amounts. It is estimated, for example, that over 50 percent of the US population is deficient in Mg. Magnesium is necessary for the formation of chlorophyll in plants and for many enzymic reactions.

This problem of applying elements such as Cu, Mg, Mn, etc. can be solved by using the Flex Fertilizer System. This liquid fertilizer system has several advantages over conventional solid, or liquid fertilizers. The key advantage is that N and P are chemically bonded together in the root-zone and are available for up to 6 weeks under European conditions. This gives rise to rapid root growth. When a plant has a large root system it can forage better for nutrients and water. As a result, the amount of P applied can be cut by up to 50 percent and get the same result as 100 percent application of conventional fertilizer. N use can normally be cut by up to 25 percent, and leaching of N is almost eliminated, i.e. more of the applied N is actually used by the plant. Trace elements can be added to this liquid fertilizer as indicated by soil test results, giving rise to super-healthy plants that require less fungicides.

Flex Fertilizers are formulated for both soil application and foliar application. It is estimated that foliar applied N is nine times more effective than applying it to the soil, hence very small amounts of N can be applied to very good effect.

Animals grazing grass produced using the Flex Fertilizer System are also healthier, as one would expect, given that the grass they eat contains the major nutrients and trace elements they need. One farmer told me many years ago that his lambs finished one month earlier on Flex fertilized grass.

Another major advantage of the Flex Fertilizer System is that it requires much less water/rainfall to work than conventional solid fertilizers. This has profound implications for dry areas.

We won't have properly nutritious food until we provide ALL the elements necessary for plant growth at the time the plant needs them. The Flex Fertilizer System allows this to happen. It also saves 50 percent of P needed, allowing more economical use of this rapidly depleting resource.

With best regards,

James Breen

FAO Consultant

56. Jayachandran Kunjuraman Vijayamma, Kerala University of Fisheries and Ocean studies, India

Hi,

It is always better to think in terms of interdisciplinary integrated agriculture (along with other allied areas) for a balanced nutrition. Therefore it is high time to think in those lines rather than on purely plant based agriculture

Prof. Dr. K V Jayachandran
Dean, Faculty of Fisheries &
Director, School of Fish. Resource Mgt. & Harvest Technology,
Kerala University of Fisheries and Ocean Studies,
Kerala, India

57. Justine Mwanje, Uganda Forestry Association, Uganda

If you were designing an agricultural investment programme, what are the top 5 things you would do to maximize its impact on nutrition

Nutrition is enhanced when food production and distribution are efficient. The following factors maximize impact on food production and distribution, as well as nutrition:

1. **Basic infrastructure:** Roads, transportation, communication, energy, irrigation, etc. Such infrastructure enables farmers to produce, market their products and capture value (earn a living). For example, Buyambi Parish, Kibiga Sub-county, Kiboga District, Uganda is partly not covered by a mobile telephone network, the roads are poor, there is no grid electricity, and agriculture is rain-fed. This adversely affects production, marketing and productivity.
 2. **Production and storage support:** Input supply, farm machinery, extension services, weather forecasting, producer associations and cooperatives, etc. The vast majority of farmers in the above-named sub-county have no access to improved seeds, extension services, up-to-date weather services; practice digging and farmer cooperatives are not present. Production is much less than it would have been if the services were available and farmers were organized. Also, productivity has drastically reduced.
 3. **Marketing and business support:** Structural services, information services, intelligence, chambers of commerce, etc. Farmers need information on policies, markets and supportive institutions so that they can identify opportunities for profitable farming, and/or engage in farming as a business. As stated earlier, farmers should be able to market their products and make a profit. This is the ultimate purpose of farming.
 4. **Financial support:** Credit services, banking services, crop/farm insurance schemes, trading exchanges, etc. Financial services can tremendously enhance farmer entrepreneurship. However, there is not a single financial institution specifically for farmers in Buyambi Parish, for instance.
 5. **Policy and regulatory framework:** Security, land tenure, investment grants, safety net functions, etc. It is a framework which fosters innovation, transportation, storage, access to markets, collective action, risk reduction, etc. Including climate change considerations in all plans and programmes. The cumulative effect should be increased commercial agriculture, incomes and sustainable development.
2. **To support the design and implementation of this programme, where would you like to see more research done, and why?**

Research should be done in all the areas, because they complement each other in enhancing food production and distribution; and nutrition.

3. **What can our institutions do to help country governments commit to action around your recommendations, and to help ensure implementation will be effective?**

Institutions should disseminate research findings and foster dialogue. In addition, they should carry out lobbying and advocacy on the factors below:

1. **Addressing institutional weaknesses:** Often, the institutions in the agricultural sector are fragmented, inappropriate and under-funded. This has led to duplication, redundancy, losses and wastage of valuable resources. An appraisal of the institutional framework should be done, in order to ascertain corrective action.
2. **Transparency and accountability:** There is widespread corruption and mismanagement in the sector due to various reasons, including inadequate remuneration. The causes of corruption and mismanagement should be addressed.

3. Developing and implementation of quick alert systems: These would enable quick reaction to extreme events such as droughts, famine, pestilences, landslides, etc. Certainly, sustainability (and productivity) would be greatly enhanced.
4. Certification of products: Products from sources which abide by policies and regulations should be certified, with assurance of access to markets.
5. Monitoring of market and value chains: Chains should be constantly assessed, with the aim of improving efficacy and efficiency of marketing. For example, there is tremendous potential for value addition and export of raw and dry beans. That potential is not utilized because monitoring is insufficient. Such monitoring should include impacts on the environment.
6. Adequate remuneration for responsible persons (as mentioned earlier): This should attract and retain skilled and experienced persons in the agricultural sector.
7. Incentives for public and private sectors: Farmers should be provided with subsidies to purchase improved inputs (seeds, organic fertilizers, etc) and they should have access to index-based insurance schemes. Extension workers should be adequately facilitated and remunerated (even given bonuses) to work at the grassroots.

59. Moira Beery, Siyakhana Initiative, South Africa

1. If you were designing an agricultural investment programme, what are the top 5 things you would do to maximize its impact on nutrition?

Greater focus needs to be put on aspects of food insecurity other than availability - too often food security interventions focus only on agricultural production. A much greater focus on linking food to needy communities and focusing on proper utilization is required. Five suggestions are: 1) In the area of agricultural production, a greater focus is needed on skills transfer than on technology and land access. We find that too often under-prepared farmers are given access to land and tools but not to the farming and business skills and mentoring required to run a successful farm business. Farming is not an innate skillset, and education and training need to respond to this and better prepare farmers to care for land and soil, and maintain the business aspects of the farm. 2) Facilitate access to foods, particularly nutritious whole grains, fruits, and vegetables through small and medium sized markets. Ensure that emerging farmers have appropriately scaled markets into which they can sell product and that customers overlooked by traditional commercial retailers can access. 3) Make meals, not just raw ingredients available to food insecure people. It is unrealistic to assume that all people have the knowledge, interest, time, space, and equipment required to make nutritious meals. Meal programmes in schools, community restaurants, and other food support such as parcels must be made available. These types of access points also serve as outlets for emerging farmers to sell their products. 4) Invest in crops that maximise nutritional content. If governments or agencies are investing in agricultural activities, they should incentivise highly nutrition foods over foods of low nutritional value. This can be achieved in part through crop choice, and also through healthy soils and organic soil care techniques. 5) Organic farming not only can achieve foods of higher nutrition, but the environmental health benefits of pesticide and chemical fertiliser-free farming contribute to overall improved health and less of a reliance on costly outside inputs.

2. To support the design and implementation of this programme, where would you like to see more research done, and why?

Low-cost farm-site cooling systems are needed for farmers in rural areas so that they make harvest and preserve sensitive fresh foods for market. Efficient ways of meal distribution, rather than just raw food distribution is needed. Research into micronutrients and how to maximize nutrition in foods through growing and preparing foods is needed.

3. *What can our institutions do to help country governments commit to action around your recommendations, and to help ensure implementation will be effective?*

We can assist government in identifying needy communities and individuals where farming support and training is needed. Communities can best identify where markets or community restaurants should be located to best serve residents. Understanding of local foods and food preparation can help those in the nutrition community to suggest appropriate food changes to maximise nutrition

60. Subhash Mehta, Devarao Shivaram Trust, India [first contribution]

Could correcting harms of current policies or approaches be just as important, if not more so, as capturing new opportunities to make agriculture work better for nutrition?

Rural farm-based livelihood policies - key to achieving economic growth and Farm To Fork with nutritious food:

- Natural resources for nutrition and health
- Access to resources through soil, water, and biodiversity conservation
- Produce/improve nutrition through low cost integrated agriculture
- Depended on locally adapted breeds, varieties and species
- Recycling of agriculture waste for soil fertility (on farm inputs)
- Value addition (drying, processing to increase shelf life)
- Little or no post harvest losses
- Livestock & fisheries
- Bartering for access to healthy nutritious food

Quotes from numerous consultation processes I have participated to support:

Strategy on sustainable integrated agriculture was developed through a wide consultation process, involving all concerned stakeholders, is now mostly targeting poor smallholder producers, family farms and in particular women. Policies to be 'demand-driven' and 'participatory' and in the short term, to take new technologies to poor smallholder producers, which they can use and help governments make better policy.

(DFID & EIARD consultation process)

'sustainable integrated agriculture', in ways that measurably and demonstrably improves the lives of the rural smallholder producers, world's most vulnerable people.

The FTF program is working with this in mind to develop IAR4D to 'reenergize and reorient' and in positive ways, to grow safe and nutritious food to FTF.

Success will require integration of programs on the ground, undertaking the complex challenges that lie ahead, taking bold and swift action, coupled with a willingness to pursue out of the box ideas of the type pursued by successful farmers and bearing fruit in the short term, season after season, from displays of leadership, built on a willingness to listen, to learn, and to collaborate with all stakeholders and as equal partners.

(USAID FTF Consultation Process)

Public policy and funding is now mostly targeting meeting the nutritious food needs of poor smallholder producers, family farms and in particular women, with priority for IAR4D policies to follow sustainable integrated agriculture, to be 'demand-driven', 'participatory' and in the 'short term'.

USAID, UN (IFAD, etc.), DFID, EIARD, Etc.

"One-and-a-half billion low income people live in countries affected by fragility and conflict. None of them are on track to achieve even a single MDG," "Growth and development have to be inclusive, ensuring that their benefits are broadly shared," "These countries need a World Bank that is far more responsive than it is today, and capable of delivering the right financial and technical support at the right time"

World Bank President Kim

"Government funding and programs demand they actually benefit the marginal, resource poor and vulnerable populations, and thus require mechanisms of accountability"

(Rajiv Shah, Administrator, USAID).

"I take this message to the G20 ministers on behalf of the smallholder farmers around the world: The development of rural areas is central to overcoming hunger and poverty, mitigating climate change, achieving energy security and protecting the environment, and it is the smallholder farmer that holds the key. But we must seriously start investing in their potential to support them to deliver,"

Nwanze said (IFAD President)

"Rio+20 has delivered a pretty good text for farmers; now it's up to governments and agencies to act on these words, and put into place the financial commitments and practical policies that can truly deliver", "Sustainable agriculture, food security and smallholder farmers are now formally part of that equation' and the "Recognition of smallholders as key stakeholders".

Vanessa Meadu, CG Climate Change Agriculture Food Security (CCAFS)

61. George Rivers, University of Guyana

In recent years, the focus among many international food, health and agricultural organizations has been on nutrition and its link to agriculture. With billions of people continuously suffering from lack of food security and malnutrition, these entities have recognized the vital role agriculture plays "as a supplier of food, a source of income, and an engine for growth to sustainably reduce malnutrition and ill-health for the world's most vulnerable people." (Agriculture, Nutrition, and Health: Connecting the Dots, [2011 Global Food Policy Report](#))

1. If you were designing an agricultural investment programme, what are the top 5 things you would do to maximize its impact on nutrition?

- a. Firstly, it is recommended that an educational programme on nutrition be implemented in order to facilitate people's voluntary intake of healthier food alternatives. This task can be accomplished through a combination of educational approaches, such as awareness campaigns, agro-food and nutrition workshops, and school visits. At the end of such programme, persons should be better equipped with the knowledge of improving food safety, choosing and consuming locally produced and nutrient-dense foods, understanding the nutritional requirements of different family members, etc. This will enable them to lead a healthier lifestyle where they can make better informed decisions for themselves and family members when it comes to their dietary intake.
- b. Increase production and market access of nutrient-dense foods to both urban and rural populace – Having succeeded in encouraging persons to lead a healthier lifestyle, we are now faced with increased demands for non-staple foods with high nutritious values, such as fruits and vegetables, in order to prevent or minimize the risk of micronutrient deficiencies. Therefore, increased production of locally-adapted nutrient-dense foods is highly recommended. However, this is insufficient to guarantee that everyone has access to such foods, unless proper infrastructure exists in order to meet the demands of the newly health-conscious population.
- c. Promoting organic agricultural production as it addresses regional challenges such as environmental, cultural and economic sustainability, health and food security. Most importantly, organic farming is seen as an eco-friendly approach that sustains the health of soils by using natural means of fertilizers which do not contain agrochemicals residues thereby, improving the nutritional intake of the crops. Organic production also relies on techniques such as [crop rotation](#), [green manure](#), [compost](#) and [biological pest control](#).
- d. Promoting sustainable farming practices that are eco-friendly to avoid soil erosion of arable land which often times leads to lower crop yields, reduced income to farmers, shortages of nutrient-dense foods. If these concerns are not met it may lead to under nutrition especially in rural poor communities. Therefore, this calls for proper and effective management of natural resources which can result in soil fertility, crop rotation, greater productivity, improved adjustments to climate change, etc.
- e. Developing, as appropriate, a mechanism within which to monitor and evaluate the level of success/failure in improving nutrition through agriculture, for instance, creating the capacity for overlooking the environmental quality and health status of the population. Here research, monitoring and evaluation will be continuously conducted in order to facilitate changing conditions along the investment programme with an intended nutritional impact.

