



AGRICULTURAL MODELS AND FOOD SYSTEMS MOVING FORWARD

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Agriculture is increasingly recognized as an engine of economic growth in Sub-Saharan Africa. The agriculture sector is a key to rural and economic development and a significant income generating sector for the world's poor. For example, eighty percent of Africa's poor, or 60% of Ghanaian poorⁱ, live in rural areas and depend on agriculture for their livelihoodsⁱⁱ. Understanding the role of agriculture in growth and development is especially important as this is a sector that is constantly changing. By 2050, the world will need an estimated 70% increase in food production to feed the predicted world population of 9.1 billionⁱⁱⁱ. As if this was not a challenge enough, the world's natural resources are degrading and becoming polluted, which has important effects on the agricultural sector. With these issues in mind, when looking at the future of agricultural models and food systems, the underlying goal is to meet the increasing demand for food in a sustainable way that improves rural livelihoods. There is little debate over this objective, the consensus breaks down when we start to look at how it can be achieved.

You may not know...

- *It is estimated that more food will be produced worldwide in the next 50 years than the past 10 000 years combined.*
- *Almost no country has rapidly decreased poverty without increasing agricultural production.*
- *GDP growth from agriculture is at least 2% more effective in decreasing poverty as non-agriculture-based GDP growth.*

(iv For Statistics Below)

Current Models and Global Trends

Current agricultural models around the world vary by region and within regions themselves. Worldwide, there is a general trend toward intensification, concentration and specialization in agriculture. Globalization has changed the face of this sector, increasing international trade and globalizing food systems. The benefits of globalized food systems have been uneven, arguably increasing marginalization of smallholder farmers^v. There is growing disparity among agricultural systems. The gap between the most productive and the least productive farmers has increased 20 times in the last 50 years^{vi}.

Within this context, there are some leading models and approaches:

Commercial: This model is mostly practiced in developed countries. It is primarily characterised by large farms, specialization, mechanization, and the use of synthetic inputs and technologies. The expansion of commercial farming played an important role in the Green Revolution in South Asia and Latin America^{vii}. Some question this agricultural model for its perceived negative environmental and health impacts and its dependency on fossil fuels. This model also encompasses intensive, extensive and industrial agriculture.

Smallholder: Small farms, sometimes less than an acre in size, in which a combination of cash crops and subsistence crops is produced, often supporting a family unit. Smallholder farmers are particularly vulnerable to economic, environmental and social shocks, such as input price changes and environmental disasters. Worldwide, there are approximately 500 million small farms in developing countries, supporting almost two billion people, or a third of humanity^{viii}. Half a billion Africans, or 65% of the continent's population, depend on small-scale farming for their livelihoods^{ix}. Eighty percent of that number farm less than 2 acres^x.

Organic: An increasing trend toward organic agriculture has grown out of food related health concerns and a questioning of the sustainability of commercial agriculture. It has now become the fastest growing food sector^{xi}. Organic agriculture can be defined as a "holistic production management system that avoids use of synthetic fertilizers, pesticides and genetically modified organisms, minimizing pollution of air, soil and water and optimizes the health and productivity of inter-dependent communities of plants, animals and people"^{xii}. Thirty-four percent of the world's certified organic farmers are in Africa^{xiii}.

Currently, organic farming uses 45% less energy than conventional farming^{xiv}. However, it has been observed that organic agriculture may be moving closer to an industrial agricultural model, with greater mechanization, specialization and farm enlargement^{xv}. One of the main hesitations with regard to organic agriculture is whether this model could actually feed the world's growing population. Recent studies, however, have shown that organic agriculture may provide similar yields to conventional models, and even outperform these models when rain is minimal^{xvi}. Organic agriculture should not be considered a panacea, but an alternative that may prove to be more sustainable than conventional industrial farming models.

Sustainable: Whether discussing industrial, organic or smallholder farms, more emphasis is being placed on sustainable models of agriculture. Sustainable agriculture incorporates "practices that meet current and future societal needs for food and fibre, for ecosystems services and for

*Only when the last tree has fallen,
the last river has dried up,
the last fish has been caught
will we realize that
we cannot eat money.*

healthy lives, and that do so by maximizing the net benefits to society when all costs and benefits of the practice are considered”^{xvii}.

Fair Trade: A production and marketplace model based on the principles of equality and fairness, and developing better terms of trade for producers and artisans. It is a system of product identification that allows consumers to make informed purchases and decisions.

Agro ecology: The application of ecological principles to the development of agricultural and food systems. It is less a model of what these systems should be, and more an approach to looking at the systems. Agro ecology has a significant focus on sustainability and the effects on natural resources.

Note: These models and trends are not exhaustive and are not necessarily mutually exclusive.

Balancing Act: Food Security, Sustainability and Poverty Alleviation

“Shortages of nutritious food condemn millions of our fellow human beings to far shorter lives than those in more food-secure countries. In the twenty-first century, this is a scandal that must shame all of us.”

