

SUMMARY OF THE FSN FORUM DISCUSSION No. 43
HOW TO FEED THE WORLD IN 2050?
FROM 16 SEPTEMBER TO 19 OCTOBER 2009

Proceedings available at
http://km.fao.org/fileadmin/user_upload/fsn/docs/PROCEEDINGS_How_to_Feed_the_World_in_2050.doc

TABLE OF CONTENTS

I. THE DISCUSSION AT A GLANCE	1
II. FOOD IS NOT FEEDING THE POOR NOW	2
III. FAILURES OF THE GLOBAL FOOD SYSTEM AND PARADIGM SHIFTS NEEDED	2
IV. PROPOSED APPROACHES TO PRODUCTION	3
V. ROLE OF POLICY, GOVERNANCE, INVESTMENTS	4
VI. ROLE OF STAKEHOLDERS	5
VII. NUTRITION IS A KEY COMPONENT	6
VIII. ROLE OF CONSUMPTION AND DIET PATTERNS	6
IX. R&D AND EXTENSION	7
X. CROSS CUTTING CHALLENGES: CLIMATE CHANGE AND BIOFUELS	7
XI. COMMUNICATION, INFORMATION, EDUCATION	7
XII. PROPOSALS FOR ACTION AND IDEAS	8
XIII. REFERENCES	8

I. THE DISCUSSION AT A GLANCE

Participants in this discussion have expressed a wide range of observations on the current global situation of food and agriculture and of ways for moving forward. Contributions ranged from technical solutions to broader cross cutting views on the food system as a whole, including global challenges such as climate change and biofuels. Many participants advocate a shift in paradigms in looking at the next 40 years yet also urgently call for immediate actions.

Hunger has to do with not only food availability, but especially with the lack of access to food. The reasons behind this are insufficient political will to address key food security concerns, structural problems, and weak governance, perpetuated by serious flaws in the current global food system. The role and responsibilities of the various actors involved were analyzed.

It has been highlighted that there is a need to change agriculture production processes - including moving away from high input agriculture. Sustainable and organic methods, coupled with modern techniques can play a major role also in supporting farmers' empowerment, agro-entrepreneurship and crop diversification. This must be accompanied by changes in consumption

patterns in the developed world. It is also necessary to raise awareness of the importance of adequate nutrition.

In summary, there is broad agreement that for food and agriculture systems, business as usual is not an option. Shifting paradigms in agricultural production must be accompanied by interrelated challenges in re-structuring food systems, markets and international regulations, including those governing patent rights.

This vision is also to a significant extent the one proposed by the International Assessment of Agricultural Knowledge, Science and Technology for Development (IAASTD), which has been mentioned by several contributors as the way forward when taking steps towards feeding the world now and in 2050.

II. FOOD IS NOT FEEDING THE POOR NOW

Several participants shared the view that hunger is an immediate urgent problem whose causes have not to do as much with availability than with access (M. Mosisi, C. Dufour, R. Kik, M. van Heemstra, W. Mwasaa), as the world has enough food to feed the whole world but for various reasons people cannot access it. (A. Asfaw)

Access to food cannot be guaranteed simply through technical approaches to increasing global production (A. Munzara), but has to do with production capacities of vulnerable farmers on the one hand and with additional or alternatives sources of income as “Food follows where money is (G. Kent P. Shrestha) and “access to food is linked to poverty”. (M. Singh, T. Mokake, A. Chakraborty, R. Rifici)

It has to be also considered that the number of poor and vulnerable people of the cities is growing and will need to be addressed by specific measures. (D. Zimmer, J. Custot)

If regardless of these considerations we follow up with the idea of promoting large scale commercial farming and increased use of genetically modified crops, the food supply would increase basically for the middle class and reduce prices that farmers receive throughout the world, that are already too low. (G. Kent)

Additionally, some specific region / country situations are highlighted, such as:

- Sub-Saharan Africa, where in a good number of cases people were hungry in the midst of plenty of food in the markets. It is vital to strengthen food safety and post harvest systems here and to enable small producers to supply markets becoming agro entrepreneurs”. (J. Afenyo)
- India, that is a food exporter although 200 million of mainly rural go to bed hungry (A. Rodrigues) and where millions of tons of food grains in the government warehouses get burnt or used as cattle. (DSK Rao)

No hunger, a participant stated, is a precondition of development and this still needs to be fully understood by governments. (A. MacMillan)