2. To support the design and implementation of this programme, where would you like to see more research done, and why?

The literature on the need for effective institutions is endless. Nevertheless, even with the rationale out there we still have poor institutional framework in many nations. So the question remains, why is it that we continue to experience poor policy outcomes and shambled institutions in this age of information superhighway. It is believed that within Guyana this comes about because of the applicability of these models to our economy. Therefore, more research can be done on the political and social constraints within Guyana and countries of similar structure to formulate resolutions for existing poor institutional framework. Only then would we be able to see effective implementation of these programmes to achieve their fullest capacity in terms of maximizing its impact on nutrition.

3. What can our institutions do to help country governments commit to action around your recommendations, and to help ensure implementation will be effective?

- a. Information asymmetry continues to be a huge issue. International institutions can continue to help by providing easy access to necessary information and reports since often times, poor policy responses are linked to inadequate information base.
- b. Consider the possibility of co-integration of the programme with other similar ongoing programmes, and also deeper engagement with the private sector and other value-chain actors; for a bigger pool of resources and a more drastic outcome.

62. Final Year Economics Students (Group 5) University of Guyana

Dear Moderator and fellow Contributors, your comments has been very interesting and insightful on the present discussion thus far.

We would like to make our contribution to question 1:

If you were designing an agriculture investment programme, what are the top 5 things you would do to maximize its impact on nutrition?

In maximizing the impact of nutrition in an agricultural investment programme the following aspects needs to be addressed:

1. An assessment of the current status of nutritional requirement of the population in order to determine the areas that are lacking and by how much. This would provide the information needed to determine the nutritional objectives of the programme with respect to change in climate and its impact on developing countries.
2. Education by providing awareness and sensitizing citizens about the emphasis that should be placed on nutrition. Women being the care takers of homes should primarily be of focus, this factor is important in improving nutrition, since women play a unique role in the significance for households nutritional outcomes. The choices that women make are found to be more committed to an investment in their children's health and well being rather than men. Suppliers and producers themselves need to be educated about how to improve the quality of products. In the sensitizing aspect of a nutritional programme technology and more specifically the media plays a major role in the dispersion of information to those who need it. And to encourage behavioral or attitudinal changes through nutrition education to promote the consumption of healthier diets.
3. Foster institutional collaboration at every stage of production aimed at improving communication, interaction and providing resources to facilitate national sovereignty. By creating an atmosphere for producers at all stages of production to discuss the innovations in the agricultural sector and available resources and technology to improve product quality and output.
4. Introduce closely monitoring programmes and extensive documentation of activities and results attributable to each activity. Identify potential food safety and security issues - such as contamination, destruction of crops or animals due to severe weather or pest outbreak - and develop a plan for the alleviation of such issues. (food quality). Having an evaluation teams that will set regulations and will ensure that products meet a predetermined recognized hygiene and safety requirement to produce crops of the best nutrition possible.
5. Improve accessibility both logistically and financially to the targeted group. An increase in accessibility and of nutritional food in rural and urban areas. Ideally making food vouchers

available to the lower income households and specifically to those families below the poverty line to ensure each person's nutritional needs are met.

2. To support the design and implementation of this programme, where would you like to see more research done, and why?

1. Research into new approaches of biofortification is needed in the fight against malnutrition and hunger.
2. In most developing countries the average diet of the poor usually consists primarily of lesser nutritious foods – staple food crops – such as rice and wheat, cassava and maize/corn. These diets result in micro-nutritional deficiencies of vitamin A, iron and zinc. By undertaking research into the best traditional breeding practices using the latest in modern biotechnology, developing countries can efficiently produce staple food crops with a higher micro-nutritional value which would effectively address some of the nutritional issues of the targeted group(s). Biofortified crops also help to promote food safety since the added trace minerals may prove essential in helping plants resist diseases which would otherwise have been treated with potentially harmful chemicals.
3. Also, mineral packed seeds have exhibited a higher proportion of survival as well as more rapid initial growth. The culmination of these two effects will translate to higher yields in the selected crops. This essential increase in agricultural productivity can help to promote sustainable agricultural practices aimed at meeting the nutritional objectives of the programme.

63. Final Year Economics Students (Group 6) University of Guyana

Dear Moderator,

Kudos to everyone who comment so far, there has been a torrent of solutions. This has made it especially difficult to generate novel ideas. Nevertheless we chose to look at this problem from a different facet of the diamond; therefore we have decided to look at the problem through the eyes of the consumers.

If you were designing an agricultural investment programme, what are the top 5 things you would do to maximize its impact on nutrition?

1. Assessing the needs of the population.

Every population is unique in its own entirety, some are large some small, some are aging while others are young. Therefore the first things we would do when implementing a nutritional programme is to assess the age of the population in question, from that proper nutritional needs of the population can be address since different age group requires different level of nutrition. we also need to address the consumption patterns of the population what are we consuming too much of and what are we consuming too little of, even if the data for consumption in a particular country or region is limited it is safe to assume what is being produce in abundance in a particular region that is what is being consume. This situation is most prevalent in the developing or poor countries like Guyana.

2. Sensitizing household food preparation

Food preparation is unique amount people of different cultural or traditional background for example in Guyana the same dish is prepared differently amount different ethnic group. Some of these traditional methods of preparation are unknowingly diminishing the nutritional content of the dish being prepared. For example in Guyana the overcooking and undercooking of food is prevalent in households. This is one of the major reasons why we would sensitize the population on preparation of proper household cooking methods.

3. Informing the public about the benefits of healthy eating

We have to ask ourselves why is eating healthy eating important.

Even though the ideology that healthy eating is good for us is widely known, little or no thought is put into the benefits or how detrimental our consumption habits could be on our body especially in the long run. Therefore we recommend that fundamental ideas be put forward like eating for tomorrow and not just for today promoting a longer life span.

4. Decentralization of the supply channel of perishable produce.

The supply of nutritional produce is not one of question, because if we don't produce how can we eat healthy to get nutrient. But getting the produce to those who need it can be limited by distance and other environmental factors. So therefore we would decentralize our distribution channel of perishable produce especially in remote areas, rather than having the product produce at one central location. This would reduce the risks of nutritional values being loss during transportation; in addition to that the accessibility of the produce will be increase since it is being provided at a closer location. This could also aid in the problem of over and under consumption of vitamins dues to availability of produce that contains the necessary vitamins. For example in Guyana rural citizens normally consume what is available because of the limited availability of different agricultural produce which is mostly available in the main town.

5. Packaging

Packaging is very important to the supply chain, not only to hold the produce but to preserve the shelf life and retain the nutritional content of what is being package. In addition to that we would place the nutritional content of the produce on the package. This would inform consumers of what they are consuming, the exact nutritional content of the produce. In addition to that this method we would like to capture the busier portion of the population, those who don't have the time to cook a nutritional household meal. We would create a product that is rich in the basic nutrition needed for daily consumption like the Gerber single for adults; package in a comfortable an attractive manner. Taken into to account the main focus is to provide our population with nutrition and not profit, the best interest would be as such avoiding the mistakes made by Gerber adult single since they produce in an operational efficient manner for them not for the market "Harvard business review why big companies can innovate".

64. Final Year Economics Students (Group 1) University of Guyana [second contribution]

Question 2 - *To support the design and implementation of this programme, where would you like to see more research done, and why?*

In keeping with the initiatives of our last post and a general perspective, we believe that research should be emphasized in the following areas:

In order to make agriculture work for nutrition (and in part facilitate the design and implementation of this programme) more research should be done at national level on ***mechanisms of adapting to a transforming agricultural world*** (especially for LDC's) with special

emphasis on maximizing nutritional impact. This should be done so as to ascertain the most effective method of adapting modernized efforts in agriculture. In our opinion, the small holder farmers must be taken into consideration in any adaptation process so that their needs can better shape agricultural innovation.

A more formative research should be done on ***“Effective Techniques of Communicating the importance of nutrition given certain social and cultural constraints”***. Since a person’s eating habits are embedded in their beliefs, norms, habits and tradition, the research can focus primarily on the behaviours, attitudes and practices of a community, and understand the target group’s perspective, as this will help deliver effective results in terms of increasing their nutritional intake. Additionally, understanding what influences the target group’s behaviour and the barriers and opportunities to change behaviour one can decide the best ways to promote nutrition and change people’s eating habits.

65. Final Year Economics Students (Group 4) University of Guyana [third contribution]

What can our institutions do to help country governments commit to action around your recommendations, and to help ensure implementation will be effective?

To finalize our contribution to this discussion we provide the following ideas on the above stated question :

1. Establish and sustain an assessment or evaluation initiative where crucial agricultural programmes and projects will be evaluated under the supervision of technical and politically neutral experts.

2. Maintain systems of pledging accordance by developing nations, to the targets and milestones that are established by respective policies for nutrition enhancement

A system for incentivizing target achievement will surely encourage governments to commit to action. This involves the benefits that country governments can gain both politically and effectively in terms of their efforts to further the development cause in their respective nations.

3. Effective target oriented financial aid

This is especially useful in situations where projects are well designed but lack the necessary finance to be implemented.

4. Actively participate in the sharing of skills (more specifically, training) and technical expertise.

5. Enhanced communication and interaction between your institutions and the local agencies that are actually involved in the implementation phases of policies may help to bring about a positive response from country governments. The intimacy between policy makers and implementation agents can make for effective agricultural policy, and can signal to governments that your institutions are serious about effecting their mandates.

This final point about communication and intimacy between far reaching institutions and local agencies is also relevant to all the points we outlined above since many of the ideas proposed above rest on a closeness that needs to exist between the two types of entity for the purposes of informational accuracy; effective public relations and diplomacy; and mutual compliance with objectives of programmes.

We thank the moderators and all those who have contributed to the discussion for their continued involvement and support. We will definitely make efforts to improve the value of our future contributions to the forum .

66. Final Year Economics Students (Group 3) University of Guyana

Greetings all,

In addition to our earlier post, we have a little more to contribute , as it relates to Question two (which basically talks of "where we would like to see more research done and why?")

Generally speaking:

- 1) Research can be conducted to find replacement plans for pesticides that may contain harmful ingredients to human, animal and aquatic life. New strategies can be developed for pest control practices and available training for farmers on how to do same, as well as training for things like land use, growing practices, soil fertility etc.
- 2) Most countries may have a huge problem of where the people prefer imported products; therefore, more research should be conducted so as to devise a plan/strategy to promote the consumption of locally produced agricultural food.
- 3) Research or more attention should be emphasized on reducing food losses (this point refers directly to post harvest wastage) given the fact that a lot of resources are used to produce nutritional agricultural products; "it should not be thrown away!" This can be seen in many developed countries and we know for a fact that many people elsewhere can use the "excess food supply" (what the wastage is sometimes referred to).
- 4) There should be a direct involvement of producers/farmers, users/consumers in conducting and monitoring research activities; more specific emphasis should be placed on the producer's/farmers concerns.
- 5) In concluding, research can also be conducted by countries who do not have the information on how the processing/production of locally produced goods; be it fruits, fish, meat or vegetables, etc. can act as the foundation for a more sound economy that can *"MAKE AGRICULTURE WORK FOR NUTRITION BY PRIORITIZING COUNTRY-LEVEL ACTION, RESEARCH AND SUPPORT"*.

We Thank You!

67. Eutropia Mwashia, Ministry of Livestock Development, United Republic of Tanzania

Agriculture is the basis for "food" but for the food to be nutritionally meaningful for consumers it must meet the critical nutritional levels for a healthy life. Countries have different backgrounds that define the agricultural system that impact on nutritional value of what is produced. Looking at the different stages on how agriculture can work for nutrition from production in the field, processing, distribution, cooking and trade, have effect on nutrition. These processes are hugely varied from one culture to another, geographic position as well as socio-economic status of a country. It is a complex subject that demands thoughtful action from grassroots, national and international levels involving more than the one discipline.

To make agriculture work for nutrition, the natural resource base which is highly linked to agriculture and nutrition, the soil especially must be preserved, protected and enhanced. Healthy

soils guarantee the sustainable production of healthy foods and vice versa. It is necessary to adopt good agricultural practices to maintain healthy soils.

Biodiversity is fundamental for sustained food production of quality nutrition. Biodiversity should be viewed in the total perceptiveness not just the crops or domestic livestock conventionally known for food. Research and education are necessary in capturing and disseminating new knowledge and technology respectively.