John Agyekum Kufuor, former President of Ghana

The foundation of any agricultural model is to produce food, and beyond that, to ensure food security around the world. Food security includes food availability (markets – the food is there), access (you have the resources to access the food), stability (food is there at all times) and food use (the food meets all nutritional needs). Food security will become an increasing concern as populations continue to rise.

The challenge of food security does not lie with the agricultural sector alone, but also with governance, food distribution, markets, transportation etc.. In fact, the world can already produce enough food to feed double the current world population^{xviii}. Food production is not the whole answer to the question of future agricultural models, as this question has to be coupled with aspects of development, distribution, equality and sustainability. Some even argue that “the greatest food security gains typically come not directly from feeding programs, but rather indirectly, through policies that promote poverty reduction through employment creation and productivity growth among the poor, as well as safety nets to safeguard the vulnerable non-poor”^{xix}. However, increasing and expanding agricultural production and productivity will arguably play a role in ensuring food security in certain contexts.

In addition to food security, sustainability must also be considered. Sustainability is the idea that current agriculture models should not compromise our ability to feed future populations and the viability of our natural resources. Sustainability issues include water pollution, land degradation, loss of biodiversity and climate change. Smallholder farmers are particularly vulnerable to the changes brought on by degrading natural resources, as they are the most dependent on them and can lack the resources and capacity to adapt.

“We cannot change the problems we have with the same mindset that created them.” Einstein

The final weight to balance the scale is poverty alleviation. As noted, the agricultural sector remains the principal livelihood for the world’s poor and also a potential pathway for poverty alleviation. Policies and strategies to shape the future food systems of the world will also play a role in development, for rural populations in particular. This means that not only should these strategies consider the role of sustainability and food production, but also the impact on rural livelihoods. This understanding is exemplified in the Ghanaian Ministry of Food and Agriculture’s vision, which states poverty alleviation as a key role of the Ministry^{xx}.

xxi(Statistics Below)

Natural Resources Threatened

- *Costs of land degradation may be as much as 10% of GDP in Sub-Saharan Africa.*
- *In Africa, under the current trends of soil degradation, the continent may only be able to feed 25% of its population by 2050.*
- *Agriculture consumes 70% of all water use.*
- *Agriculture is the 2nd largest contributor to greenhouse gas emissions.*
- *Every +1°C increase to global temperatures will lead to 10% decrease in grain yields.*

Moving Forward: Challenges and Opportunities

Researching the future of agriculture turns up more ‘this is not going to work down the road’ than real strategies of what fields, forests and food will and should look like in the future. Agriculture is a diverse sector, and the models of what it could look like reflect this diversity. What is obvious is that there is a series of critical issues, such as food security, sustainability, equality and development, which currently have an enormous impact on the agricultural sector and will continue to play a key role in the future of this sector.

The greatest challenge for future agricultural models and food systems is to feed our increasing world population in a sustainable and poverty-alleviating way. However, there is little consensus surrounding which model would be able to feed growing populations sustainably. For example, Paul Collier, a leading development thinker, argues that, while supporting smallholder farmers is a romantic idea, it is through support to commercialization of farming and large farms that food security will be achieved^{xxii}. Steve Wiggins, a prominent agricultural development thinker, on the other hand, advocates for the potential of smallholder farmers^{xxiii}. Others that support Wiggins state that given the right conditions, smallholder farmers are innovative and will invest and conserve their natural resources.^{xxiv} Wiggins also suggests that we already know what is needed; it is a matter of implementation and prioritization^{xxv}.

What is crucial to remember, is that population growth and increasing agricultural productivity do not automatically lead to unsustainable environmental practices. Many of the technical solutions required already exist. What is required is an enabling environment that prioritizes sustainable agricultural development and is conducive to implementing practices that already exist as well as developing more sustainable and appropriate technologies for the future.

Alternatively, we can change the way we look at the problem altogether, not relying on solely one model as the panacea to agricultural development and sustainability, but understanding the role, benefit and challenges of a diversity of approaches in different contexts.

The future of agriculture is not only an economic question, but also a social, cultural and political one that must consider “the kind of rural society people would like” to see^{xxvi}.

“In times like these, we have to look for opportunities, and reshaping agriculture for the common good presents just such an opportunity.”

Dr. Louise Fresco, Head of FAO
Agriculture Department

Recommendations and Guidelines for EWB

Whether intentional or not, EWB's interventions and investments in the agricultural sector have an impact on the future model of agriculture, at least in the context of where we work. It is therefore important to start a dialogue on our vision of the future of the agricultural sector and to be asking ourselves how our work is currently having an impact on that vision. Although, as in the broader agricultural community, we may not come to a consensus on this vision, the dialogue has the potential to produce insights to help guide our work.

- In order to inform this dialogue, EWB should continue to develop its knowledge of the agricultural sector to understand how we play a role in shaping the future of the sector as well as the role of others.

EWB should look at agriculture holistically, within a frame of food security, poverty reduction and sustainability.