III. FAILURES OF THE GLOBAL FOOD SYSTEM AND PARADIGM SHIFTS NEEDED

The failures of the global food system have been widely underlined and examined, leading to the statement, quoted by many participants, that “Business as usual is not an option”. (G. Tansey, D. Stabinsky, G. Kent)

The systems for producing, buying, selling and sharing food are profoundly broken and more of the same will not help. We must accept that hunger is being caused by fractures in the structure of our global society, free trade, fossil fuelled agriculture, farm subsidies, unfair pricing policies and tariffs and the capitalist approach in general. (A. Munzara, D. Stabinsky, A. Rodrigues, R. Rifici, DSK Rao, E. Mwasaa, P.Chatenay)

We need to look at the global picture, using a multi sectoral approach and understanding “from field to fork” as well as “from undernourished to over-nourished” (D. Zimmer) and looking at things on an holistic basis. (DSK Rao)

A comprehensive analysis of the situation and the causes behind the global food system flaw is proposed by a participant:

“The core trends in the food system that dominates today have been driven by developments in the OECD countries, with saturated markets and the type of farming there. This is a fossil-fuel based, industrial and intensive approach, based on competition amongst and between the food system actors –input suppliers, traders, processors, retailers and caterers – for who makes what money out of the food system, which has squeezed both farmers and workers and aims to create new needs and demands amongst consumer for more profitable – or “value added” – products.

Within each of these areas, we have seen a growing economic concentration of power.

We have also seen a progressive deterioration in the terms of trade for rural people and farmers, the squeezing out of smaller farmers, the replacement of detailed local knowledge and labour using practices with broadly adapted varieties and breeds requiring fertiliser, pesticides and veterinary drugs to ensure productivity in more monocultural farming systems.

Furthermore, rules and regulations - and in particular those on intellectual property law - have become a key battleground in the past few decades, and, especially, since the global extension of minimum intellectual property standards through the TRIPS Agreement (World Trade Organisation Agreement on Trade-Related Aspects of Intellectual Property Rights), that offered a way to gain control of the base of the food chain by former chemical industries.

On the commercial side, retailer concentration has also led to powerful standard setting on suppliers throughout their supply chains globally” (G. Tansey).

The visions shared by many participants in the analysis of the food system flaws open the floor to the subsequent proposed choices of technologies and farming systems that covered the largest ground in the contributions received.

IV. PROPOSED APPROACHES TO PRODUCTION

Many participants stressed the need to shift away from conventional agriculture, namely large scale high-input monoculture largely based on fossil fuel.

Alternative ways of production such as sustainable and organic systems have been widely debated also by sharing experiences, evidences and literature on this matter and mentioning relevant reasons for supporting this approach from a technical, socio-economic and environmental perspective.

Reasons for rethinking the role of conventional farming systems have to do with its economic and environmental unsustainability, considering:

- the increase in energy costs: as petroleum based fertilizers, high traction inputs and export oriented crops may not be the best investments for a future world in which energy is more expensive, resources more scarce and population higher (K. Gallagher)
- carbon and ecological impacts of high input farming methods (R. Banerjee, R. Rifici)
- impacts on soil: intensive production systems using synthetic fertilizers and plant protection chemicals are leading to the steady degradation of the ecological base and a gradual decline in agricultural productivity. (PK Thampan)

On the other hand sustainable organic agriculture proves to ensure food security much better than conventional farming. Results are: diversification of agricultural production, higher income for farmers, better health status, farmer-led approach in management and diffusion. (L. Bachmann)

Environmentally sustainable, nutrition oriented cropping patterns using a blend of time-tested conventional and new technologies are the way to ensure increased availability and access to variety of foods (M. S. Bamji) as what is more relevant in the context of feeding the world is NOT just a single crop output but what can be achieved from the farming system as a whole. In this respect, organic farming in particular, pays out more dividends compared to high-input farming. (A. Widana)

Although myriads of works prove that organics can feed the world, the road from research to lifestyle still long. (M. Nurhasan)

Some contributions focused specifically on the issue of GMOs, namely supporting reasons for their limitation or elimination, although a few contributors were in favour of them.

Reliability if GM crops is questioned because plants cultivated naturally contain more complete nutrients (M. Nurhasan) and because although through genetic engineering it is possible to introduce additional genetic diversity, this diversity leads to on-farm uniformity when the new plant types start replacing the diverse varieties presently available. (PK Thampan) Moreover GM crops will neither feed India nor the world, as after 20 years of research and 13 of commercialisation, genetic engineering has not demonstrated sustainable benefits to farmers. (A. Rodrigues)

Some other techniques and methods were mentioned: the need to focus on increasing capacity of production and self production also in urban contexts (J. Custot), the development of natural resource based techniques such as watershed technologies (B. Neerchal), conservation agriculture (J. Breen and D. Glover), indigenous knowledge systems (V. Mugalavai), development of food banks (P. Shrestha), local compost methods (P. Methven).