Agricultural researchers especially in developing countries need to be more articulate in understanding local conditions as affected by challenges such as global warming, trade and individual national policy development processes. Extension service providers likewise need to be updated in a timely manner on how to cope with the challenges arising at local levels. Extension services focusing on nutrition should be multi-disciplinary involving agriculturalists, health and community experts, etc.

However, nutrition can be negatively affected by situations such as culture, food preferences and income changes. Some cultures prohibit consumption of certain foods in the community or on specific group members, based on gender. Food preferences based on taste can lead to consuming excessive foodstuffs that are health threatening. When incomes increase, there is a tendency to consume more expensive types of foods but not necessarily healthier.

In conclusion, to make agriculture work for nutrition, this demands comprehensive analysis of all aspects and players in the various disciplines in terms of administration, political, trade, education, health, environment and information technology. These should all be viewed in the context of grassroots, national and international levels.

Eutropia Mwashu (Tanzanian in Grenada, West Indies)

68. Seema Prakash, Ashoka Fellow, India

We work with a particular tribe called Korku in Madhya Pradesh (INDIA).

Since couple of decades they have been gradually divorcing their traditional tribal millets and crops in favor of cash crops like soybean and wheat and cotton. Ironically they grow soybean but is not a part of their food culture. The tribal millets like Kodo (*paspalum scrobiculatum*) and Kutki (little millet) and Sawa (Indian barnyard millet) have been going out of vogue and generating a widespread lack of essential micronutrients and manifesting in large numbers of children malnourished. The recent surveys show nearly 60% children below 5 years being underweight, 45% stunted and 30% wasted. The situation has remained chronic. Secondly Korku tribe settled from their hunter-gatherer life quite late at the end of the nineteenth century. With restriction on hunting and their divorce from wild yams and tubers have further compounded the issue.

The government policy is not titled to promote it or bring it in their Public Distribution system.

Serious research is needed to ascertain the loss this has brought to community nutrition and established chronic food insecurity among Korku and also many other tribes in Central and Northern India.

Seema Prakash

ASHOKA FELLOW

Khandwa
Madhya Pradesh
INDIA

69. Economist Views On-The-Go, University of Guyana [second contribution]

As you continue in your thrust to seek out ways to "Making agriculture work for nutrition", and further to our earlier contribution, we submit the following:

1. *Integrate Agriculture/ Food & Nutrition Programmes into the School System:* Many secondary schools have programmes of such, however, and in light of the recent developments regarding food and nutrition security, it is imperative that these programmes be expanded, and extended to the elementary schools and even nursery schools. Cultivating good habits at an early age will definitely contribute to a more 'aware' society.
2. *Promote Organic Farming:* In Guyana, we have embarked on some initiatives to foster organic farming. This is an area that some amount of attention need to be place if we are to make available wholesome foods to our people.
3. *Endorse Land Reform:* Mechanisms must be put in place to facilitate and enhance farming in a sustainable manner. Moreover, with successful land reform and the beneficiaries (farmers) having the "know how" to cultivate the land by applying safe land practices, such as, crop rotation, utilizing manure, etc., in an effort to stimulate higher quality produce, there is every reason to expect an increase in production. In Guyana, there is a huge amount of arable land, but the problem lies with ownership and use of the land. Therefore, land reform and supporting infrastructure, such as, eduaction, credit and technical assistance are necessary if output is to be increased.

We are cognizant of the many policies, programmes and projects developed and executed by many nations, however, we believe that greater efforts must be placed on the aforementioned, which the FAO can continue to play a pivotal role.

70. Glenn Ashton, Ekogaia Foundation, South Africa

Thank you all for your interesting contributions to date.

I would like to look at some more fundamental issues which I feel have not been sufficiently covered.

To improve plant nutrition, I would suggest the examination of two major aspects of the problem, firstly the availability and uptake of nutrients by plants, making nutrients bio-available to humans, and secondly, examining and education around the problem of plant anti-nutrients inherent to several major crops.

As far as making nutrients available I would tend to disagree with the proposal in posting number 6 that artificial fertilisers provide any sustainable or truly productive solution to nutrient availability.

The reality is that the availability of macro and micro nutrients is largely dependent on the health and diversity of the soil biota. If there is a healthy soil biota (the sum of bacteria, fungi, protozoa etc in the soil) then there is a good chance that the available nutrients both within the mineral matrix of the soil and within the portion of humus in the soil can be made bio-available to the root systems and thus to the plant itself. In a barren soil, i.e. one that has been overused, poisoned or damaged by over fertilisation by chemical based fertilisers plant nutrients are either not bio-available or are totally absent. If they are not available the biota needs to be supported and built up. If they are absent then more fundamental steps need to be taken to introduce nutritive sources into the soil, starting with the humic (compost and plant matter) portion and building from there.

It is generally counterproductive to rely on totally external supply of plant nutrients for sustainable agricultural nutritional requirements as these primarily artificial sources of nutrition are often not readily bio-available to plants, or are not present in correct ratios. Most importantly the cost of supplying macro and micro nutrients on an ongoing basis is a significant cost to most food insecure and nutritionally challenged communities that they can ill afford.

So, to sum up this point - research needs to be undertaken on local conditions in order that plants can take advantage of what nutrients are available in the soil and secondly, in building up the source of nutrients, so that they can be taken up by the plants and thus made available to those consuming the plants.

Secondly I would like to deal with the issue of plant nutrition looking at the matter of human manuring. While this is a distasteful subject to many communities and cultures it is one of the elephants in the living room that few wish to deal with. The vast amounts of suitable plant nutrition which is wasted in this manner is one of the major breaks in the link of the nitrogen and phosphorus cycles.

Humanure, or manure made from human faecal matter is rich in base nutrients such as phosphorus, nitrogen and so on. It also is rich in micro-nutrients and supportive of a healthy soil biota if properly treated. Accordingly sanitary practices in an increasingly urbanised world need to take cognisance of the huge losses of nutrient through not using human waste sources of nutrient.

Of course this matter needs to be treated properly. Proper composting toilets are essential. Urine diversion toilets are also very useful as the urine is a very rich source of plant nutrient.

To sum up - we simply cannot waste this important source of plant nutrients but they must be free of dangerous pathogens when used in agriculture.

If these two issues of plant and soil nutrition are not holistically dealt with in traditional farming communities then steps need to be taken to ensure that they are. Further the use of agricultural chemicals and pesticides not only impacts the health of humans but also of the soil and hence of plants. Therefore chemical use must be stopped or at the very least minimised to its lowest possible levels. This reduces the requirement for outside (bought) inputs and increases the chances of local innovation and solutions.

Other methods such as inter-cropping, layering, permaculture practices along with other agro-ecological systems provide hardy, robust methods of farming which shift away from a reliance on a limited number of crops and 'weeds' - many of which are foods, medicines and otherwise useful, and instead provides a more resilient system. This is supported by the IAASTD 2009 report "Agriculture at a Crossroads" and reinforced by the views of the UN Rapporteur on food security in various studies.

Further research also needs to be made into anti-nutrients in crops, especially from local or regional perspectives where a few major crops may provide significant portions of the diet. In this way natural compounds found in plants such as trypsin inhibitors such as those common in many legumes - themselves important sources of plant based protein - may prevent or reduce the absorption of essential nutrients such as zinc, calcium or iron.

Obviously it is worthless to increase nutrient sources if they are not being actively absorbed. This problem can be dealt with through two primary avenues - one using traditional methods such as fermentation, and secondly by addition of admixtures such as lime or clays to break down certain antinutrients. Soy is traditionally fermented and not usually eaten in its unchanged state because of anti-nutrients being high in this legume, which is a major problem with the increasing growing and inclusion of soy in supplementary foods. In some cases the apparent benefits may be outweighed by the actual costs. This is a very important matter given the modernisation of diets, adoption of

different crops in traditional farming practices and changes in lifestyle. The issue is too complex to deal with in such a short contribution but several important papers have been written on this issue; Holz and Gibson (2007) provide some useful starting suggestions, as did the Cornell GEO-PIE project on plant toxins and antinutrients.

Finally I note that genetic engineering of food crops has been touted as a way to deal with nutritional shortcomings. I, together with several other far more authoritative researchers, feel that this is a dangerous dead end wherein we are attempting to fix a symptom but not the cause. A major reason for nutritional deficiencies is a decreasing dietary diversity. Attempting to provide single solutions in single crops such as the infamous case of yellow rice is shortsighted and misses the entire reason why the problem exists in the first place.

71. Emile N. Hougbo, Université d'Abomey-Calavi, Benin

[Contribution in French]

Comment mettre l'agriculture au service de la nutrition en Afrique ?

La capacité de l'agriculture à contribuer efficacement à la sécurité nutritionnelle est fortement liée à la qualité de la gestion du secteur agricole à l'échelle nationale (macroéconomique). La forme de gestion qui faciliterait le développement de ce secteur et accroître sa contribution à la nutrition est celle qui permet de minimiser les risques auxquels les activités agricoles sont soumises dans le pays. Les activités agricoles, et surtout en Afrique, sont fortement soumises à des risques de production (risques biologiques, climatiques et agronomiques) et des risques économiques (mévente, chute drastique des prix, pourriture, etc.). La minimisation de ces risques devrait permettre de préserver l'agriculture des pertes de certains produits saisonniers en leur période d'abondance - notamment, les fruits comme la tomate, la mangue et l'orange - pour renforcer leur disponibilité toute l'année. Cette minimisation des risques est indispensable pour rendre l'agriculture performante, et donc de susciter des investissements importants dans le secteur et dans les meilleures pratiques telles que l'agroforesterie et l'agriculture écologique. Ces investissements devront accroître la contribution de l'agriculture au PIB, les recettes de l'Etat et inciter au financement de la recherche en vue de la mise au point de modèles de systèmes de production durables. La solution est donc de motiver l'Etat à s'investir dans des actions comme:

- La recherche sur la durabilité des systèmes de production intégrant les meilleures pratiques (agroforesterie, agriculture écologique, etc.);
- L'appui aux investissements technologiques pour la transformation et la conservation efficace des fruits nutritifs saisonniers comme la mangue, la tomate et l'orange;
- L'organisation des filières à spéculations vivrières rentables pour le producteur, telles que les racines et tubercules dont les rendements peuvent être très fortement accrus que ceux des céréales;
- La création/organisation de chaînes de valeurs ajoutées qui procurent un revenu satisfaisant pour tous les acteurs, notamment les agriculteurs qui restent les grands perdants à ce jour.

Dr Emile N. HOUNGBO

Agroéconomiste & Spécialiste du Développement Durable,

Université d'Abomey-Calavi (UAC),

Ecole Nationale Supérieure des Sciences et Techniques Agronomiques de Kétou (ENSTA-Kétou),

Chef du Département d'Economie et de Sociologie Rurales,

05 BP 774 Cotonou (Republic of Benin)

[Contribution in English]

How Could Agriculture Contribute to Nutrition In Africa?

The capacity of agriculture to contribute efficiently to nutritional security is strongly linked to the quality of the agricultural sector management at the national (macroeconomic) level. The form of management which could facilitate the development of this sector and increase its contribution to nutrition is the form which minimizes the risks faced in agricultural activities in the country. The agricultural activities, and especially in Africa, face farming risks (biological, climatic and agronomic risks), and economic risks (slump, drastic price downfall, rooting, etc.). The minimization of these risks should prevent agriculture from the loss of some seasonal produces in their period of abundance – mainly the fruits such as tomato, mango, and orange – in order to reinforce their permanent availability during the year. This risks minimization is necessary to improve agriculture performance, and then motivate important investments in the sector and in the best practices such as agroforestry and ecological agriculture. These investments should increase the agriculture contribution to GDP, the State returns and would incite to research financing in order to generate some models of sustainable farming systems. The solution is therefore to motivate the State to invest in public actions such as:

- Research on the sustainability of the farming systems which integrate the best practices (agroforestry, ecological agriculture, etc.);
- Support to technological investments for efficient processing and conservation of nutritive seasonal fruits such as mango, tomato, and orange;
- Organization of the channels of food crops profitable for the farmer, such as roots and tubers which yields could be strongly increased than that of the cereals;
- Creation/organization of added value links which could generate significant income to all the actors, especially to the farmers who are the greater losing till today.

Dr Emile N. HOUNGBO
Agricultural Economist & Sustainable Development Specialist,
University of Abomey-Calavi (UAC),
National Higher School of Agriculture, Ketou (ENSTA-Ketou),
Head, Department of Rural Economics and Sociology,
05 BP 774 Cotonou (Republic of Benin)

72. Peter Steele, FAO, Italy

Colleagues,

Some final thoughts: nutrition & agricultural production

Last day for making those contributions for what has been one of the more interesting and technically challenging FSN debates in recent times and not least because '*nutrition*' is fundamental for just about every aspect of human development – no people, people in poor health, people struggling to make a go of things or those who simply don't care - and everything else becomes of secondary consideration.