Looking at the future of agriculture is not only looking at future models, but also understanding under which conditions our goals can be achieved. With this in mind, EWB should support conditions for growth, research and implementation, in ways such as:

- Communicating farmer realities, and where possible, encouraging farmer participation in decision making.
- Promoting research, innovation and technologies that are appropriate to farmer realities.
- Develop innovative solutions and approaches to diffuse and implement appropriate sustainable technologies.
- Continue to share successful strategies and communicate research.



“We have a choice, the way we are heading, or the way we can imagine.”

David Sparling, ED of the Institute of Agri-Food Policy Innovation



Key Suggested Resources

Food and Agriculture Organization. June 2009. Experts Meeting: How to Feed the World in 2050. Food and Agriculture Organization. Rome.

- A variety of papers on the future of agriculture and food systems. Reflects the diversity of issues at hand, as well as differing opinions about where the future should and will lead us. Recommend reports by Steve Wiggins and Hans P. Binswanger Mkhize.
- Can be accessed: <http://www.fao.org/docrep/012/ak542e/ak542e00.htm>

El-Hage, Scialabba, Nadia. May 3-5, 2007. International Conference on Organic Agriculture and Food Security. Food and Agriculture Organization. Rome

- For insights into the role of organic agriculture in future agriculture and food systems.
- Can be accessed: <ftp://ftp.fao.org/paia/organicag/ofs/OFS-2007-5.pdf>

Tilman, David, Kenneth Cassman, Pamela Matson, Rosamond Naylor, and Stephen Polasky. Aug 8, 2002. "Agricultural Sustainability and Intensive Production Practices". *Nature*, vol. 418: 671-677.

- Definition of and insights into sustainable agriculture. Information on current trends and how they impact our environment and how they will affect future agriculture models.
- Can be accessed: <http://www.nature.com/nature/journal/v418/n6898/full/nature01014.html>

Friends of Europe. Spring 2010. "Helping Africa to Feed Itself: Promoting Agriculture to Address Poverty and Hunger". A Development Policy Forum Discussion Paper. Brussels.

- A good general overview of some of the questions and issues, specific to Africa.
- Can be accessed: <http://www.friendsofeurope.org/Contentnavigation/Library/Libraryoverview/tabid/1186/articleType/ArticleView/articleId/343/Helping-Africa-to-feed-itself-Promoting-agriculture-to-address-poverty-and-hunger.aspx>

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^v Trydeman Kudsen, Mare, Niels Halberg, Jorgen Olesen, John Byrne, Venkatesh Iyer, Noah Toly. Chapter 1: "Global Development of Organic Agriculture: Challenges and Promises". *Global Trends in Agriculture and Food Systems*. CAB International. Pg. 4.

^{vi} Ibid, pg. 5.

^{vii} For more information, you can access some of the following resources: William S. Gaud, Administrator March 8, 1968 Address: "The Green Revolution: Accomplishments and Apprehensions". Washington, DC. Accessed May 29, 2012 from <<http://www.agbioworld.org/biotech-info/topics/borlaug/borlaug-green.html>>. OR International Food

Policy Research Institute. 2002. "Green Revolution: Curse or Blessing?". USA.

<<http://www.ifpri.org/sites/default/files/pubs/pubs/ib/ib11.pdf>>.

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^{ix} African Smallholder Farmers Group. Africa's Smallholder Farmers. Accessed Nov. 18, 2011 from

<<http://www.farmafrica.org.uk/Final%20ASFG%20-%20Africas%20smallholder%20farmers.pdf>>.

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<<http://www.farmafrica.org.uk/Final%20ASFG%20-%20Africas%20smallholder%20farmers.pdf>>.

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^{xii} El-Hage, Scialabba, Nadia. May 3-5, 2007. International Conference on Organic Agriculture and Food Security. Food and Agriculture Organization. Rome. Pg. 2.

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^{xv} Trydeman Kudsen et al. pg. 2.

^{xvi} Lasheow, Sarah. Sept 19, 2011. "Thirty Years After the Original, a New Study of Organic Agriculture". *GOOD*. Accessed Oct. 2, from <www.good.is/post/over-thirty-years-proving-the-benefits-of-modern-organic-agriculture-tech/>.

^{xvii} Tilman, David, Kenneth Cassman, Pamela Matson, Rosamond Naylor, and Stephen Polasky. Aug 8, 2002.

"Agricultural Sustainability and Intensive Production Practices". *Nature*, vol. 418: 671-677. Pg. 671.

^{xviii} Statement by Jean Ziegler, UN Special Rapporteur on the Right to Food, On the Occasion of World Food Day.

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<<http://www.unhchr.ch/hurricane/hurricane.nsf/0/D53CB85688C438F9C125709D00262AEF?opendocument>>.

^{xix} Christopher B. Barrett, et al. *Measuring Food Insecurity*. *Science*. Vol 327. 12 February, 2010: 825-828, pg 827.

Accessed June 6, 2012 from

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Accessed Oct 2, 2011 from <<http://news.mongabay.com/2006/1214-unu.html>>.

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^{xxvi} Wiggins. Future Agricultures. Pg. 5.

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