Also land issues came in the debate:

- A reflection on communal versus privately owned land engaging pros and cons of both; (G. Ashton, J. Breen)
- Concerns regarding the increasing conversion of farmland into land for different uses. (C.L. van Beijma, the Kingma)

V. ROLE OF POLICY, GOVERNANCE, INVESTMENTS

Propositions for new paradigms and approaches to production need to be supported by strong and straight forward political will, as well as good governance and significant investments.

Participants called for a more effective mobilization of governments to take action to eradicate hunger and malnutrition and ensure sustainable supply growth (M. Gomez Porchini) underlining that too often political basics are lacking in many development countries (A. Chakraborty) and that the appearance of chronic malnutrition is the reflection of the structure under which the country is being ruled. (V. O. Puac)

The issue here is how to raise the level of global interest and specifically that of decision makers who have the capability of directing resources to feed the world (S. Blade) and how to make governments accountable for the engagements taken on food security issues as citizens are toothless in holding their governments accountable. (T. Mokake)

In this regard defining some quantifiable and measurable indicators and goals at national, regional and global level could help (A. Asfaw) as well as translating commitments controllable

actions. Governments should agree to sign up to a voluntary national declaration of commitment and a national food security and nutrition action plan in which they describe how they will achieve the goal in their country and how they will help other committed countries to achieve it; the Declaration and the Action Plan should be deposited in an International Public Register – for all to see – as an indication of the government's willingness to be held accountable for delivery on its commitments. (A. MacMillan)

Also the way development is measured came into the discussion: food security experts and practitioners should press economists and politicians to measure country economic growth and development with the improvement of people's life whereby household food security is the top indicator rather than striving and competing on their GDPs. (M. Mosisi)

In the direction of accountability some steps are recognised within the Right to Food framework, as the Voluntary Guidelines not only remind the governments of their obligations, they also give them guidance and support on how to realise their obligations (R. Kik): food, good health and education are human rights and as such it is mandatory to guarantee them and to respect them in all negotiations. (M. Gomez Porchini, A. Munzara)

Participants also debated on the issue of investments, arguing that there is a clear need to spend more share of budget on agricultural development for more and safe food production (R. Kakar, Y. Nath Das, V. Kumar), given that investment in agriculture has been steadily declining in percentage of national budgets since the 1970s. (PK Thampan, M.J Singh, B. Thompson & others)

VI. ROLE OF STAKEHOLDERS

For formulating any convention, policy and strategy massive interactions are required among extended numbers of stakeholders. (M. A. Roy)

Participants focused on three groups of actors in the global food and agriculture system: smallholders, corporations and international organisations, debating also on the linkages between them.

The importance of the poor farmers in the development (or lack of development) of developing countries has been too much neglected (D. Zimmer) and woman in particular need to be educated and empowered (R. Kik, D. Stabinsky, D. Zimmer, G. Tansey). The potential of farmers needs to be released providing them the tools to succeed such as market access, credit, risk management, acknowledgment of local knowledge. (S. Blade)

The issue of Local Power also come here as a key tool in advancing sustainability processes and programs. (V. O. Puac)

International development organisations have some responsibility with regard to food security and food aid; some participants also related their action or non action to multinational corporations that are setting the agenda. (R. Banerjee, C. Dufour) Often these organisations remain silent when most of the development aid meant for hunger reduction ends up being used by our state agencies for funding Agribusiness Corporations directly or indirectly, and the hungry are always excluded from the discussions on how to help them. (A. Chatterjee)

Moreover, in regard to food aid, international organisations role should not be to provide aids in food or technical packages as the cost of intermediation often is 100% and it is ineffective. The objective should be to promote choices and self decisions among the poor, infrastructure and regulation. (F. Leonardi)

The trends towards the concentration of agriculture in the hands of a few powerful multinationals sounds alarming to some (M. van Heemstra) although there are ways to wriggle out of this conflict by enabling laws that can compel the private sector to making their own contribution to

developments from huge profits they declare annually. This method had worked in Nigeria especially in the education sector where by law private sector contributes certain percentage of its annual profit to education tax fund. (L. Bamidele Taiwo)

Individuals must stop waiting for government and should take their destiny in their own hands, forming pressure groups in form of cooperative societies and prioritizing their needs. There must be the drive in the resource-poor individuals to survive. (L. Bamidele Taiwo)

VII. NUTRITION IS A KEY COMPONENT

Nutrition security was strongly recalled by some very in depth contributions to be integral and inseparable part of the question on "How to feed the world in 2050?".