This, of course, pre-supposes that *people* are the nexus of our debate and their importance, role and aspirations *always* take priority. No one, as far as I can see, has tried to shift the debate into shared environmental care, use of natural resources for other species and the longevity of climatic changes that are slowly shifting those global goal posts in which people and their agricultural production systems will continue to co-exist (although Peter Carter has pointed in this direction). There is also reference to the '*Do no harm*' approach to socio-economic development by a second correspondent. *Scope for another debate perhaps.*

The FSN facilitators will be making their appraisal of the key issues to arise around their request for direction with new investments. Amongst the wish-lists and imagination of the many contributors, I particularly enjoyed the more pragmatic inputs provided by:

Contributor	Key issues/sectors/recommendations
Lavinia Gasperini	Making education <i>all</i> -inclusive and available for <i>all</i> people (and especially rural people); and teaching nutrition within the range of life-skills required of a productive life.
Lisa Kitinova	Encouraging horticulture production wherever possible. Reduction of losses in the food chain.
Jane Sherman	Eating habits & knowledge. Producing to market demands.
University Guyana 6	Consumer focus. Supply channels & packaging.

Mine is also a request to be more pragmatic about what can be achieved – my earlier contribution - especially with limited resources, and targeting people who are not always interested in being the focus of that investment (*and who may indeed prefer that television in preference to nutritious foods*). My key words continue to remain ‘private sector’.

Well done everyone – an excellent debate.

73. Ewan Robinson, Institute of Development Studies, United Kingdom

Apologies for this contribution coming in late. These recommendations come from [John Humphrey](#), [Spencer Henson](#), and [Ewan Robinson](#), drawing on research to [link agriculture and nutrition through value chains](#) undertaken by GAIN and the Institute of Development Studies.

1. Provide learning and analysis tools to agriculture projects

We need to share and disseminate learning and tools so they reach new and ongoing agriculture projects. Agricultural programmers and practitioners may not be aware on how best to design interventions in order to maximize nutrition outcomes and link ongoing activities to nutrition.

Projects need to systematically identify which groups undernutrition reduction activities are designed to benefit; they should map the multiple pathways agricultural interventions can use to enhance nutrition, including the following:

- promoting production and on-farm consumption of nutritious foods
- promoting ‘off-farm’ consumption of nutritious foods (including by farming households in other areas, agricultural workers, and urban population.) Make nutritious foods accessible and affordable to these populations through interventions in value chains, including purchasing crops, processing, distribution, retail and marketing
- raising farmer incomes, and using education, behaviour change, etc. to enhance the link between income and nutrition

2. Improve the evidence base on agriculture-nutrition

We need a better evidence base for undertaking where and how agriculture can help improve nutrition. A recent systematic review (Masset, Haddad, Cornelius, & Isaza-Castro, 2012) found that very few agricultural interventions were designed in a sufficiently rigorous way to allow assessment of nutrition outcomes. This study also found that available research does not provide conclusive evidence that agricultural interventions can reduce stunting among young children.

Research is needed to better define the relationship between of agriculture-nutrition interventions and other nutrition-relevant interventions (i.e. health services, sanitation, behaviour change, etc.) and the relative importance of these approaches in tackling the causes of undernutrition. We need to know in which contexts and for which groups agriculture-nutrition interventions are the most appropriate approach, and when other approaches should be the primary focus.

3. Invest more in nutrition of key groups beyond farming households

Most policy recommendations on agriculture-nutrition focus on interventions into agricultural production and food consumption at the farm-level (see Herforth 2012), and most aim to improve nutrition for farming households. This is a critically important population with a high vulnerability to undernutrition. However, a farm-level approach alone cannot address the majority of the undernutrition burden, which affects populations off-farm, including urban populations and landless agricultural workers.

To address these groups' access to affordable, acceptable and nutritious foods, interventions and research need to address the agri-food value chains that can or could provide nutritious foods to populations in need, including processes of shipping, processing, distribution, retail and marketing. These interventions must happen alongside and connect with the on-farm interventions that promote the production of nutritious foods.

For example, work by GAIN and other institutions to promote orange-flesh sweet potato in Mozambique focused on providing services to farmers, but also linked farmers through value chains to merchants, urban retailers and small-scale food processors. The project supported retailers in urban areas to acquire a reliable supply of high quality sweet potato tubers, and to promote and market their health benefits to consumers based on tubers' orange colour. Projects have also piloted food products that incorporate orange-flesh sweet potato, such as so-called golden bread, in order to make the food accessible and desirable to a much wider population group, both on- and off-farm.

4. Research and interventions need to pay more attention to the role of the private sector

Much of the current efforts on agriculture-nutrition tend to overlook the importance of the private sector, instead focusing on donor-funded agricultural interventions. However, given that a majority of the world's population accesses most foods through value chains that include private sector actors, their role will need to be addressed, including overcoming barriers and aligning incentives for private sector actors to invest in and profit from producing and delivering nutritious foods to target populations.

74. Subhash Mehta, Devarao Shivaram Trust, India [second contribution]

It is my view that investments in 'Nutrition through Integrated Sustainable Agriculture and for rural producers' to set up and staff their producer co ops/ organizations/ company (PC) with professionals will ensure over a billion smallholder rural producer communities will have access to nutritious food at farm gate prices and at the same time correct the mistakes made in the past, current and proposed supply side approaches and policies, most of them focusing on Green Revolution (GR) / conventional technologies.

Smallholder producers, mostly resource poor, illiterate, out of sight and out of mind are over burdened, as 'Public Institutions' providing services have deteriorated/ non-existent during the last many decades. To fill this and other gaps, rural producers need to set up and staff their producers companies (PC) with professionals, to take over these problems/ responsibilities, manage risks (other than on farm activities) and focus on costs. The PC intervention will effectively fill the

knowledge and other gaps to design, implement and manage multi-sector integrated sustainable agriculture programs that work in the large scale for producing safe, nutritious and healthy food. The PC set up by rural producers is also a good platform for institutional and human capacity building, delivery of Government programmes and providing the need based management services.

Evidences from most producers who converted from conventional (GR) to the local low cost integrated sustainable agriculture, meet their communities' nutritious food needs, have measurably and demonstrably improved the lives of rural communities - world's most vulnerable people in developing countries. The local practices have proved that they are internally consistent for integrated sustainable agriculture and externally synergistic to these smallholder producers. The local ecology and greater overall nutritious food production for meeting their needs and at farm gate prices, suggest that integrated low cost agriculture of the area is the only way to sustainably involve the over one billion resource poor producers globally, mostly women, for economic growth and to feed the future (FTF) growing populations. This will ensure access to nutritious food security, safety of the environment; reduce hunger, malnutrition and suicides among these rural communities while improving purchasing power, net incomes and livelihoods.

The US government, through its FTF programme is working with this in mind to develop IAR4D to 'reenergize and reorient' and in positive ways, to grow safe and nutritious food for feeding the future (FTF) and in a short time. Further, 'Government funding and programmes require mechanisms of accountability, ensuring that public funds invested actually benefit the marginal, resource poor and vulnerable populations', says Rajiv Shah, Administrator, USAID.

My views given above are in keeping with the outputs of the numerous consultation processes I have participated in over the last several years.

75. Angela Olegario, International Fertilizer Industry (IFA), France

Dear Contributors and Moderators;

Allow me to share with you this symposium that is coming soon which hopefully will provide some insights on the topic under discussion. The symposium can provide some information on what we know, what we don't know and how we can move forward in relation to fertilizing crops to improve human health. I hope the link works.

<http://scisoc.confex.com/scisoc/2012am/webprogram/Session9949.html>.

Thank you.

76. Final Year Economics Students (Group 1), University of Guyana [third contribution]

What can our institutions do to help country governments commit to action around your recommendations, and to help ensure implementation will be effective?

There are many ways your institutions can help country government's commit to the actions, these are just a few:

Coordinate and integrate nutrition based programs across state agencies and governmental organizations nationwide with the aim of getting expert advice on strengthening program coordination and implementation.

Contribute more to the decision making capacities in developing countries by guiding governments on how to effectively formulate policies and strategies for agricultural development given certain technical and political constraints. Your institutions can also seek more avenues for

obtaining more accurate state and local data to guide your decision-making and policy formulation. This is very important because accurate data about a country's nutritional portfolio is an essential aspect when deciding how and when to allocate resources to address the issue of nutrition intake.

The Institutions can also help governments commit to action by providing more grants and low interest loans for nutrition based projects, they can also assist by convincing and getting donors to contribute and support to cash based intervention such as free cash grants and vouchers to much needed families (especially in LDC's), this can help increase household purchasing power. However, these cash based interventions should be based on the magnitude of under-nutrition.

Assist with capacity building efforts, by encouraging and supporting initiatives such as PROFAV worldwide. (find out more at: http://www.fao.org/agriculture/crops/news-events-bulletins/detail/en/item/92762/icode/?no_cache=1)

77. Kathleen Kurz, USA

A few lessons learned thus far in trying to improve nutrition through our agriculture and food security projects:

“Nutrition” has different meanings – being clear about them in each project or policy context is essential to good planning, goal setting and approach.

Nutritionists tend to seek to reduce the stunting and wasting rates (the poor nutritional status) among children under 2 years, and often also to reduce maternal and child anemia and vitamin A and iodine deficiencies. Agriculture and food security specialists tend to picture increasing the nutritional quality of diets in households, assuring adequate vitamin, mineral, protein and fat content. Having enough quantity of food so as to avoid hunger tends to be categorized more as household food security than household nutrition. The two are related, but not the same. Agriculture and food security projects are well-suited to improving the nutritional quality of diets. If a goal of a project or policy is to improve nutritional status (reduce stunting, wasting, anemia and vitamin and iodine deficiencies), however, two other types of interventions beyond diversifying diets are essential: improved care such as the behavior elements of child feeding practices and hygiene, and improved health such as preventing or quickly treating diarrhea, malaria and pneumonia. All three – diversified diet, care, and health -- are needed to improve a child's nutritional status; if one is missing, it will become the limiting factor; and often all three limited where child stunting and anemia are prevalent. If a project seeks, for example, to improve maternal and child dietary diversity, then the outcomes against which it is evaluated should be maternal and child dietary diversity, but not child stunting.

Awareness in households and communities of the importance of dietary diversity and of good child growth is low, and the best communication channels for increasing awareness are not always clear.

The term “hidden hunger” was coined for micronutrient malnutrition, but actually applies to the vast majority of child stunting and wasting as well. Unless a child is severely malnourished, he tends to look small, and in many countries with stunting prevalence near 50%, small looks normal. Raising awareness about the problem whose impact looks normal is extremely challenging. This is particularly true amid myriad other development priorities whose impacts are visible. A robust country- or region- specific communication strategy is essential, including knowledge on how households and communities perceive nutrition, and what and who are the key influences on raising nutrition awareness.

Kathleen Kurz, PhD
Principal Development Specialist-Nutrition
DAI, 7600 Wisconsin Ave., Suite 200, Bethesda, MD 20814

78. Rahul Goswami, Centre for Communication and Development Studies, India

Dear FSN moderators and friends,

Thank you for framing a few questions around a subject that is of utmost importance, and also for extending the deadline to submit responses. I will prefer responding to these questions in a different order. My reason for doing so is that this topic has been framed in a way that can tend to obscure key actors responsible for a number of the problems concerning cultivation, the provisioning of food, the price at which it is available, the choices that can be made by consumers, and the consequences of being unable to make choices that suit them.

Hence "Making agriculture work for nutrition" may divert us from other matters that seek to reshape agriculture. If agriculture is working as it used to (following some of the evidence that we have of pre-industrial agriculture), then the nutrition aspects are taken care of implicitly. If agriculture is not being carried out as it used to be, then our experience and knowledge (qualities that lead us to such a forum in the first place) tell us that the transformations it has been forced through, in the last few decades, are a culprit. To begin to rethink agriculture as a delivery system for nutritional goals (such as the MDGs) disconnects agriculture from its role as the locus of communities which, in their most durable forms, have been 'resilient' (a term much in vogue nowadays) for centuries. If we then ask, what has changed, I think we will find a raft of influences have changed in ways most fundamental to how crops are cultivated - in our discussions, let us not treat these as inert, for doing so will seriously if not fatally hinder our understanding of why the nutrition question is being posed on this forum.

What will be hindered or otherwise obscured? Let's look at this premise: "There is now considerable interest among international development organizations and practitioners in agriculture programming and policy to improve nutrition." Yes there is now, as there was eleven five-year plans ago in my country, India, when central planning aimed to do better to feed the hungry and to pay the farming household fairly for its service in providing foodgrain. What has changed in the interim? Some of the answer lies here: "... the increasing number of international development institutions formally weighing in on the topic ...multiple institutions for planning, implementing, and supporting nutrition-sensitive agriculture, as well as a number of gaps that limit action on these principles". In the introduction to this topic you posed a few questions.