In fact, agricultural development programmes that aim to address food security solely via increased production of staple crops, while essential, are insufficient for alleviating hunger and malnutrition: the importance of diet quality and diversity has to be recognised

Making nutrition security a priority area for investment is not only a moral imperative, it is integral to sustained economic growth and national development. (B.Thompson & others)

Moreover it has to be noted that poverty is not necessarily coincident with malnutrition. Moving from production to improved nutrition is progress. Africa's problem is not much of hunger as it is of hidden hunger which is lack of micronutrient intake (N. Nwoke Kalu) and, considering the high incidence of diseases in Africa for instance, it is clear that people require food that is able to meet their nutritional and health needs not simply "food" (S. Afenyo).

VIII. ROLE OF CONSUMPTION AND DIET PATTERNS

Consumers are key actors and may be the most important drivers in the future. (D. Zimmer)

Role of consumers and consumption patterns has been recalled emphasizing the link between production models and consumptions behaviours also in regards to dietary preferences.

This point of view in the discussion has to do mostly with sustainability aspects, as the 9 billion people expected in 40 years time will probably be unable to exist within the current exploitations systems and the challenge for agriculture as well as for everyone else meantime is to shift to a more benign set of rules where the planet is concerned. (P. Steele)

The actual richer countries patterns of behaviours and consumption from now to 2050 cannot be kept and the parallel question should be "What will feed the hungry?" if we fall into the trap of thinking that meat is the best food, then we are doomed (M. Lakhani). As a matter of fact, when people get richer they ask for more animal based proteins, but who is going to supply them? (F. Leonardi). The preference for foods of animal origin in developed countries causes the use of large amounts of food grains to feed cattle causing considerable wastage of food grains. (PK Thampan)

Moreover there is also a need to popularize locally important minor crops to ensure a more diversified and sustainable food supply. (S. Kumar)

A positive note here is that interest in local and organic foods and growing concerns on climate change are increasingly affecting local policies in western countries, where already consumers are shifting their demands towards sustainable food products. This trend can be certainly acknowledged as a starting point. (C. Dufour)

IX. R&D AND EXTENSION

Participants suggested various fields of interest related to R&D, specifying in many cases that the issue here is not just funds but the need to manage them in an effective and efficient way, with appropriate project management skills (B. Neerchal) and to direct efforts in the right research areas, which again comes back to the general issue of a clear understanding of the way forward.

Areas where R&D efforts should focus on include:

- reduction of post harvest losses via improved handling, preservation, storage, preparation and processing techniques to ensure that agricultural development leads to improved nutrition rather than simply boosting agricultural production. (B. Thompson)
- the benefits of micro-organisms in agriculture and alternative fertilizer strategies. (J.Breen)

Someone went as far as saying that we do not need more agricultural research but simply a stronger focus on participatory work with farmers and a much more efficient extension system (L. Bachmann); farmers can be perfect extensionists with some renewed education and empowering training. (A. Galvez Marsical, L. Bachman)

An issue that comes here relating to the global arena is the one of intellectual rights and patents: these should not be barriers to innovation and diffusion (R. Kik) and the exclusionary elements from patents affecting food security and climate change technologies should be removed to promote innovation more widely and beyond the control of a few players. (G. Tansey)

X. CROSS CUTTING CHALLENGES: CLIMATE CHANGE AND BIOFUELS

Climate change is already posing additional threats to food security and is likely to represent a major risk in the years to come; many contributions note that the problem should be considered more and that currently a fragmented approach is being followed at the global institutions level. (G. Tansey)

On the other hand the food sector is pointed out as a contributor to the problem and possibly to the solution at the same time.