These are, one by one: what are the main approaches we collectively see as most important? To answer, I cannot see there is a 'collective' approach - for countries (if they are small in size and population) and with sub-national regions (roughly corresponding to agro-ecological regions) there will be approaches based on more or less important needs, whether these needs are finding livelihoods, ensuring that water and land resources are not grabbed, finding alternatives to migration out of rural areas, and similar concerns. The second question was: what are some practical recommendations that can more effectively promote, support, and guarantee the integration of nutrition into agriculture and food security investments? To answer, I doubt any of us are in a position to provide guarantees of any sort. National governments can provide counter-guarantees (as these instruments are called, supported by policy measures) to 'investors' that help their 'confidence' (to invest). It is uncommon to find national governments providing counter-guarantees with similar alacrity and eagerness to their own citizens these days on the matter of providing adequate food at an affordable price. So we in this FSN community may have the knowledge and experience to make a host of practical recommendations, all at the local level - but in what way are these actions related to the idea of investment, and investment by whom?

And finally: what research is needed? To answer, if we revisit the research conducted in the rural regions of, let us say, 'developing' countries 50 and 60 years ago, we will no doubt find enough to guide us today too. The social medicine followed by Rudolf Virchow in Silesia in the late 19th century, as an analogy, has as much relevance today as it did then. The 'Indore method' of

composting, documented by Albert Howard and Yashwant Wad in the first decades of the 20th century, is more relevant today perhaps than it was then. We would be ill-advised to ignore the research conducted in the past simply because of its vintage and the perception that the major problems that beset us today - climate change, galloping urbanisation, destructive macro-economics - are beyond the scope of the learning these can provide.

Hence, taking the last question first (this is: which agriculture investments would you suggest that can improve nutrition? and can you think of interventions that at the same time correct other harms of current approaches and policies, thus creating further opportunities?), here is my short response. There is no agriculture 'investment' to improve nutrition other than the farming household and the cultivating community being allowed to follow the routes its accumulated wisdom and oral transmission of practice suggests. No more 'investment' in agriculture per se is required. Investments in social sector services - such as good quality and affordable rural healthcare, culturally relevant education - which may combine with sober and helpful local legislation and laws that protect land and water resources, these can allow cultivating communities to find sources of nutrition and provide non-growers (in towns and cities) the cereals, vegetables, fruits and herbs they need. Indeed, there have been and continue to be 'harms' embodied in current approaches and policies. But will their correction amount to justice or opportunity, and if opportunity, then for whom?

Looking at this landscape from a country that produces more than enough to feed itself (India) and which nonetheless has about 20 per cent of its children under five being wasted, 43 per cent underweight and 48 per cent stunted (in terms of numbers this is about 54 million children under five years in India who are underweight which constitutes about 37 per cent of the total underweight children in the world), the question of opportunity can sound both simple and sinister. This is because there has in the last five years (and especially since the 2007-08 food price escalation) there has been no dearth of new programmes and consortia created that aim to increase yield, deliver micro-nutrition and bio-fortification, facilitate 'better' access to 'new' markets and in general tackle hunger by promising innovation and private sector savvy.

Consider one of these, called a 'New Vision for Agriculture', and which is led by the Consumer Industries Community (whatever that means) of the World Economic Forum. This programme, in its own words, "works to develop a shared agenda for action and foster multistakeholder collaboration to achieve sustainable agricultural growth through market-based solutions". [Using the idiom so typical of the Davos gatherings this programme claims to have "defined a vision](#) that highlights agriculture's potential as a positive driver of food security, environmental sustainability and economic opportunity worldwide". Indeed, if such organisation and such prose was all that it takes, there would have been no need for an FSN Forum, would there? Market utopias are advanced by the profit motive, and are usually easily recognised as such, but again over the last five years they have become very much more sophisticated than before, and can nowadays usually be identified through descriptions such as "a diverse network of global and local stakeholders ...engaged in initiative activities, including governments, international organisations, civil society, farmers organisations, research and academia ...a high-level multi-stakeholder group, provides advisory and leadership support".

The point here is, however these are described, the monetary power and policy influence exerted by such consortia is enormous. The Grow Africa partnership, a joint programme, if I understand it correctly, of the African Union, NEPAD and the World Economic Forum, has said it will "accelerate sustainable investment in African agriculture to improve food security". Political support comes from the G8 and has taken the form of what is called a New Alliance for Food Security and Nutrition. Who are the 'stakeholders' in this case, other than the intergovernmental grouping and programme secretariats? There are 49 companies which together want to invest more than US\$ 3 billion. Is that combined figure more than the annual combined budget on agriculture of the 54 states of the African Union? If it is, would it be used in ways that support diverse farming systems that ensure that adequate diets are accessible to all, and which simultaneously support the livelihoods of poor

farmers and that are ecologically sustainable? The history of the expansion of the global agri-food industry - especially in the last ten years in what are euphemistically called 'emerging economies' - is convincingly otherwise.

To move on to the next question, which is "What can our institutions do to help country governments commit to action around your recommendations, and to help ensure implementation will be effective?" I ask you accept that my recommendations will be more or less rural- and smallholder farming household-oriented as will be others on this list. Our institutions - I am taking these to mean local institutions, in the form of small farmers' cooperatives, growers' associations, enlightened consumer groups, progressive administrators at district level - are being and will continue to be subjected to shocks caused by the volatility of prices (in what macroeconomists call the 'real' sector, indicated by the steady upward swing of consumer price indices) of food, and also by the volatility transferred to their local economic circles by the gyrations in the agricultural commodities markets. Macroeconomic planners (unfortunately, many are still cut from the same cloth, and display little useful appreciation of actual household conditions in the 'real' sector) periodically complain that such volatility has a negative impact on economic growth, discourages investment and reduces the accumulation of physical capital. I can't see these effects as provoking complaint amongst the growing number of practitioners and advocates of the Transition movement, for 'degrowth' becomes one of the several key characteristics of such a society. To touch the question again, can our current local institutions embrace a 'degrowth' manifesto which delivers food and nutrition security just as surely as it insulates itself from the volatility associated with over-exposure to the 'market'? Probably not yet, but this is a worthwhile goal. For, ranged against us is the oft-repeated logic that diversification (in and of food marketing systems and its retail front-end) and industrialisation (of agriculture) remain important factors in order that agriculture contribute to GDP growth. [You can see this logic at work in the G20 Commodity Markets sub-group summary report on the impacts of excessive commodity price volatility on growth.](#)

We are asked how, "to support the design and implementation of this programme [the one we outline under the first question], where would you like to see more research done, and why?" and to do justice here I would like to dwell upon the 'research' meme as it is applied to smallholder cultivation, to organic agriculture, to subsistence cultivation, to a human-sympathetic study of cultivating households. What might we find with a research guidance that follows cultural pathways, rather than one (so zealously peddled by phalanxes of new consortia) that is technology-driven and whose impulses are oriented towards trade and markets? I would like to explain by backgrounding my home region, in coastal western India, the small state of Goa. Here, the distance between the sea and a long chain of hills (the Western Ghats, a global biodiversity hotspot that has this year been included in UNESCO's World Heritage sites) that marks the western boundary of the enormous Deccan Plateau of peninsular India is no more than 55 kilometres at its widest. In this zone, so favoured by the south-west monsoon, there are to be found the remnants of a most ingenious rice-fish farming system which skilfully employed the tidal estuaries and a myriad small waterways. These were commons, administered collectively and their use governed by an elaborate system of coding. In the early 1980s, Goa and the adjacent regions were home to paddy histories that included over 20 varieties of rice unique to this agro-ecological region, a number of them saline-tolerant. Further towards the hills we find the dense integrated farming plots which have carefully, painstakingly accumulated growing diversity for its food value, for medicinal purposes, for commercial sale, for fruit and to fulfil the need for a ready supply of offerings (flowers, certain herbs, certain fruit) to deities (prayers and the religious calendar when read with scriptures serve as media that reinforces the ecological principle, that enshrines the ancient kernel of sustainability). In these plots, through tiered layers that rise to the canopies of the mango tree and the areca-nut tree, we find also the 'neem', the drumstick, the tamarind, small groves of coconut palms, edible gourds and a trove of local leafy vegetables.

These rural homes, for whom cultivation is a cultural activity just as much as it relates to supplementing cereal staples with the rest of the typical vegetarian food basket, have followed orally principles of sustainability for more generations than any of them can count. They maintain

high diversity in on-farm niches and to buffer against climatic and economic adversities; they have long ago combined species to enhance productivity and yields (especially in aquatic systems, which are in rapid decline over the last 20 years because of the pressure of urbanising settlements); they mastered crop rotations and intercropping, they mastered too the algebra of nutrient availability, developed their local science of pest and disease control and water management. Transmitting this lore from parents to children the knowledge of management practices that use complex, ecologically-grounded approaches (no place for off-farm inputs brought in by the seduction of short-term outputs), they invested great care in the nurturing of soil biodiversity (long before the Indian national agricultural research system began classifying the sub-continent's soil groups). They studied and conserved arthropod biodiversity to increase localised understanding of how agro-ecosystems function - this became a key ingredient in effective pest management in rice production in the rice-fish farming system, which in turn depended upon careful observations about the monsoon, and the fresh water-brackish water cycle that balanced from one season to another the entire system and so transported the community with a degree of contentment and I am sure thankfulness.

In the same way, I understand that in the Philippines there are still more than 300 kinds of edible fruit and that no more than a handful have been, as they now tend to say, 'commercialised'. There are reputed to be edible nuts in the Philippines that the urban markets are still ignorant about and yet despite the equal legacy of cultivating communities stewarding tropical diversity of utmost richness the country also contains one of the world's largest pineapple plantation businesses, whose daily and annual operations alike are overhung with the mountainous debt incurred to keep that particular supply chain in good order - it is a question of investor confidence whose ugly marriage to retail mendacity robs the growing communities of the Philippines of their accumulated wisdom, generation by generation. Yes we need a research, one that can identify and arrest this loss. And even so, what research can replace the lost rice strains of my native Goa, where the fat and fragrant red grains have been displaced by pale hybrids bearing sterile alphanumeric code names?

This is a well-trodden path, although one that governments and an internationalised agri-research network has only nodding acquaintance with, and that too reluctantly. Organisations such as the International Institute of Environment and Development (IIED) have about 40 years' experience working alongside such communities. [In its published work, the IIED has repeatedly emphasised that measures to increase 'resilience'](#) (whether for climate change or to absorb the excesses of globalisation) must view food, energy and water as interconnected and mutually dependent - indeed I would have added traditional knowledge systems, for these underpin our values and behaviour. In a similar way, this has been the core of [UNESCO's Management of Social Transformations Programme, which is of a similar vintage and has more than 40 years of study and careful reflection](#) that can guide us through troubled times ("A Guide for the Perplexed", E F Schumacher had once written, and so very useful that slim volume proved to be). These are the holistic approaches that must also be applied to economic analysis on what is now being called adaptation planning. I am convinced it is vital to use traditional knowledge and the rich raft of management skills available within communities that live with their legacies, to follow such planning - it is, in this view, the moral compass for the 'green economy' which is a term blithely and glibly appropriated by industry and their partners in government.

And so on to the final poser, "if you were designing an agricultural investment programme, what are the top 5 things you would do to maximize its impact on nutrition?". The foregoing paragraphs will help, I hope, justify why I cannot answer this as an individual or as a representative of an organisation or group. It is really not in our hands, nor ought it to be. In cities and urbanising regions of the world in which households - having struggled with food inflation for five straight years and facing no relief in the visible short term - are taking to growing some of their food basket ([see FAO's first status report on urban and peri-urban horticulture in Africa](#)) the impulse and practice to find and maintain food independence takes on a myriad shapes and directions, a kaleidoscope of growing creativity in hostile environments. Do these households - in dense housing blocks crammed into fast-expanding suburbs, in shanty towns ruled by water supply and land

mafias - have choices that are just and fair? No, they are making desperate attempts, using whatever residual community knowledge they can muster, to find an equity from within. Consider what the United Nations Special Rapporteur on the Right to Food said about the right to an adequate diet ([he called it the agriculture-food-health nexus and it was presented to the 19th Session of the United Nations Human Rights Council](#)). "The health impacts of bad diets are well known ...unhealthy diets increase the risks of cancers of the breast, colon, prostate and other organs. Low intake of fruits and vegetables, for instance, increases the risks not only of cardiovascular diseases, but also that of gastrointestinal cancers." A homogenous approach to insuring the poor and the indigent (regulated nonetheless by endless grey paragraphs of WTO directive, subject nonetheless to the need to preserve 'shareholder value', that final metric of all things financial) will further burden these households. The cash transfer programmes that have begun in several countries over the last five years and which will be emulated in many more (mine included) are not agents of change, rather they are agents of the idea that chronic dependency can be an effective tool of governance at the most local level. The corollary is that other behaviours - by households and by rural communities, convinced that reclaiming their right to grow and to choose their food and nutrition futures - is beginning to be seen as declarations of independence. In our labours to make as much sense of it all as we can, do we stand for science, for equity and fairness, for the means with which hunger may end, or for an independence rooted in cultural values and respectful of the knowledge streams that brought us this far without endangering our environment?

Thank you and regards, Rahul Goswami

Additional notes:

1. See the CGIAR [Research Program on Climate Change, Agriculture and Food Security \(CCAFS\)](#)
2. In 2012 August, [FAO recorded that the international prices of grains](#) averaged 23 percent higher in July than June- maize at record levels; export prices of maize increased sharply in the first three weeks of July and remained firm to the end of the month while international prices of wheat followed a similar trend to those of maize through July.
3. See Oxfam's report on the world's largest commodity traders which have a significant impact on the modern agri-food system. "Archer Daniels Midland (ADM), Bunge, Cargill and Louis Dreyfus, are dominant traders of grain globally and central to the food system, but their role is poorly understood," said the report. [This report considers the traders - collectively known as the ABCDs - in relation to several global issues pressing on agriculture:](#) the 'financialisation' of both commodity trade and agricultural production; the emergence of global competitors to the ABCDs; and some implications of large-scale industrial biofuels, a sector in which the ABCDs are closely involved.
4. See this report by Der Spiegel on price surges since the beginning of the agricultural crisis in 2008 that cannot be explained by normal factors. "Market prices for rice, for example, sometimes shoot up by 30 percent in a single day," said the report. [Growing demand causes futures prices to rise, which ultimately affects the real market](#)- which is precisely the problem. Many studies show that futures contracts affect prices on real markets, and experts only disagree on how large the effect is.
5. Cargill is the world's biggest grain trader and produces meat, animal feed, food additives and a host of other products. [Cargill CEO Greg Page wrote an opinion article in The Washington Post, "How to ensure the world's food supply"](#). He wrote that the keys to meeting the world's food needs are freer trade, the elimination of mandates for biofuels and "closing the agricultural productivity gap between Africa and the rest of the world."
6. The New Alliance for Food Security and Nutrition [is a programme by the government of the USA in which 45 multinational corporations are participating](#). These corporations are reported to have committed to investing billions of dollars in Africa.
7. Chinese agribusinesses are changing the landscape of farming at home. [China Dialogue in an analytical feature said that "the new face of agriculture in China is no longer the household farmer](#) but people like Liu Yonghao, president of the US\$8.8 billion agribusiness New Hope Group and China's fourth richest person". This company claims to process 750 million fowl and 8.5 million pigs a year and already owns 16 feed factories outside of the country.

8. Shenggen Fan, director of the International Food Policy Research Institute ([IFPRI, which is one of the CGIAR institutes](#)), [is reported to have said that the food price crisis "is not here yet"](#) but that "if droughts in India, Russia and a couple of other major food producers become worse, we will see continued tightened food supply. Trade restrictions by these countries will make the situation worse." This is an extremely problematic viewpoint as it ignores (a) the crisis that has not departed since the 2007-08 food price escalation, and which has deepened since 2011 as a cursory look at country CPIs shows, and (b) that food inflation is being advanced as evidence that trade restrictions are to blame, when in fact it is exposure to global price volatility as a result of such trading that has been transmitted to local food markets and which has helped drive up food inflation.

79. Daniel Adotu, Africare, Uganda

We need to educate the farmers on how they can obtain and eat nutritious foods without us providing these foods.
Farmers should be taught on locally available nutritious foods and be able to sustain themselves once we leave the community, also considering the nutritious needs of each age group.

Daniel Adotu

80. Subhash Mehta, Devarao Shivaram Trust, India

Dear colleagues,

I am happy that FSN has focused on this very important subject and received very valuable suggestions and solutions to reduce hunger, malnutrition, poverty and suicides while improving access to nutritious food, purchasing power, net incomes and effects of climate change.

Quoting Patrick Webb, Director, Global Nutrition CRSP – Asia and Dean, The Fletcher School, Tufts University, United States

“There is agreement internationally that evidence - based programming at scale is possible, ‘things that work’, to improve nutrition. It’s no more pilots and efficacy trials but an understanding of delivery, ‘what works at large scale in practice - with a big focus on costs and effectiveness’, integrated sustainable agriculture for the production of safe and nutritious food. The largest gap is in, ‘knowledge of how best to design and implement multi-sector, integrated programs at scale that combine the positive impacts of integrated agriculture, producing nutritious and healthy food and managed through the whole value chain’. The CGIAR (CRP4) and USAID’s Global Nutrition CRSP are focused on this and where the FTF’s research agenda is expected to play an important role in advocating for and sustaining, this kind of research globally”.

I am looking forward to CFS taking forward most of the suggestions and solutions given, thus ensuring the long term sustainability of the resource poor rural communities/ smallholder producers.

Warm regards

Subhash

81. Murasi Mulupi, Kenya Red Cross Society, Kenya

There is need for research and advocacy on good agricultural practices geared towards sustainable agriculture. Pre-harvest conditions of food crops have direct impact on the nutritional and overall

quality of harvested foods. Toxins accumulated in crops as a result of irrigation using water with high levels of salts like Chloride and Sodium manifest on leaves and fruits as burns and discolorations reducing expected yield and market value. Repeated irrigation results into leaching of minerals causing a pile up in the lower soils. With the increasing shortage of safe water for domestic use and agriculture globally coupled with the ever increasing urban population and poor sewage management especially in the developing countries, sewage water is being used for irrigation purposes Scott et al (2004). It is estimated by the IRC 2005 report "Wastewater irrigation: sewage waters a tenth of world's crops" that one tenth of world food is produced using sewage water. Heavy metals and bacteria absorbed by plants end up in plates with adverse health implications on the consumers.

Farmers in the rural should be sensitized on the need for using mild chemicals by hazard as classified by the World Health Organization, with shorter pre harvest intervals and persistence for pest and disease control. An integrated approach in pest and disease management involving biological, mechanical and chemicals as the very last resort has proved to be workable and cost effective.

Africa experiences huge postharvest losses caused by deterioration and rotting of fresh farm produces, which implies that the final product reaching the consumer is nutritionally flat. Temperature directly affects rate of respiration of the products and hence deterioration, rotting and reduced shelf life. In most developing countries it is difficult to talk about food nutrition before first addressing food shortage. A number of factors ranging from changing climatic variables, scarcity of resources and knowledge, insistence on traditional livelihoods to the expense of modern trends in agriculture among others factors have contributed to this phenomenon.

Awareness campaigns on hygienic handling of foods at all levels of production is key in ensuring global food safety.

Investment by stakeholders and governments in knowledge and infrastructure in cold chain management, waste water recycling, advocacy and adoption of resistant crop varieties to harsh climate, pests and diseases will guarantee food availability and enhanced nutrition at all times.

References

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http://www.source.irc.nl/e_source_news/e_source/source_news_sections/fea...

82. Lalita Bhattacharjee and Abdul Mannan, National Food Policy Capacity Strengthening Programme, FAO and Mostafa Faruq Al Banna, Food Planning and Monitoring Unit, Ministry of Food, Bangladesh

1. If you were designing an agriculture investment programme, what are the top 5 things you would do to maximize its impact on nutrition?

- As part of the agricultural policy, it would be foremost necessary to view agriculture within an ecosystem context rather than focus on enhancing production and productivity alone. The agricultural system should be able to provide a diverse variety of foods that can be locally grown/produced. From a household nutrition perspective, this should encompass an integrated farming system that supports the production of integrated horticulture, small livestock, indigenous food systems and pond aquaculture.
- In promoting local foods for household food security and nutrition, engage national and sub national level agriculture specialists assist in identifying a list of nutritious local foods (indigenous roots, herbs, leaves, fruits, and fish), suitable for production in household gardens in collaboration with the community for production and promotion of affordable local foods compatible with the local ecosystems.
- Identify and establish explicit nutrition (production, consumption and dietary diversity and anthropometric) indicators to be monitored as part of nutritional impact assessment

especially focusing on the first 1000 days of life covering the period from conception until 2 years of age.

- Integrate and incorporate a set of core, consistent and critical messages in nutrition for dissemination across core sectors of agriculture, food and health extension services so as to enhance consumption of a variety of foods - on correct food combinations, preparations, processing using appropriate technologies and storage for household and community levels focusing on enhancing the diets of mothers and young children.
- Invest in training and capacity building of extension workers, community workers and women farmer groups across agriculture, livestock and fisheries and health sectors equipping them with an integrated package of agriculture, nutrition, health and hygiene promotion modules.

2. To support the design and implementation of this programme, where would you like more research to be done, and why?

- Developing, documenting and promoting nutrient dense food varieties/cultivars/species also specific to agro climatic conditions are required at national levels. This would include HYV cereal varieties, coarse grains/millet, nutrient - rich pulses, local poultry and indigenous/small fish species as well as insects, livestock development and genetic improvement with a focus on cow and goat for milk production, mushrooms, vegetables and fruits (yellow sweet potato, pumpkin, leguminous/bean vegetables, vegetable and fruits rich in pro vitamin A carotenoids, citrus fruits and others), herbs, spices and medicinal plants.
- Establishing mixed fruit orchards and intercropping for increasing production of horticulture foods that provide micronutrients, anti oxidants and intensifying the process of crop diversification to make available more energy and protein rich foods at affordable cost .eg. sorghum, millets and maize; intercropping to produce non staple food crops.
- Such research is required not only make available a range of nutritious foods and food combinations but also to address issues of bioavailability that is crucial for the development and promotion of food based strategies based on dietary diversification. Overall, it is necessary for sustainable increase of diversified food production with a nutrition orientation that is developed through improved technology and resilient management practices.

3. What can our institutions do to help country governments commit to action around your recommendations, and to help ensure implementation will be effective?

- Research and academic organizations, relevant UN agencies, Development partners as well as the private sector (as and where necessary) will need to commit support through innovative technical expertise, technology transfer, strengthening extension services, establishing /strengthening food storage and supply chain facilities, policy advice, monitoring and strengthening policy implementation with achievement of targets and nutrition improvement outcomes and impacts especially on maternal and child nutrition.
- Country- led agriculture plans and initiatives need to be developed that are anchored in the policy, programmatic and financial frameworks of the national development plans and strategies. Prioritization and costing of agriculture and food security interventions that impact on nutrition are required in addition to putting in place processes and systems that are results- based, guide monitoring and implementation and demonstrate policy impact to enable effectiveness of nutrition oriented agriculture interventions.
- Given the climate change impacts on food and nutrition security particularly for the vulnerable poor, integrated agricultural development and resilience interventions and actions will be required that lead to enhanced production, productivity, balanced growth, value chain and increased access to food and nutrition through appropriate institutional arrangements and sustainable resource management.

- Strengthen the integration of nutrition education through agricultural extension, investing in and mobilizing women and supporting agricultural tasks that women are engaged in and prioritizing those that generate employment and improve nutrition of households and children.

83. Lizzy Nneka Igbine, Nigerian Women Farmers Association

I will give a brief on sensitive food and making Agriculture work. and a summary of Nutrition. However in my submission to [ICN's call for Papers](#), I will give my full research report.

Food is a daily consumptions by man to live and continue his existence on earth in other words food is life and it requires value for existence.

Sensitive food can be described as high calorie high value food. This has more vitamin content and has various functions that enables proper growth and gives required vitamin content for the required age, group or people..

Making Agriculture work for Nutrition is the science of Producing Adequate foods of value, high in vitamin content, iron, energy and suitable for consumption for the entire population at affordable price and available within the reach of the population.

The definition of value, quality and affordability is the challenge we face. This makes us to go further to How and What should be done.

There is need to do an assessment of daily vitamins requirements, of each group and the science of producing suitable food for the population.

This will be properly stated in submission to ICN call.

There is need also to look into GMOs (Genetically modified foods and there vitamin content and ask if GMOs are a sustainable substitute. (Our research institutes.)

There is need to evaluate past and present interventions, to this I will like to use statistical datas in finding out modern challenges of today's Agriculture and Nutritional values.

LIZZY IGBINE
NATIONAL PRESIDENT
NIWAAFA
NIGERIAN WOMEN AGRO ALLIED FARMERS ASSOCIATION.

84. Julien Sanon, Grand View University, USA

Dear moderators and colleagues,

There are so many great ideas and contributions to the forum that it has become extremely difficult to come up with original ones. I will second [Professor James Levinson's](#) idea that the infant and young child nutrition (IYCN) program will be an excellent starting point considering the devastating effects of malnutrition in those vulnerable populations. With an agricultural focus on maternal, infant and young children nutrition on the first 1000 days, there is no doubt that the impact on nutrition in developing countries will be impressive. Empowering the women through education and agriculture with government and private policies will certainly reinforce the important role that women play in nutrition while at the same time maximizing the impact of agricultural activities on nutrition.

The most frustrating aspect of designing a program is usually when the results of all those laborious researches are "lost in translation" during its implementation stage. To that effect, I would love to see more research done in behavioural science within both fields in order to come up with the most effective and sustainable methods to maximize the results of such projects.

On the other hand, institutions could use a similar approach to the "conditional cash programs" in order to make country governments more accountable. One of the drawbacks to this method, however, relates to the particular characteristics of those specific countries which may not be

amenable to a “one size fits all” formula. Therefore, it would simply be fair to apply the sanctions only after the program has been tailored and individualized for each country government.

J
ulien Sanon

85. Action contre la Faim (ACF), France, sent by Etienne du Vachat

Dear all,

First of all, we would like to thank the moderators for the important topic of this consultation which echoes many current initiatives in a constructive way.