The evidence highlights the fact that the global industrial food system is the most important "single factor behind global warming, responsible for almost half of the world's greenhouse gas emissions" and that its role in the climate crisis has been seriously underestimated. Soils contain enormous amounts of organic matter and therefore, carbon. Calculations show that the organic matter that has been lost over the past decades can be gradually rebuilt, if policy is oriented to agriculture in the hands of small farmers and their ability through alternative farming practices to restoring soil fertility (A. Rodriguez) and CO2 reduction programs should include sustainable agriculture as one viable way of reducing emissions. (L. Bachman)

Several participants called for action to minimize the competition between food and fuel, also proposing a stronger orientation of biofuels production based on crops that not compete with food supply. (M. Singh)

XI. COMMUNICATION, INFORMATION, EDUCATION

Three arguments were proposed here:

- Communication and awareness raising to support political action against hunger: to generate genuine political commitment, there is a need for a massive campaign aimed at raising popular awareness throughout the world about the problems of hunger and malnutrition and the solutions, with the aim that this should express itself in strong support for serious action. (A. MacMillan)

- Communication and information to the people, as without information people are condemned to be poor and malnourished. People need the information to allow them to participate in solving their problems, including food production and rising production levels. In other words, people need info to take their fate in their own hands (P. Steele, M. Gomez Porchini) and without info they are likely to be condemned more to malnutrition than poverty. (N. Nwoke Kalu)
- Education: no program to feed the world will succeed if education is not there as a basis to empower consumers, smallholders and farmers especially women. (A. Galvez Marsical)

XII. PROPOSALS FOR ACTION AND IDEAS

Many proposals and creative ideas came from the contributors, in particular, among others:

- Innovative use of information and communication technologies (ICT) in agriculture, that is lagging behind if comparing with other sectors such as education (C. Mugarura, V. Kumar);
- Enhancing the role of agriculture in other global debates, positioning it as solution provider: agriculture can sequester carbon, enhance nutritional density, increase biodiversity, manage wetlands, be an economic driver in rural economies, increase the amount of calories made available and deliver a host of other answers to global issues (S. Blade);
- Strengthening agriculture education: agricultural education in Universities should be interdisciplinary, with links to sociology, anthropology and other disciplines; moreover national programs where urban kids (and adults...and maybe political leaders) spend time in rural areas with farm families, including a garden in all schools for children to learn to grow food and having practice growing things as a compulsory part of school curriculum, as important as Maths or History and creating urban communal gardens in inner cities (M. van Heemstra);
- Measure food production per capita, and publish a list in the Economist every year of which countries have increased their productivity. Perhaps an "enhanced value" ratio (value-added production/raw commodity exports) could be highlighted (S. Blade);
- Setting a multi-stakeholder forum: to support the development of the comprehensive view of the issues which are a priority today that may help to raise the political dimensions of food issues is to set a multi-stakeholder forum (including decision makers, experts and civil society), building on the experience of the World Water Forum (D. Zimmer).

XIII. REFERENCES

Background Readings

FAO

- How to Feed the World in 2050 Issue Briefs
<http://www.fao.org/wsfs/forum2050/wsfs-background-documents/hlef-issues-briefs/en/>
- World Food Summit 1996 Portal
http://www.fao.org/wfs/index_en.htm
- Une voie étroite pour la sécurité alimentaire d'ici à 2050
<http://www.fao.org/DOCREP/003/X3002F/X3002F00.htm#TOC>

- A Synthesis Report of the Africa Region: Women, Agriculture and Rural Development
<http://www.fao.org/docrep/x0250e/x0250e00.htm>
- Food requirements and population growth
<http://www.fao.org/docrep/003/w2612e/w2612e04a.htm>