Action Against Hunger - ACF has really appreciated the quality of the FAO report "Synthesis of Guiding Principles on Agriculture Programming for Nutrition" and shares its recommendations. Maximising the nutritional impact of our interventions in food security and agriculture - as well as in other sectors - is a main challenge for us.

1. If you were designing an agricultural investment programme, what are the top 5 things you would do to maximize its impact on nutrition?

Targeting the 5 key actions is a difficult task indeed when eventually a holistic approach, looking at the global coherence (particularly with regard to 'doing no harm') of the intervention, will be required. It's such a holistic approach which is needed around the following 5 main issues to make agriculture work for nutrition:

- A better nutrition (and the protection of the nutritional status of the populations) as an explicit goal of programmes and policies in agriculture and nutritional outcome indicators to measure the long-term effects. To this end, ensuring the availability of nutritional statistics for agricultural decision-makers at all level, to be used as references, outcome indicators, etc., is highly needed.

- A better understanding and consideration of the nutritional situation and trends, the seasonality of under-nutrition, its causes, the identification of the most at-risk groups (the most vulnerable and the most affected by undernutrition), etc., by the 'programers' as well as the 'implementors' (agricultural extensionists for instance). This requires stronger knowledge in nutrition AND a closer coordination between sectors. To this regard, trainings of Ministry of Agriculture staffs on the importance of nutrition, the use of nutritional indicators, the links between agriculture and nutrition and the need for multisectoral approaches is a high priority. This should be done within the broader capacity building and strengthening of the national agricultural extension systems.

- A stronger attention to the nutritional value of crops (vs their commercial value only), including biodiversity and local knowledge. This includes promoting diversification of crops and livelihoods, especially with diverse nutrient-rich food crops. A focus on post-harvest nutrient conservation is very much needed as well.

- A better understanding and systematic consideration of the key role women play at the same time in agricultural/livelihoods activities, household members diet and care practices. Ensure agricultural programs are actually benefiting and empowering women, mainstreaming gender issues in their different dimensions: availability of food, income, access to land, knowledge and inputs, not increasing time constraints, etc.

- Systematically questioning at each step of programme development what impacts, positive and negative, it can have on nutrition to adjust accordingly. In this regard, the IYCN Nutritional Impact Assessment Tool is a very practical tool to facilitate this process. Here again, support and inputs from nutrition experts is required.

Here we want to stress that there is a strong risk that stand-alone specific actions (targeted on one causal factor for instance) will not be the most effective to tackle undernutrition.

2. To support the design and implementation of this programme, where would you like to see more research done, and why?

Clearly, there is a need to identify "what works" for improved nutrition and to experiment different approaches and programmes, to capitalize and scale-up the lessons learned at the national policy level.

3. What can our institutions do to help country governments commit to action around your recommendations, and to help ensure implementation will be effective?

This is a very important point. The SUN roadmap is actually quite light on this issue of 'nutrition sensitive agriculture' and needs to be strengthened. We want to suggest the production of a framework document or roadmap based on the 'guiding principles on Agriculture Programming for Nutrition' targeted at national government decision-makers. This should be done ideally within a high level, inclusive forum or platform to foster consensus and agree on priorities.

To this regard, we would like to draw your attention on a recent ACF report on the main strengths and weaknesses of the SUN implementation at country level (with two focus on Niger and Bangladesh), available: <http://www.actioncontrelafaim.org/sites/default/files/publications/fichiers/underthesunreportacf.pdf>. One of the recommendations is to work towards defining what 'nutrition-sensitive' interventions should look like and building consensus on that. "Determining what a multisectoral approach and effective 'nutrition sensitive' interventions should be is proving to be difficult at country level, which has led to calls for more efforts on evidence building to help determining what effective 'nutrition sensitive' interventions should be." (see page 63)

This should be done with a focus on different key sectors (obviously including agriculture but also education, social protection, water and sanitation, women empowerment, reproductive health and family planning).

We hope this will contribute to the discussion.

86. Christian Kouebou, IRAD, Cameroun

[Original contribution in French]

1. Si vous étiez chargé d'élaborer un programme d'investissements agricoles, quels seraient les 5 principales mesures à adopter pour en maximiser l'impact sur la nutrition ?

Au Cameroun à l'exemple de l'Afrique subsaharienne, la zone des savanes est plus vulnérable que la zone forestière. Les programmes abordant les thématiques suivantes seraient prioritaires:

1.1- Accroître la production agricole, en particulier intensifier à travers les axes suivants :

- renforcer l'accès aux intrants agricoles de qualité, avec en priorité les semences, les engrais et les produits phyto-sanitaires. Par exemple, le système semencier au Cameroun est orienté d'abord vers les cultures industrielles (cacao, coton, bananier, palmier), très faiblement vers les denrées amylacées (céréales, racine et tubercules) et les fruitiers (agrumes, manguiers), quasi-inexistant pour les légumineuses (arachides, niébé, haricot, soja) et les légumes feuilles. Au niveau animalier,

seule la filière « poulet » semble émerger. Les efforts de développement des autres espèces animales (bovin, ovin, caprin, porcs...) et halieutiques sont soit inexistantes soit imperceptibles.

- accroître les possibilités de mécanisation de certaines opérations-clés : labour (traction animale ou tracteur motorisé), semis (semoir mécanisé ou motorisé) et égrenage. Il y a insuffisance de ces prestations à travers des services collectifs ou individuels. Au nord-Cameroun, seuls 15 à 20% des exploitations ont des équipements de traction animale (paire de bœuf, âne, cheval) et le semis et l'égrenage se font à 95-99% manuellement.

1.2 – Mieux gérer la production

- renforcer le stockage des récoltes. Des initiatives publiques (Office Céréalière, MIRAP) et privées (Confédération Nationale des Producteurs de Coton du Cameroun) et humanitaires (PAM) existent dans le sahel mais elles sont individuelles. Leur effets sont parcellaires et leur impact peu visible sur les populations (au sahel).

1.3- Mieux éduquer sur la nutrition

- Inclure l'éducation nutritionnelle dans les programmes de formation des formateurs et de renforcement des capacités des producteurs entre autres acteurs agro-sylvo-pastoraux. L'importance nutritionnelle des légumineuses, des légumes-feuilles, des fruits tropicaux, des insectes (termites) de lait (bovin), des œufs (poules, canard, pigeons, cailles) et bien d'autres produits animaux et halieutiques entre autres produits forestiers non-ligneux est mal connue (ou absolument pas) par les groupes vulnérables et les décideurs. Cette biodiversité est pourtant disponible et accessible. Elle mérite d'être mieux connue non seulement pour sa valeur marchande mais également pour sa richesse en nutriments.

2. Dans quels domaines souhaitez-vous intensifier les recherches pour étayer l'élaboration et la mise en œuvre d'un tel programme, et pourquoi?

- Mieux appréhender la dynamique de diversification entamées par les paysans à travers les cultures de contre saison (sorgho de contre saison, maraichage, racines et tubercules), l'agriculture périurbaine et celle des bas fonds. La sécurité alimentaire reste une affaire des paysans tel que le montre les exemples du sorgho de contre saison (dans le bassin du lac Tchad) et du riz (réémergent depuis la crise cotonnière) au nord-Cameroun.

- densifier la recherche en faveur de systèmes de multiplication et fourniture des semences de qualité (céréales, légumineuses...), les systèmes favorisant la conservation des sols (couverture végétale) ou leur enrichissement (agro-foresterie, résidus de récoltes et autres matières organiques).

- comprendre les mécanismes actuels (public et privé) de stockage des récoltes (acteurs, financement, fonctionnement...) afin de les rendre davantage performants.

- étudier et communiquer sur la composition nutritionnelle des denrées et l'impact des traitements post-récolte et culinaires sur leur valeur et la disponibilité des nutriments. En fait la recherche gagnerait à mieux étudier l'évolution des pratiques alimentaires dans le contexte de crises (environnementale ou politico-militaire) et les stratégies locales et régionale d'adaptation ou de mitigation des crises. Elles permettent à aux populations du nord Cameroun de survivre et contiennent probablement (au moins en partie) les bases de la réussites des politiques.

3. Que peuvent faire nos institutions pour contribuer à ce que les gouvernements des pays s'engagent activement en faveur de vos recommandations, et en garantir la mise en œuvre efficace?

- encourager le gouvernement à renforcer les capacités (humaine, matérielle et financière) des ministères en charge de l'agriculture et de la recherche. Après près de 20 ans sans recrutement, une opération spéciale de « Recrutement de 25000 jeunes diplômés dans la fonction publique » a été menée en 2011 au Cameroun. Elle semble salubre pour le ministère de l'agriculture et l'enseignement supérieur. Bien que globalement insuffisante pour celui de la recherche. Le personnel de l'Institut de Recherche Agricole pour le Développement (le principal institut de recherche avec près de 2500 personnes) reste fortement en sous effectif (tant en qualité que quantité). D'autres recrutements seraient en cours.

- motiver le gouvernement à améliorer les conditions de rémunération des agents (cadres et autres) dans ces ministères en charge de l'agriculture, de la recherche. Comment retenir au Cameroun ou obtenir le meilleur d'un chercheur qui perçoit mensuellement 200000 à 300000 FCFA (\$400 - \$600) alors que son homologue de l'enseignement supérieur en a 2 à 3 fois plus et les cadres dans les institutions étrangères ou internationales en ont près de 3 à 10 fois plus ? L'âge de départ à la retraite (55 ans à la recherche contre 65 ans dans l'enseignement supérieur) est à harmoniser lorsqu'on a pas assez de professionnels dans la recherche et l'agriculture comme au Cameroun.

- inciter au renforcement (ou création) de cadres de concertation et d'actions synergiques entre les ministères de la recherche, de l'agriculture et celui de la santé et des enseignements (professionnelle ou universitaire).

[English translation]

1.If you were designing an agricultural investment programme, what are the top 5 things you would do to maximize its impact on nutrition?

In Cameroon, as in Sub-Saharan Africa, the savanna areas are more vulnerable than the forestry areas. Programs which address the following aspects would be a priority:

1.1- Increase agricultural production: in particular along the following lines,

- improve access to quality agricultural inputs, with priority on seeds, fertilizers and phytosanitary products. For example, the seeds system in Cameroon is aimed firstly at industrial crops (cocoa, cotton, bananas, palms) to a much lesser extent at starchy foodstuffs (cereals, roots and tubers) and fruits (citrus, mangoes) and is almost non-existent for pulse (peanuts, cowpeas, beans, soya) and leafy vegetables. For animals, only the "chicken" sector appears to be emerging. Development efforts on other animal species (cattle, sheep, goats, pigs...) and fisheries are non-existent or almost invisible.

- increase the mechanization possibilities of some key operations: ploughing (animal or power-driven tractor), sowing (a mechanized or engine-driven seed-drill) and husking. There is insufficient provision of these through collective or individual services. In the north of Cameroon, only 15 to 20% of farms have equipment drawn by animals (a pair of oxen, donkeys or horses) and 95 to 99% of sowing and husking are carried out manually.

1.2 – Better management of Production

- improve crop storage. Public Initiatives (National Cereal Board, MIRAP[Mass Product Consumer Regulatory Authority]) and private (National confederation of Cotton Producers of Cameroon) and humanitarian (WFP) exist in the Sahel but they are working individually. Their efforts are fragmented and their impact on the population (in the Sahel) not very evident.

1.3-Improve Education on Nutrition

- Include nutritional education in the training-of-trainers' programmes and development of capacities of the producers among other actors in the agro-sylvo pastoral sector. The nutritional importance of pulse, leafy vegetables, tropical fruits, insects (termites), milk (cows), eggs (chicken,

duck, pigeons, quails) and lots of other animal and fish products, among other non-timber forestry products is not well known (or not known at all) by the vulnerable groups and the decision-makers. This biodiversity is however, available and accessible. It deserves to be better known not only for its market value but also for its wealth in nutrients.

2. To support the design and implementation of this programme, where would you like to see more research done, and why?

- Better understand the dynamic of the diversification undertaken by farmers through out of season crops (out of season sorghum, market gardening, roots and tubers), semi-urban and swamp based agriculture. Food security is still the farmers' business as the examples of out of season sorghum (in the Lake Chad basin) and rice (re-emerging after the cotton crisis) in the north of Cameroon.

- Intensify research towards systems for multiplication and supply of quality seeds (cereals, pulse...), the systems that benefit soil conservation (vegetable cover) or their improvement (agro-forestry, crops residues and other organic matter).

- understand the present mechanisms (public and private) of crop storage (actors, financing, how it works...) in order to improve their performance.

- study and communicate the nutritional composition of foodstuffs and the impact of after harvest and culinary treatment on their value and the availability of nutrients. Actually, the research would benefit by further studying the evolution of feeding practices in the context of crises (environmental or political-military) and the local and regional strategies for adaptation to or mitigation of crises. They allow the people in the north of Cameroon to survive and probably contain (at least in part) the basis for successful policies.

3. What can our institutions do to help country governments commit to action around your recommendations, and to help ensure implementation will be effective?

- encourage the government to reinforce the capacities (human, material and finances) of the Ministries responsible for agriculture and research. After more than 20 years without recruitment, a special operation of "recruitment of 25,000 young professionals for public service" has taken place in Cameroon in 2011. It seems to benefit the Ministry of Agriculture and higher education. However, it is globally insufficient for research. The staff at the Agriculture Research Institute for Development (the main research institute, with 2,500 people) remains very insufficient (both in quality and quantity). Another recruitment drive will follow.

- motivate the government to improve staff remuneration conditions (executive and others) in the ministries responsible for agriculture and research. How can one retain in Cameroon, or get the best out of, a researcher who gets between 200,000 to 300,000 FCFA (USD\$400-600) a month, while his equivalent in higher education will earn 2 to 3 times more, and the executive at foreign or international institutions could earn between 3 to 10 times more? The retirement age (55 years old in research against 65 in higher education) should be brought into line considering that we do not have enough professionals in research and agriculture in Cameroon.

- promote the reinforcement (or creation) of frameworks for consultation and joint actions between the ministries of research, and of agriculture and those of health and education (professional or university)

Christiant Kouebou

Cameroun IRAD (Institut of Agric. Res. for Devlpm - Institute for Agricultural Research for Development)

87. Kamal Karunagoda, Department of Agriculture, Sri Lanka

1. If you were designing an agricultural investment program, what are the top 5 things you would do to maximize its impact on nutrition?

- **Scrutinize the appropriateness of current agricultural development ideas vis a vis improving nutrition.** The rural community had endowed with rich and diverse sources of foods. If analyzed properly, traditional food habits and diversity were able to provide adequate nutrition and nutrient content of those foods were comparable to the modern recommendations. Many interventions have been adopted to improve agricultural production but impact of bizarre development ideas has resulted less availability quality foods, loss of important plant genetic resources and less diversity of food in many regions. Participatory approaches in agricultural development planning would make better outcome than top down approaches.
- **Promotion of appropriate farming systems to improve local availability of food in regions where chronic malnutrition prevails.**

The recent statistics indicate increase in proportion of population with malnutrition. The prevalence of high levels of malnutrition in rural areas, particularly among agricultural households, indicates that there are constraints in availability, affordability and accessibility to adequate nutrition. These constraints are brought about by differences in many factors such as institutional setup, infrastructure, socio-economic characteristics, and quality of resource base. Decrease in nutritional status in rural areas needs special attention in development planning. Investments on R&D and increase in adaptive research, allocation of resources to promote local production of food would improve the local availability and accessibility of food. Promotion of diversity in farming systems in non-food production agricultural region would be a challenge as workers may not have property rights for lands to invest on food production. Therefore, innovations are required in such regions to promote appropriate farming systems to cater for nutrition of residential labor force and their families.

Support for local innovations and scaling up of identified innovations would provide fast track approach to expedite agriculture work for nutrition.

- **Investments in supply chain development and capacity development programs to improving household nutrition.** Improvement in both economic and agricultural indicators, both at macro and micro levels, has been witnessed during the past few decades. Despite these developments, nutritional indicators of children and adults show deterioration in many regions. It indicates the influence of other factors on nutrition of households. The changes in socio-economic environment may have induced households to demand more non-food than food and thus, considerable portion of household's income has to be allocated to non-food items. Further, household's dependency on formal market for food and nutrition has been increased overtime. Therefore, investments in improvement of efficiency of food supply chains, promotion/development of food markets at micro level and concerted effort to improve household's knowledge on proper nutrition would be imperative investments in promotion of agriculture working for nutrition. Improved efficiency of markets and knowledgeable households would stimulate demand and supply forces. The services of extension officers

could be enhanced to pass the messages of nutrition for the benefit of farmer community as well as consumers.

- **Conservation and popularization of traditional food crops/trees to increase local availability and diversity of food.**

Traditional knowledge and practices had been in place to protect and sustain agriculture work for nutrition for many decades. The value of these resources has not been given adequate attention in agricultural policies and interventions that were undertaken to increase food production. Consequently, many agricultural areas have transferred from high crop/food diversity to low food diversity regions. Degradation of natural resources (soil, water and plant genetic resources), deterioration of local knowledge on nutritive foods are also evident in these agricultural regions.

The recent advances in agriculture have improved food availability but the capacity of these advances to work for nutritional equity is limited by many economic and non-economic factors. The climate and geographical heterogeneity of different agricultural sub regions may not provide single solution to the theme. Regional specific policies that rely on local knowledge and promotion of traditional knowledge/crops related to nutrition would support agriculture working for nutrition. Promotion of participatory approaches in natural resource conservation, increase public investments in conservation of food-plant genetic materials, maintenance of food supply abilities of different land classes (eg. seasonal and perennial crop lands), adoption of strategic policies to avoid causes of degradation of diverse food sources, strategic interventions in private land use on non-agricultural purposes are imperative for agriculture to work for nutrition.

- **Coordination of production/supply programs to reduce seasonality of supply**

Seasonality of food supply may act as a constraint to promote agriculture work for nutrition. There is a need of technological breakthrough for off-seasonal agricultural production or utilization of natural climate differences to maintain food supply levels. Further, innovations and incentives are necessary to reduce severe seasonal fluctuation of supply and prices. It would be a difficult task to coordinate large number of small scale farmers in production decision but, use of ICT would provide cost effective solution to implement supply management programs. Diversification of farm income sources and institutional development to stabilize farm prices are required for stabilization of farm income.

- **Promote home gardening and protected agriculture to increase supply during off-season.**

Home gardening provides numerous health benefits through nutrition and recreation. Home gardener's effort should be facilitated with educational programs and availability of inputs. The small gardens could be developed into agricultural gardens that are working for nutrition.

2. To support the design and implementation of this program, where would you like to see more research done, and why?

- i. More R&D on locally available plant genetic resources to improve nutrition and use of traditional knowledge related to nutrition.

- ii. Use of perennial tree food crops to supplement seasonal crop production and off-seasonal food supply. The capacity of tree crops in nutrition has not fully utilized and tree crops can provide year round food supply.
- iii. Use of different land classes to supplement food demands. More attention has been given to increase seasonal crops in low lands. The importance of highlands in food production has not given adequate attention and high lands are being converted to non-agricultural purposes.
- iv. Institutional impacts, particularly laws and regulation, and changes in land markets could prevent land use for agriculture in suburbs of urban centers. The land masses around urban centers could remain idle due to non-agricultural interests, property right issues, economics of crop production and poor market development. Utilization of these land masses close to the urban markets needs R&D investments, policy changes and support of many institutions.

3. What can our institutions do to help country governments commit to action around your recommendations, and to help ensure implementation will be effective?

1. Support in identification of best solution that is adaptable to regional needs and promote institutional partnership to achieve nutritional objectives

The lack of high correlation between economic growth and nutrition indicates the need of alternative measures for agriculture to work for nutrition. In such a situation, policies and research could play an important role in promoting agriculture to work for nutrition. Statistics are available on regions with severe malnutrition problems. The necessary conditions to overcome this problem are; action plan, targeted R&D investments, promotion of financial and institutional commitments to achieve the targets. Informal education could be promoted to enhance nutrition and transfer of local knowledge to practice. Policy directives and budgetary commitments have to be focused more on conservation of diverse food sources and promotion of cultivation.

88. Anna Herforth and Cristina Lopriore, facilitators

We are astounded by the richness of this discussion. There are so many important, useful, well-said ideas that it is impossible to make note of them all without copying and pasting the entire proceedings. We are grateful to those who contributed in writing, as well as those many more who read and thought about the contributions. More largely, we are grateful for the important work you do with conviction, as expressed through the thoughts you shared – truly actualizing these ideas. Participants wrote in from many parts of the world, based in many professional and student roles; that we were able to share across these boundaries on a topic of common interest is one of the best parts of this Forum. How encouraging it was to see class projects inspired by the discussion from the University of Guyana; and responses from the very people who are sometimes the focus of advice in this topic: students in non-nutrition academic training programs, ministry staff, and women agriculture extension and marketing professionals! We are encouraged that this topic was important to you, and we are grateful to read your contributions.

We introduced this discussion with the idea to provide inputs and key points back to upcoming high-level agenda-setting events, such as the CFS (next week), GCARD, workshop on nutrition in CAADP, and others. Remarks made by leaders of global organizations at the recent [SUN high-level event at the UNGA meetings in New York](#) (Sept 27, 2012) provides a way of putting this discussion into perspective of the global momentum around this topic. José Graziano da Silva (FAO Director

General) emphasized the need to recover traditional foods and gastronomy, as an opportunity to promote small-scale farmers and local production; and also to increase food and nutrition education in view of both obesity and hunger. Tamar Manuelyan Atinc (World Bank VP, Human Development) spoke of the need to produce affordable, diverse, nutritious foods throughout the year, as an essential to child growth and nutrition, itself essential to poverty reduction; and ensuring that the Bank's large agriculture investments have nutrition objectives and indicators. As noted by moderator David Nabarro, these comments represent a transformation happening within institutions, new resources being directed toward improved nutrition, and willingness of leaders to be accountable and to learn.

What is particularly encouraging about this momentum is that all of these institutions have many messages in common about the best way to link agriculture and nutrition, as shown in the [synthesis paper](#) shared at the outset of this discussion. Contributors to this Forum discussion represented a different cross-section of professionals than those involved in publishing the recent guidance; yet nonetheless, all the same key principles were raised many times over. These are some of the principles echoed very strongly in this discussion:

- The importance of understanding the nutrition situation, through participatory assessment, and causal analysis to understand pathways to nutrition outcomes for given set of actions. In combination with understanding the resources available, this will help focus resources on solutions that would address the problems.
- Nutrition objectives, and their measurement through monitoring and evaluation, as critical for designing programs to address nutrition, to link production better with nutritional needs, and for accountability.
- Systematic assessment of both positive and negative impacts.
- Emphasis on nutritional quality of food produced, not just quantity – supported through diversification, research, and national policy.
- Actions to empower women and put women at the center of interventions.
- Nutrition education in many forms.
- Natural resource management in many forms (e.g crop rotation, protection from soil erosion, biocontrol of pests).
- Reduction of food waste, and the important roles of value chain actors around food storage and distribution.
- Better access to markets, including infrastructure and post-harvest value addition, balanced with an approach that does not over-emphasize economic profit over diets and sustainability.
- Collaboration and communication across sectors and among all stakeholders.
- Advocacy for nutrition, with messages especially tailored to investors and those with ample political and financial resources (e.g. governments, private sector).
- Capacity building in extension, educators, and government staff.

While consistent with current institutional guidance as summarized above, there are a number of distinct priorities FSN Forum contributions emphasized more strongly:

- Environmentally sustainable production, including organic and low-input production, more innovative fertilization techniques and agronomic practices supporting soil biota.
- Diversity as the primary production approach (more than the language of “growing nutrient-rich foods”). The viewpoint is concerned with access to nutrient-rich diets among smallholders, but additionally reflects the value of biodiversity for both humans and ecosystems.
- Underutilized/orphan crops; and in the “do no harm” category, consideration of not only the impact of what is sown, but what may be lost in the harvest – including traditional knowledge as well as wild foods and indigenous crop varieties.
- Outcomes for communities, not just households or individuals, given the strong influence of local resources, knowledge, and norms on behavior.
- Overnutrition and undernutrition as both important nutrition problems, equally indicative of an inefficient and inequitable food system.
- Resilience in risk management and disaster response/mitigation, and including climate change considerations in all plans.
- Participatory or community-led approaches in program planning.

These themes emphasize, consistent with [FSN Forum discussion #76](#), a “systems approach for looking at how food and agriculture can contribute to better nutrition.” The research needs identified were very much along the lines of how to carry out the above priorities effectively, and with the right tools and technologies. We need to generate knowledge in “what works” – and ensure that more of it be documented and shared. Here, the supporting role of our institutions becomes important.

So what can our institutions do? These are the priorities we heard:

1. Carry out the recommendations voiced above in our operational work: Focus on local solutions and systems (context matters). Focus on women. Focus on vulnerable groups in a way that empowers. Focus on nutrition education including traditional knowledge. Do everything within an overarching goal to improve resilience and empowerment of households and communities, based in the natural resource base of water, living soil, and biological and genetic diversity.
2. Foster collaboration and communication – across sectors, across institutions.
3. Support research and evaluation of agriculture-nutrition projects: 1. with financial and human resources, and 2. with tools, methodologies, and indicators (for example, developing “mutual metrics” to consistently and accurately measure progress and impact, such as indicators of food security, dietary diversity, and women’s empowerment).
4. Advocate for nutrition. Shape understanding of “food security” in terms of dietary and nutrition impact.
5. Widely share knowledge: The international organizations have a role in providing easy access to common guidance and messages, important reports and forums, to reduce information asymmetry. Our institutions have a role in communication and knowledge sharing, for example through discussions like this one.

There is now a great deal of momentum around nutrition, and commitments of agencies to increase attention to nutrition through agriculture. There are a series of high-level meetings on these topics in the coming months and through 2013, and input from this discussion can emphasize a certain tone of inclusion. Together we were able to prioritize some key messages that should come across clearly to planners and policy-makers, and all actors. We hope to see a very productive year for nutrition, and this discussion certainly has already, and will continue to contribute to the momentum. We again thank you for your time, thought, and rich inputs.

Anna and Cristina