Others

- International Assessment of Agricultural Knowledge Science and Technology for Development (IAASTD)
<http://www.agassessment.org/index.cfm?Page=Overview&ItemID=3>
- World Bank's World Development Report 2008.
<http://econ.worldbank.org/WBSITE/EXTERNAL/EXTDEC/EXTRESEARCH/EXTWDRS/EXTWDR2008/0,,menuPK:2795178~pagePK:64167702~piPK:64167676~theSitePK:2795143,00.html>
- Report by the Commission on the Measurement of Economic Performance and Social Progress, Joseph E. Stiglitz, Amartya Sen, Jean-Paul Fitoussi,
http://www.stiglitz-sen-fitoussi.fr/documents/rapport_anglais.pdf
- The Feeding of the Nine Billion: Global Food Security for the 21st Century
Chatham House Report, Alex Evans
<http://www.chathamhouse.org.uk/publications/papers/view/-/id/694/>
- How Biofuels Could Starve the Poor, C. Ford Runge and Benjamin Senauer
<http://www.foreignaffairs.com/articles/62609/c-ford-runge-and-benjamin-senauer/how-biofuels-could-starve-the-poor>
- Earth population 'exceeds limits', Steven Duke
<http://news.bbc.co.uk/2/hi/science/nature/7974995.stm>
- I Remember / Norman Borlaug, Stanford Blade
<http://v1.theglobeandmail.com/servlet/story/LAC.20090929.IREM29ART2147//TPStory/Obituaries>
- Declaration from governments to eradicate hunger and malnutrition
<http://www.moreandbetter.org/en/news/declaration-from-governments-to-eradicate-hunger-and-malnutrition>
- Time to Deliver on Commitments: Eradicating Hunger and Malnutrition by 2025
http://typo3.fao.org/fileadmin/user_upload/fsn/docs/Background_Paper_and_Draft_DoC_25Sept.pdf.
- Feeding people is easy, Colin Tudge
<http://www.colintudge.com/articles/article12.php>
- Waste: dishing the dirt, Food Ethics Council
<http://www.foodethicscouncil.org/node/477>
- Economics of the entire farming system, Anura Widanapathirana
http://agriculturas.leisa.info/index.php?url=show-blob-html.tpl&p%5Bo_id%5D=12138&p%5Ba_id%5D=211&p%5Ba_seq%5D=1
- Food Access Model, Walter Mwasaa
http://typo3.fao.org/fileadmin/user_upload/fsn/docs/Food_Model.pdf

Role of policy (including Right to food), governance, investments

- A Call from the Cordoba Group for Coherence and Action on Food Security and Climate Change
http://www.fao.org/righttofood/news_pdf/news35_cordoba_declaration_EN.pdf
- Interactive Thematic Dialogue of the U.N. General Assembly on the Global Food Crisis and the Right to Food, Statement by Mr. Olivier de Schutter
<http://www.un.org/ga/president/63/interactive/globalfoodcrisis/oliverstatement.pdf>
- Investing in Agriculture: Far-Reaching Challenge, Significant Opportunity, DB Climate Change Advisors - Deutsche Bank Group
http://www.db.com/usa/download/Ag_whitepaper_062409.pdf
- The Future Control of Food - A Guide to International Negotiations and Rules on Intellectual Property, Biodiversity and Food Security, Geoff Tansey and Tasmin Rajotte
http://www.idrc.ca/en/ev-118094-201-1-DO_TOPIC.html#begining
- El Control Futuro de los Alimentos - Guía de las negociaciones y reglas internacionales sobre la propiedad intelectual, la biodiversidad y la seguridad alimentaria, Geoff Tansey y Tasmin Rajotte
http://www.idrc.ca/es/ev-118094-201-1-DO_TOPIC.html#begining

Approaches to production

- The Food and Farming Transition - Toward a Post Carbon Food System, Post Carbon Institute
<http://postcarbon.org/food>
- Conservation agriculture and smallholder farming in Africa: The heretics' view'
http://www.sciencedirect.com/science?_ob=MIimg&_imagekey=B6T6M-4WW16SX-1-9&_cdi=5034&_user=6718006&_orig=search&_coverDate=10%2F01%2F2009&_sk=998859998&view=c&wchp=dGLzVzz-zSkWb&md5=9b5b50fe525dc7db46e8a3d0c54d779a&ie=/sdarticle.pdf
- Organic Agriculture and Food Security in Africa United Nations, UNEP-UNCTAD Capacity- building Task Force on Trade, Environment and Development
http://www.unctad.org/trade_env/test1/publications/UNCTAD_DITC_TED_2007_15.pdf
- Thinking in Systems, Donella H. Meadows

Nutrition

- Biodiversity and Nutrition: FAO's role, Barbara Burlingame
http://www.cohabnet.org/cohab2008/documents/Day1BarbaraBurlingameUNFAO_001.pdf
- Nutritional composition of aquatic species in Laotian rice field ecosystems: possible impact of reduced biodiversity, Mulia Nurhasan
<http://www.ub.uit.no/munin/handle/10037/1434>
- Symposium on Nutrition Security for India Issues and Way Forward, Indian National Science Academy
http://typo3.fao.org/fileadmin/user_upload/fsn/docs/Symposium_Report_Nutrition_Security_India.pdf

Case studies

- Food from chemicals-free paddy fields
<http://cid-d45da47840a43937.skydrive.live.com/browse.aspx/Food%20from%20chemicals-free%20paddy%20fields>
- Sujala Watershed Project
http://watershed.kar.nic.in/website_dec2006/suj_hompg.htm
- Anaarkali - The saga of Bhil Tribal Adivasi Indigenous People
<http://www.anar-kali.blogspot.com/>